PINpoint INFORMATION SYSTEMS

# V6.1 User Guide

# TOC

# PINpoint

## About this Manual

This documentation is designed for people who work with the PINpoint Software Suite.

### Conventions

Throughout this documentation, we've decided to present information in certain ways.

#### *Warnings and Notes*

For special information, watch for warnings and notes.

Warnings provide cautionary information on the possible effect of certain actions. Be sure to read and understand all warnings before performing a related procedure.

Notes provide additional information to help explain the functionality better. They also provide important information on exceptions to general guidelines.

#### *Structure*

The PINpoint System consists of websites, applications, services, and databases. This user guide is split into sections for each page of the website and for each application. The PINpoint Portal contains links to all the websites.

Each of these pages is represented by a section in this manual. In addition, there are sections which will give a broader understanding of a topic or contain specific instructions on how to perform a task. A list of the function of all the properties in the software is contained at the end.

# Contacting PINpoint

## Website

https://PINpointinfo.com/

https://PINpointinfo.com/Manuals

## Email

| Email | Address |
|---|---|
| Sales | sales@pinpointinfo.com |
| Administration | admin@pinpointinfo.com |
| Technical Support | techsupport@pinpointinfo.com |

## Phone

| Telephone | Number |
|---|---|
| Sales and Customer Service | 905 639-8787 then press 1 |
| Technical Support | 905 639-8787 then press 2 |
| Fax: | 905 639-8529 |

### Mailing Address

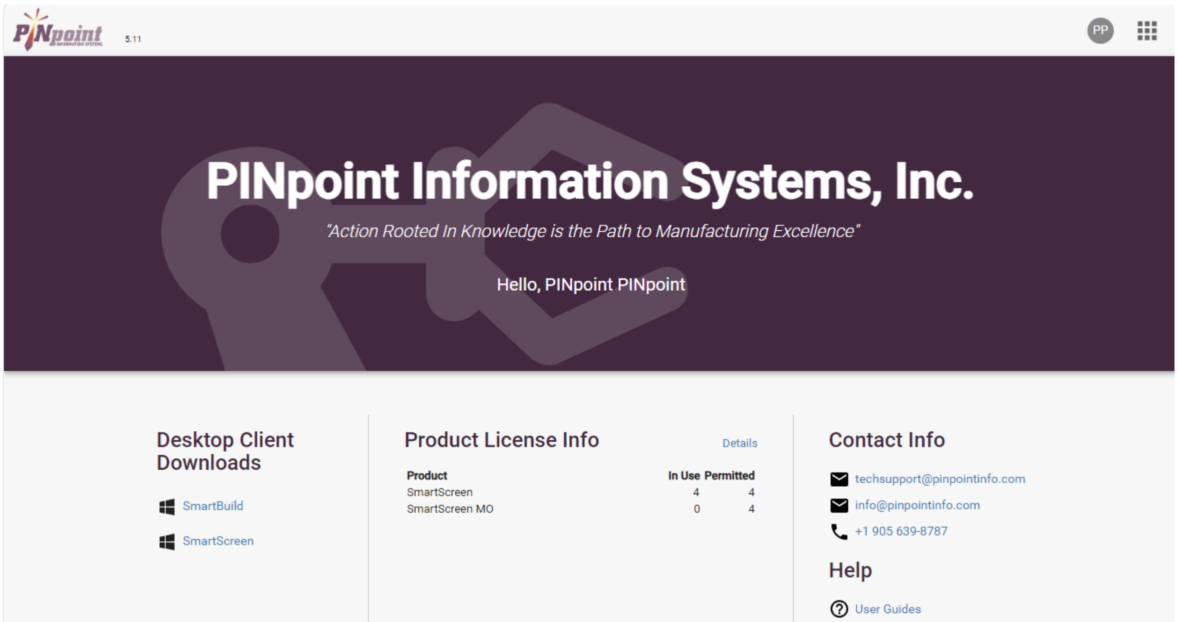
| Region | Mailing Address |
|---|---|
| Canada | PINpoint Information Systems Inc.<br>5045 South Service Road, Suite 201<br>Burlington, Ontario |

| Region | Mailing Address |
|---|---|
| | L7L 5Y7<br>Canada |
| USA | PINpoint Information Systems USA Inc.<br>725 Cools Springs Blvd Suite 600<br>Franklin, TN. 37067<br>U.S.A. |
| Asia | PINpoint Information Systems Inc. Shanghai Office<br>Room 915, 9/F, Tower 12, KIC III<br>No.333 Song Hu Road<br>Yangpu District<br>Shanghai 200433, China |

# Portal

The PINpoint Portal is the home page to the PINpoint software. It is installed on the customer intranet and the link is [https://customer/PINpoint.Portal](https://customer/PINpoint.Portal).

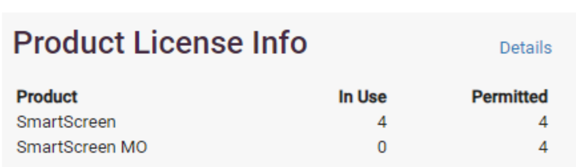
The PINpoint Portal




## Licensing

The PINpoint system must be licensed. PINpoint personnel will license the software installed at the facility. The license covers a certain amount of stations which can be run concurrently. The Portal home page will display an icon to allow users to check the current license information.

The product license info button will show the list of Licensed software products permitted.



Product License Info — Details

| Product | In Use | Permitted |
|---|---|---|
| SmartScreen | 4 | 4 |
| SmartScreen MO | 0 | 4 |

If there is an issue with the license there will be a warning message on all SmartScreen client's and BigScreens. The Portal will display information indicating what the license issue is.

The portal displaying a license issue. This shows that there are 12 SmartScreen clients running consuming 2 available SmartScreen MO licenses and 10 SmartScreen licenses when only 6 SmartScreen licenses are permitted.

### Product License Info

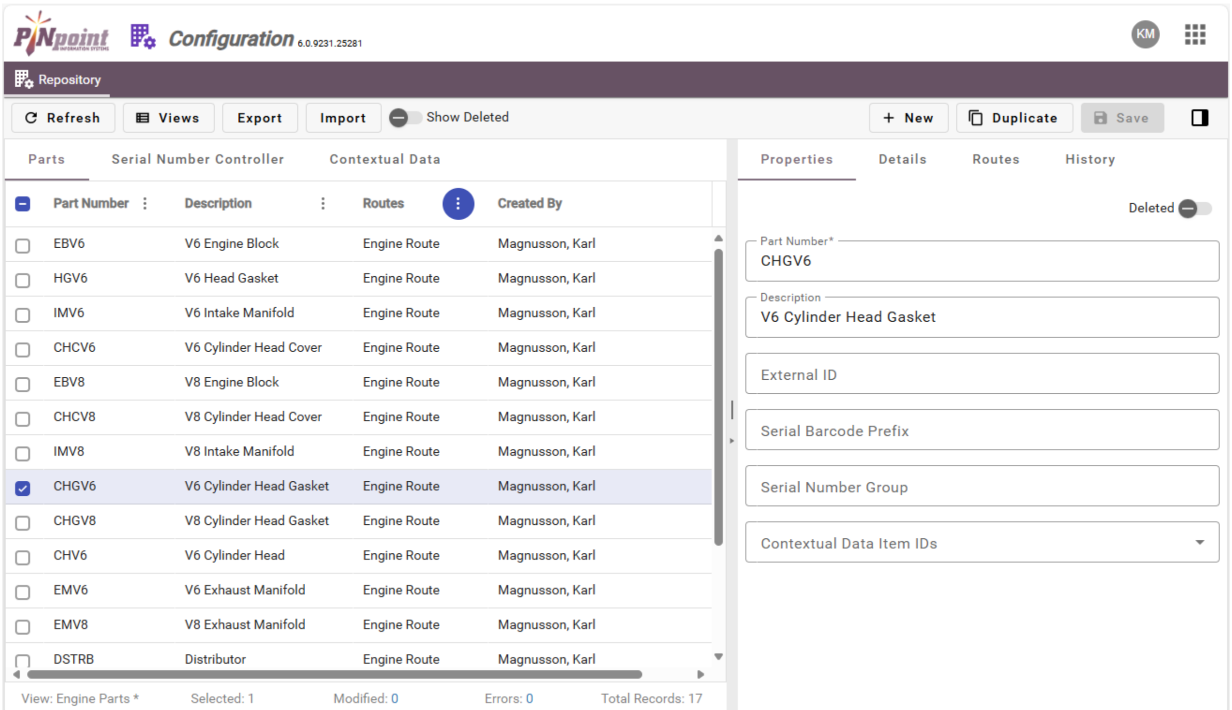
Details

| Product | In Use | Permitted |
|---|---|---|
| SmartScreen | 12 (10 SmartScreen + 2 SmartScreen MO) | 6 |
| SmartScreen MO | 5 | 7 |

# Configuration

## Overview

The Configuration web app allows users to work with repositories and configure quality settings.




## Repositories

The configuration web app has a repository for each item type. Repositories have different columns based on the item's type and relationships.

Repository items have a common set of tabs, **Properties** which contains editable fields, **Details** which contains metadata, and **History** which contains a filterable history of changes. Deleted items are hidden by default and can be shown using the toggle. Duplicating an item also duplicates it's relationships.

Items can be bulk edited by selecting multiple items in the repository, and then adding multiple properties, and applying multiple values.

The Bulk Editing dialogue appears when multiple items have been selected. The Add field button adds a new property which can be applied to all selected items.


Repositories allow items to be exported and imported based on the item type.

When editing the repository rows are highlighted to indicate whether a new item is created, or an item is modified.

## Views

The repository table can be customized. Using the Views button customization of column orders and column filters can be saved as a personal or shared view. Personal views are only available to the user who created them. Shared views are available to all users.

## Import/Export

The items in a repository can be exported to an excel file. There are two export options, Basic and Advanced.A basic export will export the information exactly as shown on the repository.

An advanced export allows users to include the repository item's associations, and export the filtered list of items or only those items which are selected. An Advanced Export is designed to allow users to edit the information and then Import the information back into the repository.

When creating new items in a spreadsheet the new items should be noted with the same negative number on all tabs. This allows the system to create the new items and create the relationship at the same.

Example of a spreadsheet modified for Import. Belt and Pully are new parts identified with -1 & -2, they are each related to the Engine route on the PartRoutes Tab because the PartID is the same.

| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | PartId | PartNumbe | Description | SerialNumberGrour | SerialBarcodePrefix | ExternalId | IsDeleted |
| 2 | 63 | EMV6 | V6 Exhaust Manifold | | | | FALSE |
| 3 | 64 | EMV8 | V8 Exhaust Manifold | | | | FALSE |
| 4 | 70 | DSTRB | Distributor | | | | FALSE |
| 5 | 75 | SUPR | Super Charger | | | | FALSE |
| 6 | -1 | BELT | | | | | |
| 7 | -2 | PULLEY | | | | | |

Parts | PartRoutes | +

| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | PartRouteId | PartId | RoutingTemplateId | IsEnabled | IsDefault | IsDeleted | RouteName |
| 2 | 55 | 54 | 12 | TRUE | TRUE | FALSE | Engine Route |
| 3 | | -1 | 12 | | | | |
| 4 | | -2 | 12 | | | | |

Parts | PartRoutes | +

## Repository Objects

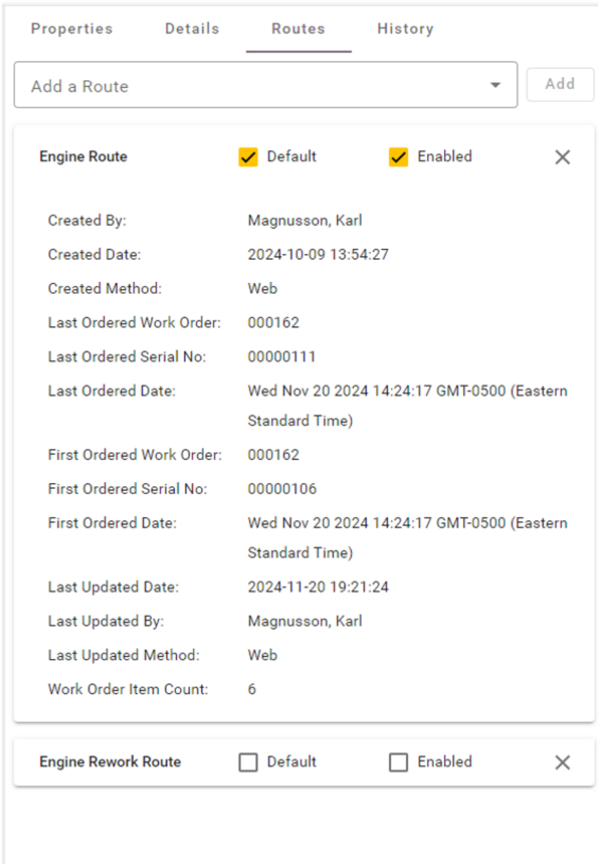
This section describes the unique properties of each repository object.

### *Parts*

See: "Part Properties List" on page 450

The Routes tab allows parts to be linked to Routes and selecting a route displays the metadata of the usage of the part on the route.

A Part linked to a route on the Routes tab



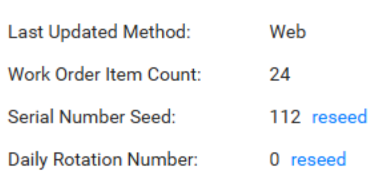

## *Serial Number Controller*

See: "Serial Number Controller Properties List" on page 465

When generating a serial number for a new work order item the system uses the serial number controller to determine how the serial number should be formatted. Each route must have a serial number controller and there must be a plant default serial number controller. Only one serial number controller can be the plant default controller. Routes do not need to be related to the plant default serial number controller because it is used automatically.

The Details tab allows users to change the enter a new value for the **Serial Number Seed** or **Daily Rotation Number** by selecting Reseed. Entering a value by using Reseed will be recorded in the history.

The Serial Number Seed



The Serial Number Format has a preview which allows the user to preview the serial number based on the Part Selected. The preview allows users to enter the Part Number and Serial Number Group if those tokens are in the Serial Number Format.

Serial Number Format Tokens

| Token | Description |
|---|---|
| {00DAY} | inserts the current day of the month as a two-digit value |
| {000DAYOFYEAR} | inserts a three digit day of year number |
| {000...DAILYROTATION} | inserts a variable length number which will apply to all serial numbers created using this product. |
| {00MONTH} | inserts the current month of the year as a two-digit value |
| {YEAR} | inserts the current year as a four-digit value |
| {00YEAR} | inserts a two digit year expression for the two least significant digits.<br>(2017 is expressed as 17 with this token) |
| {PN} | The top level Part Number.<br>For example: {PN} would return MYPARTNUMBER from MYPARTNUMBER.<br>Part numbers can be trimmed by including {PN[X:Y]}. These are optional {PN[X:]} or {PN[:Y]} are also valid. X and Y are the character indexes of the Part Number.<br>{PN[3:6]} would return ART from MYPARTNUMBER.<br>(-) can be added to indicate that the index begins from the end.<br>{PN[-6:-3]} would return NUM from MYPARTNUMBER. |
| {SNGROUP} | The Serial Number Group value of the Top Level Part Number. |
| {PAD} | Pads the part number from the {PN} token with a value by including {PAD[X:Y]}. X is the digit value which should be used to pad and Y is the maximum length of the serial number. The padded value does not affect any other tokens or any static text.<br>{PAD[1:15]}{PN} with the part number MYPARTNUMBER will return 111MYPARTNUMBER |

| Token | Description |
|---|---|
| | {PAD[1:15]}{PN[-6:} with the part number MYPARTNUMBER will return 111111111NUMBER<br>XYZ{PAD[1:15]}{PN[-6:} with the part number MYPARTNUMBER will return XYZ111111111NUMBER |
| {###} | Inserts an amount of digits from the Serial Number Seed |

## Contextual Data Items

See: "Contextual Data Item Properties List" on page 405

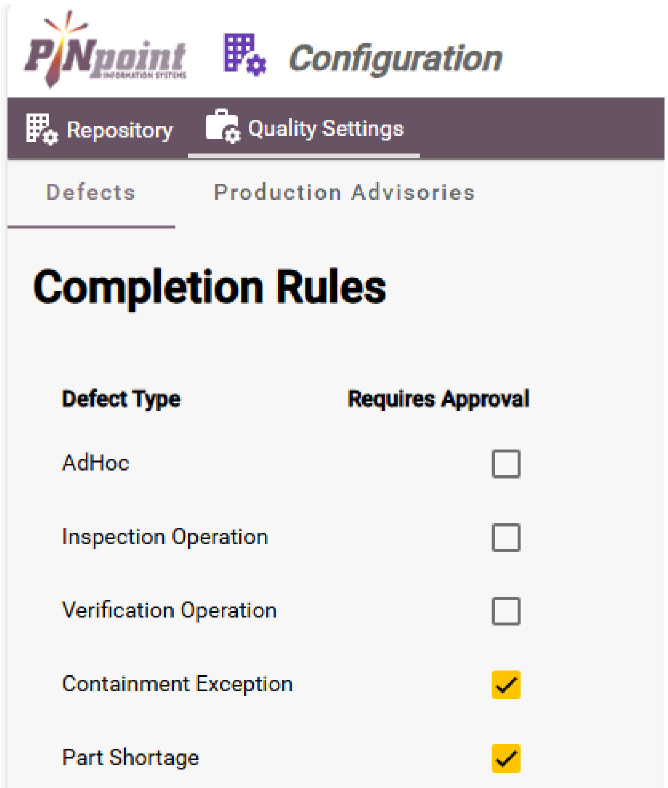
In the Properties tab contextual data items can be linked to parts listed in the part repository and OPC tag items. When linked to an OPC tag item the value of the OPC tag item will be sent to the input source when the station is loaded.

# Quality Settings

Quality settings, in this context, encompass settings related to *defects* and *production advisories*.

## Defects

The **Defects** subtab of the **Quality Settings** tab is used to specify types of defect that require approval.




There are five types of defect:

- AdHoc: A defect that is detected outside of an inspection operation or verification operation.
- Inspection Operation: A defect detected during an inspection operation.
- Verification Operation: A defect detected during a verification operation.
- Containment Exception: A workpiece removed from a production line to a containment zone.
- Part Shortage: A shortage of a part (e.g., bolt) that halts an operation until the shortage is remedied.

Each of these defect types may be configured to require approval. When one is, defects of that type go through a 3-status workflow: **Initialized** to **Resolved** to **Approved**. When one isn't, defects of that type go through a 2-status workflow: **Initialized** to **Resolved**.

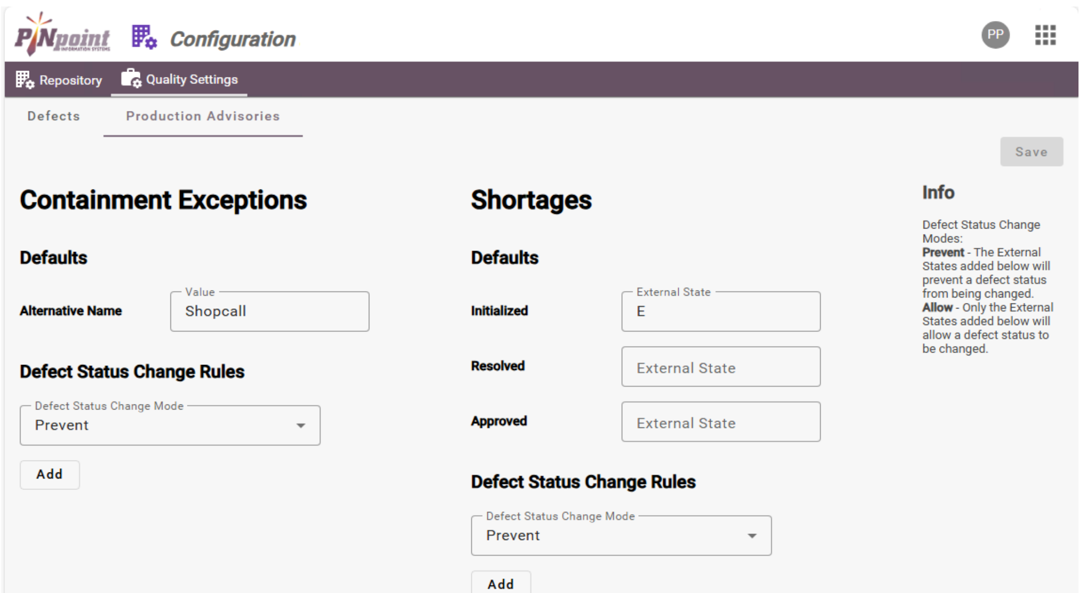
Configuring a defect type to require approval is done by checking its **Requires Approval** checkbox.

The current status of a defect is indicated by its *medical bag* color. Yellow indicates **Initialized** (by default). Blue is unique to the the 3-status workflow and indicates **Resolved** but not **Approved**. Green indicates **Resolved** in the 2-status workflow and **Approved** in the 3-status workflow.

The ability to approve a defect requires the **AllowApproveDefects** role. Users assigned this role can approve defects others set to **Resolved** . For process integrity, however, they cannot approve defects they themselves set **Resolved.** Their **Resolved** defects must be approved by another user with the **AllowApproveDefects** role.

## Production Advisories

The **Production Advisories** subtab of the **Quality Settings** tab is used to specify supplemental information about two of PINpoint's five defect types: **Containment Exception** and **Part Shortage**. That supplemental information is referred to as a *production advisory*.



## Containment Exception Production Advisories

A **Containment Exception** production advisory can have multiple **Containment Exception** defects associated with it. This is because defects that necessitate a workpiece being contained are, by nature, likely present in other workpieces.

There are two pieces of supplemental information in a **Containment Exception** production advisory: an *alternative name* and a *rule* related to the changing of a defect status.

An alternative name gives customers a way to call a containment exception something else, such as *Shopcall*. This is useful for workforces that are familiar with a different term for the containment concept. The alternative name is displayed both in **SmartScreen** and **Tracking Web**. Leaving the alternative name field blank results in the term **Containment Exception** being used.

## Shortage Production Advisories

In contrast to a **Containment Exception** production advisory, a **Shortage** production advisory corresponds to a single **Part Shortage** defect only.

## Production Advisory Rules

Production adviories can have rules that limit when the status for a **Containment Exception** or **Part Shortage** can be changed. It may be appropriate to only allow the **Resolved** status, for instance, when one or more conditions are met. These conditions are referred to as *external states*.

It is important to understand the different between a *status* and an *external state*. A status always exists for every defect. It is not optional and there are only three statuses a defect may be in: **Initialized**, **Resolved** , or **Approved.** External states are optional and are applied to statuses. They affect when a status can be changed to another status. An external state can be any condition a customer wants to define.

For flexibility, there are two **Defect Status Change Mode** options: **Allow** and **Prevent.** The **Allow** option requires the defect be in a specified external state for the status to be changed. The **Prevent** option requires the defect not be in a specified external state for the status to be changed.

For **Containment Exceptions**, any external state a user defines applies to all statuses. For **Shortages**, external states are status-specific, meaning you can, for example, specify an external state for the **Resolved** status without specifying one for the **Initialized** status. Also, exclusively for **Shortages**, default external states may be specified.

# SmartBuild

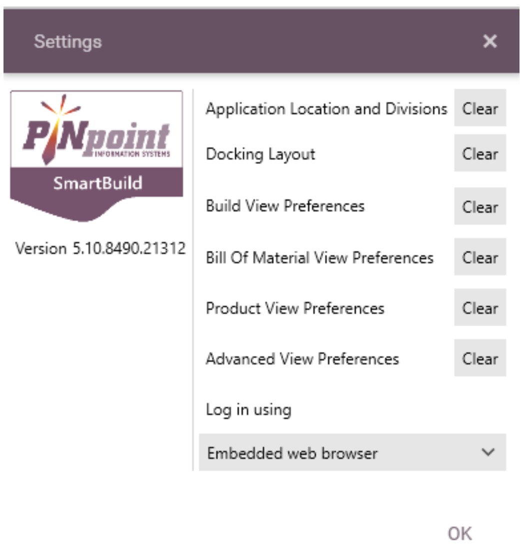
SmartBuild is a configuration tool used to configure, program, and monitor aspects of the PINpoint System. Utilizing its many tabs, users can configure the Lines, Stations, and Devices. Users can also add logic for Andon and monitor connectivity between devices.

The SmartBuild application can be downloaded from the **PINpoint Portal**.

## Single Sign On

The SmartBuild application supports single sign on. When users start SmartBuild the web browser will appear to allow users to log in. If the System web browser is selected then the user's login credentials from the Portal will be reused and they will be logged in automatically.

The SmartBuild settings menu.




# Hardware Tab

The **Hardware** tab of SmartBuild is where all of the production lines and their various devices which must communicate with PINpoint are defined. It enables the user to create Events and Buttons that can be used in conjunction with Stations and BigScreens. This section will describe the functions of the hardware tab. The How to section describes how to create a line and route.

## Hardware Tab Definitions

The following definitions summarize concepts in this section.

Hardware tab definitions

| Term | Definition |
|---|---|
| BigScreen | A BigScreen is PINpoint software used to display the line status and production metrics. |
| Station | A Station is a location where an Operator performs work using the SmartScreen Client. |

## Lines and Stations

**Lines** are a collection of stations and the devices used at them. There are many different station types which can be added to a line.

Station Types

| Station Type | Description |
|---|---|
| Andon Only | An Andon Only Station does not display process steps but does allow the operator to access the buttons configured for use with andon devices. |
| Automated | An Automated Station is a service which is typically run on the application server. It has no user interface and is intended to command a machine and record information. It loads process steps but there is no user interface. The steps must be configured to receive information using another method. |
| Buffer | A Buffer Station is typically only used on Sync by Index lines and is intended to provide an intermediate location for a build item to reside when the line indexes. When a build item arrives at a buffer station a station complete is sent automatically. |
| Repair | A Repair station has the ability to load the steps from other stations on the line but it does not have steps of it's own. Repair Only steps can be created at other stations which will be loaded at this station. It is typically used as a location in the middle of the route where a build item which was found defective can be routed so the mistakes can be rectified. It is also often used as the last station on a route in order to identify any incomplete or bypassed steps to an operator before shipping. |
| Station | A Station is a location where operators use the SmartScreen client to complete the steps for each new serial number arriving at their workstation. |

# Stack Lights

A Stack Light is associated with a particular station on the line. It may also feature a loudspeaker. Loudspeakers may also be entirely separate devices, as, for example, pole-mounted units accompanying a station. In either case, the Sound Device is created, configured, and actuated separately from the Stack Light.

A Stack Light being controlled by the PINpoint Device Bridge (a service installed on the computer to which the Stack Light is connected) has the following properties:

- The green light is on by default.
- The green, red, and yellow lights cannot be on at the same time: only one of the three can be on at a time.
- When a red or yellow light is turned on, the green light will turn off.

When the Stack Light is first plugged in and connects to the Device Bridge, all the lights will blink. Once it has successfully connected, the following behaviors will indicate the status of the Stack Light's connectivity:

- Green solid: the Device Bridge is connected to the Data Manager
- Green and red flashing: the Device Bridge was connected to the Data Manager but has since lost connection
- No lights: the Device Bridge has never connected to the Data Manager

## *Create a Stack Light*

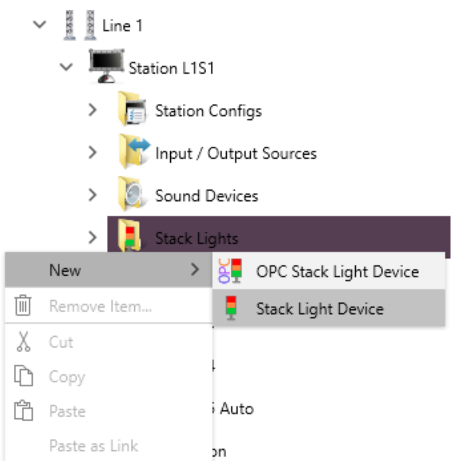
A Stack Light Device must be associated with a Station. It cannot be associated with a Line or a parent facility.

The user can add a stack light device which connects to the computer via USB or an OPC stack light which is controlled by the PLC.

To create and configure a Stack Light Device, follow these steps.

1. On the **SmartBuild Application**, select **Hardware**.
2. Expand the **Line.**
3. Expand the desired **Station**.
4. Right-click **Stack Lights** and select **New > Stack Light Device**. The **New Stack Light Device** dialog opens.

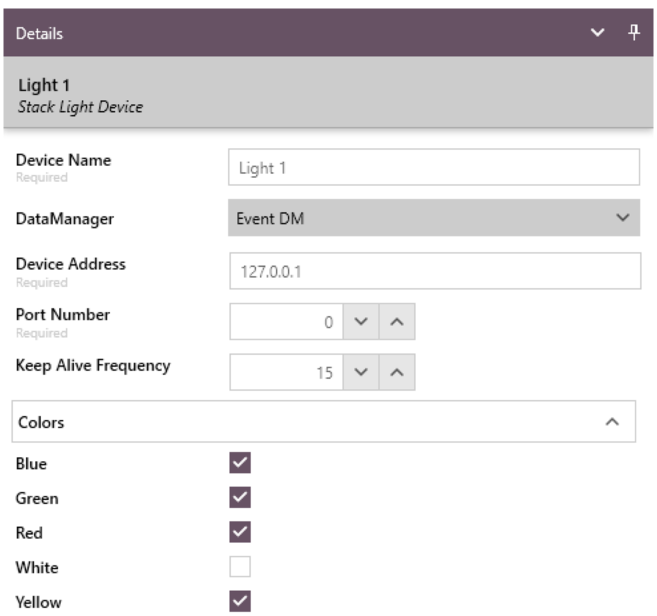
   Add New Stack Light




5. Type a name for the Stack Light and click **OK.**

   The new Stack Light Device is displayed in the **Stack Lights** hierarchy and the **Details** pane populates with the properties.

   Stack Light Device Details




6. Configure the properties

## Sound Device

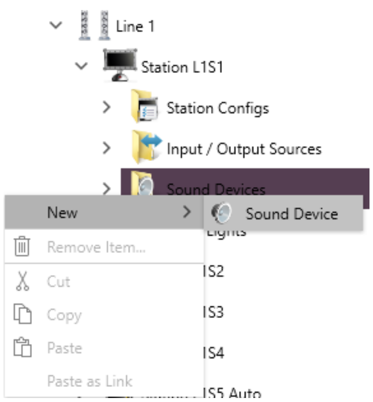
A Sound Device must be associated with a Station. It cannot be associated with a Line or a parent facility.

To create and configure a Sound Device, follow these steps.

1. On the **SmartBuild Application**, select **Hardware.**
2. Expand the **Plant.**
3. Expand the **Line**
4. Expand the **Station.**
5. Right-click **Sound Devices** and select **New > Sound Device.** The **New Sound Device** dialog opens.

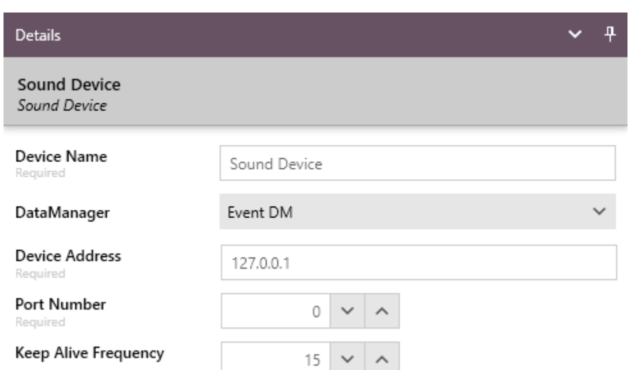
   Add New Sound Device


6. Type a name for the Sound Device and click **OK.**

   The new Sound Device is displayed in the **Sound Devices** hierarchy and the **Details** pane populates with the Stack Light Device's configurable properties.

   Sound Device Details


7. Configure the following properties

   Input / Output Sources

   This folder is located beneath a plant or a station. Items in this folder are available for use in the Process Tab on an operation. Right click on the folder to add a device. Items may be shared between 2 or more stations.

Input / Output Sources for use in PINpoint

| Category | Input Source |
|---|---|
| Tester Input Source | |
| Fastening Input Sources | |
| | Acradyne IEC Standard Serial |
| | Aimco UEC-4500 Serial |
| | Banner Omni P4 Device |
| | Broadcast Tester Device |
| | Cognex Device |
| | Desoutter CP CVI PC4 Serial |
| | Hik Robot SC3000 |
| | Hosted Tester Device |
| | Keyence Device |
| | List Select Input Source |
| | Network Serial Input Source |
| | OPC Fastening Input Source |
| | OPC Hybrid Desoutter CP CVI PC4 Serial |
| | OPC Tag Item Input Source |
| | OPC Tester Device |
| | Open Protocol Fastening Job Input Source |
| | Open Protocol Fastening Tool Always On Input Source |

| Category | Input Source |
|---|---|
| | Open Protocol Fastening Tool Input Source |
| | Open Protocol MT Focus 6000 |
| | Pick Light Input Source |
| | Positional Fastening Tool Input Source |
| | Sentinel C28 Tester Device |
| | Sentinel I28 Tester Device |
| | Serial Barcode Scanner Input Source |
| | SIC Serial Marker Device |
| | Stanley Wireless Wrench CA Series |
| | Tester Device |
| | Tohnichi R-FH256 |

# Fastening Tools

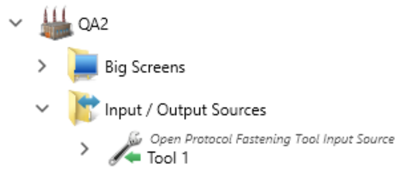
## Setup of an Open Protocol Fastening Tool Controller

Tool controllers which communicate with PINpoint should be setup so that the PINpoint system has exclusive control over the tool commands. Typically this means that the tool controller should be in *Ethernet Control Mode* and that the *Open Protocol Port* should be set in the tool controller. Some manufacturers also require an additional method to allow open protocol communication such as an additional dongle to be attached to the controller or a software key to be input on the tool controller.

### *Sharing Tools*

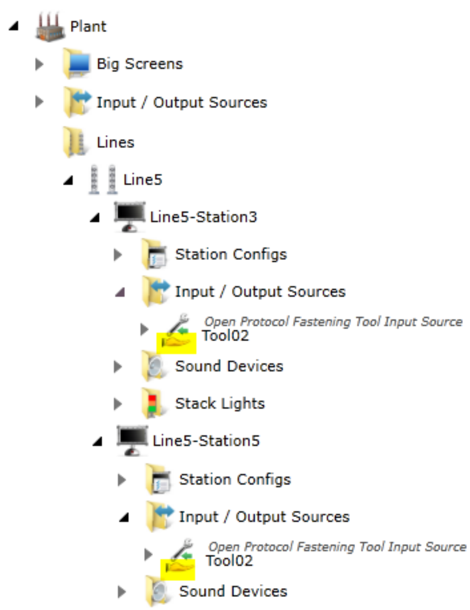
Tools can be created under the plant or under a station. Fastening tools can be shared between more than one station. When a fastening tool is shared it can be controlled by the fastening operation on more than one station but only one station can command the tool and receive the rundown values. Shared tools should have the properties *Exclusive PSet* and *Exclusive Subscribe* set true.

Tools created under the Input/Output folder of a plant are shared by default. A plant input source can be assigned to any fastening operation and can be used at any station under the plant.




Tools can be shared between stations on the hardware tab by right clicking on the tool and selecting copy and then right clicking on the desired location and selecting **Paste as Link**.

When a tool is shared there is a hand icon under the tool.




## Using a PINpoint Socket Tray

To Setup a PINpoint Socket Tray:

1. On the **SmartBuild Hardware** tab Right-click a tool and select **New Socket Tray.**
2. Enter the name and configure the properties
3. Save
4. Locate the Process Step on the Process Tab containing the Fastening Operation that will use this Socket Tray.
5. Configure the **TraySocket** attribute of each Fastening Operation to request a specific socket position.

## *Share a PINpoint Socket Tray Between Multiple Fastening Tools*

A PINpoint Socket Tray can be used by more than one fastening operation on more than one SmartScreen client at the same time.

Sharing options allowed:

1. Sharing tools across different stations (without socket trays)
2. Sharing tools across different stations (dedicated socket trays per tool)
3. Sharing a socket tray across tools on the same station

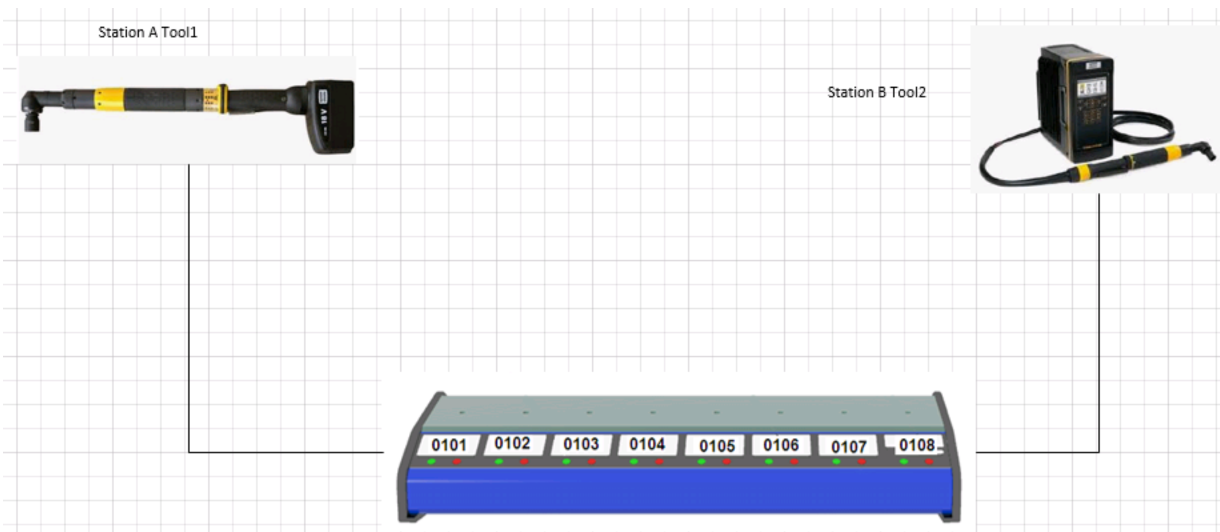
Sharing options which are not allowed:

1. Tools at different stations are actively trying to use the same socket tray.

## *Example of Sharing a PINpoint Socket Tray*

When tools are assigned to different stations both tools can be activated simultaneously. This is a simple setup of 2 tools sharing 1 socket tray. Tool 1 is on Station A and Tool 2 on Station B.

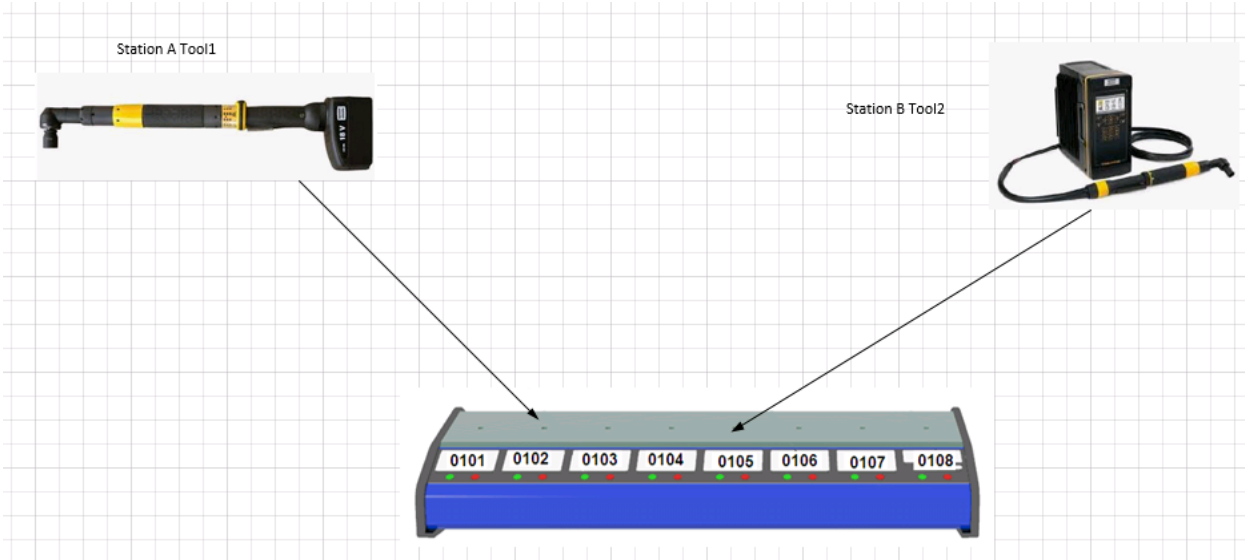
Two tools connected to 1 socket tray




In this example socket position 0101 – 0104 is used by Tool 1 and 0105-0108 is used by Tool 2. In SmartBuild the fastening operation property TraySocket is the socket which is required to be selected when the fastening operation is active. The socket commanded must be different for each tool.

The fastening operation for Tool 1 is calling for socket 0102 and the fastening operation for Tool 2 is calling for 0105.




In the beginning all sockets are returned to the PINpoint Socket tray. The Fastening operation using Tool 1 requests socket 0102 and when the operator of Station A selects socket 0102 Tool1 gets enabled. When the fastening operation for Tool 2 requests 0105 the socket tray receives 2 commands to activate different positions. If the operator of Station B selects socket 0105 the socket tray will report to both tools that 2 sockets were selected (0101 and 0105), and both tools will be disabled because more than the required sockets are selected.

## Using Atlas Copco Socket Trays

This section describes how to configure an Atlas Copco Socket Tray to work with PINpoint.

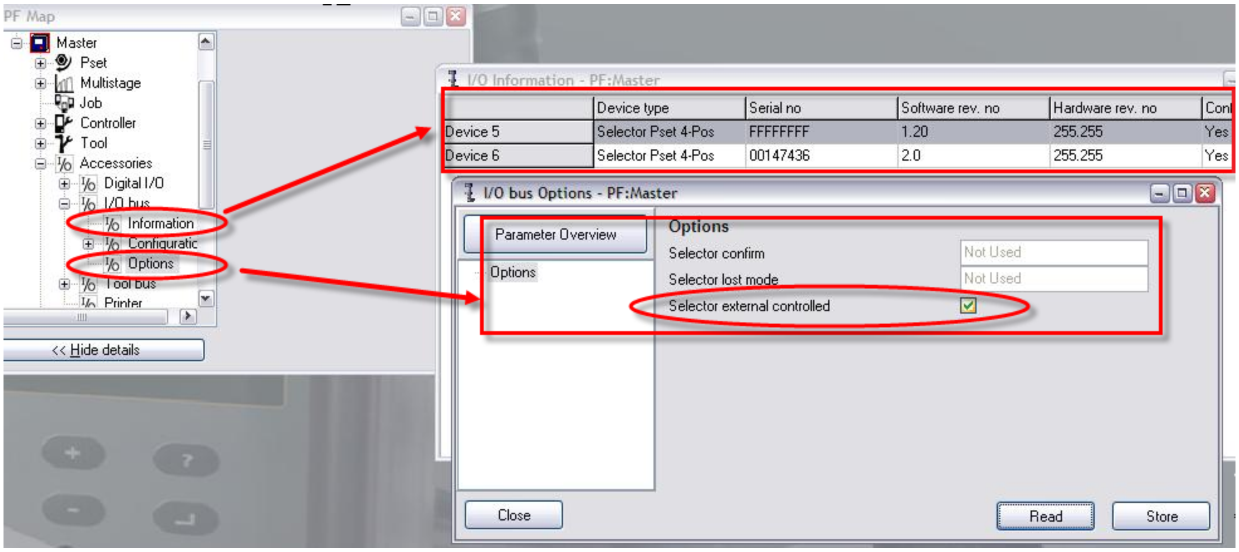
### *Configuring Atlas Copco Tools Talk for an Atlas Copco Socket Tray*

To configure the Socket Tray to communicate with a PF3000/4000 for remote Socket Tray logic, the Socket Tray must be converted to version 1.20 (or downgraded if it's 2.0). Use position 1 and 4. The node ID of the tray is selected on the bottom, if you are daisy chaining multiple trays together, ensure the addresses are unique.

The Atlas Copco controller version must be 7.5x in order to support remote Socket Tray control.

The ToolsTalk configuration should appear close to the following. Ensure that **Selector external controlled** is checked.

Tools Talk Socket




## SmartBuild

Ensure the Fastening input source has the **Socket Tray Enabled** option set when using an Atlas Copco Socket Tray.

Ensure that the **Fastening Operation** has a tray position specified. 0502 represents tray node 5, socket position 2.

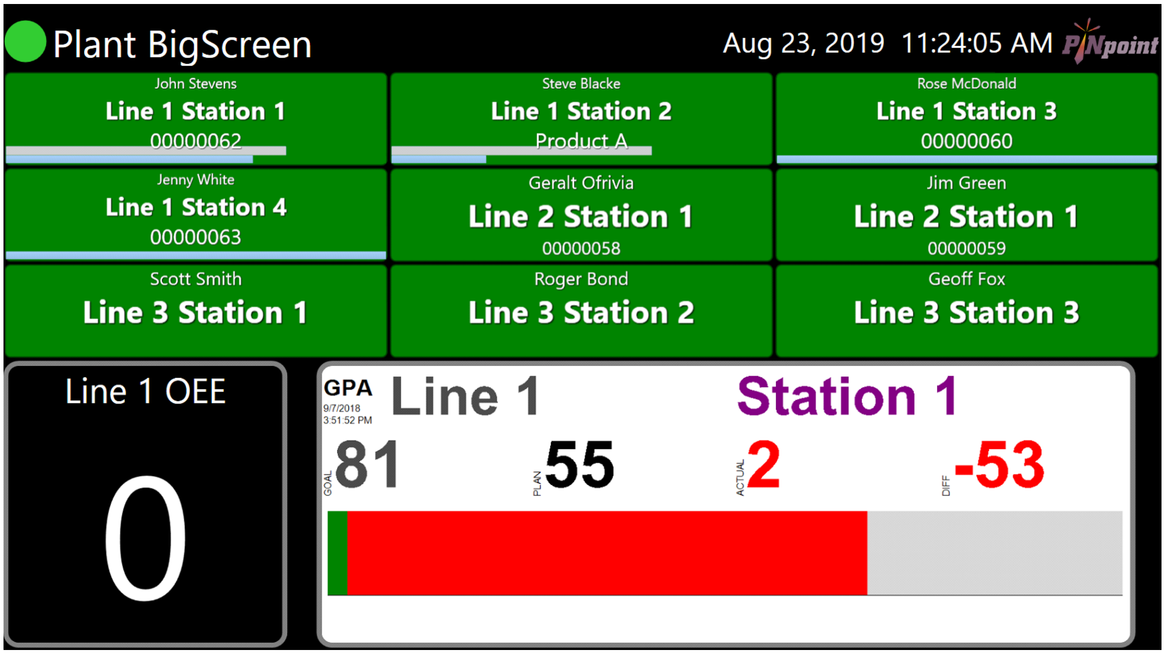
# BigScreens

A BigScreen is a computer running the PINpoint BigScreen software. This allows the PINpoint system to display station statuses and other information in real time on the factory floor.

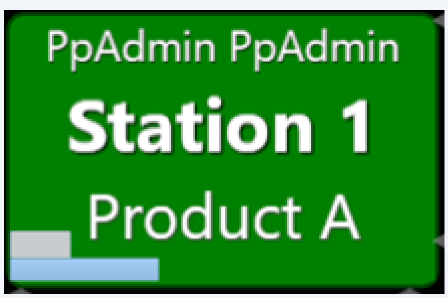
The BigScreen displays the status of the stations and can display reports on the bottom half of the screen. The station box on the BigScreen displays the user's first and last name, the station name, and the serial number/part number. The serial number and the top level part number will rotate. The grey bar represents cycle time and the blue bar represents progress as a percentage of steps completed. Whether or not the cycle time bar or progress bar are displayed on the BigScreen is configured in the hardware tab in the properties of each station displayed on the BigScreen. The 3 boxes on the top right allow statuses from specific events to be displayed. This is configured in the SmartBuild Events tab.

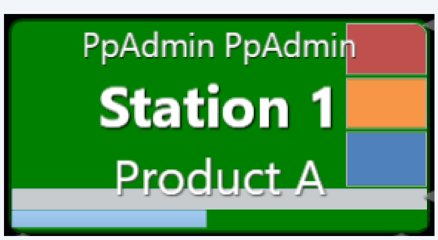
An Example of a BigScreen

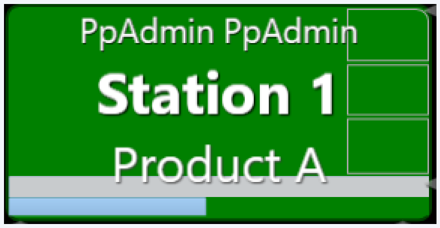
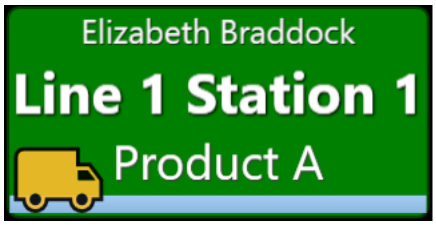
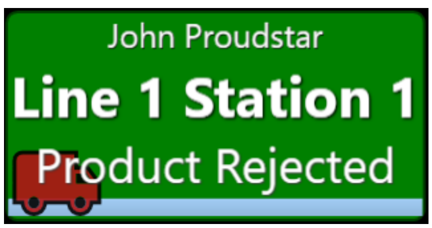



A Description of how Stations can appear on the BigScreen

| Status | Example | Description |
|---|---|---|
| Green |  | User is Logged In. |
| Grey |  | User is Logged Out |

| Status | Example | Description |
|---|---|---|
| Yellow |  | Event Driven |
| Red |  | Event Driven. This will override the yellow status. |
| Stripes |  | Break period. This is independent of other statuses. |
| X |  | Station Not Con-nected |
| Status Events |  | Events such as buttons can trig-ger a status. Up to 3 statuses can be shown on the sta-tion box. |

| Status | Example | Description |
|---|---|---|
| |  | |
| Product Quality | <br> | The truck indicates the product quality. Green is not displayed. Cargo is not displayed. |

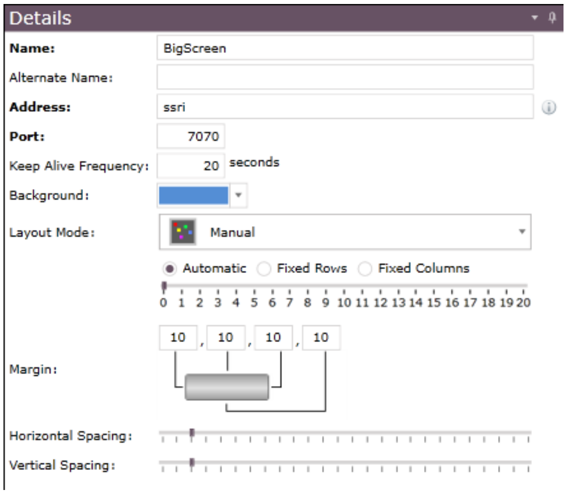
## *Creating a BigScreen*

To create and configure a BigScreen, follow these steps.

For the purposes of illustration, the associated screen captures detail the process at the station level, though the instructions are intended to be universally applicable.

1. On the **SmartBuild Application**, select **Hardware**.
2. Expand the **Plant.**
3. Click the **BigScreens** folder to make it active.
4. Right-click the **BigScreens** folder and select **New > BigScreen Device.** The **New BigScreen Device** dialog opens.
5. Type a name for the new BigScreen and click **OK.** The new BigScreen is displayed in the **BigScreens** folder and the **Details** pane populates with the BigScreen's properties.

   BigScreen Details pane




6. Configure the following BigScreen properties:

| Attribute | Description |
|---|---|
| Name | This is the provided at the time the BigScreen Device was created. It is possible (though not necessary) to change it using this field. Changing the name here is automatically reflected in the BigScreen Device in the BigScreen's folder. |
| Alternate Name | An alternative name for the BigScreen Device; e.g., if a different name is required for the purposes of reporting. |
| Show Cycle Time Gauge | If true the cycle time gauge will be shown. |
| Show Progress Bar | If true the progress bar will be shown. |
| Address | Enter the IP address where the device is located in the network. |
| Port | Enter the port number of the BigScreen's device address. Note that the port number, in combination with the device address, must be unique to the device. If it is not, an error message will display when saving the BigScreen Device configuration. |
| Keep Alive Fre-quency | This is the frequency in seconds that a keep alive message will be sent to the device. |
| Background | Use this drop-down list to select a standard color for the background of |

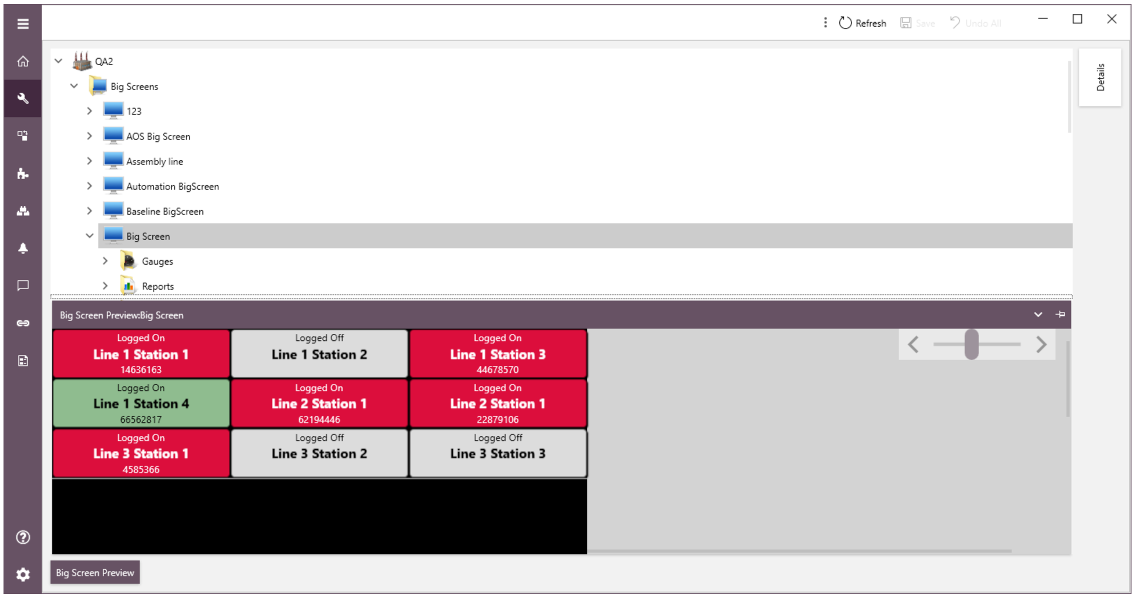
| Attribute | Description |
|---|---|
| | the BigScreen. |
| Layout Mode | There are two controls here:<br>▪ The first is a drop-down menu that enables the user to designate the flow order of the stations, with the choices being: **Across Then Down**, **Down Then Across**, **Manual**.<br>▪ The second control enables the user to control the spacing of the station flow. Radio buttons enable the user to select whether the spacing should be **Fixed Rows** or **Fixed Columns**, or **Automatic**, which allows the system itself to dynamically arrange the array. In the case of Fixed Rows or Fixed Columns, the slider beneath the radio buttons enables the user to set the number of fixed rows, or columns, respectively. |
| Margin | These are four value fields where the user can enter the number of pixels forming the margins at all four edges of the BigScreen. The default value in each case is 10. |
| Horizontal Spacing | Use this sliding scale to designate the horizontal space between stations on the BigScreen. |
| Vertical Spacing | Use this sliding scale to designate the vertical space between stations on the BigScreen. |

### *Previewing a BigScreen*

It's possible to preview the way the configuration of a BigScreen will actually appear when implemented on the line, and to make adjustments more knowledgeably. To do this, follow these steps.

1. On the **SmartBuild Application**, select **Hardware**.
2. Expand the plant. The **BigScreen's** folder is displayed.
3. Click the **BigScreen's** folder to make it active.
4. Select the BigScreen.
5. Click the BigScreen Preview button. A view of the BigScreen as configured is displayed at the bottom on the interface.

BigScreen Preview button




Changes made in the **Details** pane are reflected by viewing the preview again, and do not require being saved to be viewed. However, changes must be saved in order for them to be put into effect on the actual BigScreen.

The size of the preview is controlled by means of the sliding scale control at the upper right of the preview.

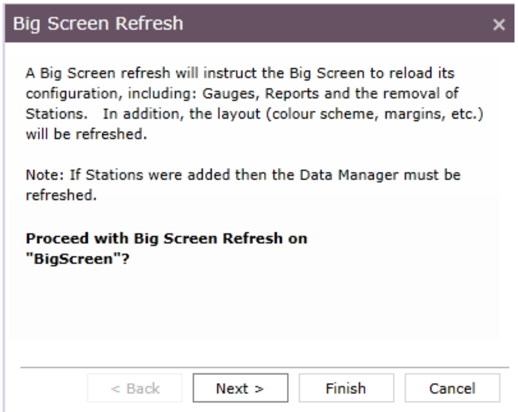
## *Refreshing a BigScreen*

To refresh the connection between a BigScreen and the Data Manager follow these steps.

1. On the **SmartBuild Application**, select **Hardware**.
2. Expand the Plant, and continue to expand its **BigScreens** folder to view the BigScreen.
3. Right-click the BigScreen and select **Refresh Data Manager for BigScreen**. The **BigScreen Refresh** dialog opens.

BigScreen Refresh dialog




4. Click **Next.** A dialog opens to inform the user of the status of the refresh attempt.

5. Click **Close** to close the dialog.

## *Adding a Gauge to a BigScreen*

**Gauges** are used to display various metrics in real time on a BigScreen. There are four types of Gauges that can be added to a BigScreen:

Descriptions of Gauge types

| Type | Description |
|---|---|
| Radial | A Radial Gauge appears on the BigScreen as a circle with a numeric range arrayed at the outer edge and a needle at the center pointing to the current value to which the Gauge is configured. It resembles a speedometer. |
| Quadrant | A Quadrant Gauge appears on the BigScreen as a quarter of a circle with values arrayed at the curve and a needle centered at corner, pointing to the current value to which the Gauge is configured. |
| Linear | A Linear Gauge appears on the BigScreen as a number line of values with a floating indicator stationed at the current value to which the Gauge is con-figured. |
| Numerical | A Numerical Gauge appears on the BigScreen as an LED displaying an actual numeric value. |

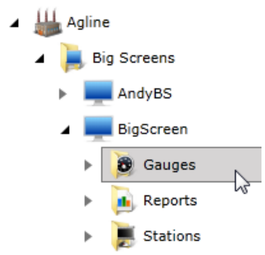
To add a Gauge to a BigScreen, follow these steps.

These steps are identical for all Gauge types, including the attribute set.

1. Expand the BigScreen to view its **Gauges** folder.

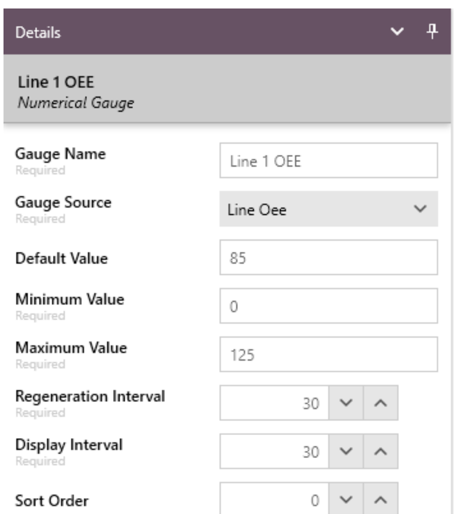
BigScreen Gauges folder




2. Right-click the **Gauges** folder and select **New**, and the select the Gauge type. The **New [Gauge Type] Event** dialog opens.

3. Type a name for the new Gauge and click **OK**. The new Gauge is displayed in the **Gauges** folder and the **Details** pane populates with the Gauge's properties.

   Example of a Gauge Details pane




4. Configure the following Gauge properties:

| Attribute | Description | Data Type | Input Type |
|---|---|---|---|
| Gauge Name | The title on top of the gauge and the name of the Gauge as it appears in SmartBuild. | Text | Text Box |
| Gauge Source | The type of information from the SQL file. | Text | Text Box |
| Default Value | The default value is the value the gauge will display unless it receives information | Text | Text Box |

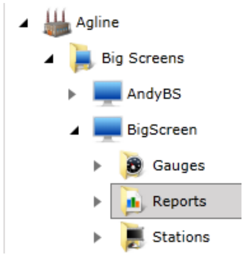
| Attribute | Description | Data Type | Input Type |
|---|---|---|---|
| | from the SQL query. | | |
| Minimum Value | The minimum value of the Gauge. | Number | Counter Box |
| Maximum Value | The maximum value of the Gauge. | Number | Counter Box |
| Regeneration Interval | The length of time in minutes until the data is refreshed. | Number | Counter Box |
| Display Interval | The length of time in seconds the Gauge will be displayed for. | Number | Counter Box |
| Sort Order | The order of which Gauge will be dis- played in SmartBuild. The order in SmartBuild is the same as the order on the BigScreen. | Number | Counter Box |

## *Adding a Report to a BigScreen*

Reports are used on a BigScreen to display information about Station status over a determined period.

1. On the **SmartBuild Application**, select **Hardware**.
2. Expand the Plant, and continue to expand its **BigScreen's** folder to view the BigScreen
3. Expand the BigScreen to view its **Reports** folder.

BigScreen Reports folder




4. Right-click the **Reports** folder and select **New**, and the select **Report**. The **New Report** dialog opens.

5. Type a name for the new Report and click **OK**. The new Report is displayed in the **Reports** folder and the **Details** pane populates with the Report's properties.

6. Configure the following properties: *"Report Properties List" on page 461*

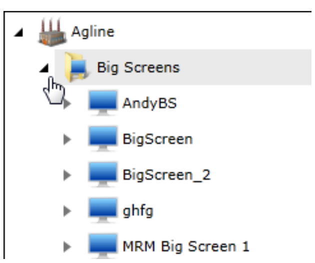
## *Adding a Station to a BigScreen*

In order for Stations to be associated with, and appear on, a BigScreen, they must be added to the BigScreen. To add a Station to a BigScreen, follow these steps.

1. On the **SmartBuild Application**, select **Hardware**.

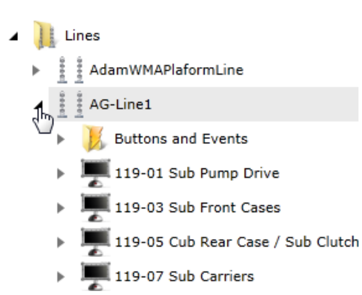
2. Expand the Plant, and continue to expand its **BigScreen's** folder to view the BigScreen.

   Expanding the BigScreen's folder




3. Expand the **Line** in question and its **Stations** folder to access the Station.

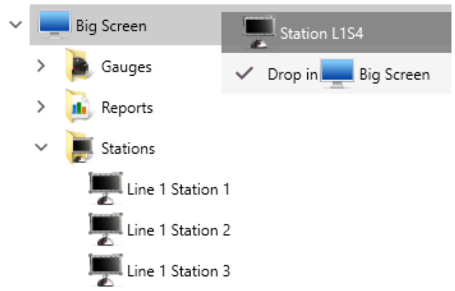
   Viewing the Stations of a Line



4. Click-drag the Station and drop it on the BigScreen. The Station is displayed in the BigScreen's **Stations** folder.

   Dragging a Station to a BigScreen




# Build Tab

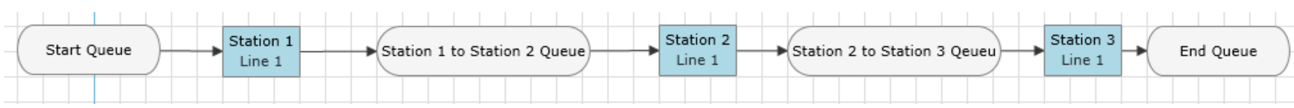
The Build tab allows users to create and modify Routes. Routes are used to track how build items travel from station to station.

*Before Reading this section please read: "Tracking Overview" on page 376*

## Line Tracking Model

On the Build tab the rectangular boxes represent Stations and the rounded boxes represent Queues. The arrows indicate the direction of build item flow.

Route example




In this example, the stations are Station 1, Station 2, and Station 3. Their queues are Start Queue, Station 1 to Station 2 Queue, Station 2 to Station 3 Queue, and End Queue.

Stations have rules set up on the build tab. Those rules dictate how Build Items are made available to Stations, how Build Items are tracked, and what to do when the Build Item is complete at each Station.

Queues are used between each Station and at the beginning and end of each Route. Queues serve as holding places for build items released by an upstream Station and make build items available to a Station downstream.

# Methods to Track the Line

There are several methods to track build items as they move around the line. The system can be configured to use a combination of any of the following methods.

- Manually – Loading the next build item in the queue with the on screen selection
- Scanning – Operators can scan the serial number from a barcode which may be printed on a sheet or affixed to the product
- Tracking Items by ID – Loading items based on the tracking ID assigned to a pallet which is read by a PLC when it arrives at a station
- Tracking Items Serial Number – Loading items based on the serial number sent by the PLC when it arrives at a station
- Synchronizing by Index – If the entire line moves at the same time tracking can be commanded by the PLC to increment the position of all of the build items
- Push – If the build items move in a fixed order then the stations can load the next build item whenever the pallet present and data ready bit toggle

## *Understanding Station Rules*

The Rules pane lists the station rules available. This section will explain the purpose of each type of rule.

Station Rules

| Section | Description |
|---|---|
| Create Work Order | Determines whether a work order, which includes a serial number, can be created at this station.<br>Creating a work order at this station will place the work order item on the route the station belongs to. It will also populate all the start queues on a composite route. It will not populate the queues on other routes. |
| Adjoin Tracking Id | Indicates if the provided Tracking Id should be associated with the Build Item. Typically, this would only occur at one Station in a Route, and subsequent Stations would use the Tracking Id to load the Build Item.<br>If there is a Build Item already assigned to the Tracking ID and it arrives at a station it will not be replaced.<br>**No - A Build Item will not be adjoined.** |

| Section | Description |
|---|---|
| | **Next Available** - When the Tracking ID arrives at the station then the next Build Item in the queue will be loaded and adjoined to the Tracking ID.<br><br>**By Serial Number** - When the Tracking ID arrives at the station then the Serial Number Input tag will be read and used to select and load a build item which will be adjoined to the tracking ID. |
| Load Sequence Trigger | Determines the method by which a station will determine a build item has arrived.<br><br>**SmartScreen Client** - If true the client will allow a user to select the build item from the Work Orders window. This should be true if the operator is scanning or typing in the serial number.<br><br>**OPC Input**<br><br>When the PLC is used to determine the position of build items then one of the following options should be set.<br><br>**Not Set** - This is the default option. This should be true if the PLC is not used.<br><br>**Pallet Present & Tracking ID** - When the *Is Data Ready* tag becomes true then the *Pallet Present* and *Tracking ID* tag will be read and the Build item associated with the *Tracking ID* will be loaded.<br><br>**Pallet Present & Serial Number** - When the *Is Data Ready* tag becomes true then the *Pallet Present* and *Serial Number Input* tag will be read and the build item for the serial number will be found, and provisioned if necessary, and then loaded at the station.<br><br>**Pallet Present Only** - When the *Is Data Ready* tag becomes true then the *Pallet Present* tag will be read and the next Build Item in the queue will be loaded.<br><br>**Synchronizing Index** - When the Synchronizing Index assigned to the station changes then the station will load the next Build Item in the queue. |
| Load Depends on Child Build Item | Determines whether this station should load the build item based on whether or not one or all of the child build items are complete. Build items are created in all start queues and all merge queues when a work order item is provisioned on the route. A build item |

| Section | Description |
|---|---|
| | can be viewed in the Tracking tab if it was created but it is not available to the station unless the rules for the station are met.<br>**Not Set - If this is false then the queue is not considered a merge queue.**<br>**At Least One Child Is Complete** - If one of the child build items is complete then the parent build item will be available in the queue.<br>**All Children Are Complete** - If all of the child build items are complete then the parent build item will be available in the queue. This is used when multiple build items are being merged into one. |
| Unload Sequence Trigger | Determines what can cause the SmartScreen client to unload the build item and release it to the destination queue. Moving a build item manually on the tracking app ignores these rules. If a Synchronizing index is used then it will unload the build item.<br>**SmartScreen Client -** If true this allows the user to select *Release to Destination* on the work order window.<br>**Pallet Present OPC Input** - When the PLC indicates that the pallet is no longer at the station then the build item will be unloaded. |
| Completion Action | This action is executed when the build item is released to the destination by the operator or forcibly by another mechanism, such as loading the next build item in queue.<br>**None** - The build item will be sent to a graveyard queue. This should be set if the next station has **All Children Are Complete** set true or if this build items from this station will be merged at the next station.<br>**Send To Next Queue** - If this is true then the build item will be sent to the next queue. This is the default setting. |
| Delete Empty on Exit | Determines if an Empty Build Item should be deleted once it leaves the Station. This should typically be set if this is the last station on the route. |
| Disjoin Tracking Id | Indicates if and when the Tracking Id should be disassociated from the Build Item.<br>**Not Set** - The Tracking ID will not be disassociated from the build item. |

| Section | Description |
|---|---|
| | **On Enter** - The Tracking ID will be disassociated from the build item when the build item enters the station. This is typically set if the work piece is taken off the pallet and the pallet continues to another station where it is reused.<br><br>**On Exit** - This Tracking ID will be disassociated from the build item when the build item departs the station. This is typically set if the work piece is taken off the pallet and the pallet continues to another station where it is reused. |

## Notes on Adjoining Tracking ID

**Adjoin Tracking ID** tells the Station that it should assign the current Build Item to a Tracking ID. This should be used where a PLC has assigned a carrier or pallet with a specific identifier. For instance, all pallets on a line will be assigned a Tracking ID. Instead of the PLC telling the PINpoint System what build item is at a specific station, the PLC will just tell the PINpoint System what pallet number is at each station.

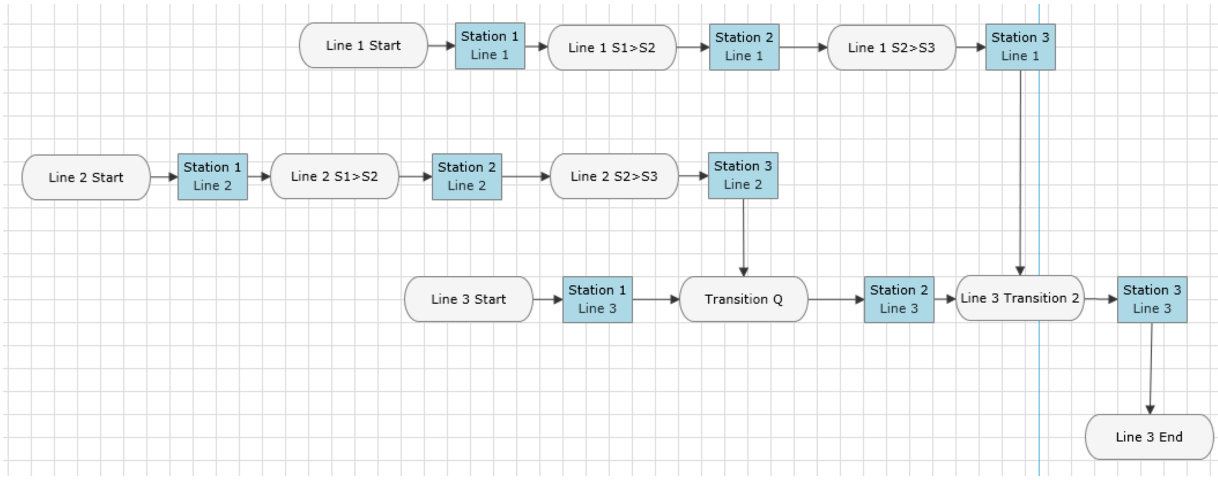
For Example: A pallet with Tracking ID 249 will arrive at Station 1. The PLC will tell the PINpoint System that the current pallet is Tracking ID 249. **Adjoin Tracking Id** should be **True**, the PINpoint System will then assign whatever Build Item that is at Station 1 to pallet 249.

Later, when the PLC tells the PINpoint system that pallet 249 arrives at Station 2 the build item joined at station 1 will be loaded. **Adjoin Tracking Id** at Station 2 (and all subsequent stations) is **False**.

## Notes on Load Depends on Child Build Item

**Load Depends on Child Build Item** must be used when more than one Build Item depends on the completion of a previous Build Item.

Station Rules application




For Example: when the Build Item is complete at Line 2 Station 3, the Build Item will move to the Transition Queue. The Transition Queue is also supplied by Line 3 Station 1. In this example the goal is to start the Build Item at Line 3 Station 2 when both the build items are complete at Line 3 Station 1 and Line 2 Station 3. In that case **All Children Are Complete** must be set **True.**

If only one of the build items needs to be complete set **At Least One Child Is Complete** to **True.** This will allow an operator to start the Build Item on Line 3, prior to it being complete on Line 2.

Typically **Load Depends on Child Build Item** is **Not Set.** This is used when a Queue is only supplied by one Station.

## Creating a Queue

To create a Queue, follow these steps.

1. On the **SmartBuild Application**, select **Build.**
2. Click the **Please Select a Route** drop-down menu and select a Route. The **Queues and Stations** pane becomes accessible, as does the **New Queue** button.
3. Click the **New Queue** button. The **New Queue** dialog opens.
4. Type a name for the new queue based on its function in the line.
5. Click **OK.** The new queue is displayed in the **Available Queues** list in the **Queues and Stations** pane.
6. Click the **Save** button to save the new Queue.

# Working with Routes

The Build tab allows users to design a Route using drag-and-drop graphic elements to both define their real-world relationships and to set load and unload conditions for moving Build Items along the Line.

## *Creating the Route*

Routes are used to define the work flow of Build Items as they progress from Station to Station. Every Route must begin and end with a Queue. A Queue is also needed between every Station. It is not possible to directly connect Stations. A facility must have a default route. Each route uses a the plant default serial number controller unless one is specified.

To create a new Route, follow these steps.

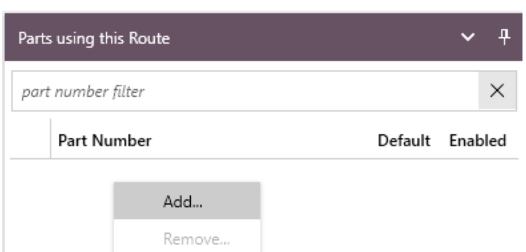
1. On the **SmartBuild Application**, select **Build**.
2. Click the **New Route** button.
3. Type a name for the Route and click **OK**.
4. Optionally, Edit the properties "Route Properties List" on page 462

### Adding a Part to a Route

Parts must be added to a route before a work order can be created. Parts can be added to a route in the build tab and on the configuration web app.

To add a Part to a route in the build tab right click on the empty space in the Parts Using This Route pane. This will open a dialogue box which allows the user to add multiple Parts to the route. A Part must also be set as default on a route. A Part can only be set to default on one route so that when it is created from a station the tracking manager can determine which route to use.

Parts Using This Route Pane. Right clicking will show the dialogue box.

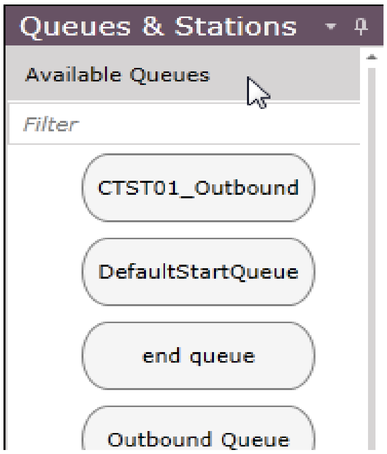


## Adding Stations and Queues to the Route

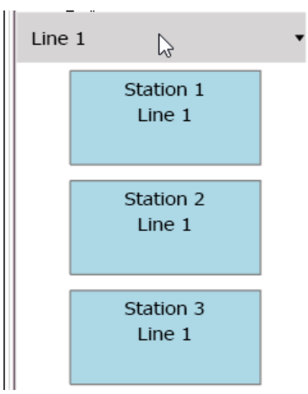
1. In the **Queues and Stations** pane, expand the **Available Queues** list.

   Available Queues

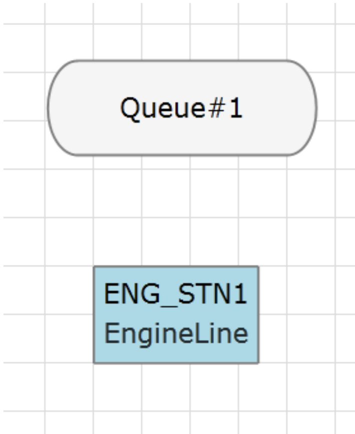
2. Locate the Queue for the build process and drag and drop it into the work area.
3. In the **Queues and Stations** pane, locate the Line and click on it to expand it. Its Stations are displayed.

   Expanding a Line

4. Drag and drop the first Station in the work flow into the work area.

Placing a Station



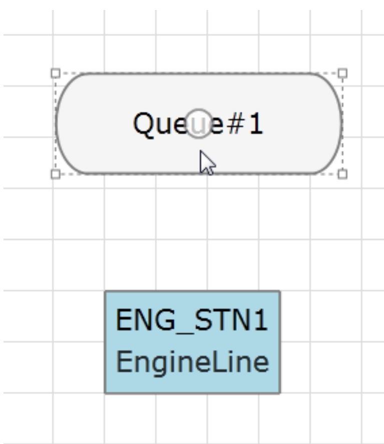

Continue to add Queues and Stations to the work area until all the Stations in the current Line are represented, and the Queues necessary to define their relationships exist.

## Using the Connections

Connect the Queues and Stations in the order they occur in the Line. To do this, follow these steps.

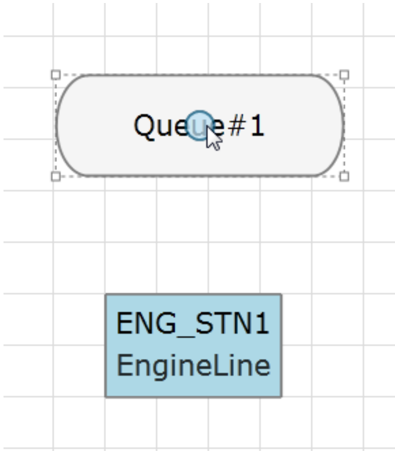
1. Click the Queue or Station to select it. A small circle is displayed in the center of the item.

   Selecting a Queue



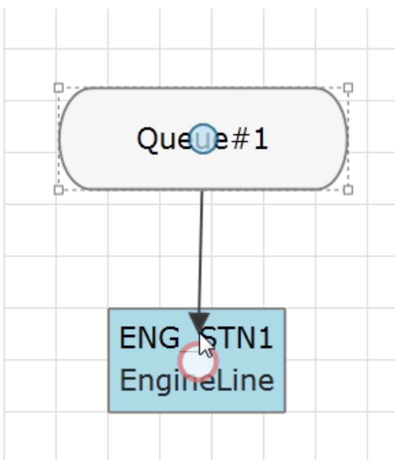

2. Hover the mouse over the circle to activate it (the circle will change to a light blue color when active).

Making the Queue's connector active




3. Click-drag the circle to another item to connect them. A direction arrow will follow the drag and connect to any eligible item it is dragged in to, indicating the process flow.

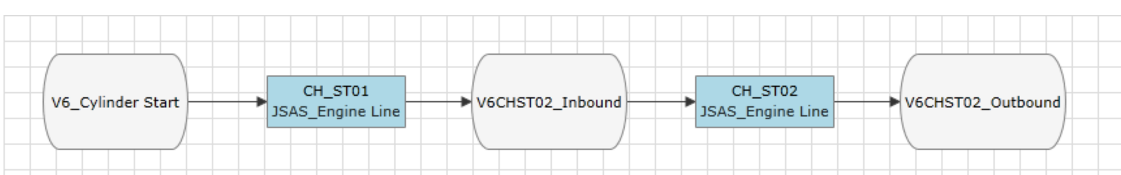
   Connecting the Queue to the Station




It is possible for a Queue to receive from, or distribute to, multiple Stations (such as Stations running in parallel); but it is not possible for a Station to receive from, or distribute to, more than one Queue at a time.

The maximum amount of connections into and out of a single object is 40

Completed Route example



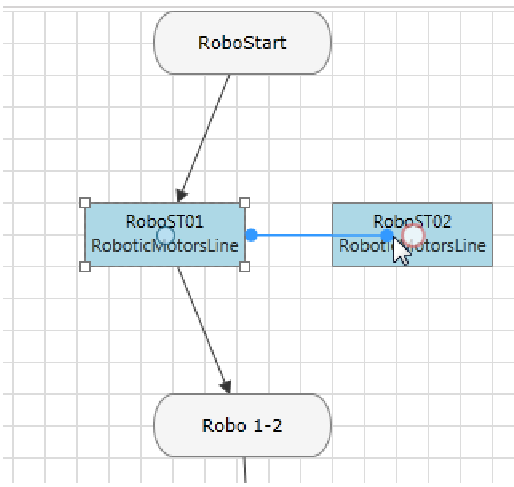
### Peer Connections

The Peer Connection is used to join two or more stations which work on the same build item at the same time, and all of whose work must be completed before the Build Item can be moved to the next Queue. Each station in a set of peer stations will display a message about the completion status of the other stations.

To create a peer connection right click on the work area, choose connections, and then select Peer.

Use the Peer Connector to connect the adjacent Stations that should share a Peer connection relationship by clicking the connection spot of one Station and dragging to the other.

Creating a peer connection




While it’s possible for a Station to have more than one Peer connection to other Stations, only one Station in the Peer Relationship can have the connections to the upstream and downstream Queues.

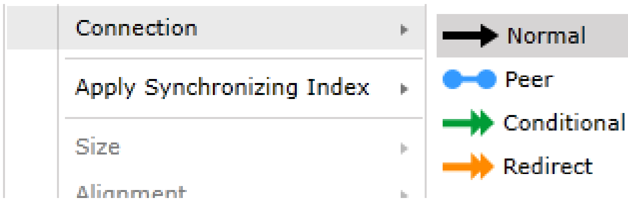
## Conditional and Redirect Connections

Connections between queues can be created which move build items from the source queue to the destination queue if they meet the conditions. Build Items are evaluated and moved as soon as they enter the queue. Moving a build item does not generate a move exception.

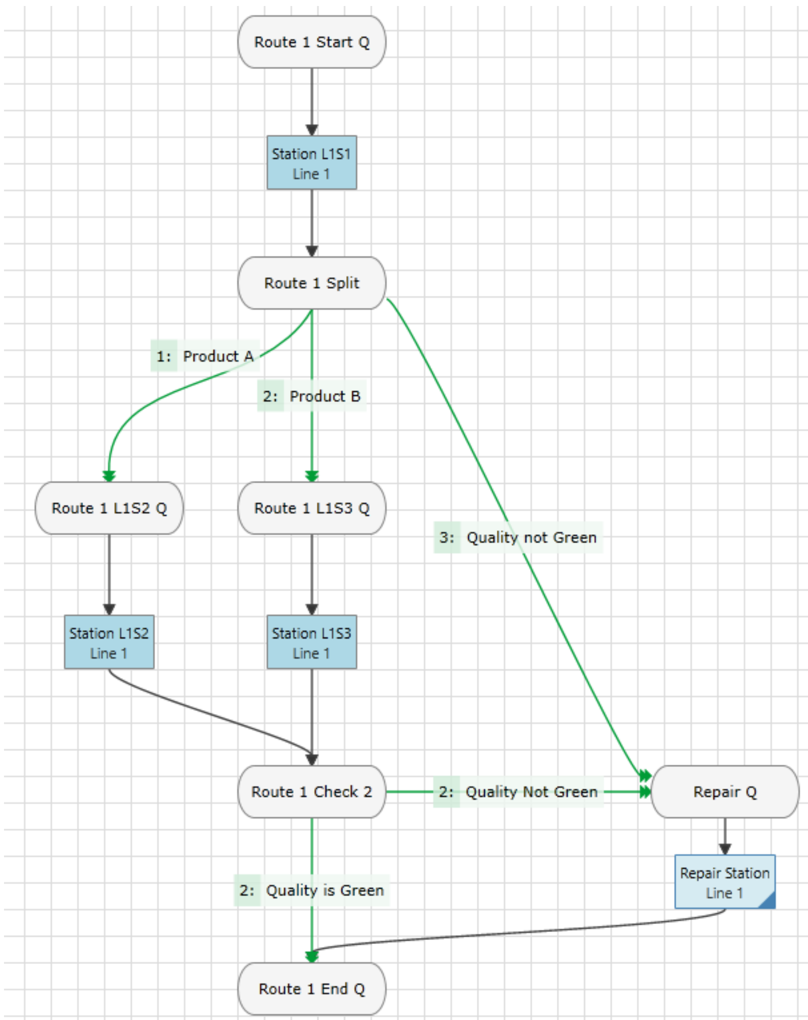
The purpose of conditional connections is to allow for variation in the way a build item traverses the route without requiring multiple routes to be created. By using conditional connections the user can create logic which moves a build item from one queue to another.

To create a conditional connection, right click and select the connection type from the drop down box.

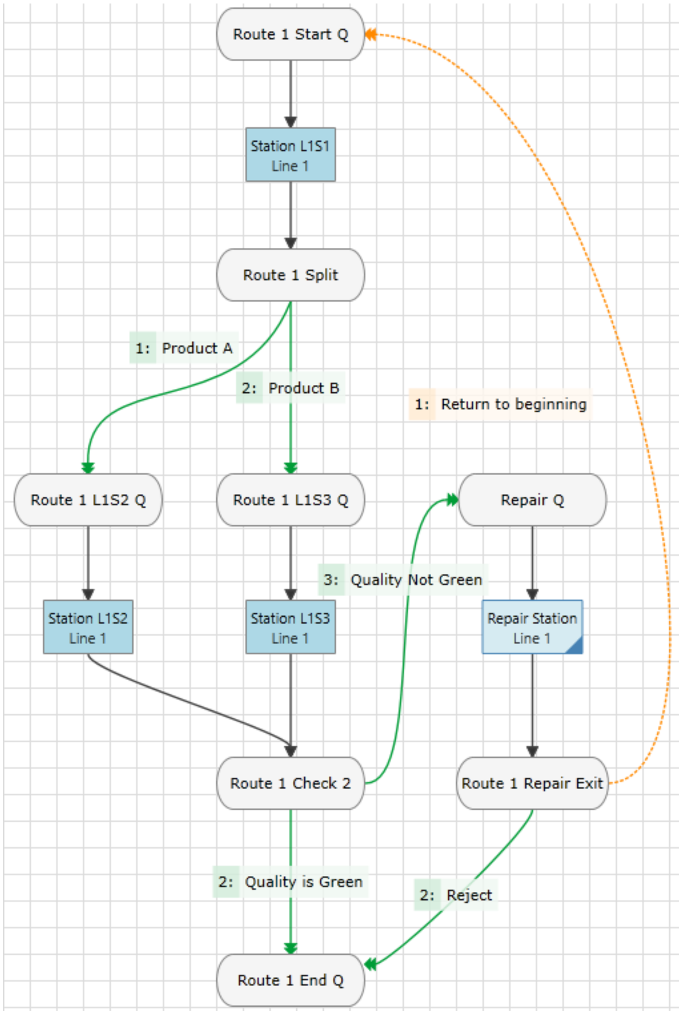



An example of a route with conditional connections




Conditional connections and Redirect connections function the same way but Redirect connections are not considered a normal path for a build item to take. The system does not check that the path created by a redirect connection leads to the end queue. The system does not consider a redirect connection to be one of the valid paths a build item can take when determining if it traveled through the route correctly. A conditional connection should never connect to the start queue since this would create a situation where the start queue can no longer be determined however a redirect connection can reconnect to the start queue since it is not considered when determining the start queue.

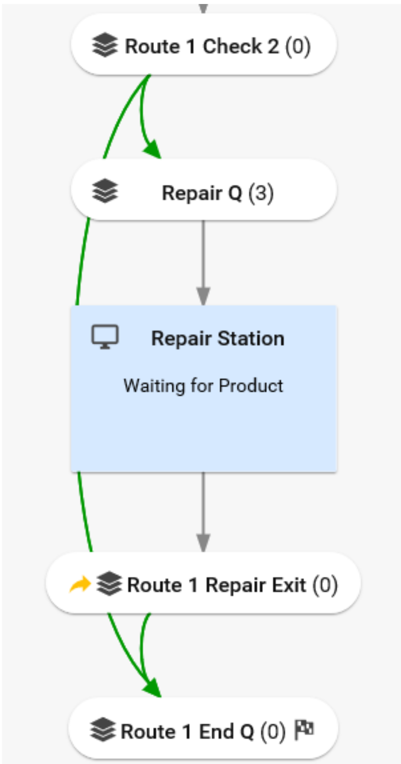
An Example of a route with a Redirect Connection




Conditional connections should always be used unless the build items should be moved to the beginning of the route in which case a redirect connection should be used. Redirect connections are not drawn on the production view of the tracking app.

The tracking app showing conditional connections as a green line hopping over the standard route and an orange arrow indicates the redirect connection.

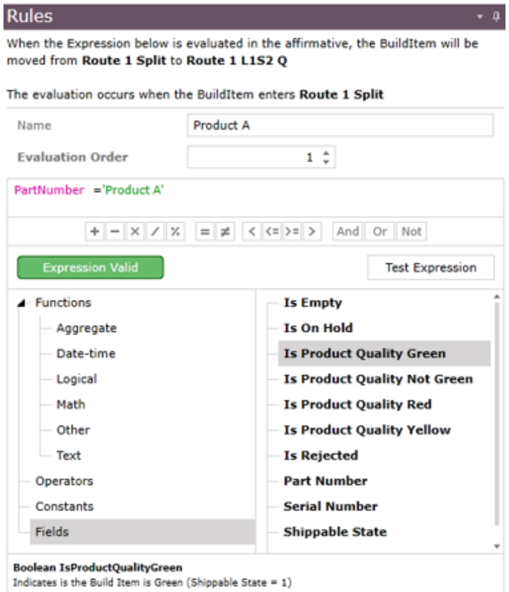



## *Rules for Conditional and Redirect Connections*

The rules pane allows the user to create an expression to programmatically determine whether to move the build item to the destination of the connection. The expression is written using the provided functions, mathematical operators, constants, and the PINpoint fields which apply to build items.

An example of the Rules pane showing the expression options




The evaluation order is the order that the conditional and redirect connection expressions are be checked in. The first function to evaluate true is executed.

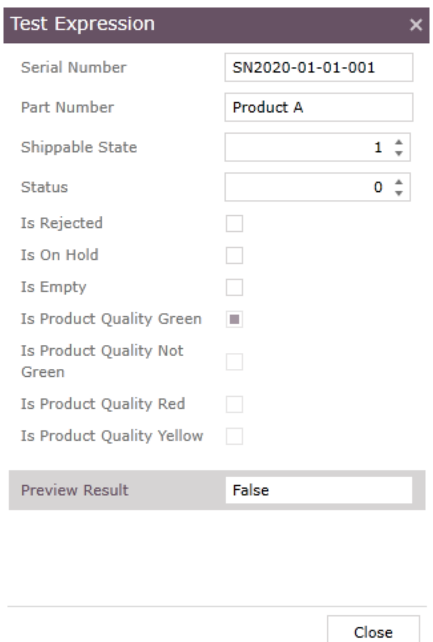
Each function must result in a true of false outcome. Some sample queries are:

| Expression | Description |
|---|---|
| IsProductQualityGreen | When using a field which is listed as boolean, such as IsProductQualityGreen then the expression will be true if the field is true. |
| PartNumber ='PartB' | When using a string field the value can be checked against a string. This is true if the part number is **PartB** |
| SerialNumber.contains('2020') | When using a function with a string field the function must return true. In this case the serial number must contain 2020 which can be used if serial numbers contain the date. |
| SerialNumber.contains('2020') And PartNum-ber = 'PartA' | Expressions can be combined with the And statement. |
| serialnumber.endsWith("0001") | This will return true if the serial number ends in 0001 |

| Expression | Description |
|---|---|
| serialnumber.startsWith("0001") | This will return true if the serial number begins with 0001 |
| serialnumber.Substring(2,2)='CD' | This will return true if characters 3 and 4 are CD. Example ABCDEF001 |
| EveryNth(6) | This will return true for every 6th build item that enters the queue. |

The test expression button opens a window which allows the user to type in sample serial numbers and part numbers and adjust the product quality to verify that the expression evaluates as expected.

The Test Expression menu




## Product Quality and Shippable State

Each Build Item has a Product Quality. The database lists the product quality as ShippableStateID which is an integer: Grey (0), Green (1), Yellow (2), Red (3). The ShippableStateID field is listed to give a user more options when creating an expression.

## *Limitations*

Conditional routing is supported for composite routes but connections are not allowed between different route segments.

Conditional routing is not allowed in between queues within a sync cluster. Conditional routing connections may be applied on the entry and exit to the sync cluster of a route.

When using the *Part Number* in the expression only the top level part number is checked. If the work order item uses features they are not checked.

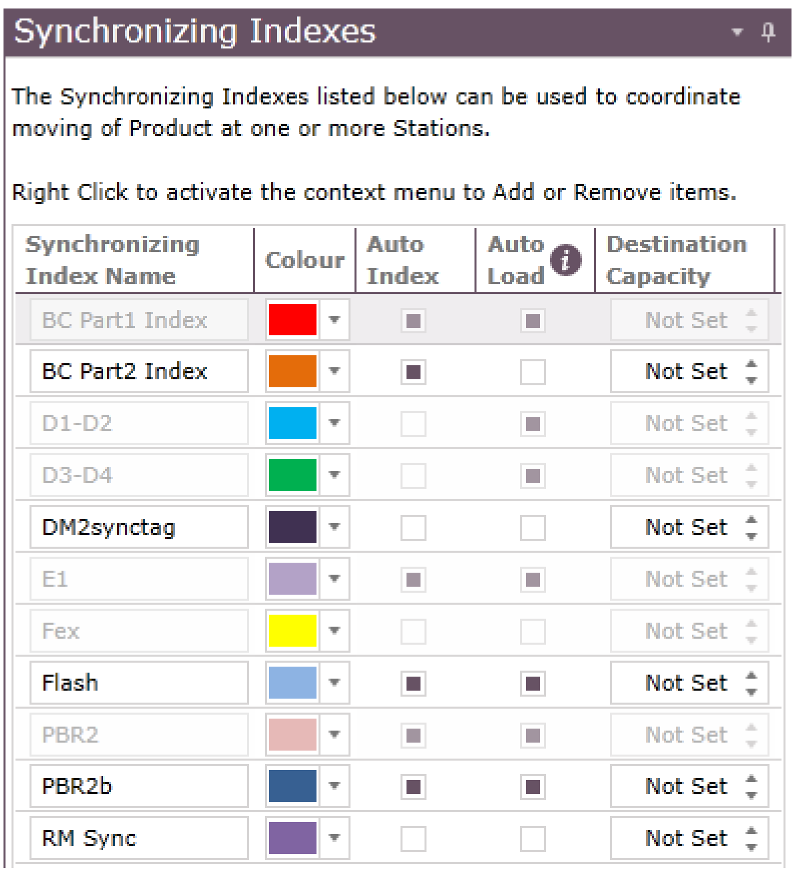
Conditional routing must be verified by the user. The PINpoint system cannot verify every logical outcome of the conditions within the routes. It is the responsibility of the user to ensure that build items always have an exit path, and that there is no condition which would create an infinite loop.

## Synchronizing Tags

Synchronizing the movement of many stations can be done using synchronizing tags. Synchronizing tags are setup on the build tab. On the station properties in the hardware tab a Synchronizing tag can be assigned to multiple stations. Synchronizing tags are integers. When the integer value changes the tracking manager will increment the position of each build item at all stations which share the synchronizing tag.

Existing Synchronizing Tags can be viewed in the Synchronizing Tags tab.

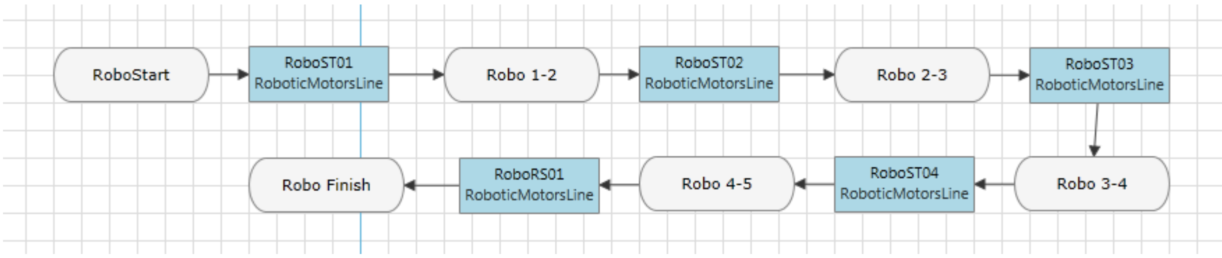
Examples of existing Tags in Synchronizing Tags tab



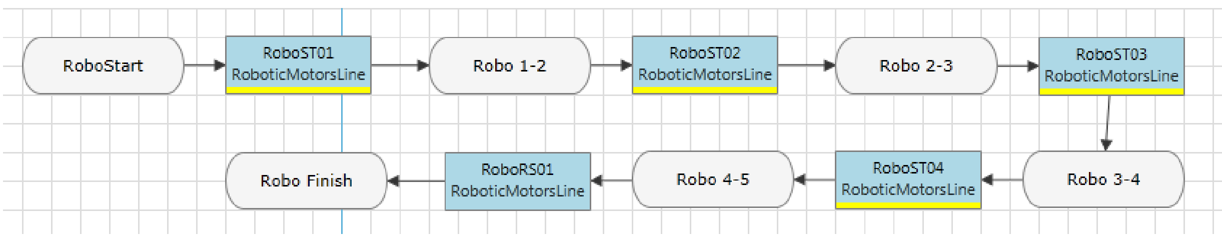
In the example below, an ordinary Line has no Synchronizing Tags. Build Items move independently from Station to Queue without regard to the work being done at other Stations.

Route without Synchronizing Tags




Below is that same Route with four of the Stations clustered by a Synchronizing Tag to synchronize the movement of their build items in Tracking.

Route with Synchronizing Tag applied

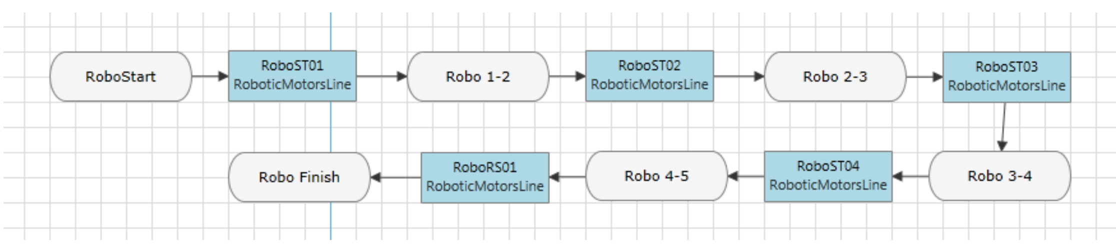



## *Creating a Synchronizing Tag*

To create a new Synchronizing Tag, follow these steps.

1. On the **SmartBuild** Application, select **Build**. The **Build** workspace opens.
2. Use the Route drop-down menu to select the Route.

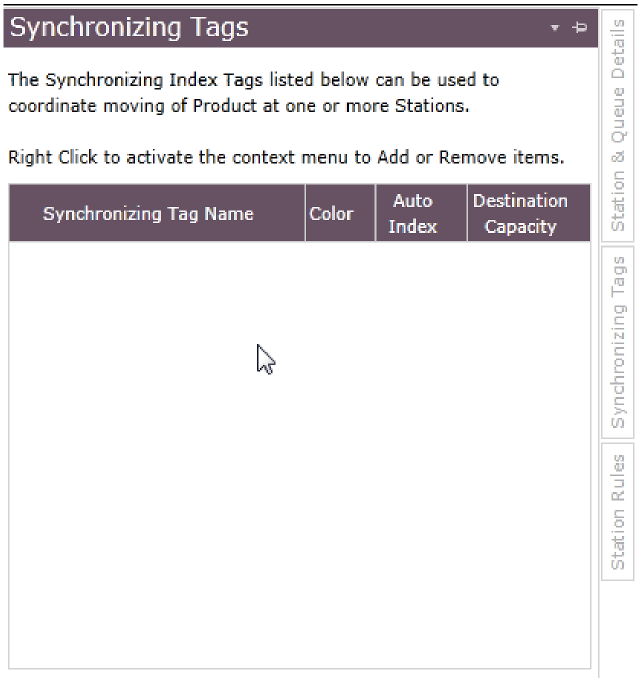
   Route without Synchronizing Tags




3. Click the **Synchronizing Tags** tab to open it.

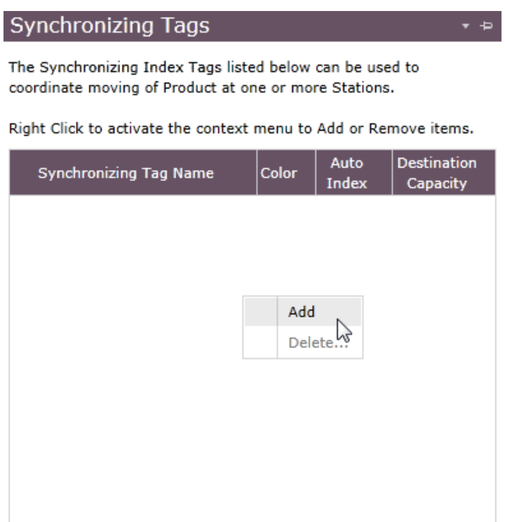
 

Synchronization Indexes pane without tags




4. Right-click in the tab and select **Add**. A new tag line opens in the tab.

   Adding a new Tag

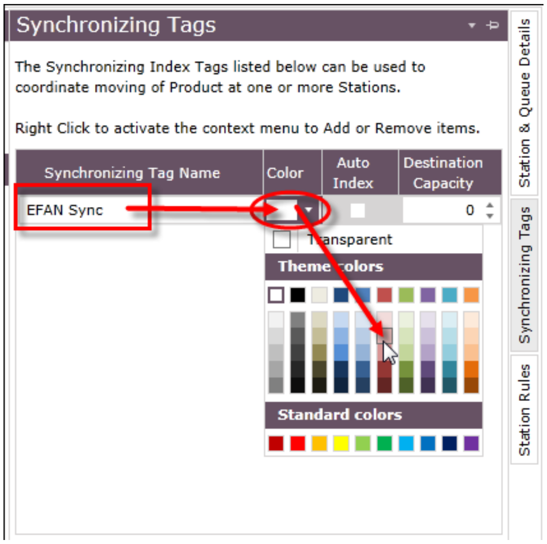



5. Type a name for the new Synchronizing Tag.

6. Use the Color drop-down menu to select a color for the Tag. This will apply a bar of that color to the bottom of all Stations in the Route to which the Tag is applied.

Enter name and select color

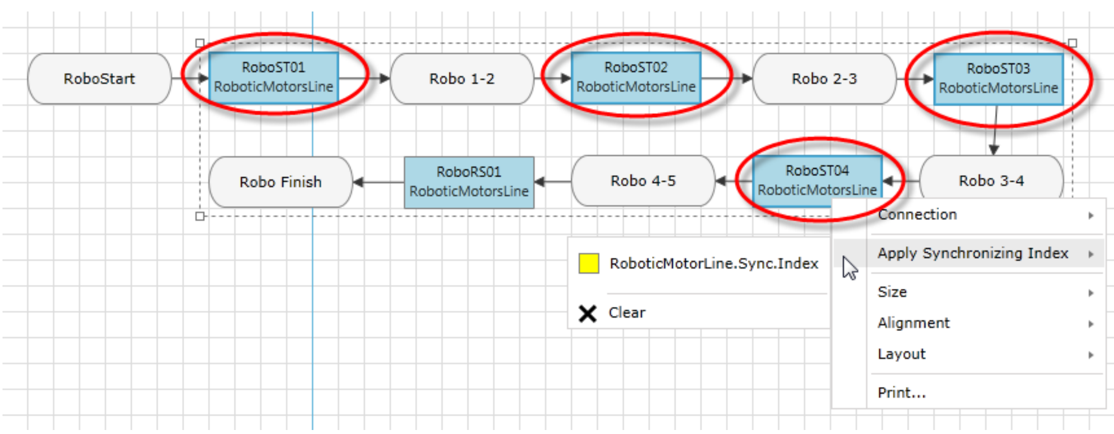



The Tag is now available for application to Stations in this Route.

## *Applying a Synchronizing Tag*

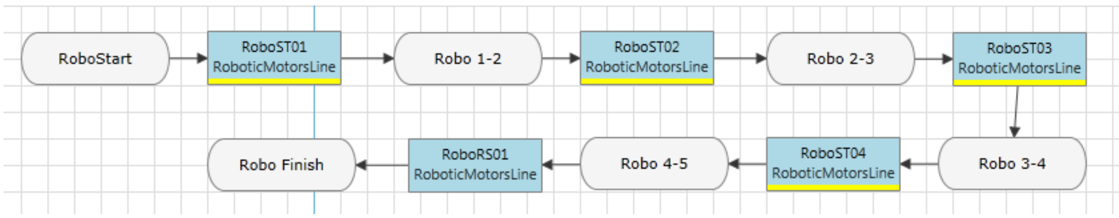
1. On the **SmartBuild Application**, select **Build.**
2. Use the Route drop-down menu to select the Route.
3. Select one or more stations.
4. Right-click one of the selected Stations and select **Apply Synchronizing Index** and choose one from the list.

   Select Stations and apply Tag




The selected Stations are now marked at the bottom with a color bar indicating they have been clustered together with the designated Synchronizing Tag.

Route with Synchronizing Tag applied

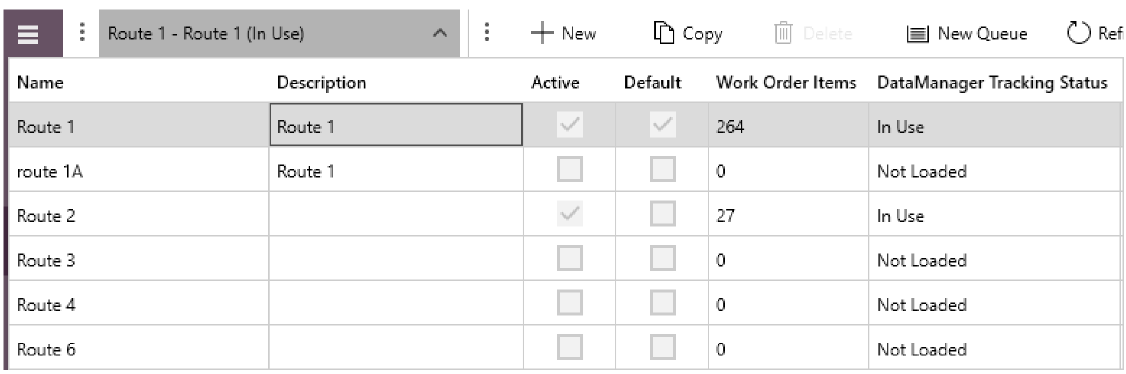



## Viewing Existing Routes

To view an existing Route follow these steps.

1. On the **SmartBuild Application**, select **Build**.
2. Select the route from the drop down list

   List of existing Routes




| Name | Description | Active | Default | Work Order Items | DataManager Tracking Status |
|---|---|---|---|---|---|
| Route 1 | Route 1 | ✓ | ✓ | 264 | In Use |
| route 1A | Route 1 | ☐ | ☐ | 0 | Not Loaded |
| Route 2 | | ✓ | ☐ | 27 | In Use |
| Route 3 | | ☐ | ☐ | 0 | Not Loaded |
| Route 4 | | ☐ | ☐ | 0 | Not Loaded |
| Route 6 | | ☐ | ☐ | 0 | Not Loaded |

## Editing Existing Routes

Routes can be modified while they are in use however there are some limitations when editing a composite route. A composite route is a route where two or more build items are combined at any point. If any station on the route has the rule *Load Depends on Child Build Item* set to *At least one child is complete* or *All children are complete* then it is a composite route.

It is not possible to edit the *Load Depends on Child Build Item* rule or the *Completed Action* rule for a station while the route is in use. These restrictions are also applied to stations which are added while the route is in use. If a modification to a route requires that those rules be modified on a new station or an existing station on the route then the route should not be modified while it is in use.

In general; Adding, removing, or modifying, a station in the middle of a section of the route is acceptable because the rules do not need to be changed on that station or any of the surrounding stations of that section. Adding, removing, or modifying, a station which connects to a merge queue is not possible because the rules for that station or the surrounding stations would need to be modified.

While it is possible to add or remove a station there are consequences for modifying stations which connect to start queues or stations which have graveyard queues.

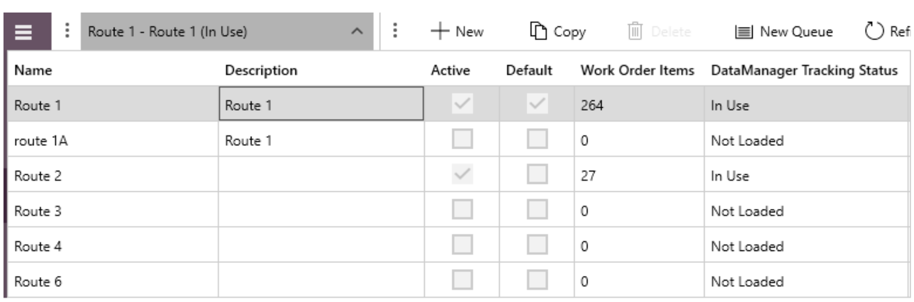
A start queue is the first queue on a route. Some routes can have more than one start queue. When a work order is provisioned build items are created in each of the start queues for each of the work order items. Adding a new station and creating a new start queue can be performed while the route is active but the new start queue will not have any build items. The new start queue will not have any build items because build items are only created when the work order is provisioned. Work order items which were not released when the route was modified will create a build item at each start queue when they are released.

A graveyard queue is the queue shown on a station (this is displayed on the production view of the tracking app) if that station has the rule *Completed Action* set to None. This is setup when several stations merge into the same queue. The graveyard queue is where child build items go after they complete all the stations on a section of the route. Stations after the merge queue must have the rule *Load Depends on Child Build Item* set to *At Least One Child Is Complete* or *All Children Are Complete.* The purpose of this setup is to ensure that one or both branches of the route are complete before the next station in the route can load the serial number. Modifying a station with a graveyard will affect the parent build item in the next merge queue. If a child build item is located in a graveyard queue the parent build item in the merge queue can be started at the station after the merge queue, but if the graveyard queue is removed then the child build item is also removed which means the parent build item status changes. Extra caution should be taken when modifying stations with graveyard queues while the route is active.

To edit an existing route:

1. Open the **SmartBuild Build Tab**.
2. Click the Route selection drop-down menu to view the list of Routes.

   List of existing Routes

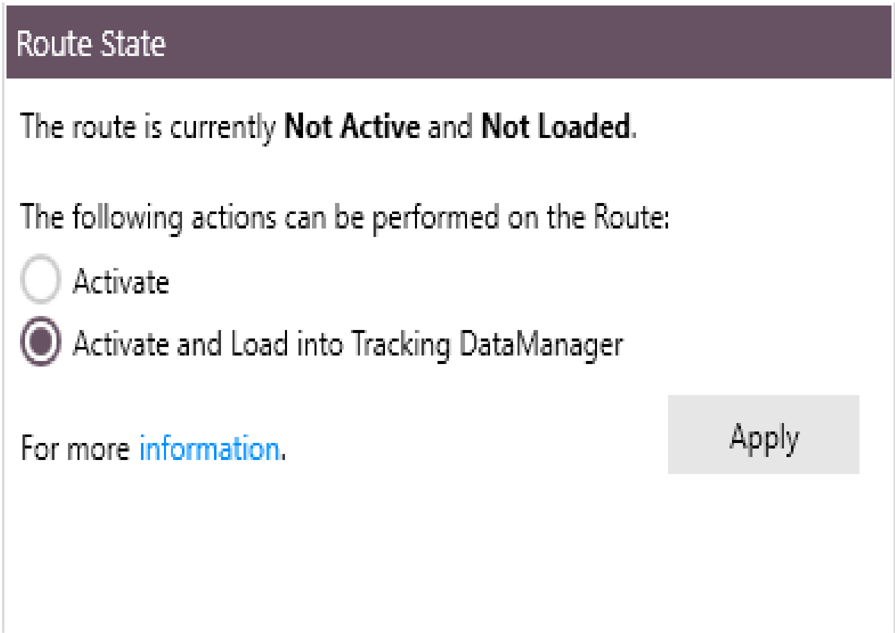



| Name | Description | Active | Default | Work Order Items | DataManager Tracking Status |
|---|---|---|---|---|---|
| Route 1 | Route 1 | ✓ | ✓ | 264 | In Use |
| route 1A | Route 1 | | | 0 | Not Loaded |
| Route 2 | | ✓ | | 27 | In Use |
| Route 3 | | | | 0 | Not Loaded |
| Route 4 | | | | 0 | Not Loaded |
| Route 6 | | | | 0 | Not Loaded |

3. Click the Route. The Route opens in the work pane and its properties are populated.

   Route open



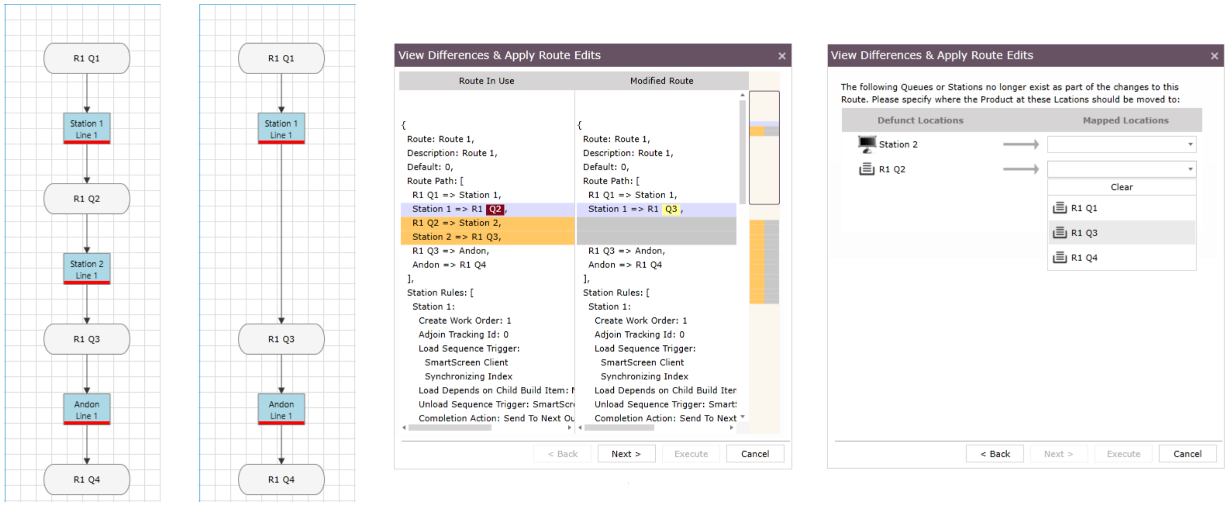

The Route can be edited provided that its status is not **Read-only**.

4. Make the changes that required and click **Save**.

## *Applying Changes*

After changes to the rules or the structure of the route have been saved choose view/apply. This will display the differences on the routes before they are applied. The window shows a comparison of the changes as two side by side text files and highlights the rows with the changes. If there is a change to the route structure then a window will appear asking for input about where items currently in queues and at stations should be moved to. Once this process is completed by the user the changes are activated.

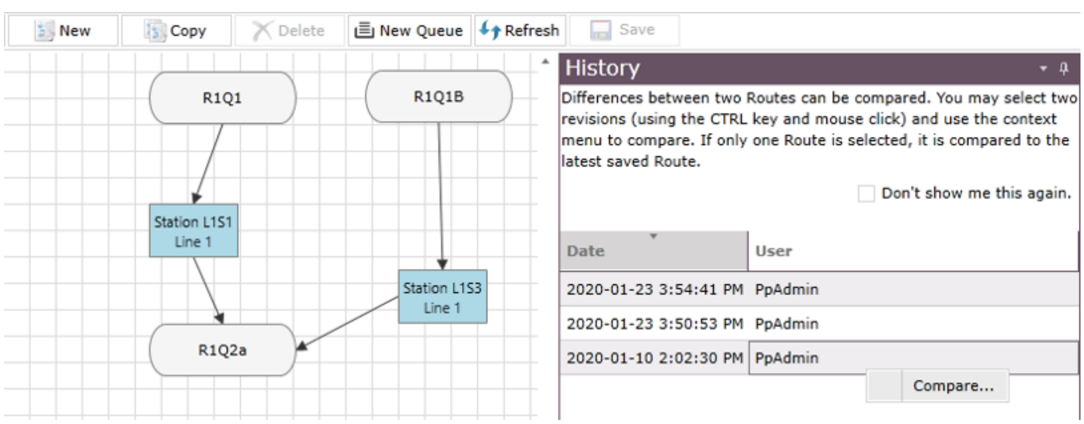
An Example of the Procedure After Changing a Route



## *History Pane*

The history pane provides a history of changes to the route. The versions of the route can be selected by using control and right clicking on them provides the ability to compare them. The compare window is the same window which appears when modifying a route.

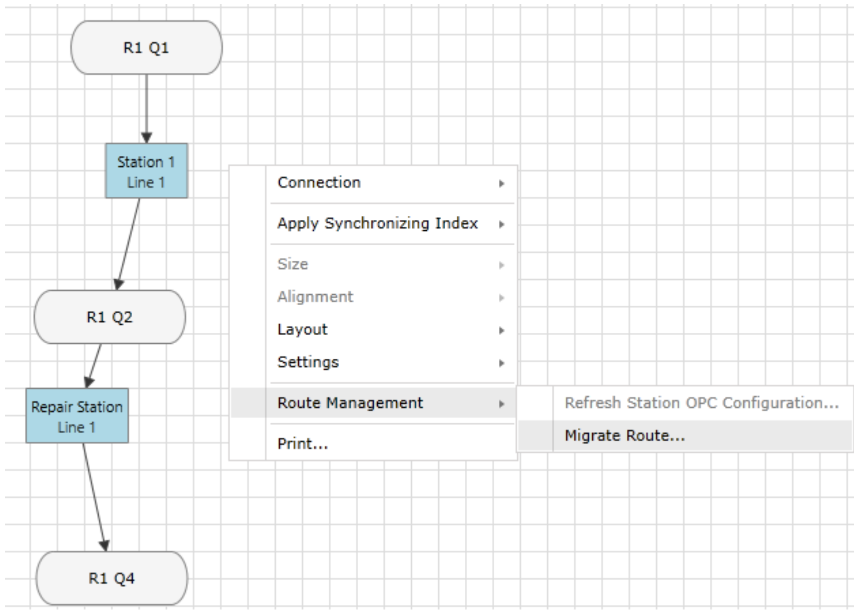
The history Pane




## *Migrating Routes*

If a route needs major modifications or a route is scheduled to be changed at a certain date then a copy of the route can be created and modified. When the route is ready to be migrated right click on the work area and select Route Management -> Migrate Route. This will show a window allowing for selection of the new route and mapping items into the new queues.

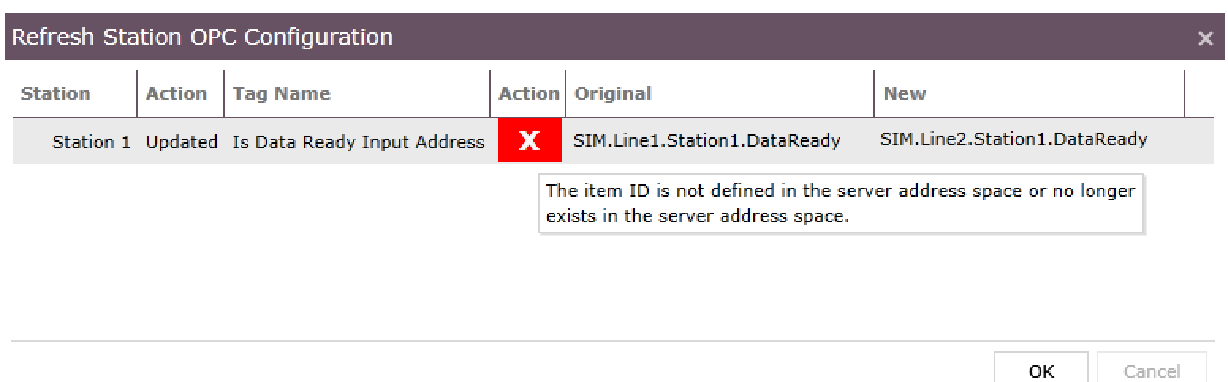
The Migrate Route Dialogue Box




## Station OPC Tags

OPC Tags for a station can be changed and applied on the build tab. After making a change to an OPC tag address on the station and queue details right click on the main work area and select Route Management-> Refresh Station OPC Configuration. The dialogue box will display a list of changes. Changes are applied immediately and do not require the station to be restarted. Some changes require a change of the state before the system attempts to write to the tag.

An Example of the Dialogue Box When Modifying a Tag. If There is an Error the Action Column Will Explain It



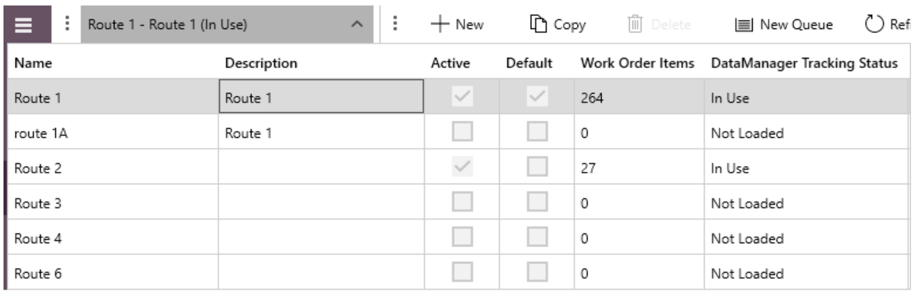

 

## *Copying an Existing Route*

To create a copy of a Route:

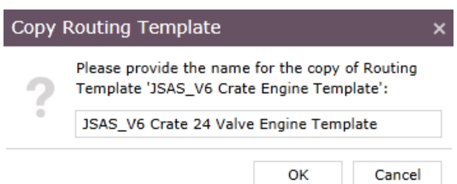
1. On the **SmartBuild Build Tab** select the route selection drop down.
2. On the Route selection drop-down choose a route to Copy.

   List of existing Routes




3. Enter the new name.

   Copy Route dialog




4. Enter a name for the Route copy and click **OK.**
5. Save the new route**.** By default the status of the new Route is **Not Active and Unloaded**.

## *Changing the State of a Route*

The tracking manager has a state for each route. The state of the route determines what actions can be performed on the route. In general the state of the route determines whether or not work orders can be created and built on the route and whether or not build items will be tracked when they move.

A description of terms for a route state

| Term | Description |
| --- | --- |
| Active | The route will be loaded next time the tracking manager service is started. |
| Not Active | The route will not be loaded next time the tracking manager service is started. |

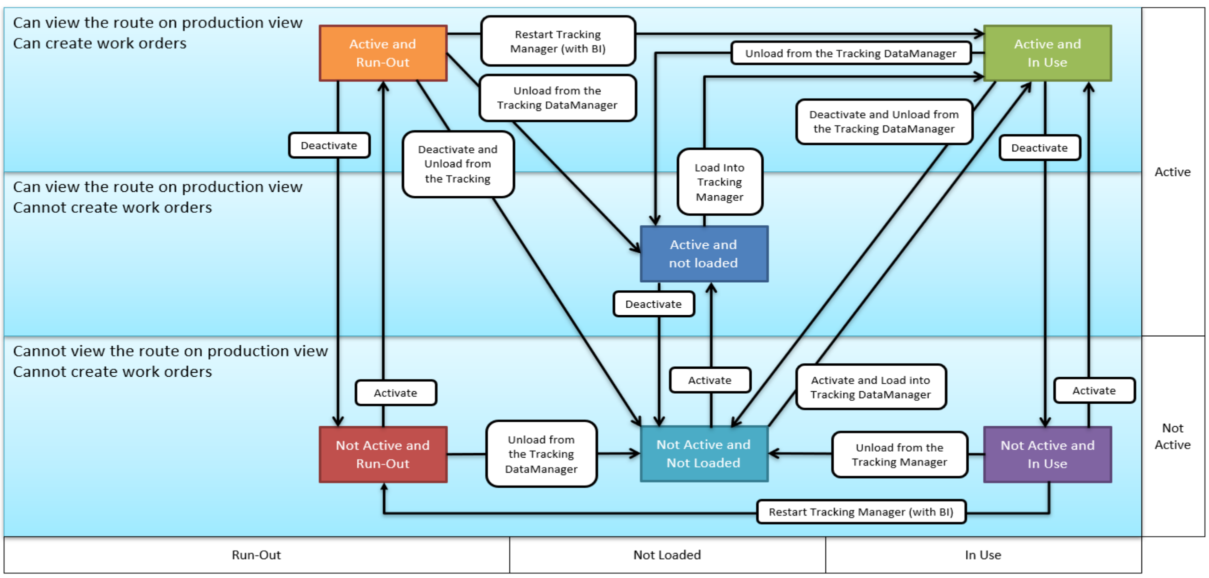
| Term | Description |
| --- | --- |
| In Use | The route has build items on it and is loaded into the tracking manager. |
| Not Loaded | The route is not loaded into the tracking manager. |
| Run-Out | The route has build items on but it has been deactivated and unloaded from the tracking manager. This is typically used to empty the route and prevent new work orders from being started on it. |

Route States

| State | Description |
| --- | --- |
| Active and In Use | Build Items are being tracked on this route.<br>The route can be viewed on the Tracking app<br>Work orders can be created for this route |
| Active and Run-Out | Build Items are being tracked on this route. This special state is only possible if a route which is already **Not Active and Run-Out** is made active.<br>The route can be viewed on the Tracking app<br>Work orders can be created for this route |
| Active and Not Loaded | Build Items are being tracked on this route but new work orders cannot be created. If the tracking manager is restarted this route will become Active and In Use. The route is in this state to prevent users from creating work orders on it.<br>The route can be viewed on the Tracking app<br>Work orders cannot be created for this route |
| Not Active and In Use | Build items are not being tracked on this route but build items exist on this route. The route is in this state to prevent users from creating work orders on it.<br>The route can be viewed on the Tracking app<br>Work orders cannot be created for this route |
| Not Active and Not Loaded | Build Items are not being tracked on this route. Build Items will not be tracked on this route unless the state is manually changed.<br>The route cannot be viewed on the Tracking app |

| State | Description |
|---|---|
| | Work orders cannot be created for this route |
| Not Active and Run-Out | Build items are not being tracked on this route but there are build items currently on this route. If the tracking manager is restarted this route will not be loaded.<br>The route cannot be viewed on the Tracking app<br>Work orders cannot be created for this route |

Map of route State changes. The boxes represent the route state and the bubbles indicate the actions which can be taken on the build tab to change the state.




# Process Tab

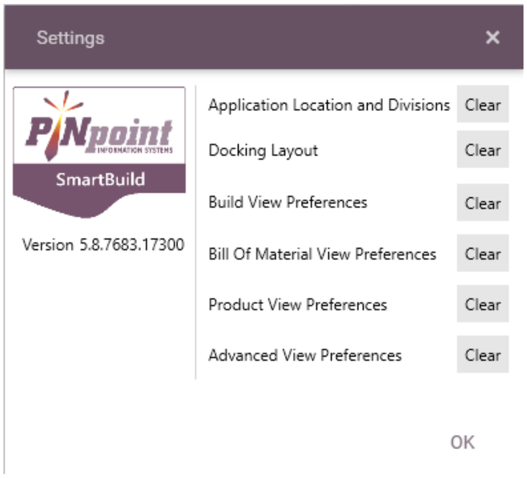
The Process tab is used to create Processes and steps, and assign them to stations. When a Build Item is loaded at a specific station the SmartScreen client will load the Processes and Process Steps.

Each Process Step can have one or more Operations. There are several types of operations available.

The layout of SmartBuild can be customized to facilitate the user's work flow. To reset the layout right click on the settings and select Clear.

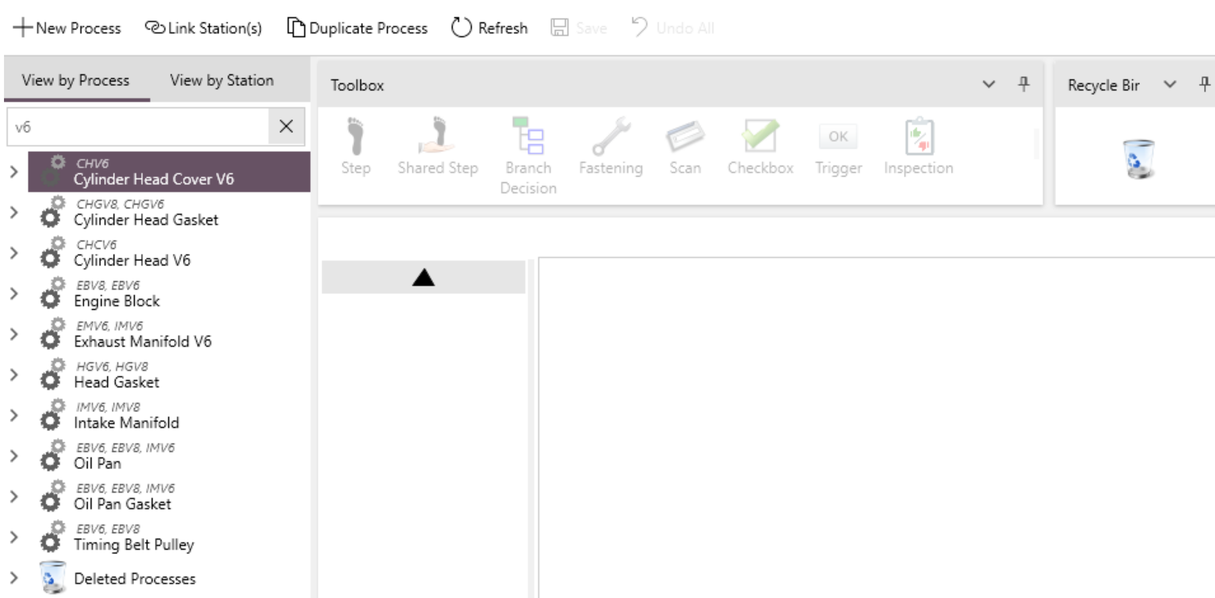
Reset Layout




# View by Process

The **View by Process** tab organizes the view by listing the Processes and allows the user to see which Stations are assigned steps. It allows the user to assign more Stations to that Process. New Processes can be created here. When Stations or Steps are selected, the Toolbox pane becomes active, enabling the creation, configuration, and editing of Steps.

View by Process tab




## *Filtering the view*

The text filter matches the Process name and the Part Numbers in the Process's Parts list.

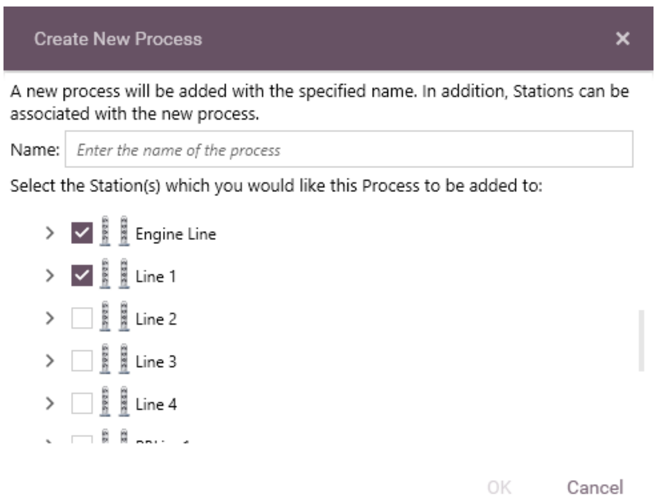
## Creating a New Process

The **New Process** button is available at all times while working in the View by Process tab. To create a new Process.

1. Click the **New Process** button. The **Create New Process** dialog opens.

2. In the **Name** field, type the name of the new Process.

   Create New Process dialog




3. Select the lines or stations to link and select **OK.**

## Linking Stations to a Process

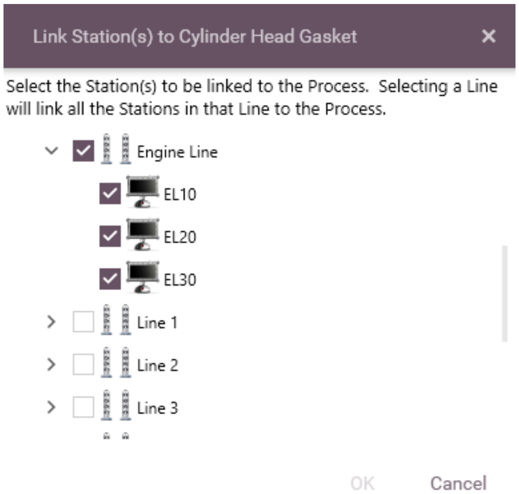
To add Stations to a Process after the Process was created, follow these steps.

1. In the **View by Process** tab, select the Process. The **Link Station(s)** button becomes active.

2. Click the **Link Station(s)** button. The **Link Station(s) to [Process Name]** dialog opens.

Link Station(s) to Process



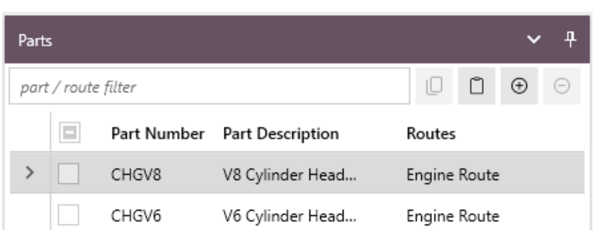

3. Select the items to link and select **OK.**

## *Adding Parts to a Process's Parts List*

Each Process has a list of Parts. Each Work Order Item has a list of parts. When a build item (for a work order item) arrives at a station the work order item's parts list is used to select which processes to load. If a process is linked to a station, and has a part in the process's parts list which is also in the work order item's parts list, then the process is loaded.

Parts are added on the Parts tab of the Process. The Add Parts button opens a dialogue box where parts can be selected and added to the list. Parts in the list can be selected from the list and removed with the Remove Parts button. Parts in the list can be selected and then copied to clipboard with the copy button. The Paste button allows the list of parts previously copied to be pasted to another process's parts list. A comma separated list of part numbers can also be pasted with the Paste button.

The Parts List




## *Duplicate Process*

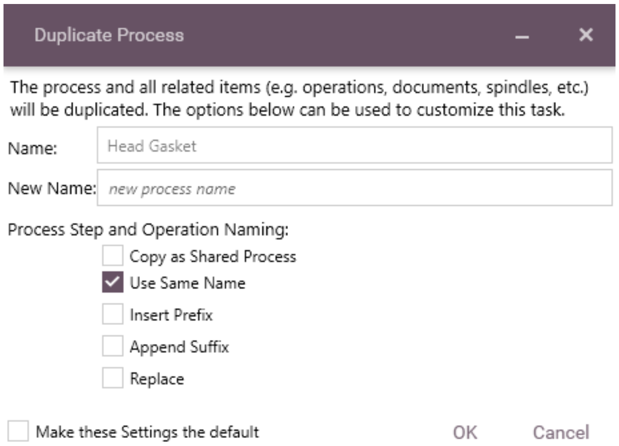
The **Duplicate Process** function allows users to create a copy of a Process which includes all the Stations, Process Steps, and Operations.

To duplicate a Process:

1. In the **View by Process** tab, select the Process for duplication.
2. Select **Duplicate Process.** The **Duplicate Process** dialog opens.

   Duplicating a Process




3. Select the options:

   Duplicate Process options

| Option | Description |
|---|---|
| New Name | The name of the new process |
| Use Same Name | When selected, this option will preserve the names of Process Steps and Operations when the Process is duplicated. Selecting this disables the **Insert Prefix** and **Append Suffix** options, but still enables the use of the **Replace** option. |
| Insert Pre-fix | When selected, this option displays a text field into which a string can be typed that will be prefixed to the beginnings of names of duplicated Process Steps and Operations. |
| Append Suffix | When selected, this option displays a text field into which a string can be typed that will be suffixed to the ends of names of duplicated Process Steps and Operations. |
| Replace | When selected, this option displays two text fields that enable a string to be replaced from the names of duplicated Process Steps and Operations, and another enabling string to replace it in those names. |

| Option | Description |
|---|---|
| Make these set-tings the default | Select this option if to make these the default the next time. |

4. Click **OK**. The duplication process runs.

5. When SmartBuild finishes, click **OK**. The new process appears in the list.

### *Deleting a Process*

To delete a Process and all of its Steps and Operations drag the Process from the **View by Process** pane to the **Recycle Bin**. Deleted Processes will appear in the **Deleted Processes** folder at the bot-tom of the list of Processes.

To permanently delete a Process drag a Process from the **Deleted Processes** folder to the recyc-ling bin and a dialogue will appear asking for verification. Permanently deleting a process cannot be undone.

## View by Station

The **View by Station** tab lists the Processes which are linked to each station. This view provides an alternate way of visualizing how processes apply to stations.

### *Link Processes*

Processes can be linked to a station in this view in 2 different ways.

#### Method 1

1. Select a Station to link a Process.

2. Click the **Link Process** button. The **Link Process to [Station Name]** dialog opens.

3. Check the Process. Processes can be filtered in this popup.

4. Click **OK**.

#### Method 2

1. Drag and drop the Process from one station to another.

2. Select Link Process on the popup dialogue box.

### *Removing a Station from a Process*

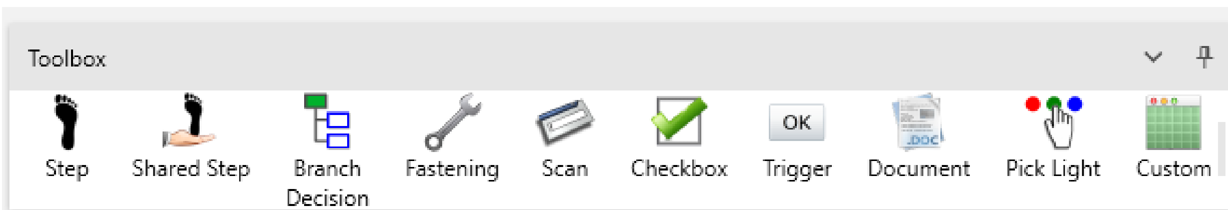
Remove a Station from a Process by dragging the Station to the Recycle Bin. Removing the Station does not delete the Station from the PINpoint system.

## Using the Toolbox

The **Toolbox** panel is used to create and configure Process Steps and Operations for the Process. It allows the user to build and configure the sequence of steps for a process.

Steps, Shared Steps, and Branch Decisions are added to the root pane. Other Operations are then added to Process Steps. Any Step or operation can be renamed by selecting it and pressing F2.

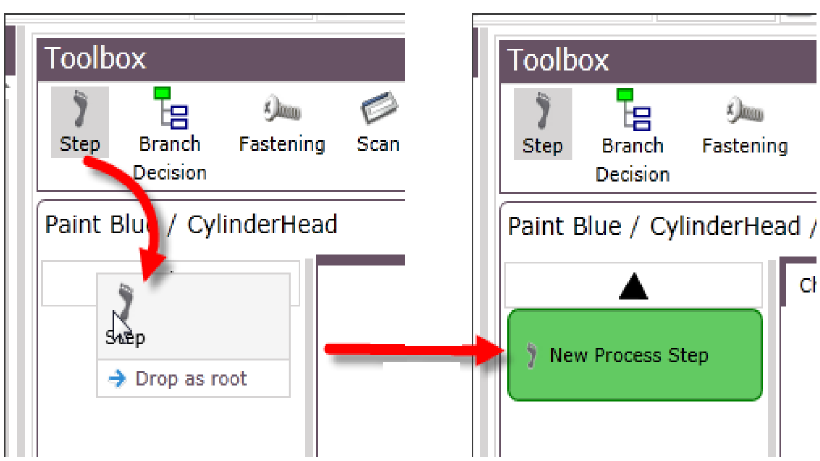
Toolbox interface




### *Adding a Process Step*

To add a Step to Process, Click and drag the Step down into the Process Steps panel of the work area. Drop the step in the panel and then type a name for the step.

Dragging a Step to a Process




### *Shared Process Step*

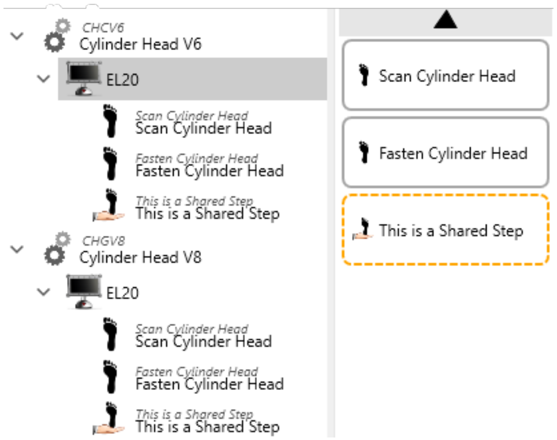
Shared process steps are a method of reusing the same steps on multiple processes.

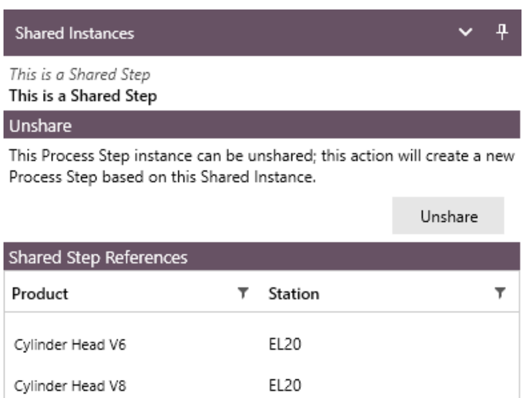
Steps can be turned into shared steps and vice versa. Steps can be shared across different Processes but only on the same station. When a Process is duplicated there is a feature which allows all the steps to be shared in the duplicated Process.

When dragging a shared process step from the toolbox into the step list SmartBuild will prompt the user to choose a step which should be shared and placed on this Process. Shared steps have a new icon and a border around them denoting they are shared.

An Example of a Shared Step




The Shared Instances Tab (On Right Side of Screen) Allows Users to Identify and Quickly Navigate to All Instances of a Step. There is an Unshare button which will turn this instance of the step into a regular step.




## *Add a Repair Step*

Repair Steps are instructions displayed at Repair Stations only. see "Add Stations to a Repair Station" on page 343

## *Adding a Branch Decision*

A Branch Decision is a feature that will enable or disable steps depending on a true/false decision on an another process step. The Branch Decision allows the operator to proceed to the next Step provided the output of the Checkbox or Scan operation matches the condition set to do so.

A Branch Decision has two configurable properties:

- **Source**: the Checkbox or scan operation of any of the Steps preceding it
- **Comparison Value**: a string, true or false

To create and configure a Branch Decision, follow these steps:

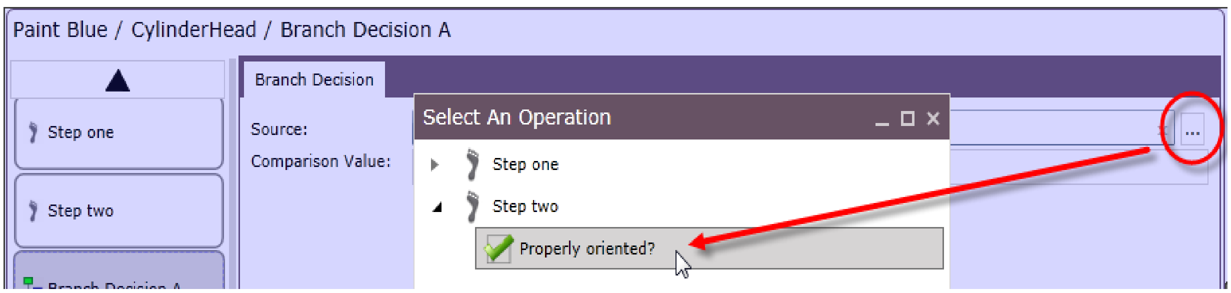
1. Click and drag the **Branch Decision** icon down into the **Process Steps** panel of the work area.

2. Drop the **Branch Decision** in the panel below the Step with the source operation to be referenced.

3. Type a name for the Branch Decision.

4. In the **Branch Decision** panel in the work area, click the ellipsis button (**...**) at the end of the **Source** field to be shown the options. The **Select an Operation** dialog opens.

   Select an Operation dialog

5. Expand the **Step** and select the source **Checkbox** or **Scan** Operation.

6. Click **OK**. The Step and source operation are added to the Source field.

7. In the **Comparison Value** field, enter a value of **true** or **false**, or the expected value of the scan operation.

8. Click **Save**

## *Sharing Branch Decisions*

Branch decisions and the source step for the branch decision may be shared.

To create and share a branch decision

1. Share the source step to the new Process

2. Create a branch decision.

3. Select the source step. When selecting the source for the branch decision, if the source is shared then it will also share the branch on all the Processes where the source exists.

To share a branch decision which is already shared.

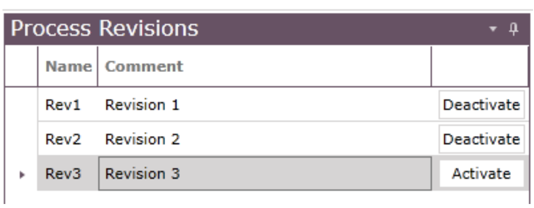
1. On the Process which requires the new branch and step, drag a new shared step onto the list of steps.
2. In the *select process steps to share* popup select the step which is the source for the branch decision
3. click OK. This will share the branch decision, the source, and all steps within the branch decision to the new Process.

## Process Revisions

Process revisions allow the user to create a revision and then add steps to that revision and then choose when to activate the revision. A Revision is a label for a group of steps. When a revision is activated the steps will be made available on the SmartScreen Client.

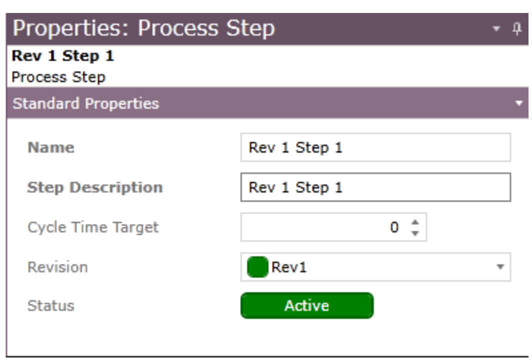
A revision can be created on the Process Revisions tab. Steps can be added to a revision by selecting the revision from a list on the properties of a process step.

Process Step Revisions




Revisions can include steps on different Processes or different stations. When a revision is activated all of the steps in that revision are available on the SmartScreen client.

Steps on an inactive revision are displayed differently in SmartBuild.

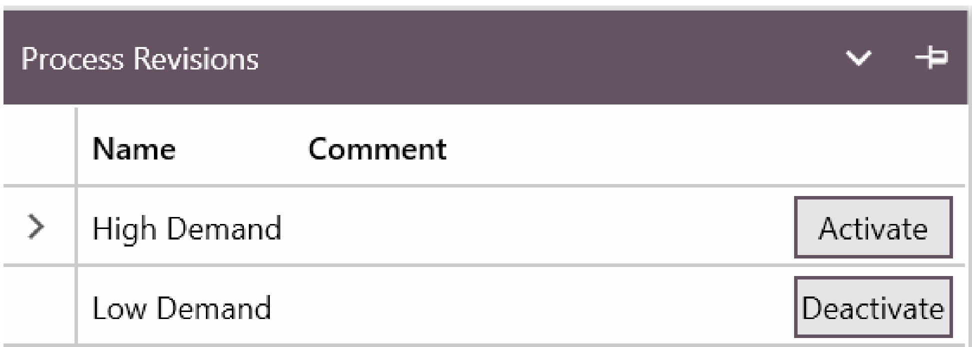

 

## Using Revisions to control the process

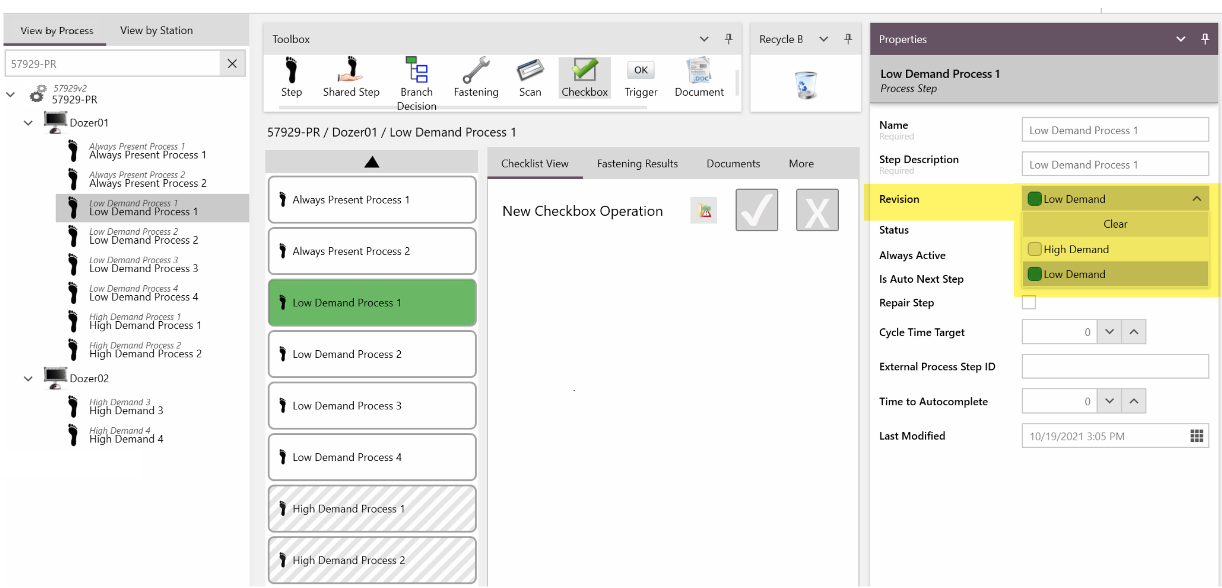
Revisions can be used to control the process. Revisions activate steps if the revision is active. Revisions can be used to activate process steps on stations when there is a period of high demand at the facility allowing work to be split between 2 stations. This allows the work to be done by one operator when there is low demand and by multiple operators when there is high demand.

In this example consider a scenario where steps are performed on station 1 when there is low demand but when there is high demand the steps are split up to 2 different stations. To accomplish this scenario there should be 2 revisions created. The High demand revision contains steps at station 1 and station 2. The low demand revision contains steps at station 1 only.

High demand and Low demand revisions




The steps associated with high demand and low demand revisions




To split the work up enable one revision and disable the other. This will take effect when a Process is loaded at a station.

Once a revision has been determined for a serial number and that serial number is on the line it is best not to change the revision as it could result in missed process steps or some process steps requiring completion on the High Demand station

If the PLC is not going to be stopping the Pallet at the High Demand station in the Low Demand Mode the High Demand station has to be excluded form the Shippable Quality determination

If the PLC is to stop and announce the pallet at the High Demand station every single time then the SmartScreen Client must be running and have an operator logged in at all times (even during Low Demand operation) so the station can receive a proper station complete. The station will receive a proper complete even if no process steps are configured for the station because this will trigger the "Station Complete with no Process" message. If the PLC is stopping the pallet every single time then the station does not have to be excluded from the Route Deviation determination.

# Operations

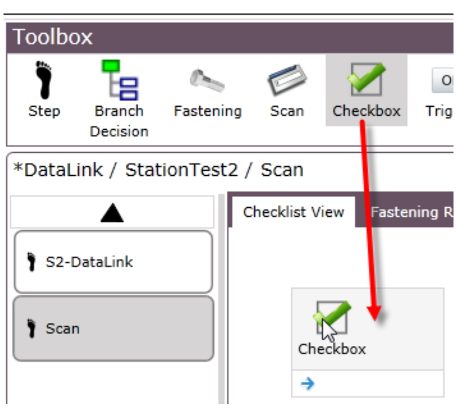
## Checkbox Operation

A Checkbox is simply a Boolean (true/false; yes/no) indicator whose state is controlled by the operator. It can ask a question, serve a reminder, or furnish an instruction that requires an acknowledgment on the part of the operator for the Step to proceed. Typically input is done by means of a touchscreen or the use of a mouse, though other input methods can be configured.

To add a Checkbox to a Step, follow these steps:

1. Select a Step
2. Select the **Checklist View** tab in the work area.
3. Click-drag the **Checkbox** icon down into the **Checklist View** tab and drop it.

   Dragging a Checkbox to a Process

4. Type a name for the Checkbox.

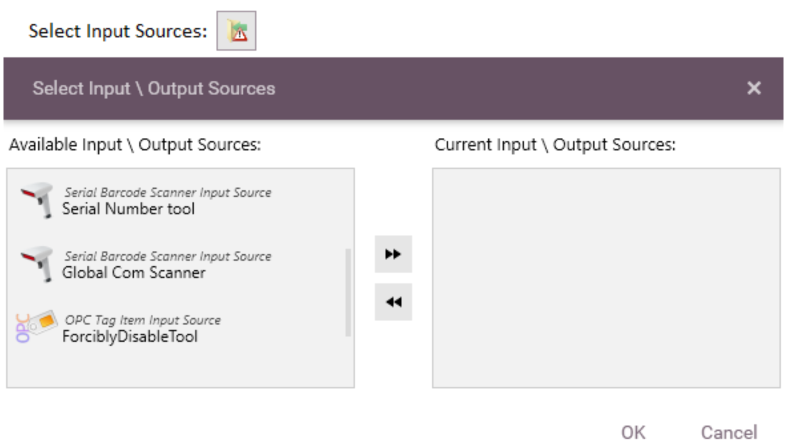
 

5. Click **Save**.

A Checkbox can have its state changed by the operator by touching the screen or using the mouse. To use a different input source click the Options button and select one from among the input sources configured for that Station. To do so, follow these steps:

1. Select the Step.
2. In the **Checklist View** tab, select the Checkbox operation.
3. Click the **Select Input Sources** icon of the Checkbox operation.

   Select Input Sources dialog




4. Select the **Input Source** and click the **Add** button. The Input Source moves to the Current Input Sources field.
5. Click **OK**. The Input Source is added to the Checkbox operation.
6. Click **Save**.

## Trigger Operation

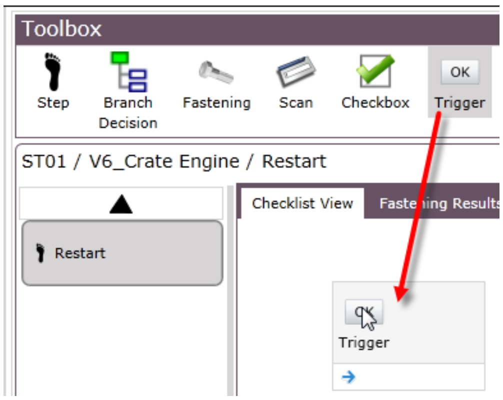
A Trigger operation is used to add a button to the Process Step that enables an operator at a SmartScreen Client to initiate the execution of custom PLC code. When the button is pressed an OPC Tag Item Input Source is activated. It provides the operator with the ability to generate a momentary start signal which can be triggered multiple times. The Product and Analyze Reports will show Trigger Operations.

To add a Trigger to a Step, follow these steps:

1. Select the step
2. Select the **Checklist View** tab in the work area.

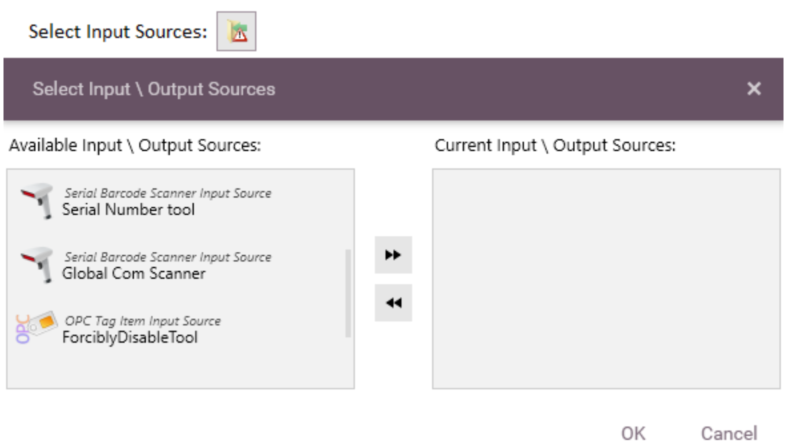
3. Click-drag the **Trigger** icon down into the **Checklist View** tab and drop it.

   Dragging a Trigger to a Process




4. Type a name for the Trigger.
5. Click the **Select Input Sources** icon of the Trigger operation.

   Select Input Sources dialog




6. Select the **Input Source** and click the **Add** button. The Input Source moves to the Current Input Sources field.

   The only applicable Input Source for a Trigger operation is an OPC Tag Item Input Source. If none are available for the Trigger operation, create one for the Station in the **SmartBuild > Advanced** tab after saving the Trigger operation.

7. Click **OK**. The Input Source is added to the Trigger operation.
8. Click **Save**.

# Document Operation

Documents are PDF files or paths to a URL. Documents are typically added to steps with other operations on them to provide context to the operator. The operator does not need to perform any action to complete a document on a step. If a document is the only item on a step the operator must click on the step to complete it.

## *Uploaded Document*

The only file type accepted is PDF. Other file types (such as DOC, TXT, RTF, XL, HTML, etc.) must first be converted to PDF in order to be uploaded. The PDF file must be no larger than 3MB. Uploaded documents will be previewed in Smartbuild.

CAD software often outputs PDFs with hundreds of line segments in order to create a detail drawing which can cause rendering issues. PDFs with a large amount of shapes and line segments have been found to take a significantly longer time to process on lower end hardware despite having a small file size. This can be resolved by copying the images the CAD software generates and pasting it into an image and then using that image in a PDF document.

Document Properties

| Property | Description |
|---|---|
| Name | The name of the document. |
| Start Date | The document will be available if the date is after the start date. |
| Enabled | If true the document will be made available provided the Start Date has been reached. |
| L3 Demotion | If true a level 3 user will be demoted to level 2 if a) the station is in training mode and b) the user accesses the document. |

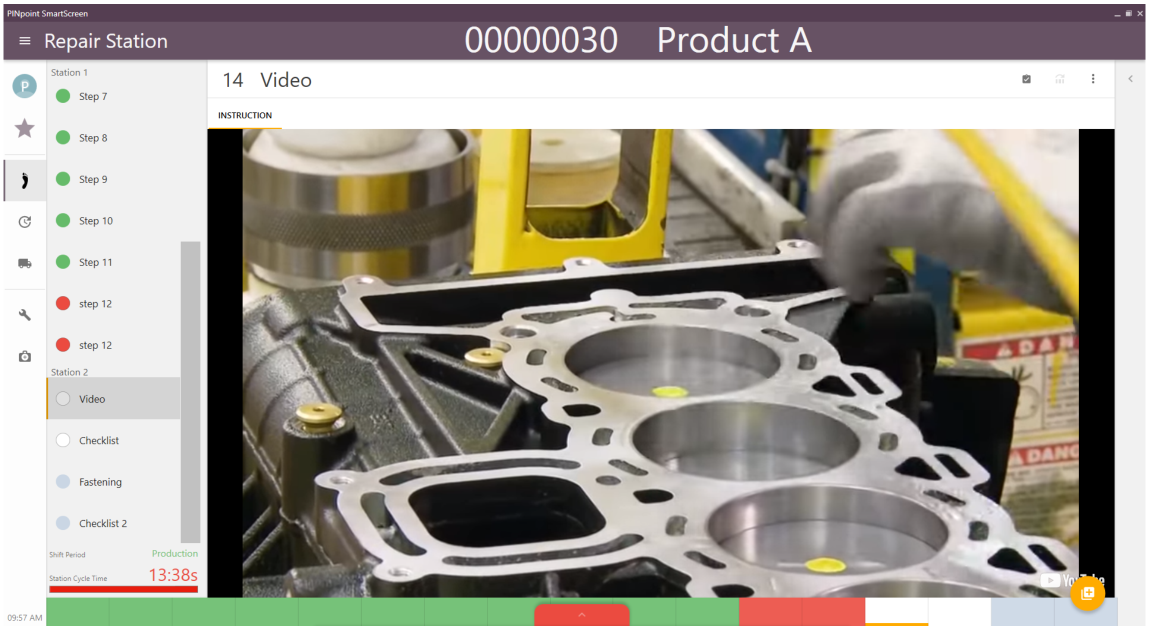
## *External Documents*

External documents are documents which are not stored in PINpoint’s database. A link can be entered to a network share or to a file on the internet and the linked item will be displayed on the SmartScreen client.

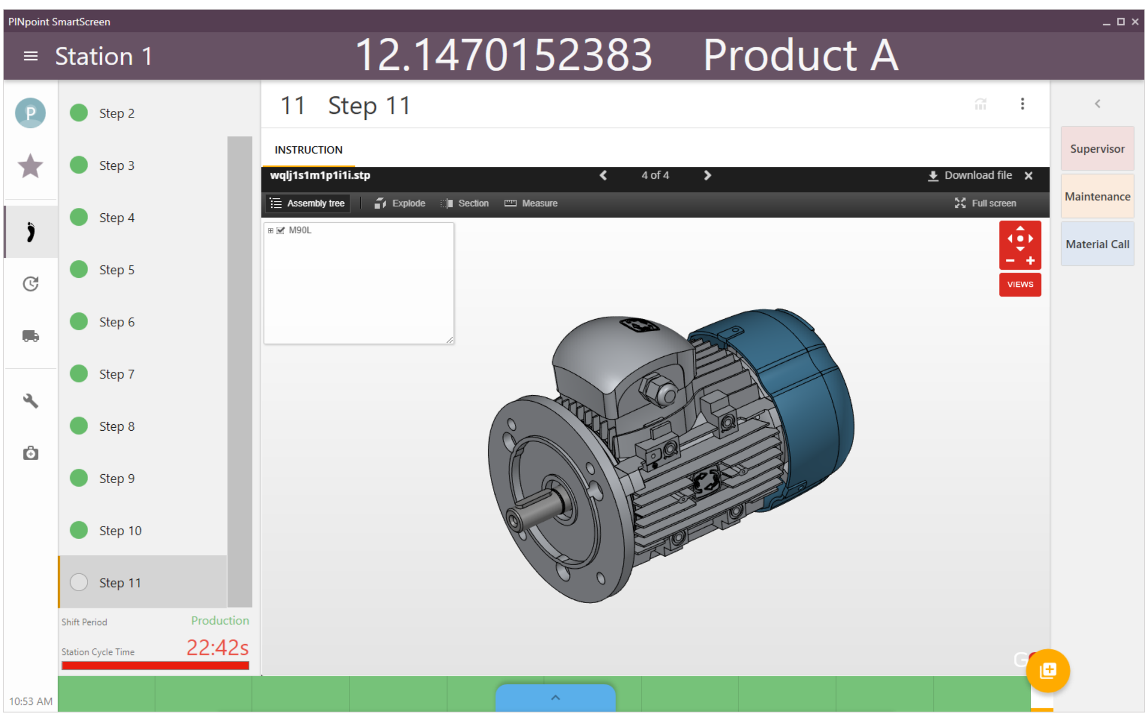
External documents which are network links to PDF files will be opened in the default PDF viewer. Any information in the string to the PDF to go to a specific bookmark or page will be omitted when previewing.

SmartScreen connects to the URL using the permissions granted to the account which is running the SmartScreen client. The URL can accept query parameters See:"Query Parameters" on page 505

An Example of a Video on a Step




An Example of a CAD Model on a Step. This Model is Displayed by Loading the Embedded Viewer on the Website



Examples

- **PDF**: C:\My document.pdf

  This will load the PDF from the local PC where the SmartScreen client is running

- **PDF from a remote computer**: \\computername\directory\My document.pdf

  This will load the PDF from the remote directory. More information about specific arguments which can be used is found here. They are not all guaranteed to work.

  https://www.adobe.com/content/dam/acom/en/devnet/acrobat/pdfs/pdf_open_parameters.pdf

- **PDF to a specific bookmark**: \\computername\directory\My document.pdf#nameddest=chapter1.pdf

  This will load the PDF at the bookmark called “chapter1”. This is omitted when previewing the file in SmartBuild but is maintained on the SmartScreen client.

- **PDF to a direct page number**: \\computername\directory\My document.pdf#page=3

  This will load the PDF at the specific page, 3.

  This is omitted when previewing the file in SmartBuild but is maintained on the SmartScreen client.

- **Website**: http://sitename.com

  This will load the website within the documents tab.

- **Video**: https://www.youtube.com/embed/VIDEOID?rel=08&autoplay=1&showinfo=0&controls=0&autohide=1&loop=1&playlist=VIDEOID

  This will load a YouTube video. It will automatically play, hide information about the author, hide controls, hide the YouTube logo, and play in a loop.

  Hiding the 'Click to watch on YouTube’ button is not possible. It will pop up every time the video restarts. Adding &modestbranding=1 will hide the YouTube button but it will show the video info at the top of the window which will load YouTube if the operator clicks on it. modestbranding does not work with showinfo.

  More information can be found here:

  https://developers.google.com/youtube/player_parameters#controls

- **3D CAD model**: http://intranetCADsite.com/library/item

  It is possible to display a 3D CAD model by loading a CAD viewer which is embedded on a website. If there is a direct link to a website with an embedded viewer which will display a specific model the client will be able to display it. Results will vary based on the GPU on the PC running the SmartScreen client and the complexity of the model.

# Pick Light Operation

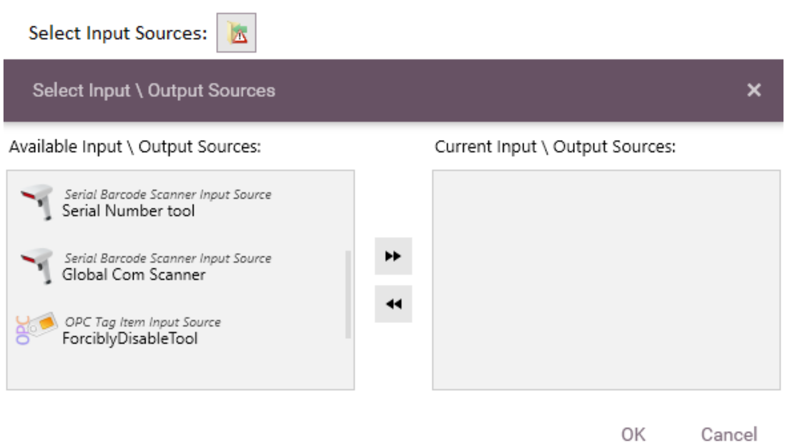
A Pick Light is a control device associated with a storage bin. Typically, it both indicates to an operator that the part contained is required for a Step (generally by means of a blinking light), and also determines that the right part (and requisite number of those parts) has been selected by the operator. For example, that the correct type of fastener has been removed from the bin for a particular fastening operation, and in the right amount.

Pick Lights, as hardware, are set up in the Hardware tab of SmartBuild. This process explains the addition of that hardware to a Process Step.

To add a Pick Light to a Step, follow these steps:

1. Select the step.
2. Select the **More** tab in the work area.
3. Click-drag the **Pick Light** icon down into the **More** tab and drop it.
4. Type a name for the Pick Light.
5. Click the **Select Input Sources** icon.

   Select Input Sources dialog




6. Select (one of) the Pick Light(s) configured for this Station and click the **Add** button. The Pick Light moves to the Current Input Sources field.
7. Click **OK**. The Input Source is added to the Pick Light.
8. Edit the properties see: "Pick Light Operation Properties List" on page 451
9. Save.

## *Using a PINpoint Socket Tray as an input source on a Pick Light Operation*

A PINpoint Socket tray can be used as an input source for a pick light operation.

Configuration steps

1. In Advanced create a PINpoint Pick Light Controller and set it up under a device manager.
2. Set the *Version* of the socket tray to 2. Set the *Device Address* to the address of the socket tray. Set the *Port Number* to the number of the socket tray (normally 5059).
3. In Hardware configure a pick light input source for each position of the socket tray by right clicking on the station and choosing a pick light input source. Select the controller created in step 1 as the controller for the pick lights. Make the *light location* and *sensor location* a position e.g. 1.
4. Add a pick light operation to the step and select the pick light input source.
5. On the Pick Light Operation Properties set *De-energize After Step* True.
6. 2 pick lights can be satisfied on the same step by using 2 pick light operations.

## Scan Operation

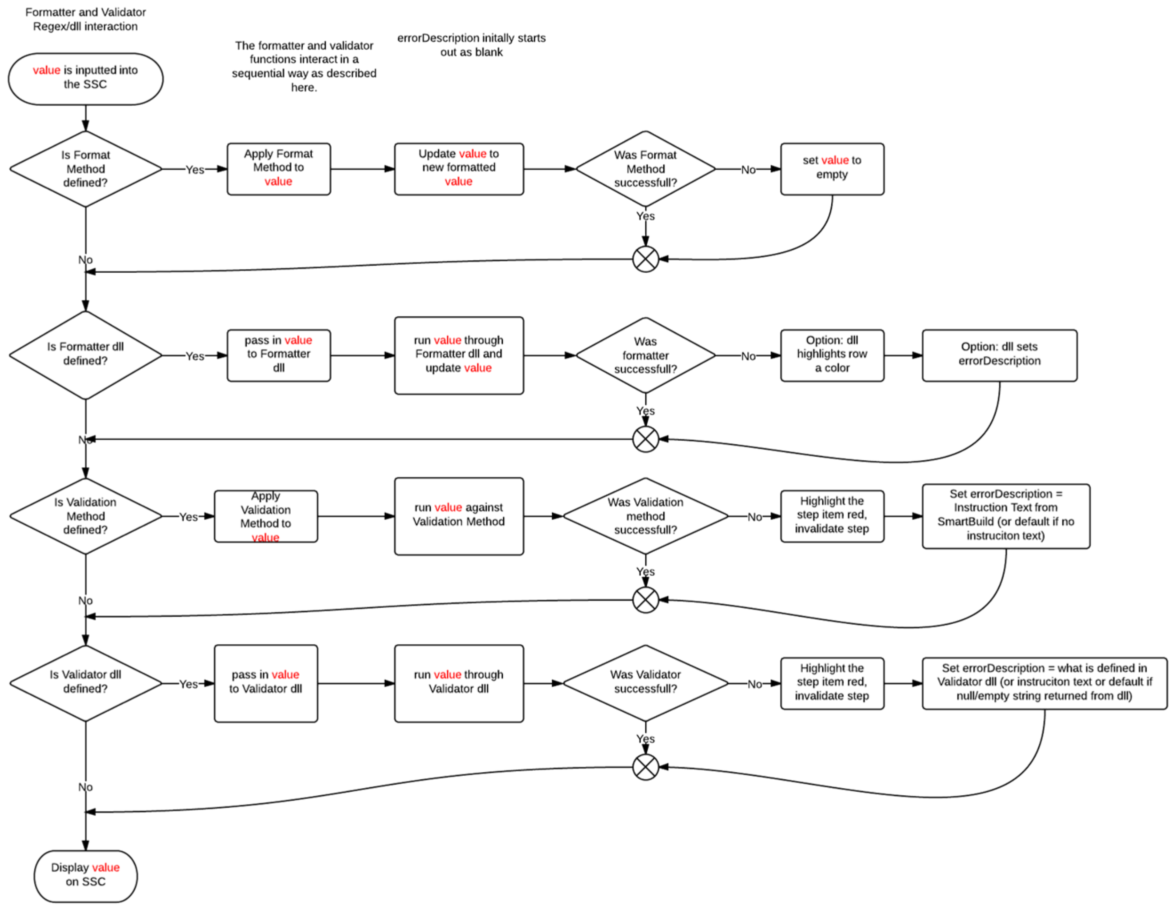
A scan operation validates a string of characters. The string can either be typed in by the operator or come from an input source such as an OPC tag or a barcode scanner.

Refer to the table "Custom Assembly Properties List" on page 406.

### *Custom Assemblies*

The Format method returns the first match from the string input and this match is then compared using the validation method.

scan logic diagram




This diagram explains how custom assemblies are called. Formatter Regex->Custom Formatter.dll->Validator Regex->Custom Validator.dll

## Serial Number Validator

To use Scan matching add the file “Pinpoint.Library.Validator.SerialNumberValidate.dll” in the custom validator path field. The Serial Number Validator assembly uses the value inserted in the Validation Method field to do a regular expression with capturing fields to match up the serial number and any other user specific data in the inputted data. A regular expression captured group is a special field which, when it is matched up, will be marked as a captured group and software can access the captured group and perform logic based on the result of it. A regular expression can have multiple captured group and captured groups are numbered from 0 onward. A captured group in a regular expression is denoted by the opening symbol “(“ and the accompanying closing symbol “)”. Anything that is matched between the “(“ and “)” is considered a captured group.

The Serial Number Validator assumes that the only regular expression captured group will be the serial number, everything else specified in the Validation Method field will be a matched up on a value basis.

The Serial Number Validator will first take the value in the captured group and compare it to the serial number which is currently loaded on the SmartScreen Client. If the serial number found in the input data matches what is currently active on the SmartScreen Client then the rest of the regular expression in the Validation Method will be evaluated. If the Serial Number is a match and the rest of the regular expression in the Validation Method is a match then the custom validator will return “True” to the SmartScreen Client which will mark the scan Operation as valid. If a scan Operation is red then the data entered has not been found to match the validation method.

1. Example 1

   **SmartScreen Client Serial Number**: LAE00875

   **Input Data**: 1SBCYL/LIFT SLAE00875ZC

   The input data in this example is specified as follows: “1SB” is a prefix that is always present, “CYL/LIFT” are 10 characters that specify the Part Name/Part Number, the “S” is always present after the Part Name/Part Number, the next 8 characters, LAE00875 are the Serial Number, and one character following the Serial Number can be anything that is a number or letter, the last character is a suffix that is always a “C”.

   **Validation Method**: 1SBCYL/LIFT S([A-Z]{3}[0-9]{5})[A-Z0-9]C

   **Explanation**: The custom validator will apply the Validation Method field regex and try to evaluate the capturing group first. It will try to look for 3 characters in between A to Z ([A-Z]{3}) and then 5 characters in between 0 to 9 ([0-9]{5}). Since this part of the regex is between the “(” and “)” it is treated as a capturing group. The captured group, which resolves to LAE00875 is matched up against the active Serial Number (LAE00875 = LAE00875) loaded on the SmartScreen Client and this resolves as true. Then the rest of the regex in the Validation Method field is evaluated. The “1SBCYL/LIFT S” can be treated as literal and this matches the input data. The custom validator then resolves the “Z” following the serial number in the input data by looking for a character that is between A to Z and 0 to 9. The letter “C” suffix is matches up on the C in the input data. Since all the data has matched up the Serial Number Validator will return “True” for the validation of the input data and the scan Operation will be validated true.

   **Result**: True

2. Example 2

   **SmartScreen Client Serial Number**: TRFT223800

   **Input Data**: 1SBVALVED6T STRFT223800ZIThe input data follows the same specification as in example one, with the only change being the serial number consists of 4 Alpha characters and 6 numeric characters. Validation Method: 1SBVALVED6T S([A-Z]{4}[0-9]{6})ZI

   **Result**: True

3. Example 3

   **SmartScreen Client Serial Number**: GHD00234

   **Input Data**: 1SBFNDRR/THYDSLAE00875ZC

The input data follows the same specification as in example one. Validation Method: 1SBFNDRR/THYDS([A-Z]{3}[0-9]{5})[\w]{2}

**Result:** False (the serial number contained in the input data does not match the Serial Number loaded on the SmartScreen Client.)

4. Example 4: Special Case

**SmartScreen Client Serial Number**: 1YV67DND045687

**Input Data**: 1YV67DND045687

**Validation Method**:

**Result**: True

The Validation Method is blank. This is a special case where no part numbers, prefixes, or suffixes are present in the input data. If the Validation method is blank the Serial Number Validator will match the input data directly against the Serial Number loaded on the SmartScreen Client.

### Simple Scan Match

To use Simple Scan Match add the file "PinPoint.Library.Validator.SimpleScanMatch.dll" in the custom validator path field. This will only return a true result to the value of the scan box if it matches the value of all other scan boxes which have a matching variable name.

The variable name does not need to be made global. If more than 2 scan boxes have the same variable then the scan with the custom validator will not become true unless all other boxes have the same variable.

The custom validator will not function unless a matching variable name is found and it will not function if the variable name is null.

### Stored Procedure Execute

To use Stored Procedure Execute add the file "PinPoint.Library.Validator.SPexec.dll" in the custom validator path field and add the name of the SQL stored procedure which should be executed in the Name field. This will execute the stored procedure on the step when data is entered into the critical scan. It will also execute the stored procedure if data exists in the scan and the step is reloaded. The value and name of other checkboxes will be sent to the stored procedure as a key value pair.

## *Scan Math*

A scan can be setup as a variable and referenced by other scan items at the same station. A variable can be local or global. A local variable is named like this: "input" and a global variable is signified with a "#" like: "#input". Variables should not contain the text of functions. For example a variable name should not be "standA" because it contains TAN which will be treated as a function.

- Local Variable - A local variable can be only be used on one step.
- Global Variable - A global variable can be used on all steps.

Mathematical operations available on a scan

| Function | Example | Result of: (a=3,-,b=4.5,d=0.5,f=-5) | Definition |
|---|---|---|---|
| + | a+b | 7.5 | Adds the values |
| - | a-b | -1.5 | subtracts b from a |
| * | a*b | 13.5 | multiplies a and b |
| / | a/b | 0.67 | divides a by b |
| ^ | a^b | 140.30 | Raises a to the power of b |
| ABS | ABS(f) | 5 | Returns the absolute value of a number |
| ACOS | ACOS(d) | 1.0472 | Returns the arccosine, or inverse sine, of a number |
| ASIN | ASIN(d) | 0.5236 | Returns the arcsine, or inverse since, of a number |
| ATAN | ATAN(a) | 1.2490 | Returns the arctangent, or inverse tangent, of a number |
| CEIL | CEIL(b) | 5 | Returns number rounded up |
| COS | COS(a) | -0.9900 | Returns the cosine of the given angle |
| COSH | COSH(a) | 10.0677 | Returns the hyperbolic cosine of a number |
| EXP | EXP(a) | 20.0855 | Returns e raised to the power of number |
| FLOOR | FLOOR(b) | 4 | Returns number rounded down |
| LN | LN(a) | 1.0986 | Returns the natural logarithm of a number |
| LOG | LOG(a) | 0.4771 | Returns the logarithm of a num- |

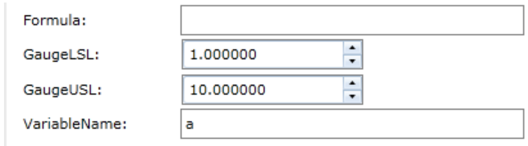
| Function | Example | Result of: (a=3,-,b=4.5,d=0.5,f=-5) | Definition |
|---|---|---|---|
| | | | ber |
| MAX | MAX(a,b,d,f) | 4.5 | Returns the largest value in a set of values |
| MIN | MIN(a,b,d,f) | -5 | Returns the smallest value in a set of values |
| SIGN | SIGN(a) | 1 | Determines the sign of a number. Returns 1 if the number is positive, zero (0) if the number is 0, and -1 if the number is negative |
| SIN | SIN(a) | 0.1411 | Returns the sine of the given angle |
| SINH | SINH(a) | 10.0179 | Returns the hyperbolic sine of a number |
| SQRT | SQRT(a) | 1.7321 | Returns a positive square root |
| TAN | TAN(a) | -0.1425 | Returns the tangent of the given angle |
| TANH | TANH(a) | 0.9951 | Returns the hyperbolic tangent of a number |
| TAPER | TAPER(a,b,d,f) | 5 | Converts all values in a set of values to their absolute values and then returns the highest value in the set |

In extended properties the following properties determine how each scan operation functions.

- **VariableName** is the variable for this scan operation.
- **Formula** is an expression using the variables to calculate a result.

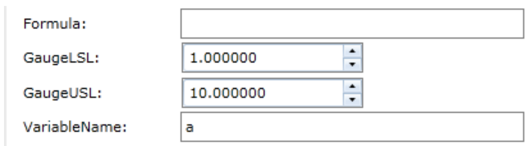
scan extended properties

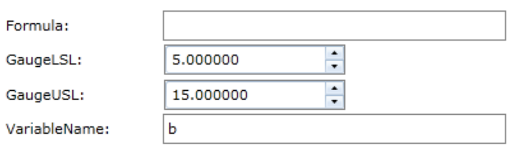



For example; to require the operator to type or scan in three numbers with varying limits and then have a scan operation calculate a value from those numbers. Also require this final value to be between 10 and 20. Setup 4 scan operations with the following properties.

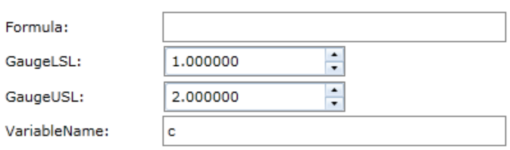
Scan Operation 1



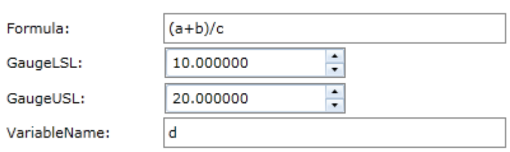

Scan Operation 2




Scan Operation 3

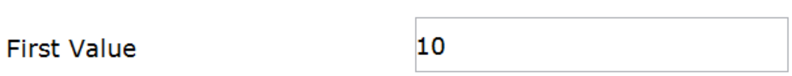



Scan Operation 4




In this example the value in Scan Operation 1 must be between 1 and 10, the value in Scan Operation 2 must be within 5 and 15, and the value in Scan Operation 3 must be between 1 and 2. Scan Operation 4 has a formula so its value will be determined by whatever is entered in Scan Operations 1-3. Its final result must be between 10 and 20. For instance when the user enters a valid number in Scan Operation 1:

Scan Operation 1




Versus an out of range number

| | |
|---|---|
| First Value | 15 |

The Calculated value is also checked.

In Spec

| | |
|---|---|
| First Value | 10 |
| Second Value | 10 |
| Third Value | 1.5 |
| Calculated Value | 13.33333333 |

Out of Spec

| | |
|---|---|
| First Value | 1 |
| Second Value | 10 |
| Third Value | 2 |
| Calculated Value | 5.5 |

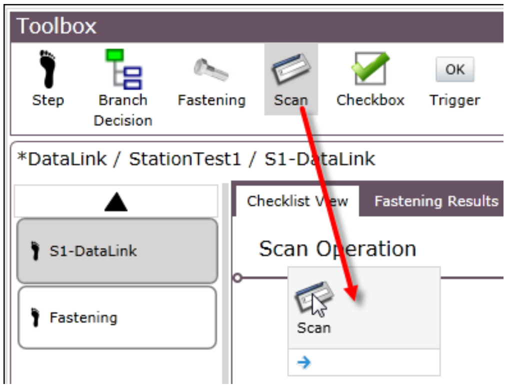
Be careful not to create a circular reference as this may cause unintended results

## *Adding a Scan Operation to a Step*

To add a Scan Operation, follow these steps:

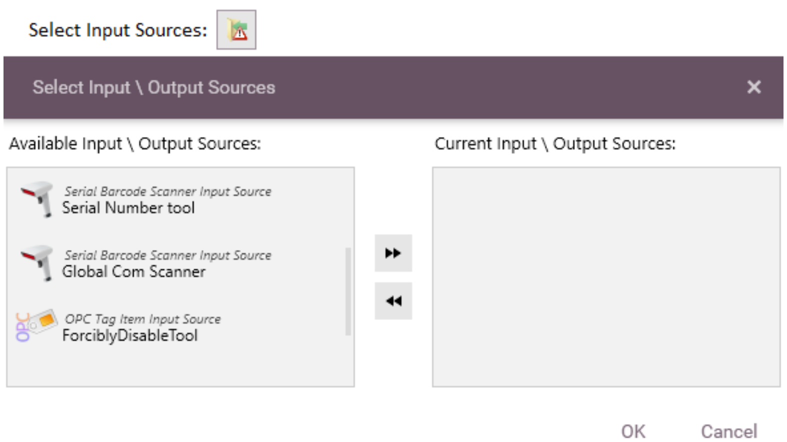
1. Select the step.
2. Drag the **Scan** icon down step and drop it.

Dragging a Scan operation to a Process




3. Type a name for the Scan operation.
4. Click the **Options** button. The **Select Input Sources** dialog opens.

   Select Input Sources dialog




5. Select the **Input Source** to use for the Scan operation and click the **Add** button. The Input Source moves to the Current Input Sources field.
6. Click **OK**. The Input Source is added to the Scan operation.
7. Click **Save**.

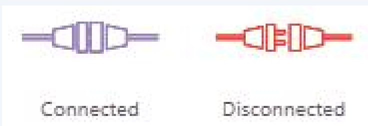
## Fastening Operation

The fastening operation allows the SmartScreen client to control a fastening tool and record the rundowns which the operator performs. The operator must complete the amount of rundowns set in the rundown count using the tool setup on the fastening operation. The rundowns must be within the torque and angle Lower Specification Limit (LSL) and the Upper Specification Limit (USL) and the Overall status from the tool must be OK. If the rundowns are not within the limits the tool can be locked. If a fastening operation cannot be completed then a supervisor must manually increment the count to meet the required rundown count or bypass the step.

Resetting a fastening operation will reset the rundown count to 0 and unlock the tool. This will include a record on the fastening operation when the step was reset. The system can be configured to not affect the rundown count or the tool lock status by changing the setting Reset All Operations Includes Setting Fastening Count to 0.

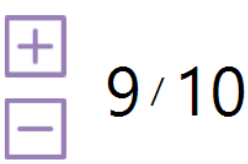
## Icons and Controls

These icons indicate the status of the tool:

| | |
|---|---|
|   | Connected/Disconnected<br><br>If the data manager cannot communicate with the tool it is disconnected. |
|   | Enabled/Disabled<br><br>A tool is disabled but not locked if a condition to run the tool is not met |
|   | Forward/Reverse<br><br>The direction of the tool. |
|   | Unlocked/Lock Level 1/Lock Level 2<br><br>Level 1 can be unlocked by an operator. Level 2 requires a supervisor. |

These controls can only be accessed by a supervisor:

*Supervisor Controls*

| | |
|---|---|
|   | This will increment or decrement the count of good rundowns on the fastening operation. |

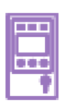
 

| | |
|---|---|
|  | This will send the forward or reverse PSET to the tool. |

The fastening results are displayed in a table on the SmartScreen client. This table contains optional columns based on the settings. Manual entries are also reflected.

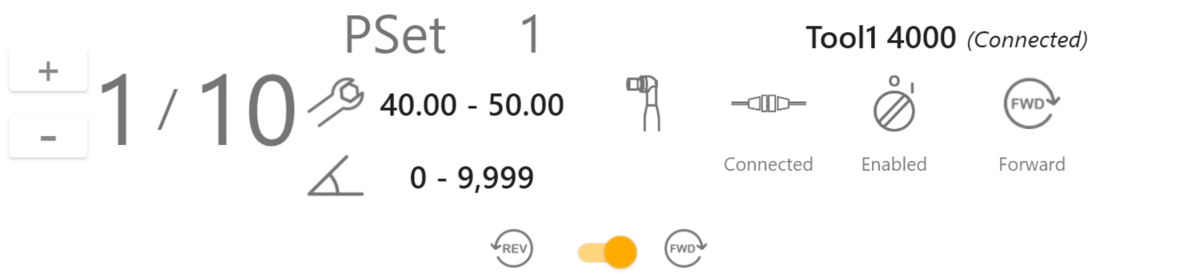
 

*Fastening Results Icons*

| | |
|---|---|
|  | ***Reverse*** *– This symbol indicates that this entry is a reverse.* |
|  | ***Manual Entry*** *– This symbol indicates the entry was made with the +/- buttons to manually adjust the count* |
|  | ***Torque*** *– The peak torque value reported by the tool controller* |
|  | ***Angle*** *– The final angle value reported by the tool controller* |
|  | **Controller Status** *– The overall status of the rundown according to the tool controller determines if there is a checkmark (OK) or an X (NOK). Error messages from the tool controller will also be displayed.* |
|  | **PINpoint Status** *– If the torque and angle values of the rundown are within pinpoint limits a checkmark (OK) or an X (NOK) will be displayed* |
|  | **Chart** *– This icon indicates the user can click on this rundown to bring up the Rundown Details window* |
|  | **Reset** *– The step was reset* |

Fastening Results Example. This includes many simulated results. The +/- and FWD/REV controls are available because a supervisor is logged in.



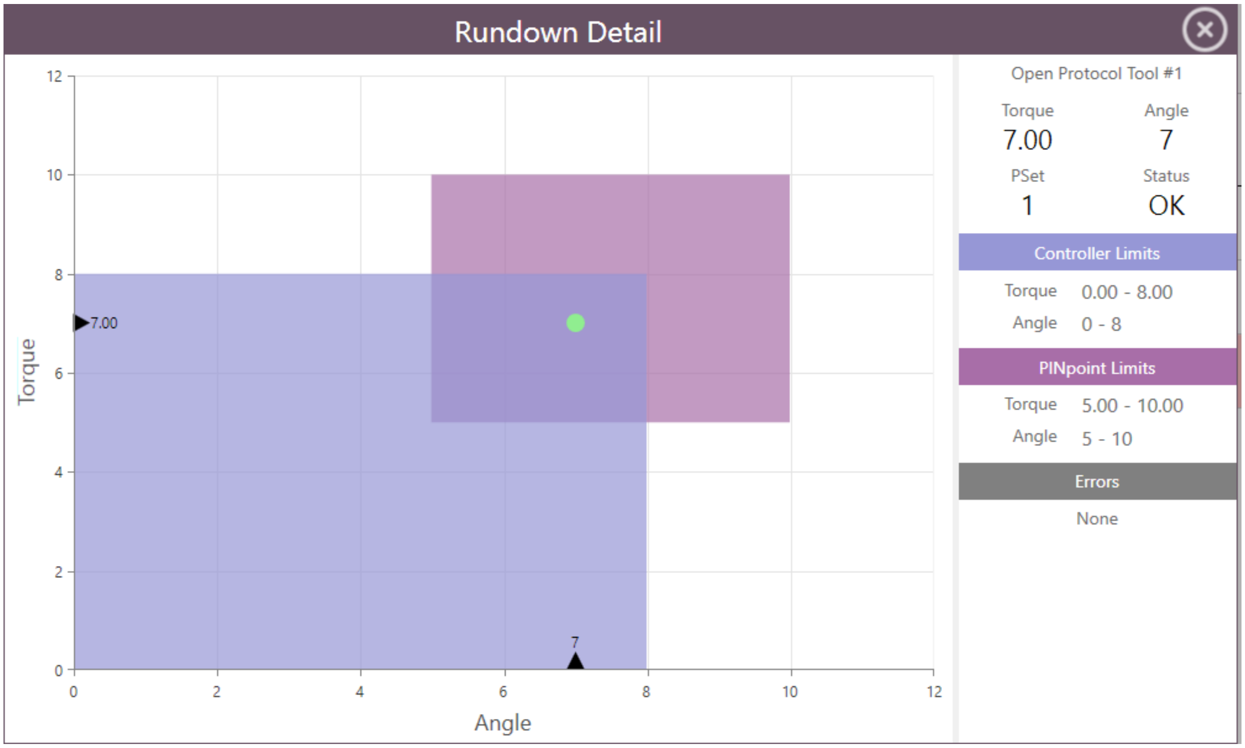

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7 | | 45.00 | 65 | ✓ | ✗ | Wrong PSet: 2 | |
| 6 | REV | - | - | - | - | | |
| 5 | | - | - | - | - | | |
| 4 | REV | 45.00 | 65 | - | - | | |
| 3 | | 60.00 | 95 | ✗ | ✗ | Current Monitoring Max ShutOff | |
| 2 | | 45.00 | 0 | ✗ | ✓ | | |
| 1 | | 45.00 | 0 | ✓ | ✓ | | |

- Rundown 7 – NOK because the PSET is wrong
- Rundown 6 – A manual reversal. Reversals are shown in blue.
- Rundown 5 – A manual rundown
- Rundown 4 – OK Reversal
- Rundown 3 – NOK because the rundown was greater than PINpoint limits and because the overall controller status of the rundown was NOK. In this line the tool controller has added sample errors.
- Rundown 2 – NOK because the tool controller reported that the rundown was NOK
- Rundown 1 – OK Rundown

If a user clicks on a rundown with a chart icon they will see the rundown details window.

Rundown Detail Window showing that the controller limits and the pinpoint limits do not need to match, but the rundown should be within both.




## *Locking*

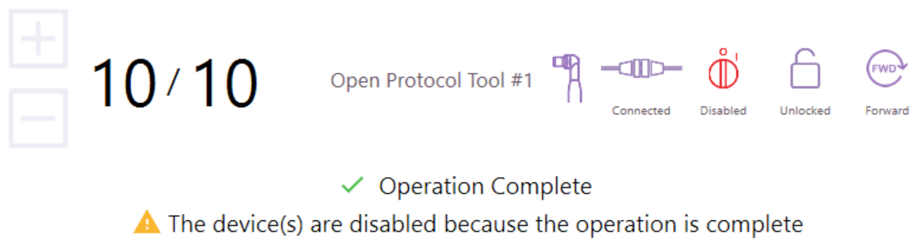
Locking a tool is controlled by the Fastening Operation properties Level 1 Tool Lock and Level 2 tool Lock. An operator can clear a Level 1 tool lock but a supervisor is required to clear a Level 2 tool lock. A rundown is considered NOK if: It is outside of the PINpoint limits or if the tool controller states that the overall result is NOK. Tool controller limits are for reference only. Typically Level 1 Tool Lock is set and Level 2 Tool Lock is set to 2. In this configuration the first time the user performs an NOK rundown they can resolve the situation but if the operator performs 2 NOK rundowns in a row then a supervisor must resolve the situation. If the Level 2 Tool lock is set to 1 then the tool will require a supervisor to unlock it after the first NOK rundown. When the Level 2 Tool Lock is stored, an event can be configured in the notifications tab to send a message to the supervisor.

## *Disabled Vs. Locked*

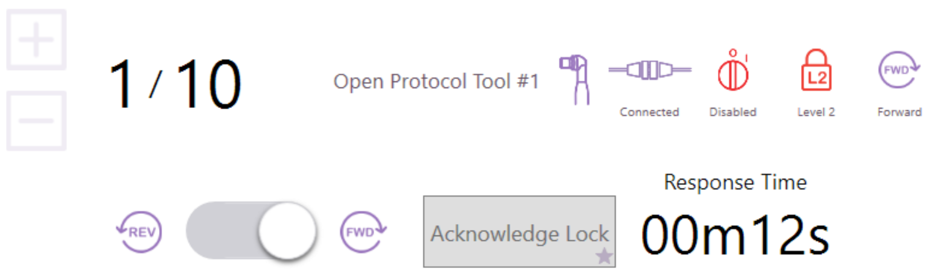
A tool is disabled if the conditions of the fastening operation are not met prior to pulling the trigger. If a tool is disabled the SmartScreen client will show a message explaining why and satisfying the conditions will allow the operator to run the tool. For example, if a tool is disabled because the correct socket has not been selected a message will appear. A tool is locked if a NOK rundown has been received and if the operation is configured to lock the tool. For example, if a tool is locked because Level 2 Tool Lock is set to 2 and an operator has performed 2 NOK rundowns a supervisor would normally be required to resolve the situation. In this case the tool controller will state “Error 139 locked by open protocol” to indicate PINpoint is locking the tool.

A disabled tool with an explanation.



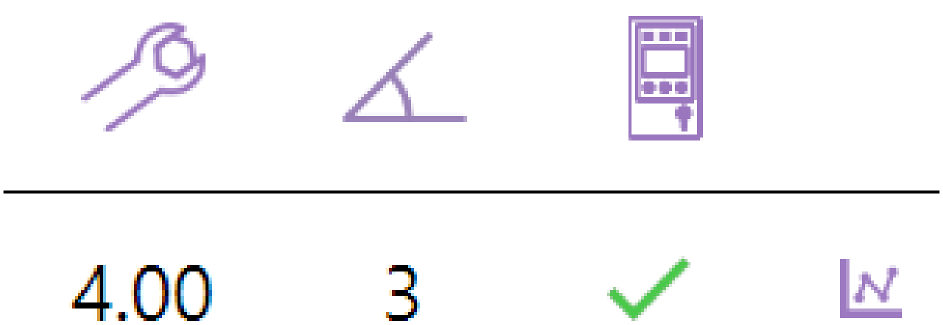

A locked tool requiring a supervisor to Acknowledge the Lock condition.




## Controller Limits Vs. PINpoint Limits

The fastening operation allows the user to choose whether the operation should use the limits specified in SmartBuild to decide if the rundown is OK or to ignore those and use the overall status of the rundown from the tool controller. If the Fastening Operation's property Use Controller Limits Only is true then the limits specified on the fastening operation are not used. The controller limits are used in the rundown grid but only the overall status of the rundown is used to determine if the rundown is OK. The PINpoint limits will not be shown on the rundown details chart.

The rundown grid when only controller limits are used.




## Other Methods to Disable the Tool

The tool can also be disabled based on the following conditions:

- Tool direction – The direction switch for a tool can be monitored. If the tool is in reverse it will be disabled. *For more information, see "Open Protocol Fastening Tool Input Source Properties*

*List" on page 446*

- Socket tray – If a socket tray is used the tool can be disabled until the correct socket is selected. *For more information see "Fastening Operation Properties List" on page 415*
- OPC tag – If a PLC is used to enable the tool then the tool can be disabled until a condition in the PLC is met using an OPC tag. *For more information, see "Fastening Operation Properties List" on page 415*
- Position – if a set of rundowns must be performed in the correct order then PINpoint can interface with a GCI spatial positioning arm to disable the tool until it is the correct position. *For more information, see "Positional Fastening Tool Input Source Properties List" on page 455*
- Never lock – A tool can be setup to never disable or lock. *For more information, see "Open Protocol Fastening Job Input Source Properties List" on page 441*
- Never lock this fastening operation – A single fastening operation can be setup to allow the operator to do as many operations as they want but locking should be disabled on the step if this is being used. *For more information, see "Fastening Operation Properties List" on page 415*

## Free Mode

Free mode allows users to record an unlimited amount of rundowns. It is typically used when a torque tool is needed to rotate a component into place before another step is used to record a torque result. When using free mode the rundown count is not considered. Free Mode will not disable the tool when the rundown count is met.

A fastening operation with free mode is complete as soon as it is started. When using free mode a check box should be added to the step for the operator to activate to signify that they have completed the step.

Free mode is a property of the fastening operation. When *Free Mode* is true the property *Disable Tool When Complete* should be false. Tool disabling and locking settings are not restricted by Free Mode, they can be enabled if needed.

## Job Mode

The fastening operation can be configured to work with jobs instead of Psets. A job is a program in the tool controller which can contain multiple Psets. The advantage of this method is that complex operations can be performed and recorded on only one PINpoint process step.

The disadvantage is that PINpoint does not control the state of the tool. PINpoint will record the results of the rundowns but will not act on the results of the rundowns to disable or lock the tool. A fastening operation automatically uses job mode if the tool assigned is an Open Protocol Fastening Job Input Source. Multi-spindle Rundowns are accepted.

An Example of the Fastening Operation When Configured in Job Mode

Please select Job: **1**
Alternate Job(s): 2, 3
Repair Job(s): 4

Currently Selected Job: **1**

Operation Complete

| Torque | Angle | Result | PSet | Job | JBC/JBT | Job Status |
|---|---|---|---|---|---|---|
| 3.08 | 9 | OK | 2 | 1 | 5/5 | OK |
| 3.04 | 9 | OK | 1 | 1 | 4/5 | NotComplete |
| 3.12 | 7 | OK | 1 | 1 | 3/5 | NotComplete |
| 3.14 | 5 | OK | 1 | 1 | 2/5 | NotComplete |
| 3.11 | 1 | OK | 1 | 1 | 1/5 | NotComplete |
| - | - | - | - | 1 | 0/5 | NotComplete |

Job mode operates in one of 2 methods; either PINpoint sends the job number when the step is loaded or PINpoint only receives the job information. To configure PINpoint to send the job select send job on the fastening operation. Enter the job which is required and if necessary enter the alternate jobs which may be selected. When PINpoint receives the job complete message from the tool controller the step will be complete.

If the serial number is rejected on the PINpoint SmartScreen client then the client will send a command to abort the job.

*There are Four (4) Statuses which can be Recorded for Fastening Job Rundowns:*

| Status | Meaning |
|---|---|
| Not Complete | This is the default status each rundown gets while the Job is in process. |
| OK | If all of the rundowns in the Job were ok then the last rundown in the batch will display this status which indicates the Job completed with a good status. |
| NOK | This indicates the Job completed with an incomplete status. |
| Aborted | This message could be sent to PINpoint when a Job is aborted within the tool controller. |

On the fastening operation there are 4 properties relevant to job mode: Send job, Job, Alternate Job, and Repair Job. Rundowns are expected to be received under the configured job but they can also be received under any of the alternate jobs or if the tool is used on a repair station then the repair job is expected. See: *"Fastening Operation Properties List" on page 415*

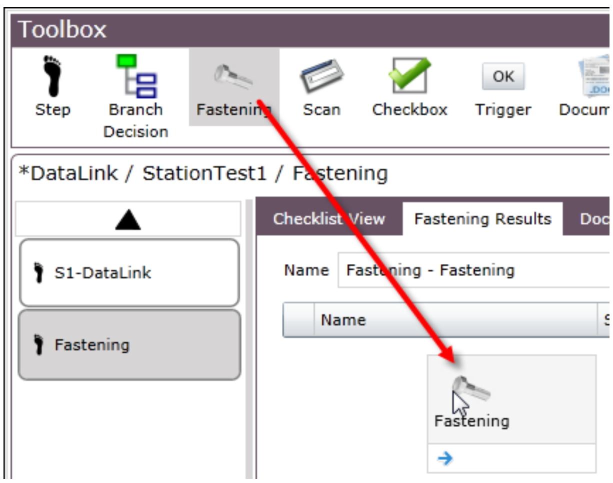
On the Open protocol fastening job input source there is an additional property extended jobs which allows job numbers 1- 9999 where normally only 1-99 will be accepted by the controller. See: *"Open Protocol MT Focus 6000" on page 448*

## Adding a Fastening Operation to a Step

To create and configure a Fastening operation, follow these steps:

1. Select the Step.
2. Drag the **Fastening operation** and drop it on the step.

   Dragging a Fastening operation to a Process



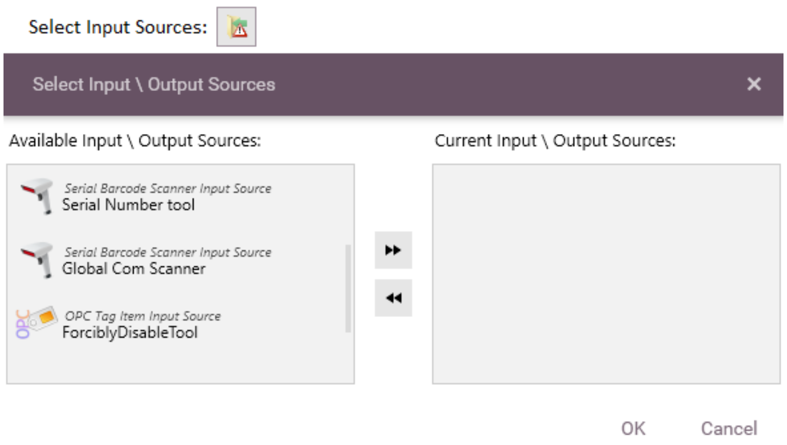

3. In the **Name** field, type a name for the Fastening operation.
4. Set the following **Fastening Operation** properties.

| Attribute | Description |
|---|---|
| PSet | The Program Set in the tool which PINpoint will command. This must be formatted "Pset###" (e.g. PSet001). |
| Reverse PSet | The reverse Program Set in the tool which PINpoint will command. This must be formatted "Pset###" (e.g. PSet001). |
| Rundown Count | The number of successful rundowns required to complete the operation. For example, if the step requires five fastening operations to be completed, then set this value to "5". |

5. Click the **Options** icon. The **Select Input Sources** dialog opens.

Select Input Sources dialog




6. Select an available **Input Source.**
7. Click the **Add** button. The Input Source moves to the Current Input Sources field.
8. Click **Save.**

## *OPC Fastening*

The OPC Fastening Input Source is designed to read signals from tags on an OPC server and treat them as if they are a fastening tool. This section describes how it should be setup and how it behaves on a fastening operation.

The tags are divided into 2 types:

Input (PLC -> PINpoint)

- Reverse Switch (bit)
- Trigger (bit)
- Rundown New (bit)
- Rundown Overall Status (bit)
- Rundown PSet (int)
- Rundown Torque (float/int)
- Rundown Angle (float/int)
- Tightening ID (string)

**Output (PINpoint -> PLC)**

- Disabled (bit)
- PSet (integer)

When the Data Manager starts the Disabled tag will be set true and the PSet tag may or may not contain a value. The PSet tag should be ignored by the PLC until the Disabled tag is set false. When the Disabled tag is set false the PLC should read the PSet tag and then command the tool to perform a rundown. The Disabled tag can be set to true at any time during the rundown/test so the PLC must react to the Disabled tag at any time.

Any time after the Disabled tag is set false the PLC can signal the following:

- Reverse Switch
- Trigger
- Rundown New

### Trigger and Reverse Switch

These tags are used to allow the same functionality as the Enable Relay Communication option on an open protocol fastening tool. The purpose of this feature is to allow the tool to be disabled if it is in reverse when it should be in forward. The trigger tag is used to communicate the state of the tool activation trigger to the data manager. If the trigger tag is true then the tool is active.

The reverse switch should be set true to indicate that the tool has been set in reverse.

### Rundown New

When the Rundown New tag is toggled (from zero to one, or one to zero) PINpoint will read the other Rundown tags to obtain the result of the rundown. When the Rundown New tag is toggled the data manager will read Overall Status, PSet, Torque, Angle, and send the values to the SmartScreen client.

The Rundown PSet tag must match what PINpoint set PSet tag to when the Disabled tag was set false.

## *Positional Tools*

PINpoint can interface with a positional tool controller. The tool should be setup as a Positional Fastening Tool Input Source. PINpoint will display the positional UI in the PINpoint client so operators can see what position they should fasten. The property **Reset All Operations Includes Setting Fastening Count to 0** will determine whether or not resetting the steps commands the positional tool to start at 0. Decrementing the count by performing a removal or manually with the minus button will command the positional controller to move back one position in it’s program.

*For more information, see "Positional Fastening Tool Input Source Properties List" on page 455*

# Custom Operation

Custom Operations are in the Toolbox and can be dragged into the station editor to create them. Custom Operations are where items which are not Checklist Items, fastening items, or documents, are added to the step. Typically they will create a new tab on the Client for a specific purpose.

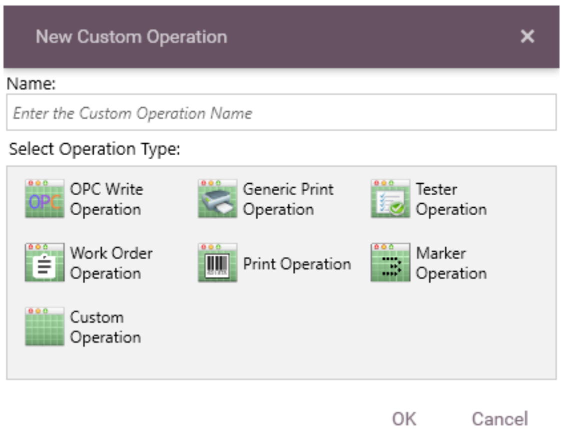
Custom Operations can also be used to house a new piece of functionality.

## Creation

To add a Custom Operation to a step a user must drag a Custom Operation from the Toolbox into the step. Once the Custom Operation is dropped in the step a dialogue box will appear showing the list of Custom Operations to choose from. The user must enter a name and select an operation type to continue.

New Custom Operation dialog




Operation Types are:

- OPC Write Operation
- Tester Operation
- Print Operation
- Marker Operation
- Custom Operation
- Work Order Operation

### Properties

These properties are present by default.

| Property | Description | Data Type | Input Type |
|---|---|---|---|
| Name | The name of the item as it appears in SmartBuild | Text | Text Box |
| Data Type | This is the .Net data type of the item input. The data type should not normally be changed. | Text | Text Box |

| Property | Description | Data Type | Input Type |
|---|---|---|---|
| Label Text | The description of the item as it appears on SmartScreen. | Text | Text Box |
| Custom Step Item Path | not used | text | Text Box |
| Custom Formatter Path | not used | text | Text Box |
| Custom Validator Path | not used | text | Text Box |
| Default Value | not used | Text | Text Box |
| EditType | This should not typically be changed. This should be 5 | number | counter box |
| Format Method | not used | Text | Text Box |
| Instruction Text | not used | Text | Text Box |
| Validation Method | not used | Text | Text Box |

## OPC Write Operation

The OPC Write operation writes a value to an OPC tag when the step is loaded.

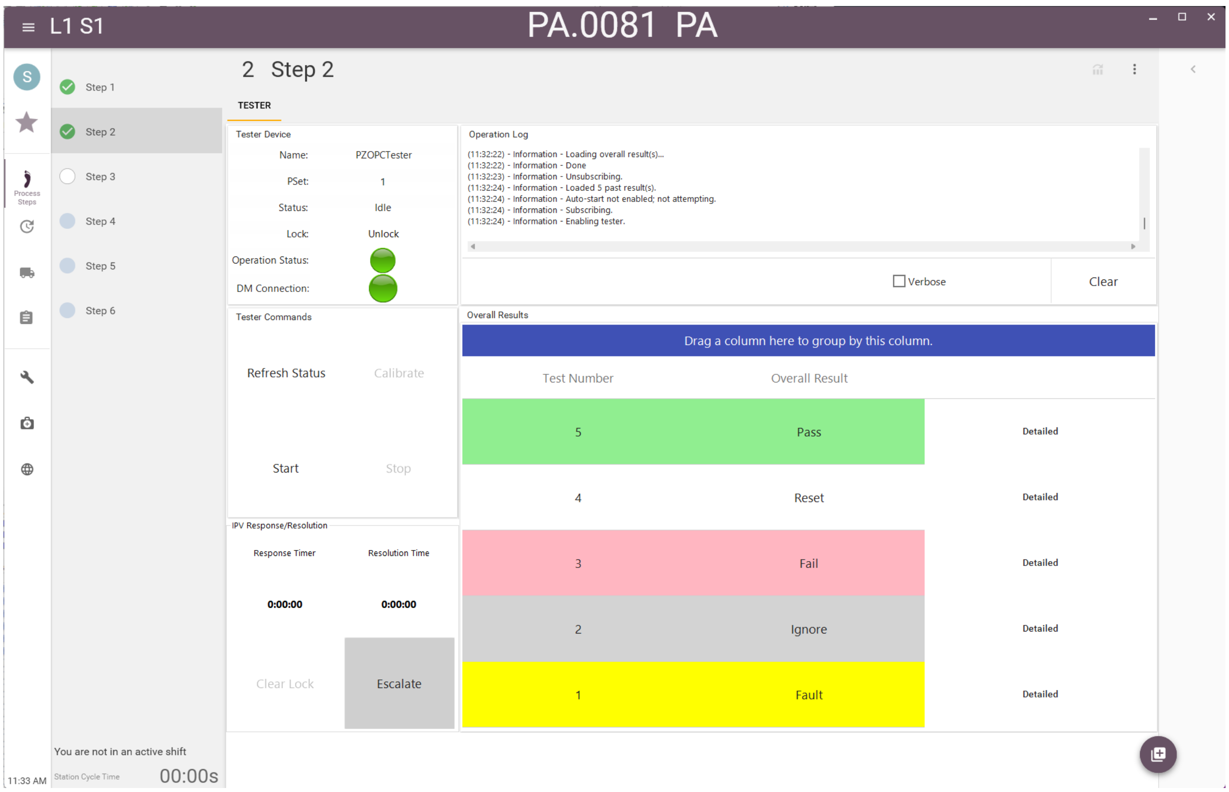
## Marker Operation

The Marker operation allows a string to be sent to a serial marker device.

# Tester Operation

Tester operations appear on the tester tab. When the step is loaded with this operation on it the data manager will subscribe to the tester, this can be verified in the **Connections** tab. The operator should typically push start, to start the test, and then wait for the result. Results will be displayed in sets with the overall result being displayed first. Clicking the details button will display all the results in the test and they may contain graph data within them, but it is not mandatory.

A Tester Operation in SmartScreen Client showing the different statuses which can be returned for a test.




The graph data is controlled by the message sent from the tester device. The message controls where the USL, LSL, X axis label, Y axis label, and whether or not the chart is logarithmic. This message is sent to the Device Manager first and then to the SmartScreen Client second so any data which appears on the Client is already stored in the database.

## Buttons

- Refresh Status - Will ask the tester for its status. This should not interrupt any running tests. This does not subscribe to the tester. This does not have an effect on OPC Testers.
- Start - Will send the start command.
- Stop - Will send the stop command.

- Calibrate - Will send the Start Calibration command. If the tester does not have a calibration program then this will not do anything. This does not have an effect on OPC Testers.
- Clear - Clears the log displayed in this tab.

## *IPV Locking*

A tester operation can be locked based on certain rules. The rules for when to raise an IPV event and lock the operation are setup in the advanced tab. In the advanced tab IPV events are created in the Organization->IPV Locks Folder.

To Create an IPV Lock

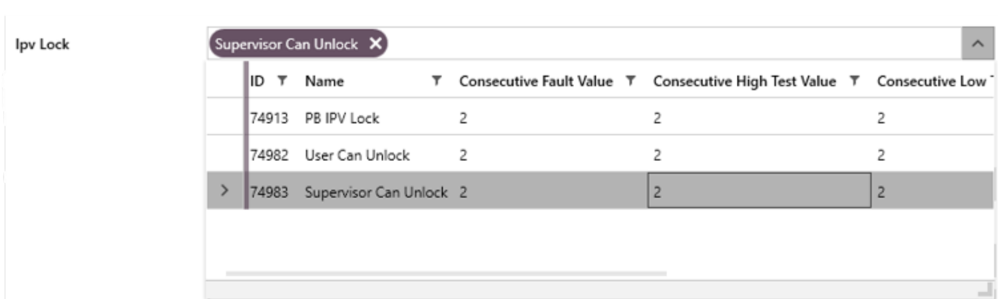
1. Go to the SmartBuild Advanced tab
2. Open the organization folder
3. Right click on the IPV locks folder
4. Select New IPV Tester Lock
5. Enter the properties

An example of an IPV lock


Once the IPV lock is created it can be linked to the tester operation using the IPV lock selection. If an operator performs the actions in the IPV tester lock properties then the tester operation will become locked. The tester operation can be unlocked by selecting the ***Clear Lock*** button if a user has the required Unlock Role.

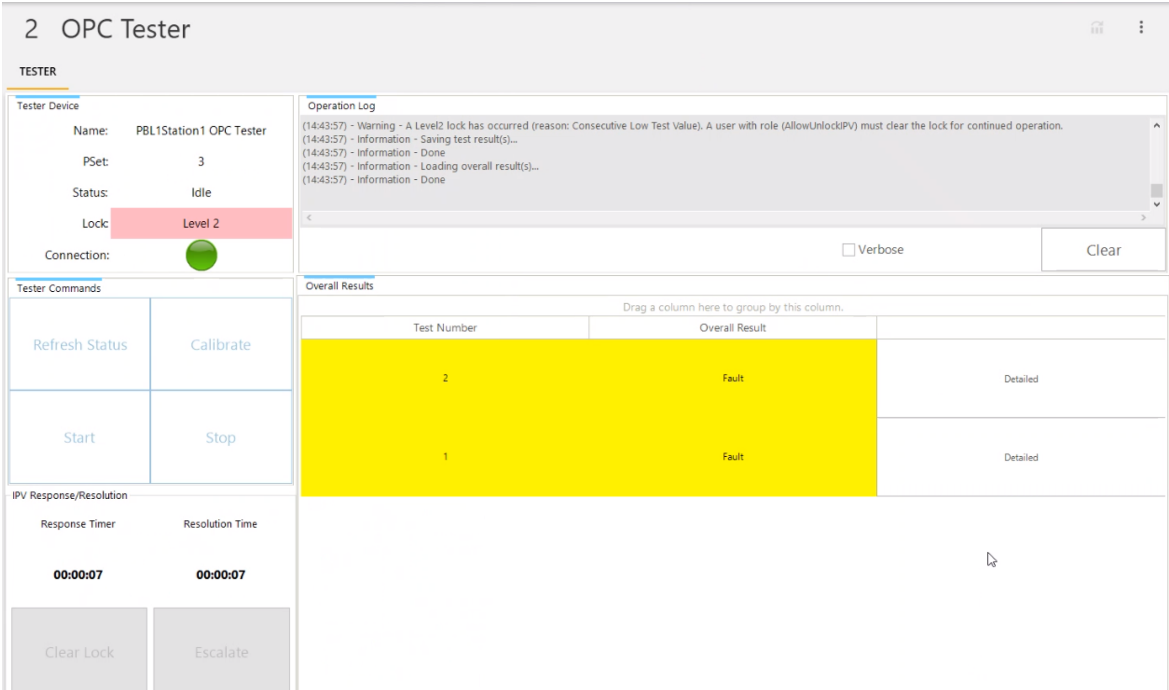
On the tester operation the IPV lock can be selected from a dropdown list. Only one IPV lock can be selected.

An example of selecting the IPV lock for the tester operation. The properties of the IPV lock are displayed in the dropdown.



An example of a locked tester operation showing a Level 2 Lock

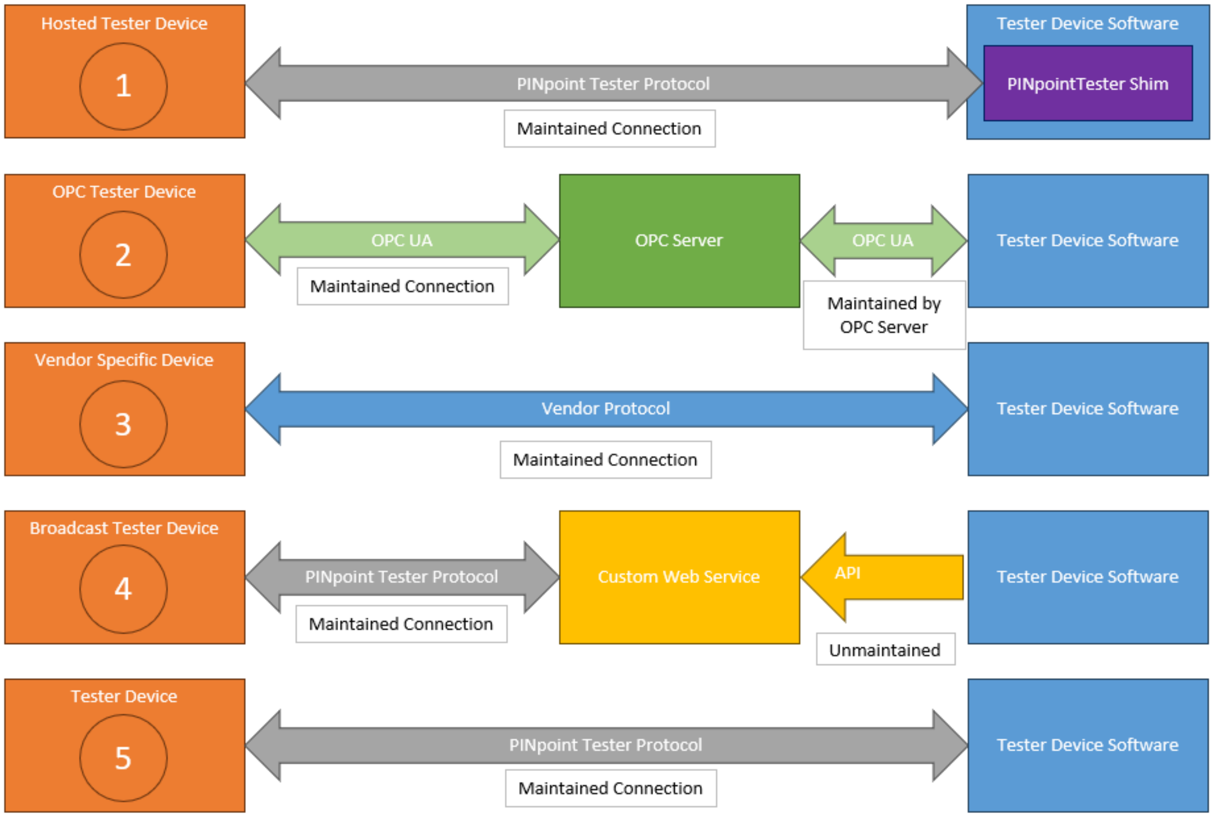



## *Tester Devices*

Tester devices must be added as input sources to the tester operation. Tester devices are added as input sources under the station in the SmartBuild Hardware tab. The Tester device chosen in SmartBuild must be selected to based on the connection type.

Tester devices connect to the PINpoint Data Manager using different connection types and communication protocols. Connections Maintained by the Data Manager to show the connection status of the device in SmartBuild and on the SmartScreen Client. Connections which are not maintained by the Data Manager cannot be used to report the connection status of the tester device.

Diagram of Tester Connection Types. Each tester connection device type on the left is managed by the PINpoint Data manager and each Tester Device Software on the left represents the software running on a physical tester device.




The Tester Connection Types Relation to the Tester Input Sources in Smartbuild

| # | Connection Type | Examples | Details |
|---|---|---|---|
| 1 | Hosted Tester Device | Simetric SigPOD<br><br>VMC Testers | A **Hosted Tester Device** is used when connecting to a tester device which has software which is designed to use the PINpoint Tester Plug-in (PIN-pointTesterShim.dll).<br><br>The tester device's software will run the code in the PINpoint Tester Plug-in file when communicating with the Data Manager. This allows the tester device's soft-ware to data into a format PINpoint can use. The tester device's software will use the plug-in to com-municate with the Data Manager via the PINpoint Tester Protocol. Scan Operations and values are sent to the device when commanding a test for use by the device.<br><br>PINpoint can provide documentation to developers detailing the plug-in and provide an example applic- |

| # | Connection Type | Examples | Details |
|---|---|---|---|
| | | | ation to vendors who are capable of integrating this into their software. |
| 2 | OPC Tester Device | | An **OPC Tester Device** should be used when the tester device is controlled by a PLC. The PINpoint Data Manager will communicate with an OPC server, such as Kepware, to communicate with the PLC and control the tester device.<br><br>This solution is versatile and can be used for devices other than testers where multiple sets of results need to be recorded.<br><br>PINpoint can provide documentation to PLC programmers detailing how to communicate with PINpoint using OPC tags. |
| 3 | Vendor Specific | | This connection type covers each of the tester devices which PINpoint has specifically developed a communication method for according to the vendor's communication protocol.<br><br>The tester device configured in SmartBuild must match the tester device in use.<br><br>Banner Omni P4 Device<br><br>Cognex Device<br><br>Keyence Device<br><br>Sentinel C28 Tester Device<br><br>Sentinel I28 Tester Device |
| 4 | Broadcast Tester Device | WMA Tester | A **Broadcast Tester Device** should be used when connecting to a tester device which has software designed to communicate with a custom web service.<br><br>The custom web service is an intermediary between the Data Manager and the tester device. The custom web service is developed by PINpoint. The custom web service does not receive commands from PINpoint, it only relays test results from the tester device to the Data Manager to be recorded on the |

| # | Connection Type | Examples | Details |
|---|---|---|---|
| | | | SmartScreen client. |
| 5 | Tester Device | VIC-Torr | The **Tester Device** Input Source should be used when connecting to a tester device which has software which is designed to communicate with PINpoint using the standards set in the PINpoint Tester Protocol. |

## Print Operation

A SmartScreen client can be setup to command a printout on a step. Printouts are typically used to create labels which are affixed to the workpiece or as a report which travels around with the workpiece.

Printing can use Loftware Print Server or NiceLabel software on the application server to create print documents and to send the print command to the printers. The document which will be printed must exist in the printing software on the application server.

The general process to setup printing in SmartBuild is:

1. Create a *Print Server* under a Data Manager. This is where the connection settings are between the PINpoint software and the printer software. The connection settings will vary between a Loftware Print Server and a NiceLabel Print Server.
2. Create a *Print Document* as a plant input source. This is the document which PINpoint will command Loftware to print. This will be linked to the Print Server
3. Create a *Print Operation* on a process step. The *Print Documents* created as plant input sources will appear as input sources to this operation similar to how tools are input sources on fastening operations.
4. When the *Print Operation* on the step is loaded on the SmartScreen client the data manager will command the printing software to print the file specified on the *Print Document*. Variables such as the serial number, station name, and any contextual data attached to the build item, will also be sent to the printing software. The variables sent to the printing software can be used by the printing software label file.
5. The step will automatically print when it is started unless the option *print on complete* is true. If *print on complete* is true then the print operation will start the print when all other items, such as check-boxes and scans, are complete.

## *Print Variables*

When the print operation is commanded to print PINpoint will send the standard parameters, any contextual data items attached to the serial number and, any scan items on the step and their values as Key Value pairs, to the print server. The printing software **Field Name** in should be the same as the **Parameter Name**.

The Standard Parameters Sent by PINpoint to a print server.

| Variable | Description |
|---|---|
| All Contextual Data Items | The key is CD_'Contextual Data Item Name'. Spaces will be converted into underscores |
| All Same Step Checkboxes | The key is the Checkbox Name |
| All Same Step Scans | The key is the Scan Name |
| All Stored Procedure Items | The Key name in the table |
| Date | Date only (DD/MM/YYYY) |
| DateTime | Date and time (DD/MM/YYYY HH:MM:SS XM) |
| DocumentID | The document ID in the database. |
| DocumentName | The SmartBuild document name. |
| ErrorVariable | Not Used |
| FirstName | The current operators first name. |
| IdenticalLabelCopies | The amount of copies to be printed. This comes from the Print Document Properties. |
| LabelSets | The amount of sets of labels to be printed. This comes from the Print Document Properties. |
| LastName | The current operators last name. |
| LCID | The locale ID the client was in when the print request was issued. |

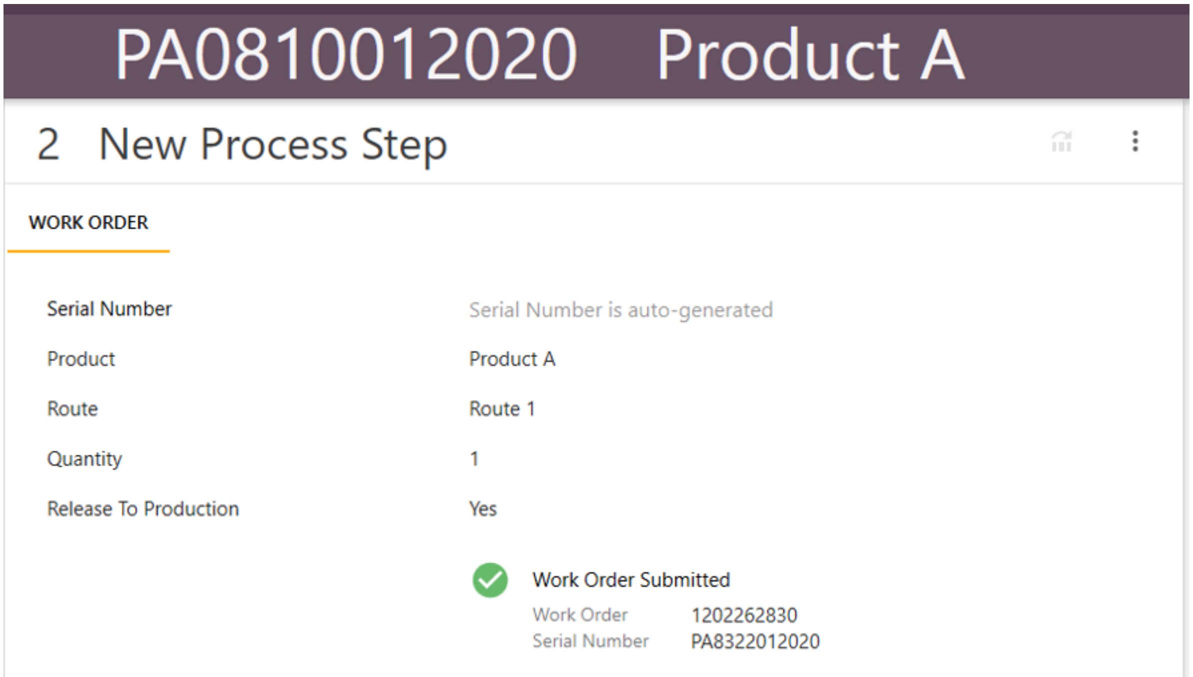
| Variable | Description |
|---|---|
| LineID | The Line ID in the database. |
| NumberOfSkippedLabels | The amount of lables to skip. This comes from the Print Document Properties. |
| PartNumber | A comma delimited list of the work order item's part numbers. |
| PrinterName | The Printer Name. This comes from the Print Document Properties. |
| PrinterSettings | Not Used |
| PrintServer | The Loftware print server name as it appears in SmartBuild. |
| ProcessStepID | The Process Step ID in the database. |
| ProcessStepItemID | The Process Step Item ID in the database. |
| ProductName | A comma delimited list of Process Names loaded for the build item at the station. |
| SerialNumber | The loaded serial number on the SmartScreen client. |
| StationID | The station ID in the database. |
| StationName | The station name of the SmartScreen client issuing the print request. |
| Time | Time only (HH:MM:SS XM) |
| Username | The current operators user name. |

## Work Order Operation

The work order operation allows the client to create a work order when the step is started. When the work order is created the operation is complete. If the step is reset the work order is not resent but a retry button is available which will allow the operator to retry the creation of the work order.

In SmartBuild the Work Order operation allows users to search for a Part and choose the quantity, serial number, and whether or not it is released to production immediately. If the amount is more than 1 the serial number is automatically generated. The serial number field can use variables or contextual data. The serial number field is optional, the serial number will be automatically generated if it is left blank.

The Work Order operation on the SmartScreen Client does not require input from the operator.

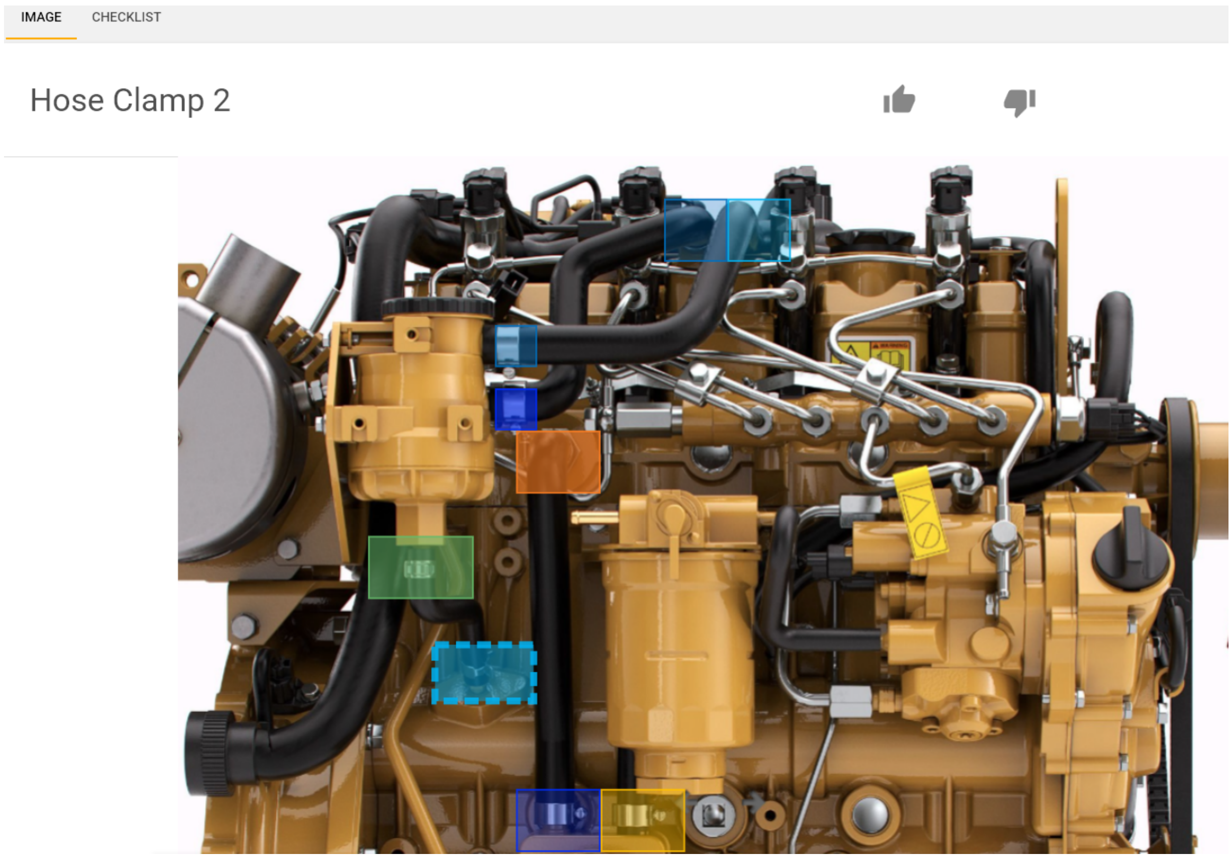



## Inspection Operation

The inspection operation guides users through inspection locations (Hot Zones) on an image. Users should perform an inspection at each location and indicate the results of the inspection by selecting the thumb up or thumb down icon. The inspection is complete when the user has selected that it has passed or failed. Multiple reasons can be added when an inspection fails. The reasons will be added to the list of defects for the Build Item and each reason added needs to be resolved.

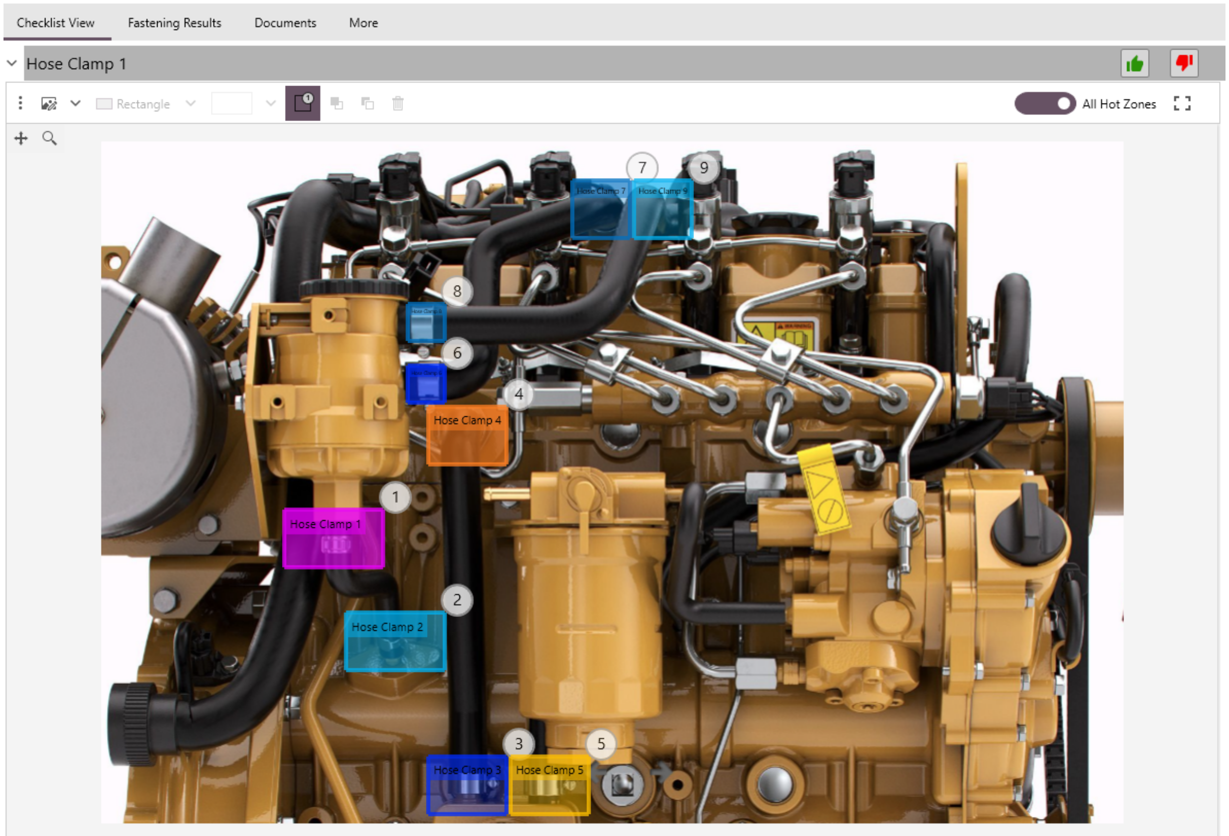
When the inspection operation is activated the user will go through the inspections one at a time and the hot zone for each inspection will be displayed. All inspection operations on the same step use the same image. The user should inspect the area which has the dashed lines around it.

The Inspection Operation.




The inspection operation configuration options allow the user to upload an image and define a hot zone for each operation on the step. The shape and colour of each hot zone can be configured. The toggle to show all hot zones will hide or show all the hot zones on the step to allow for configuration of overlapping hot zones.

An example of the hot configuration options.

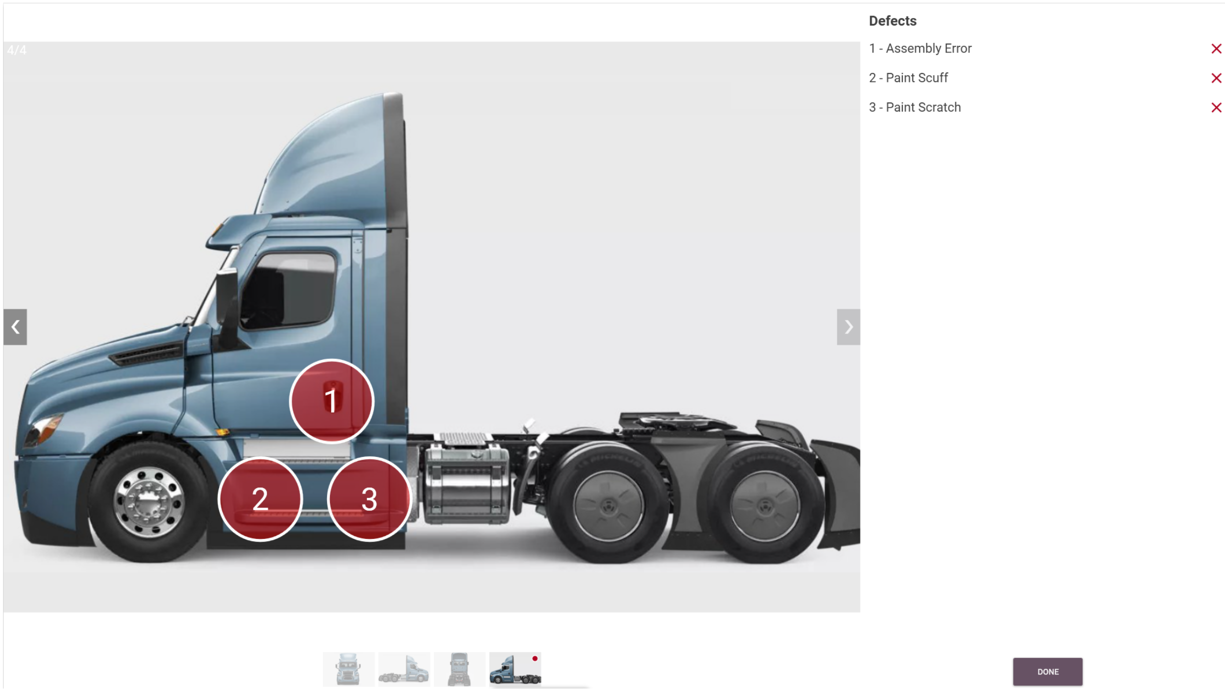



## Verification Operation

The Verification operation instructs the user to review the product in the station and verify that there are no defects. The user should use the images on the step to locate and create any defects. The defects are logged on the right side of the operation. Each defect is also added to the defect list for the build item. The verification operation will only list defects created on it. If the step is reloaded the defect icon appears next to each defect, allowing the user to resolve each one.

The Verification Operation with defects added by the operator.




# Bill of Materials Tab

The **Bill of Materials** tab allows users to define a structure of Parts. When a Part is ordered in a work order the Bill of Materials will be checked and the Parts in the Bill of Materials structure will be added to the work order.

Bill of Materials tab definitions

| Term | Definition |
| --- | --- |
| Buildable Item | A Part |
| Item | A component which is not defined in the PINpoint system, used for reference only. |

## Adding Buildable Items

To add Items to the Bill of Materials:

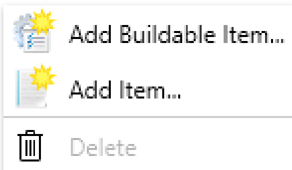
1. Open the **Bill of Materials** tab.

2. Right-click on an item to create a sub item, or in any open area of the workspace and select **Add Buildable Item**.

3. The dialog includes a list of all the Parts defined. Select the Part.

4. Click **OK**.

Add Item menu




### *Buildable Item Properties*

Buildable Item properties

| Attribute | Description |
| --- | --- |
| Identifier | The name of the item in the Bill of Materials structure |
| Alternate Iden-tifier | An alternate name for this item for the purposes of reports. |
| Description | A description of this item. |
| PINpoint Name | The Part Number. This cannot be modified. |
| Quantity | The number of work order items which should be created using this Part if the parent item is in the submitted work order item.<br>Not visible if the Buildable Item is the top level item in the BoM structure. |
| Comment | Enter any comments about this item in this field.<br>Not visible if the Buildable Item is the top level item in the BoM structure. |
| Instructions | Enter any particular instructions regarding this item in this field.<br>Not visible if the Buildable Item is the top level item in the BoM structure. |

### *Item Properties*

| Attribute | Description |
|---|---|
| Identifier | The name of the item in the Bill of Materials structure |
| Alternate Identifier | An alternate name for this item for the purposes of reports. |
| Description | A description of this item. |
| PINpoint Name | Unused. |
| Quantity | The number of work order items which should be created using this Part if the parent item is in the submitted work order item.<br>Not visible if the Buildable Item is the top level item in the BoM structure. |
| Comment | Enter any comments about this item in this field.<br>Not visible if the Buildable Item is the top level item in the BoM structure. |
| Instructions | Enter any particular instructions regarding this item in this field.<br>Not visible if the Buildable Item is the top level item in the BoM structure. |

# Events Tab

## Overview

The Events tab is where events are created and the logic for notifications is setup. There are 3 tabs used for configuration. Events & Notifications is where most of the configuration is done. View by Source shows which station has which event linked to it. Email & Text Message settings, allows messages to be sent to the correct user at the correct time.

### *Events & Notifications*

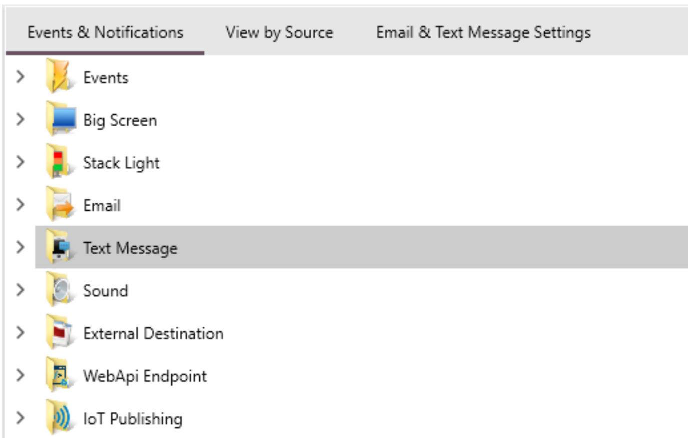
The Events & Notifications tab is where notifications, and the logic which controls when each notification activates, is setup. There is a folder for each type of event and a folder for each type of notification.

Events are something which occurs in the PINpoint system such as a tool being locked or a station exceeding cycle time. Buttons are a type of event which can also be used to trigger notifications and they are also setup here. Generic Events are a type of event which is triggered by an OPC tag.

Notifications are activated by events and sent to output devices. The output devices such as the stack light, sound device, and BigScreen, are setup in the hardware tab. Notifications can be set to send based on a delay since the event first occurred.

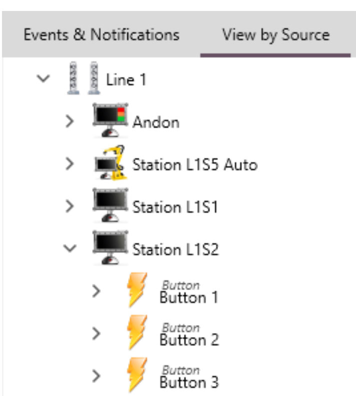
The Events & Notifications tab




## *View by Source*

The View by Source tab shows the Events which are linked under each station. Each event will show what notification it is configured to trigger. The link between the station and the event can be removed in this view by right clicking and deleting it.

The View By Source Tab




## *Email & Text Message Settings*

The **Email & Text Message Settings** tab displays a list of PINpoint users which can receive text or email notifications. It allows users to be disabled and allows a user to be assigned to a line and a shift. Users will only receive notifications if they are enabled and the line and shift is selected in the *Shift* dropdown list.

# Adding Events to Notifications

Events will not send a notification unless there is an event to trigger the notification. Events must be added underneath a notification destination, such as a sound device, in the list. Changes the events will not be active until the event data manager is refreshed or restarted.

1. Right click on the notification and choose “Select Events…”
2. Choose the Event, Button or, Generic Event, from the list.
3. Select the event which was just added and on the details pane choose the conditions to activate the event and which locations the event can be activated from. If the event is a button this will put the button at that station
4. Save
5. Refresh the event data manager for the change to take effect.

## *Escalating Events*

Events can be setup to escalate the message to a supervisor if the event has been active for a certain period of time using the Delayed Notification setting. A delayed notification will send a notification a specified amount of minutes after the condition of the event was met if the condition is still true. A resend notification will resend after a specified amount of minutes if the condition is still true.

To setup an event to send a message to a supervisor after a certain period of time create 2 notifications. The first notification should send a message when it is met. Create a second event with the same settings and add a delayed notification time. The second event will be sent if the conditions are met for the specified time period. This method allows the system to send a message to user 1 on the first event and user 2 after a specified time period.

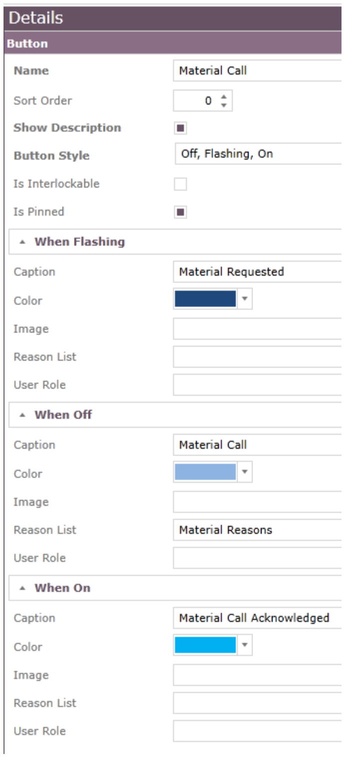
# Creating Buttons

Buttons are created in the *Events & Notifications* tab and appear on the SmartScreen client. A button is a type of event and is used to trigger a notification. Each Button can have 2 or 3 states. Each state is defined on the button details. Once a button is created it must be linked to a notification.

Buttons are not intended to, and do not, offer the functionality of emergency stop buttons or devices. They are intended solely for the purpose of communicating events, issues, and statuses to signaling devices and PINpoint for the purposes of tracking and reporting.

To create a button:

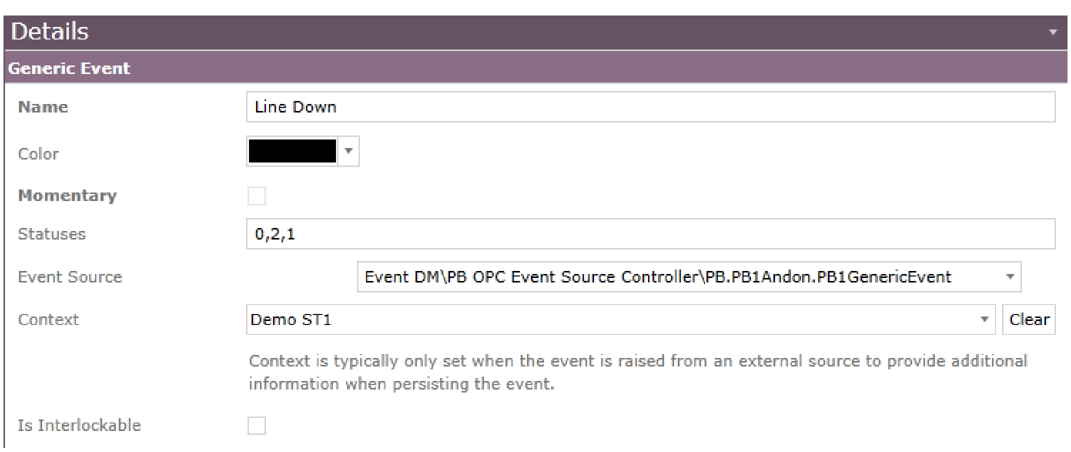
1. Right click on the Buttons folder and choose “Add”
2. Enter the name of the button and press “OK”
3. Enter the properties of the button.




4. Save

## Generic Events

Generic events are events which are activated when an OPC tag item changes state. They are setup the same way buttons are. They must be linked to a notification the same way a button would be. The context field for a notification is used when the event triggers a BigScreen Notification. The context field is used to activate the notification on the correct station box on the BigScreen.

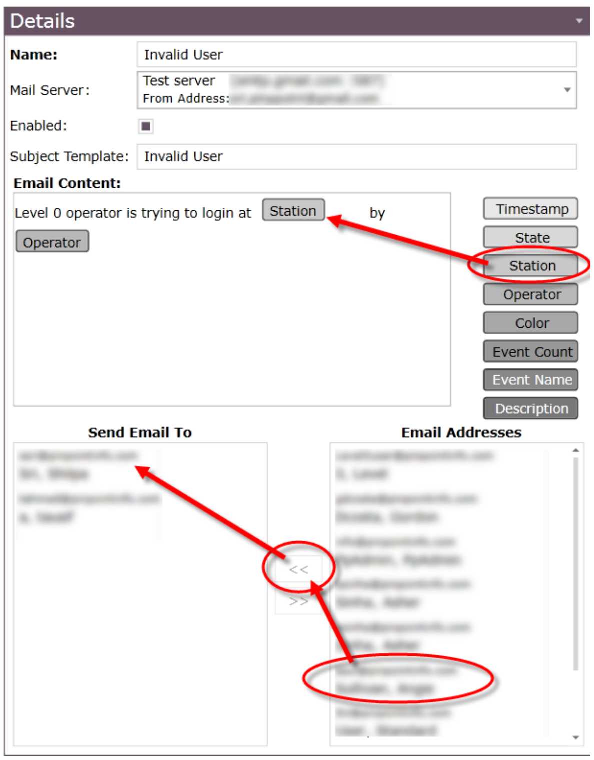


# Email Notifications

Email notifications allow the PINpoint system to send a notification to an Email address setup in the Security tab. Email notifications require an SMTP server to be configured in the SmartBuild advanced tab. To create an email notification right click on the email folder and then add.

Once the message is setup users can be excluded from receiving messages based on the relevant shift in the *Email & Text Message Settings* tab.

Email details. The variables on the right can be dragged and dropped into the email content.




Email Details properties

| Attribute | Description |
|---|---|
| Name | The name of the email. |
| Mail Server | Selects the SMTP server from the list in advanced. |
| Enabled | Enables the email. |

| Attribute | Description |
| --- | --- |
| Subject Template | The Subject of the email |
| Email Content | Type the body of the Email in the **Email Content** field. The following variables can be dragged into the body of the email:<br>**Timestamp**: This is the time the Email was sent.<br>**State**: This is the state of the Event triggering the Email (0, 1, or 2).<br>**Station**: This is the station from which the Email is sent.<br>**Operator**: This is the ID of the operator sending the Email.<br>**Color**: This is the color of the Event.<br>**Event Count**: This is the count value of the Event.<br>**Event Name**: This is the name of the Event triggering the Email.<br>**Description**: Any additional information for the event, such as the reason they it was selected, or in the case of something like an Operator Login event, the operator name.<br>Serial Number: The serial number at the station when the event was triggered. |
| Send Email to | The **Email Addresses** field contains the email addresses of the users in PINpoint. Select the ones to which this Email should be sent (This can be done one at a time, or CTRL+click allows the user to add many), and click the << button to move them to the **Send Email** to field. The >> button will send any selected address back to the **Email Addresses** field. |

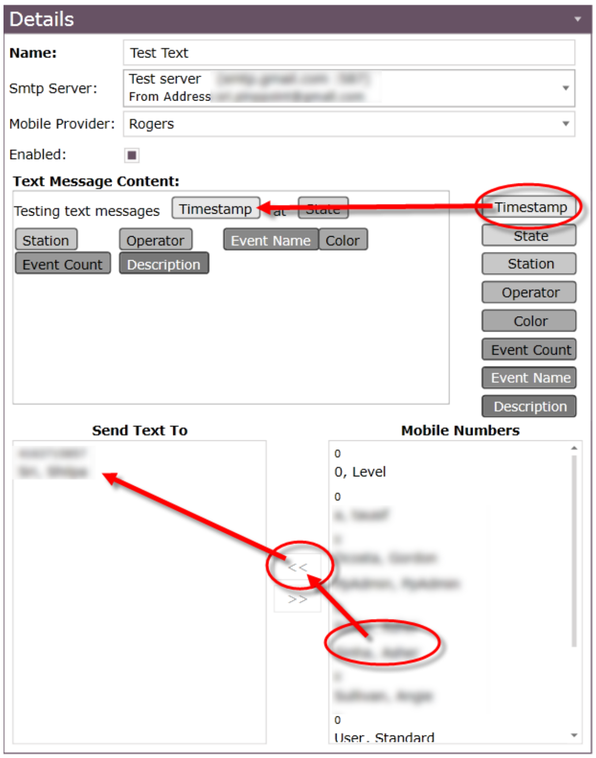
## Text Message Notification

Text Message notifications allow the PINpoint system to send a notification to an Email address of a mobile provider using the phone number of a user setup in the Security tab. The mobile provider will deliver the email as a text message. Text Message notifications require an SMTP server to be configured in the SmartBuild advanced tab's Organization folder. Text Message notifications require an Email to Text Provider to be created in the SmartBuild Advanced tab's organization folder. To create a Text Message notification right click on the Text Messages folder and then add.

**Email to Text Providers** are items which are used when sending a text message from an event. The PINpoint event manager sends an email to the address with the user's phone number and the Email To Text Provider receives the email and sends the contents in the form of a text to the phone number. Common Email to Text Providers have already been added by PINpoint.

Once the message is setup users can be excluded from receiving messages based on the relevant shift in the *Email & Text Message Settings* tab.

Text Message Details




Text Message Details properties

| Attribute | Description |
|---|---|
| Name | The Name of the Text Message |
| Smtp Server | Selects the SMTP server from the list in advanced. |
| Mobile Provider | Selects the Mobile provider from the list in advanced. |
| Enabled | Enables or disabled the message. |
| Text Message Content | Type the body of the Email in the **Email Content** field. The following variables can be dragged into the body of the text:<br>**Timestamp**: This is the time the Text Message was sent. |

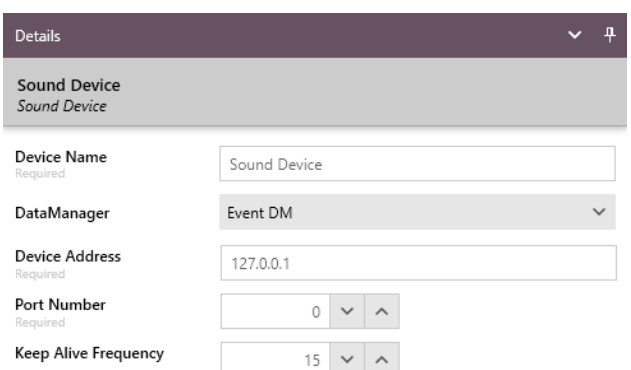
 

| Attribute | Description |
|---|---|
| | **State**: This is the state of the Event triggering the Text Message (0, 1, or 2).<br>**Station**: This is the station from which the Text Message is sent.<br>**Operator**: This is the ID of the operator sending the Text Message.<br>**Color**: This is the color of the Text Message.<br>**Event Count**: This is the count value of the Text Message.<br>**Event Name**: This is the name of the Event triggering the Text Message.<br>**Description**: Any additional information for the event, such as the reason they it was selected, or in the case of something like an Operator Login event, the operator name.<br>Serial Number: The serial number at the station when the event was triggered. |
| Send Text to | The **Mobile Numbers** field contains the mobile numbers of the users in PINpoint. Select the ones to which this Text Message should be sent (This can be done one at a time, or CTRL+click allows the user to add many), and click the << button to move them to the **Send Text To** field. The >> button will send any selected address back to the **Mobile Numbers** field. |

## Sound Notifications

Sound Notification allow the PINpoint system to play a sound on a computer running the PINpoint DeviceBridge software. It can play to a speaker or a USB stacklight. The sound device must be setup in the SmartBuild Hardware tab. To create a new Sound Notification right click on the Sound folder and select Add.

Sound Details




Sound Event properties

| Attribute | Description |
|---|---|
| Name | The name of the Sound Notification |
| Enabled | Enables or disables the sound. |
| Sound File | This is a list of available sounds which can be played. A new sound can be uploaded using the new button. This will only play through the computer speaker. Acceptable formats are: .mp3 .wav |
| Volume | Use this sliding scale to set the volume at which this sound will be played over the sound device. |
| Duration | This is the amount of time, in seconds, the sound is played in a single cycle. |
| Time Between Repeat | This is the amount of time, in seconds, between repetitions of the sound. If unset or set to "0", the sound will play for the designated duration. |
| Number of Repeats | This is the number of times the sound will be repeated for the triggering event. A setting of 1 means the sound will play 2 times. |
| Tone | The tone will only play when using a stacklight as a sound device. The choices are:<br>Off (no tone)<br>Fire<br>Emergency<br>Ambulance<br>Beep, Beep, Beep<br>Continuous. |
| Sound Device | Select the sound device from the sound devices configured in the SmartBuild Hardware tab. |

## External Destination Notification

An external destination is used to send a signal to an OPC tag when an event is triggered. The destination is a generic OPC Tag Item. If this is triggered by a button event a value based on the state of the button will be sent to the external destination. PINpoint will send one of three values: 0 Off, 1 On, 2 Flashing. The tag item must be an integer in the OPC server.

## WebApi Endpoint Notification

A WebApi endpoint event is used to send information to a web service which will trigger action by a 3rd party system. The message is sent to the destination in the WebApi Endpoint by the event manager when the event is triggered. A WebApi Endpoint sends the event message to an Endpoint item created in the advanced tab. The details of the message are in the PINpoint API documentation.

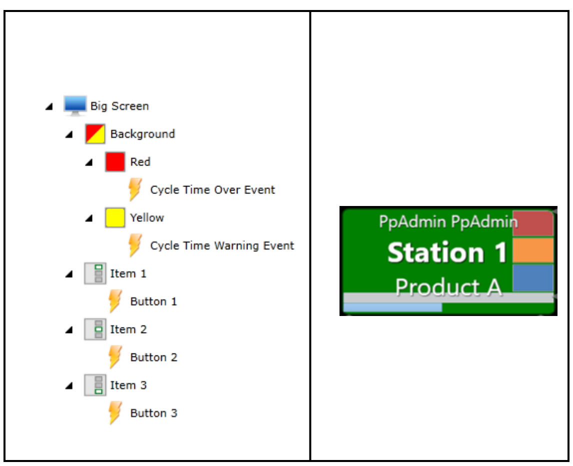
## IoT Publishing Notification

IoT publishing events send notifications to the Andon Event IoT broker specified in the hardware tab. This broker is setup under the IoT Publishing folder. When an event triggers a notification the message is published to the IoT broker. The details of this message are detailed in "Andon IoT Topics" on page 391.

## BigScreen Notifications

BigScreens have 5 different notification areas for each station where notifications can be triggered. An Event can be linked to a background or one of the items. The Station on a BigScreen has 3 boxes on the right side which can be used as notification outputs, they are listed as items in the events tab. The background can be changed to either red or yellow by linking an event to it.

*An Example of a Typical Bigscreen setup*




## List of Events

Descriptions of Event types

| Event | Description | Source of Event |
| --- | --- | --- |
| Build Station Incomplete Event | This event is true when the station is active but not complete. | This event is generated by the Client when a built item arrives. |
| Button | The user can create on screen buttons within SmartBuild which show up on the SmartScreen Client. The buttons show up on all screens after the login. A button is an event written in the Hardware tab and can be used in the Notifications tab. A button can also trigger an event using the Associated event drop down. Buttons can be hidden and their access limited to different user levels. | This event is generated by the Client when a defined button is pressed. |
| Cycle Time Over Event | The Cycle Time Over Event is true when the cycle time is beyond the "CycleTime Over Percent", as defined in the Extended Properties of the Station configuration in the Hardware tab. | This event is generated by the Client when the cycle time for a specific process at a specific station has been exceeded. |
| Cycle Time Warning Event | The Cycle Time Warning Event is true when the cycle time is beyond the "CycleTime Warning Percent", as defined in the Extended Properties of the Station configuration in the Hardware tab. | This event is generated by the Client when the cycle time warning trigger threshold for a specific process at a specific station has been exceeded. |

| Event | Description | Source of Event |
|---|---|---|
| Generic Event | This is an event triggered using the PLC. Events generated by OPC tags can occur frequently. They are recorded by the data manager unless they change state too frequently. There is a data manager setting to prevent the system from being flooded with event storage. This is typically set to pause recording for a minute if the number of events recorded is more than 60 per minute. | This event is generated by an OPC Event Source. The status of the OPC event source will be passed to the generic event and sent to the output of the notification logic. The OPC tag is specified in the generic event source controller under the event manager. |
| In Process Validation Level 1 Event | This happens when an operator makes a NOK rundown. The tool locks requires the operator to clear the tool lock. | This event is generated by the Client when an InProcess Validation Level 1 is activated. IPV level 1 events can be activated from invalid scan operations. |
| In Process Validation Level 2 Event | This happens when an operator makes a certain number of consecutive NOK rundowns, with that number set in configuration. The tool locks and an LCA is required to clear the lock. | This event is generated by the Client when an InProcess Validation Level 2 is activated. |
| Index Event | This is triggered internally by PINpoint. | Whenever a sync cluster is indexed, either by the last station complete in the cluster, or the tracking site, the index event will trigger. |
| Invalid User Event | This event is true when an invalid user attempts | This event is generated by the Client when a level 0 operator attempts to log into a client. |

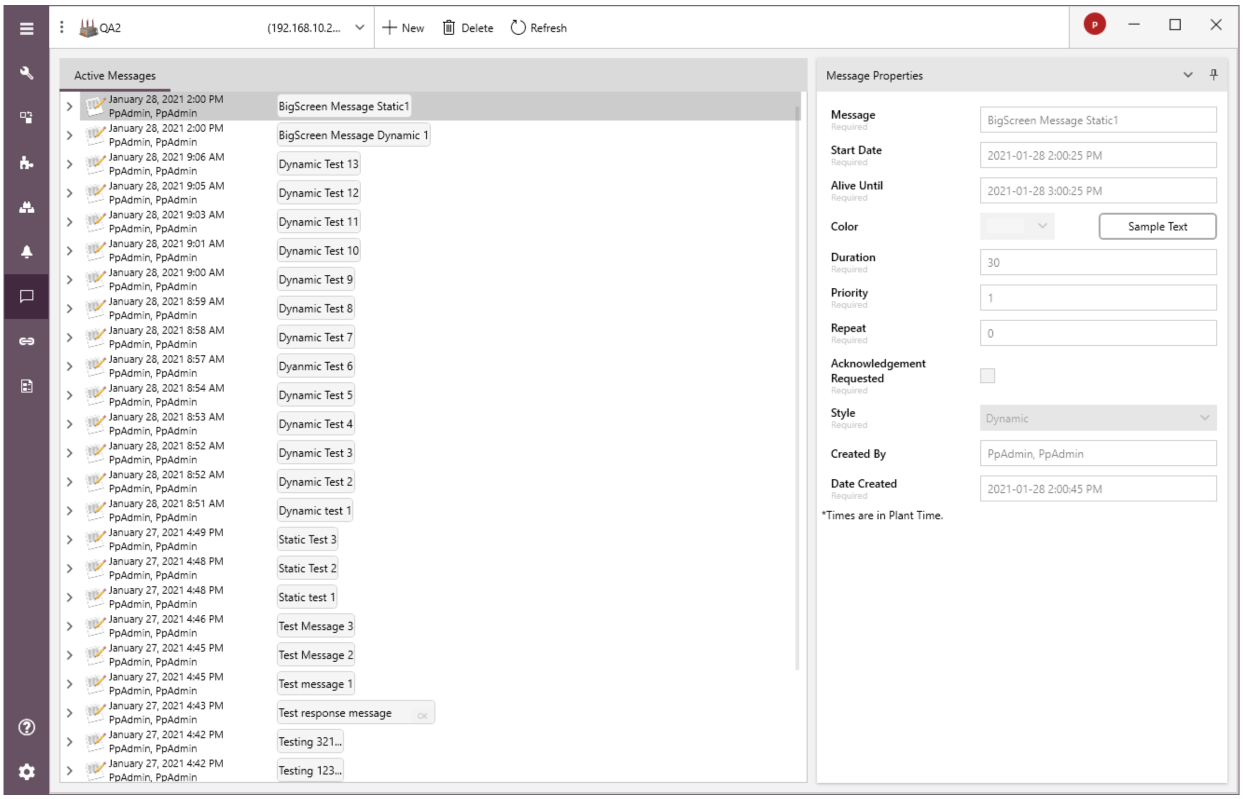
| Event | Description | Source of Event |
|---|---|---|
| | to log in. | The invalid user event is only published under certain conditions:<br>NotAllowedAtStation (Level 0)<br>OperatorIsNotATrainer<br>MasterBuildRequired<br>OperatorCapacityMetOrExceeded |
| LCA Login Event | This event is true when an LCA logs in to the station. | This event is generated by the Client when an LCA user logs into a client. |
| LCA Logout Event | This event is true when an LCA logs out of a station. | This event is generated by the Client when an LCA user logs off a client. |
| New Serial Number | This event is true when a station loads a new serial number. | This event is generated by the Client when a new serial number is started on the Client. |
| No Space to Index Event | This event is true when the outbound Queue of a set of Stations using Auto Indexing currently holds its Destination Capacity (maximum number) of build items. | This event is generated by the Tracking Manager when it attempts to Auto Index a set of Stations and the Destination Capacity has been met for outbound Queue. |
| Non-Production Shift Start Event | This event is true when the shift schedule enters non-production time. | This event is generated by the Andon Data Manager. |
| Process Complete Event | This event is true when a step is completed. | This event is generated by the Client whenever there is a change in the number of completed process steps. |
| Product Quality Changed | This event occurs when the product quality | This event is generated by the client when the product quality changes status. This event will not |

| Event | Description | Source of Event |
|---|---|---|
| Event | changes while the build item is loaded in the station. | be triggered if the product quality changes from grey to green. |
| Production Shift Start Event | This event is true when the shift schedule enters production time. | This event is generated by the Andon Data Manager. |
| Station Connected Event | This is an event that is fired when a station loses its connection to the server. The BigScreen will also display a disconnected icon. | This event is generated by the ANDON data manager to indicate an individual stations connection status on the BigScreen. |
| Trainer Login Event | This event occurs when a user with a level 3 trainer status logs into a station. | This event is generated by the Client when a trainer logs into a client. |
| Trainer Logout Event | This event is true when a user with a level 3 trainer status logs out of a station. | This event is generated by the Client when a trainer logs off a client. |
| User Login Event | This event is true when a user logs in to a station. | This event is generated by the Client when a user logs into a client. |
| User Logout Event | This event is true when a user logs out of a station. | This event is generated by the Client when a user logs off a client. |
| User Not Qualified Event | This event is true when a user logs into a station which the user is not qualified to operate. | This event is generated by the Client when an unqualified user logs into a client. |

# Messaging Tab

The **Messaging** tab allows users to create and distribute messages to SmartScreen clients and BigScreen's. Messages can be targeted all the way down from all such devices in the facility, to the stations of a particular line, and down to individual screens and stations. Messages can be configured to have different durations, repetitions, user response requirements, etc.

Messaging interface




## Messaging Definitions

The following definitions summarize concepts encountered in this section.

Messaging tab definitions

| Term | Definition |
|---|---|
| Message | Content displayed on a Station or BigScreen at the time of its connection to inform the user and/or ask the user a question requiring acknowledgment or a response. |

| Term | Definition |
|---|---|
| Active Message | A Message that is still valid in the system: it has not exceeded its Active Until date. |
| Destination | A particular Station or BigScreen to which a Message is intended to be delivered. A Message can have multiple destinations. |

## Creating New Messages

To create a new Message, follow these steps.

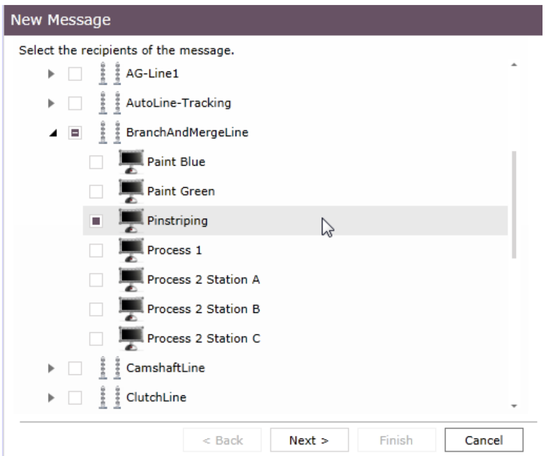
1. Open the **SmartBuild** Messaging Tab.
2. At the top of the interface, click the **New...** button. The **New Message** dialog opens.
3. Choose from the following options:

Message options

| Option | Procedure | Result |
|---|---|---|
| Send to all Stations and BigScreens | Fill the check box associated with the facility. | All BigScreens and the Stations on every Line will be sent the message provided they are active during the time the message is applicable. |
| Send to all Stations on a Line | Expand the facility hierarchy and fill the check box associated with the Line. All of its Stations inherit the status. | All the Stations on the Line will be sent the message provided they are active during the time the message is applicable. |
| Send to one particular Station | Expand the facility hierarchy, then the Line hierarchy, and fill the check box associated with the Station. | The selected Station will be sent the message provided it is active during the time the message is applicable. |
| Send to one particular BigScreen | Expand the facility hierarchy and fill the check box associated with the BigScreen. | The selected BigScreen will be sent the message provided it is active during the time the message is applicable. |

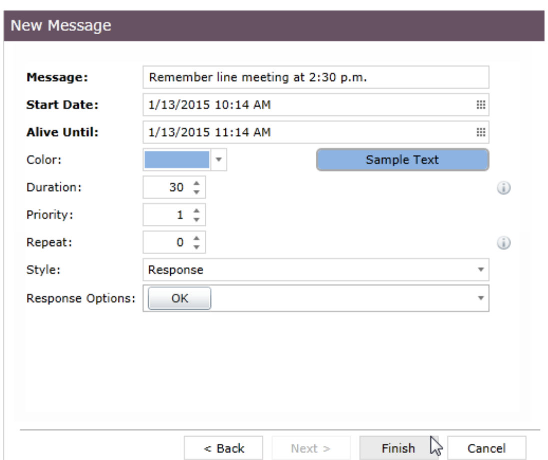
| Option | Procedure | Result |
|---|---|---|
| Send to various Stations and BigScreens | Expand the facility hierarchy to the extent necessary and fill the check boxes associated with the various BigScreens, Lines, and Stations to which the message should be sent. | The selected BigScreens and Stations will be sent the message provided they are active during the time the message is applicable. |

Selecting a destination




4. Click **Next.** The properties for the message are displayed in the **New Message** pane.

   New Message pane




5. Complete the properties in the **New Message** pane.

   Message details

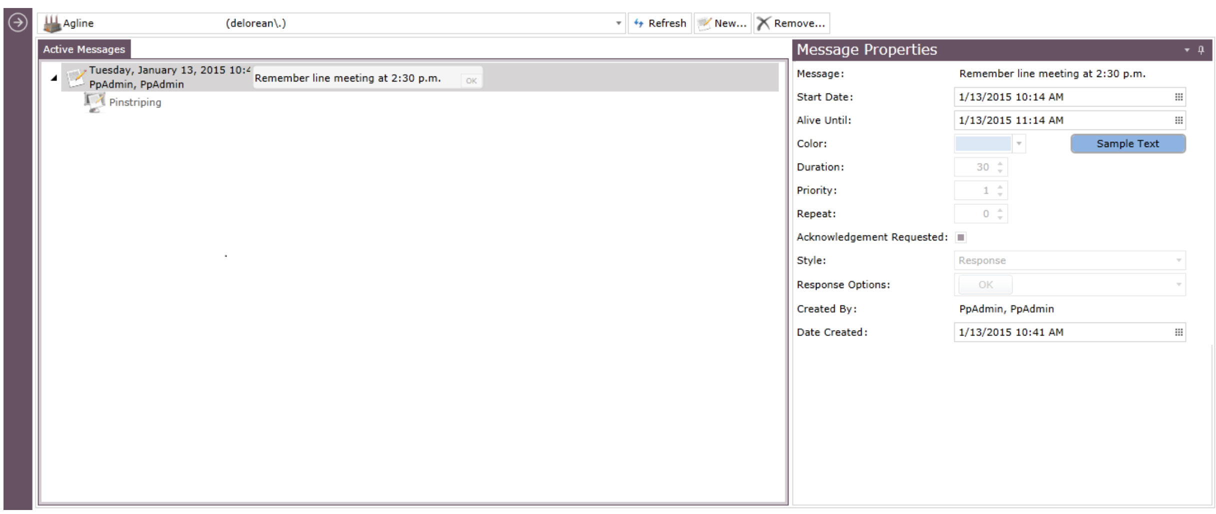
 

| Attribute | Definition |
|---|---|
| Message | Enter the text of the message.<br>This is not the name of the message. This is the text that will actually be presented to the recipients. |
| Start Date | The date and time when the message will start being delivered. The default is the current timestamp |
| Active Until | By default, **Alive Until** is set to expire the message exactly one hour after the message is created. |
| Color | The Background colour of the message |
| Duration | By default, the **Duration** of the message is set to 30 seconds. This is the length of time, in seconds, that the message will be displayed to recipients. |
| Priority | By default, the **Priory** of the message is set to 1. |
| Repeat | By default, **Repeat** is set to 0. This indicates that the message will be displayed every time the Station becomes active until either the Alive Until time is reached, or the user acknowledges the message (assuming the message has a response requirement). If this is set to any other value, the message will only be displayed that many times, regardless of the other considerations. |
| Style | **Dynamic**: this is the default. Dynamic messages cycle if there is more than one. This message type does not require a response.<br>**Static**: Static messages are displayed as long as they are alive. This message type does not require a response.<br>**Response**: This option causes the message to appear on the screen with a set of buttons to enable the user to respond. The time, user, and response are recorded. If selected, a **Response Options** attribute becomes available.<br>Dynamic and Static Messages behave the same on the SmartScreen client. They will appear until the duration expires. |
| Response Options | The **Response Options** field is available only in the event that the Style attribute is set to Response. It allows the user to designate the set of response buttons made available to the recipient to respond to the message. |

| Attribute | Definition |
|---|---|
| | The options are:<br>**OK**<br>**OK/NOK**<br>**Yes/No**<br>**Yes/No/Maybe** |

6. Click **Finish**. The message appears in the list of **Active Messages**, beside the **Message Properties** panel. Expanding the Message displays its hierarchy of recipient Stations and/or BigScreens.

   New message in Active Messages tab




## Active Messages Tab

The **Active Messages** tab is also the default workspace that opens when selecting **Messaging** in **SmartBuild**. All currently-existing Messages for a facility are displayed in this tab. This tab allows the user to check on the status of Messages and delete those no longer needed.

### *Viewing Messages*

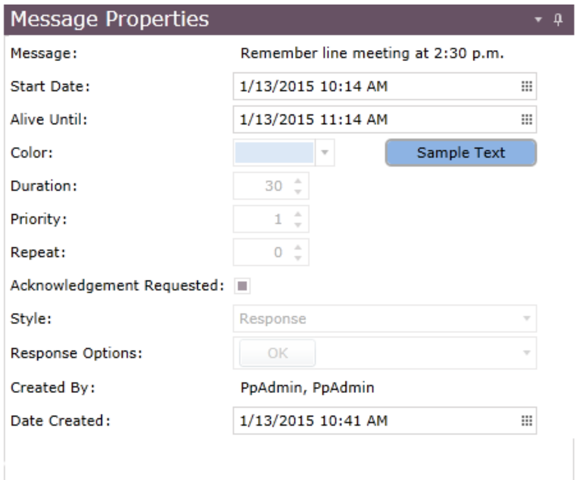
To view Messages and their statuses, follow these steps.

1. Select **Messaging**.

2. Select a Message to view. Its properties are populated in the **Message Properties** pane. Note that these are the properties for the Message itself, and the pane does not reflect the status of the Message.

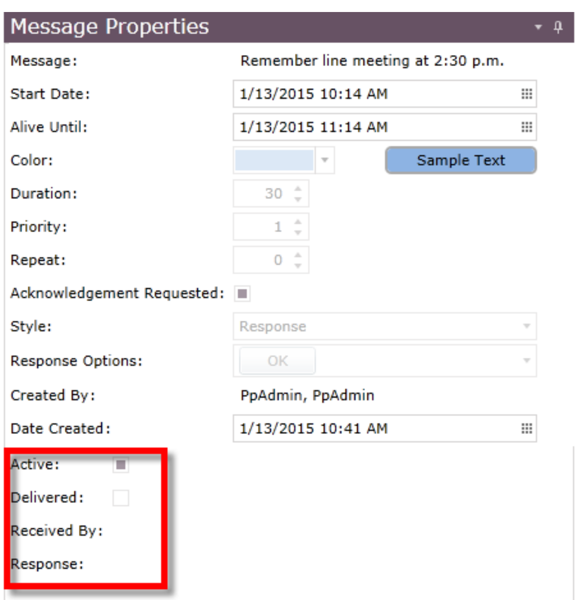
   Message Properties pane for the Message




3. To view the status of the Message for its destinations, expand the Message by clicking the small arrow immediately to its left. The Stations and BigScreens to which the Message was assigned are displayed.

4. Select a Message destination (i.e., Station or BigScreen) to view the status of the Message for that destination. Four new properties are displayed at the bottom of the **Message Properties** pane:

   Message Properties pane for a Particular destination



Message properties particular to a destination

| Attribute | Description |
|---|---|
| Active | If checked, this indicates whether or not the Message is still active; that is, if it has not exceeded its duration. |
| Delivered | If checked, this indicates that the Message has been delivered to this particular destination. |
| Received by | If the Message has been received at this destination, this displays the name of the User who was logged on at the time it was delivered. |
| Response | If the Message requires a response, the response given by the receiver is displayed here. |

## Refreshing the Messages

This communicates with the Event Manager and returns the current information about the Messages in the facility.

To refresh the Messages in the Active Messages tab, click the **Refresh** button at the top of the tab.

Refresh button


## Removing Messages

When a Message expires, or it is no longer required, it is possible to remove it, either entirely, or to make it no longer apply to one or more of its destinations.

### Removing a destination from Message

This process removes one of the Message’s destinations, rather than deleting the entire Message itself. To do this, follow these steps.

1. Expand the Message by clicking the small arrow immediately to its left. The Stations and BigScreens to which the Message was assigned are displayed.
2. Select a Message destination (i.e., Station or BigScreen) and click the **Remove...** button.
3. When asked to confirm, click **OK**. The destination is removed from the Message hierarchy.

## Removing a Message

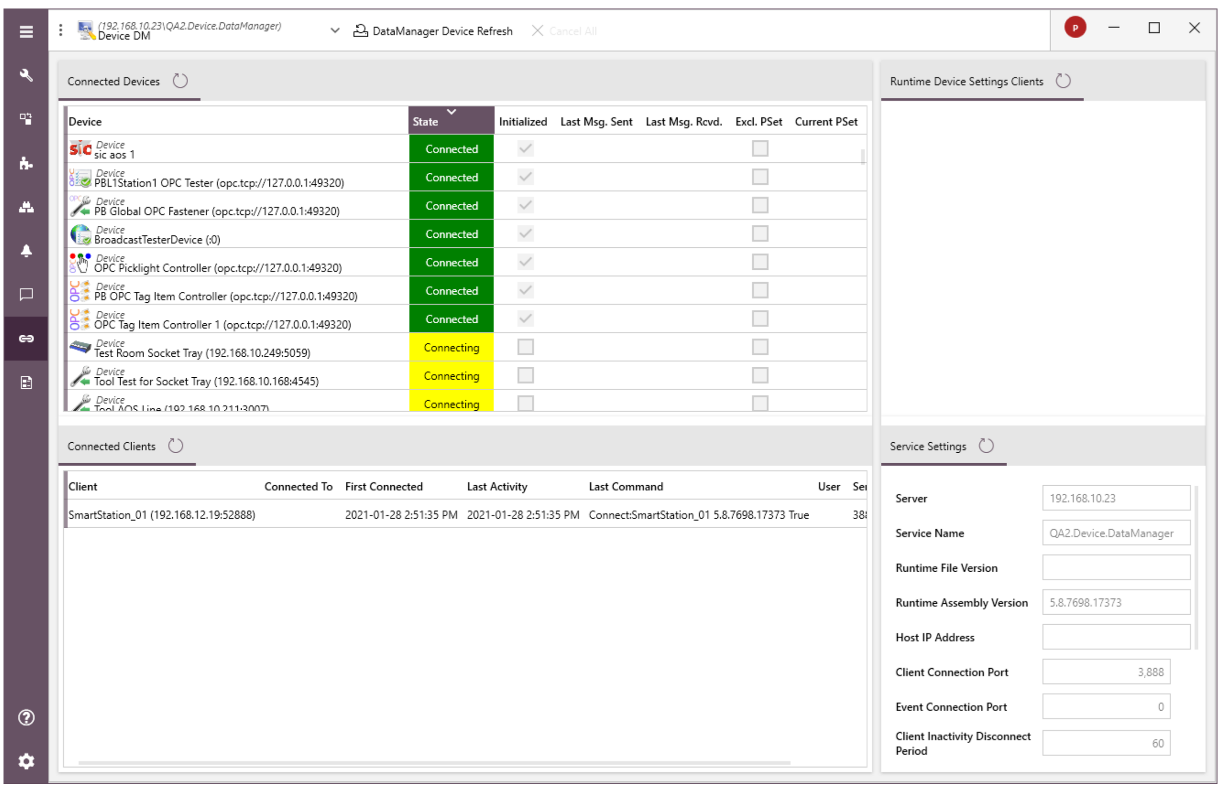
This process effectively deletes a Message and removes it from all of its destinations, whether or not they have received and acknowledged it. To do this, follow these steps.

1. Select the Message and click the **Remove...** button.
2. When asked to confirm, click **OK**. The Message is removed from the Active Messages tab.

# Connections Tab

The **Connections** tab gives users an overview of all the connections a Data Manager is handling. The Connections interface is divided into the following tabs; "Connected Devices tab" on page 145, "Connected Clients tab" on page 149, "Runtime Device Settings Clients tab" on page 150, and "Service Settings tab" on page 151.

Connections tab




Nothing is displayed until a Data Manager is selected, which is done using the drop-down menu at the top of the interface.

Data Manager drop-down menu


**Data Manager Device Refresh** checks the list of devices and notifications for this Data Manager and adds the missing ones. If something new is added, activating **Data Manager Device Refresh** will cause it to be recognized. It does not affect *currently* connected devices or notifications even they have been changed. If a notification was changed, a restart the Data Manager is required. If the IP of a tool change, **reload and restart** is required.

If the name of an existing device has changed then the icon may not appear in the device list; in this case the Data Manager service should be restarted.

Data Manager Device Refresh button


## Connections Tab Definitions

The following definitions summarize concepts encountered in this section.

Connections tab definitions

| Term | Definition |
|---|---|
| Data Manager | The Data Manager is a Windows service that manages communication between the physical world and client applications. The Data Manager has three modules:<br>**Device Manager: Handles communication for devices such as tools**<br>**Event Manager**: Handles communication for Andon devices such as stack lights.<br>**Tracking Manager**: Manages the tracking of work orders. |
| Device | In PINpoint, a device is a physical tool used in production that is capable of interacting with the PINpoint Data Manager. |
| Data Manager Device Refresh | Checks the list of devices and notifications for this DM and adds the missing ones. If something new was added it will be recognized. It does not affect currently connected devices or notifications even if they were changed. If a notification was changed the DM must be restarted. If the IP of a tool was changed need **reload and restart** will cause the change to be processes. |

| Term | Definition |
|---|---|
| | Adding devices to a station does not require the SmartScreen client at that station to be restarted. |
| Restart | Loads the configuration of a specific device from the DM memory (*not* SmartBuild). This is used if to get the DM to try to connect to a tool which it is for some reason not connecting to. |
| Reload Configuration and Restart | Downloads the configuration from SmartBuild for a specific device and commands the DM to restart its connection with the updated configuration. This is used if the IP of a tool has changed to get the DM to connect to it. If Endpoint information changes the DM must be restarted because it will not be applied to devices using it. |
| Stop | Stops all communication to a specific device. This is used if a device has disconnected from the network for a long period of time. It will improve performance if the DM is not constantly attempting to connect. |

## Interaction of the Data Manager with SmartBuild

The Data Manager interacts with the functionality of other aspects of SmartBuild in differing ways. It is important to understand how, and what the ramifications of making changes are.

### *Hardware Tab*

- Addition of stations and client button events are made on a save.
- Addition of input sources or BigScreens require interaction with the appropriate Data Manager before they will fully function.

### *Build Tab*

- Changes to the build tab take effect when the **View and Apply** is activated.

### *Process Tab*

- Changes to the Process Tab take effect when a serial number which uses the steps from that process is loaded.

### *Notifications Tab*

- Addition of notifications requires a device refresh.
- Modification of existing notifications requires a restart of the Event Manager.

### Messaging Tab

- Messages are sent immediately.

### Connections Tab

- Everything is immediate.

### Advanced Tab

- Changes to relationships of items are immediate and do not require saving.
- All changes require an immediate save.
- All changes follow the rules outlined in the other tabs.
- Addition of input sources or BigScreens require interaction with the appropriate Data Manager before they will fully function.
- Addition of stations and client button events are made on a save.
- Changes or addition of any reasons will appear as soon as the client calls the item such as pushing the bypass step button.

## Data Manager

To view the status of any devices or clients, select the Data Manager they're associated with. To do this, follow these steps.

1. Open SmartBuild.
2. On the **SmartBuild Application**, select **Connections**. The **Connections** workspace opens.
3. Click the **Please select a Data Manager** drop-down menu. The list of available Data Managers is displayed.
4. Click the Data Manager. The tabs display the information available for that Data Manager.

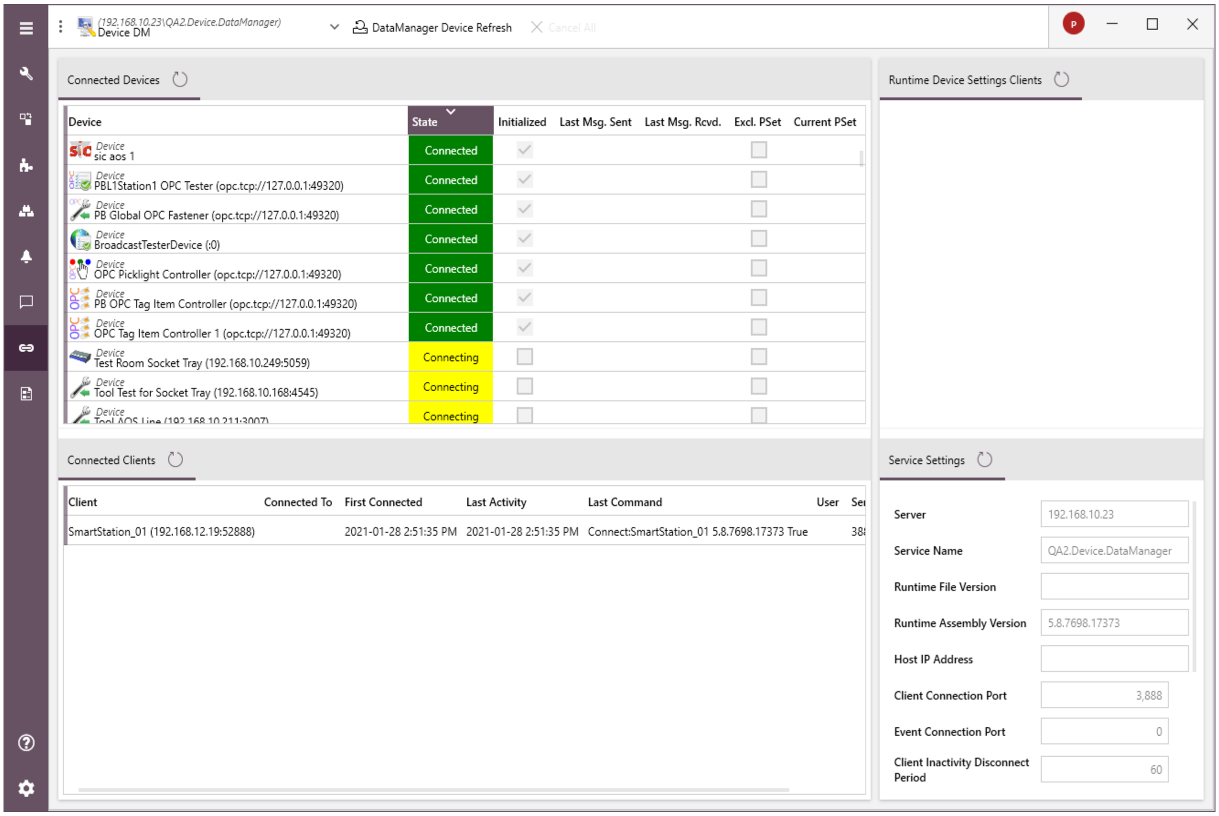
### Clear & Refresh

When a Data Manager is selected, clicking the Data Manager drop-down menu will make the **Clear & Refresh** option available. Clicking it will clear the current Data Manager selection and all of the data displayed in the tabs. It will query the database for any new Data Managers or changes made to the existing ones.

## Connected Devices tab

When a Data Manager is selected, the devices associated with it (whether or not they are currently connected to it) are displayed here, along with their connection status, and the status of several other properties.

Connected Devices tab



Connected Devices statuses

| Attribute | Description |
|---|---|
| Device | This displays the device type and the specific name of the individual device as it appears in PINpoint. |
| State | This displays the connection status of the device with regard to the Data Manager. A device can have one of three statuses:<br>**Not Connected** (orange)<br>**Connecting** (yellow)<br>**Connected** (green) |
| Initialized | If filled, this indicates that the device is initialized. |
| Last Msg. Sent | This displays the last message sent from the Data Manager to the device. |

| Attribute | Description |
|---|---|
| Last Msg. Rcvd. | This displays the last massage received by the Data Manager from the device. |
| Excl. PSet | If checked, SmartScreen will override all other PSet choice selections made by the controller and will select the PSet desired. |
| Current PSet | Designates the default PSet. |

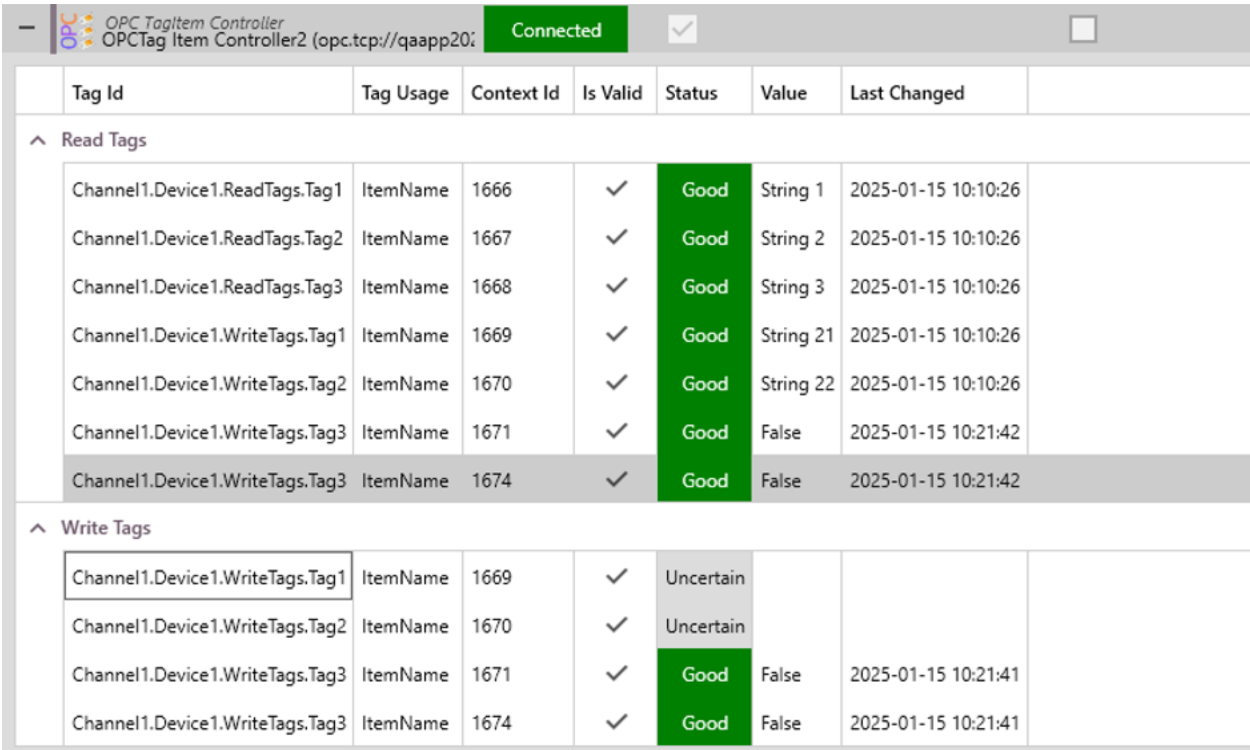
Each tab features a **Refresh** button on its tab title, to refresh the contents of the tab and view any changes in status since the last refresh. Refreshing this tab simultaneously refreshes the Runtime Device Settings Clients tab.

### *Devices with OPC Tags*

Devices with OPC Tag items such as OPC Tag Item controllers and OPC Fastening Input Sources will show the tags and the last value recorded. Tags are grouped by function and may be in both the read and write group. The values are only updated while the list is expanded. If a tag is Uncertain the value is not in memory. If a tag row is Red then the tag may be bad. The refresh button updates the table.

An OPC Tag Item controller showing the last values recorded or sent for the OPC Tags.

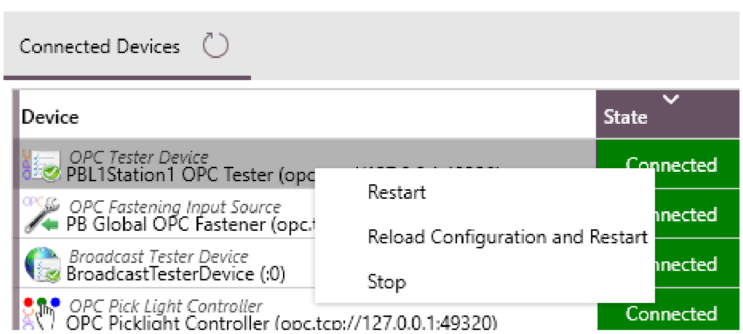
 




## Restarting Devices

Every device listed in a Device Manager's Connected Devices tab can be stopped, restarted, and have its configuration reloaded (then restarted) from within the Connected Devices tab. To do so, right-click the device and select the appropriate option from the context menu that opens.

Device restart/reload/stop menu




Menu options

| Option | Description |
|---|---|
| Restart | Selecting this restarts any device with the last configuration loaded into it. |

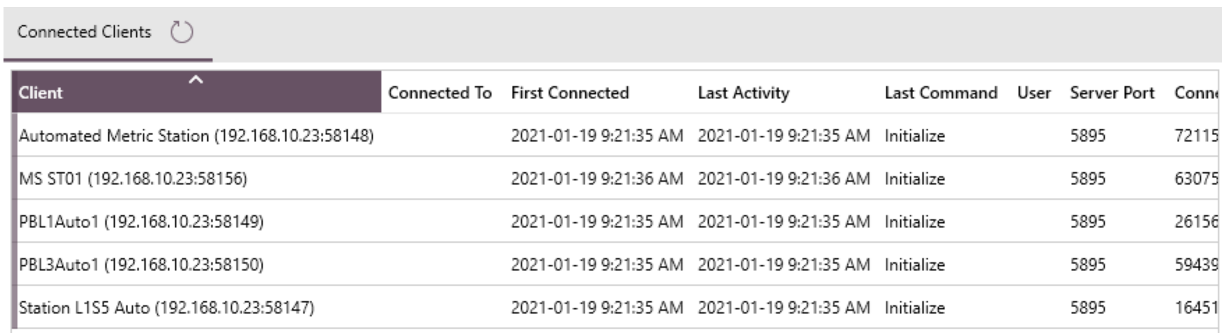
 

| Option | Description |
|---|---|
| Reload Configuration and Restart | Selecting this loads the current configuration into the device and then restarts it. |
| Stop | Selecting this immediately stops the device. |

## Connected Clients tab

When a Data Manager is selected, this tab displays the SmartScreen clients connected to that Data Manager, and the status of certain properties.

Connected Clients tab



Connected Clients

| Client | Connected To | First Connected | Last Activity | Last Command | User | Server Port | Conn |
|---|---|---|---|---|---|---|---|
| Automated Metric Station (192.168.10.23:58148) | | 2021-01-19 9:21:35 AM | 2021-01-19 9:21:35 AM | Initialize | | 5895 | 72115 |
| MS ST01 (192.168.10.23:58156) | | 2021-01-19 9:21:36 AM | 2021-01-19 9:21:36 AM | Initialize | | 5895 | 63075 |
| PBL1Auto1 (192.168.10.23:58149) | | 2021-01-19 9:21:35 AM | 2021-01-19 9:21:35 AM | Initialize | | 5895 | 26156 |
| PBL3Auto1 (192.168.10.23:58150) | | 2021-01-19 9:21:35 AM | 2021-01-19 9:21:35 AM | Initialize | | 5895 | 59439 |
| Station L1S5 Auto (192.168.10.23:58147) | | 2021-01-19 9:21:35 AM | 2021-01-19 9:21:35 AM | Initialize | | 5895 | 16451 |

Connect Clients statuses

| Attribute | Description |
|---|---|
| Client Address | This is the IP address of the SmartClient. |
| Connected To | This is the IP address to which the Client is connected, if any. |
| First Connected | This is the date and time at which the SmartClient connected to the Data Manager. |
| Last Activity | This is the date and time of the last recorded interaction by the SmartClient with the Data Manager. |
| Last Command | This is the last command of the SmartClient recorded by the Data Manager. |
| User | This is the user logged in at the SmartClient. |

Right clicking on a connected client gives the following options:

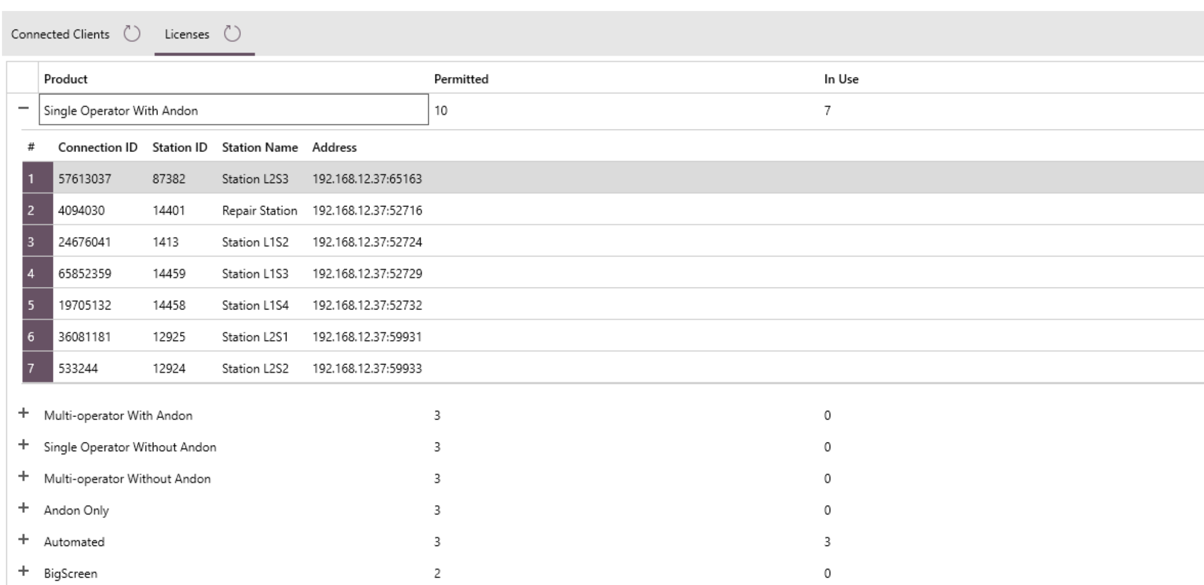
Menu options

| Option | Description |
|---|---|
| Force Installation of Update | Forces the SmartScreen client to install the latest version of the SmartScreen client from the server and restarts it. |
| Restart Client | Forces the SmartScreen client to restart |
| Shutdown Client | Forces the SmartScreen client to shut down |

## Licenses Tab

The licenses tab shows a list of the connected clients and the amount of permitted licenses versus the amount in use for each license type. If more licenses are used than are allowed the row with the issue will be highlighted red.

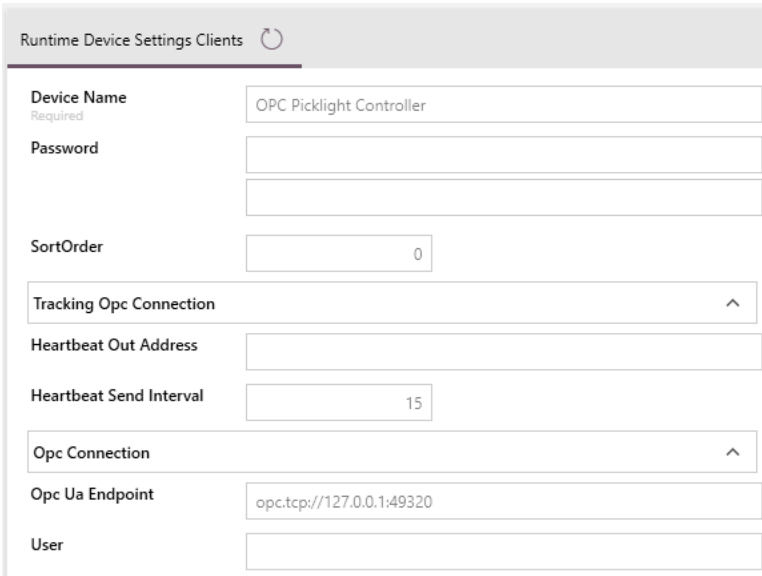
The licenses information shown in the SmartBuild Connections tab




## Runtime Device Settings Clients tab

When a device is selected in the Connected Devices tab, the Runtime Device Settings Clients tab displays the properties of that device and their configured values. Exactly what properties are displayed is dependent on the device type of the selected device.

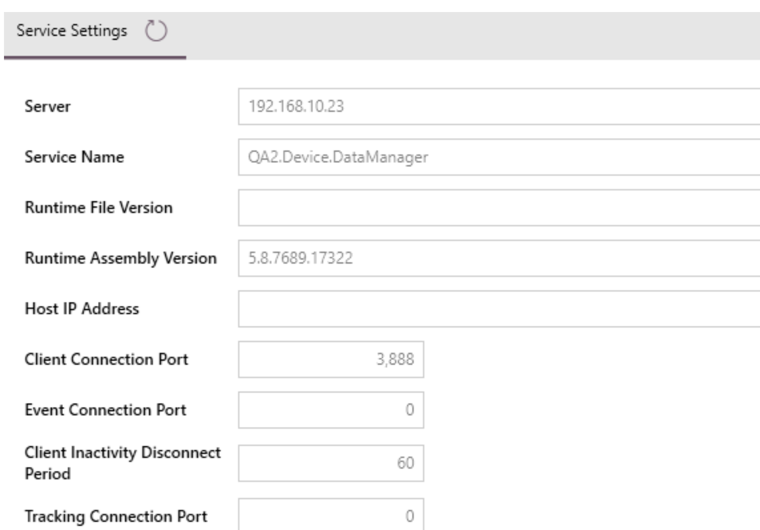
Runtime Device Settings Clients tab




## Service Settings tab

When a Data Manager is selected, this tab displays the settings for that Data Manager.

Service Settings tab




Service settings properties

| Attribute | Description |
|---|---|
| Server | This is the name of the server as it appears in PINpoint. |
| Service Name | The IP address of the server |
| Runtime File Version | The file version being used for Runtime Devices. |
| Runtime Assembly Version | The assembly version being used for Runtime Devices. |
| Host IP Address | The IP address of the host being used for Runtime Devices. |
| Client Connection Port | This is the port to which SmartScreen clients should be configured in order to connect to the server. |
| Event Connection Port | This is the port to which Events should be configured in order to connect to the server. |
| Client Inactivity Disconnect Period | This is the amount of time, in seconds, at which an inactive client connected to the server will be automatically disconnected from it. |
| Tracking Connection Port | The port at which the service communicates with the Tracking Server. |
| Instance Id | The instance number of the data manager running on the server, usually 4040.<br>If setting up a different data manager on the same server the instance ID, the client connection port, and event client connection port, must be different. |
| Database Version | Version number of the database. |
| Up Time | This is the amount of time that the service has been running relative to the time the Data Manager was chosen in the Connections tab, or the last refresh operation affecting the Service Settings tab was run. |

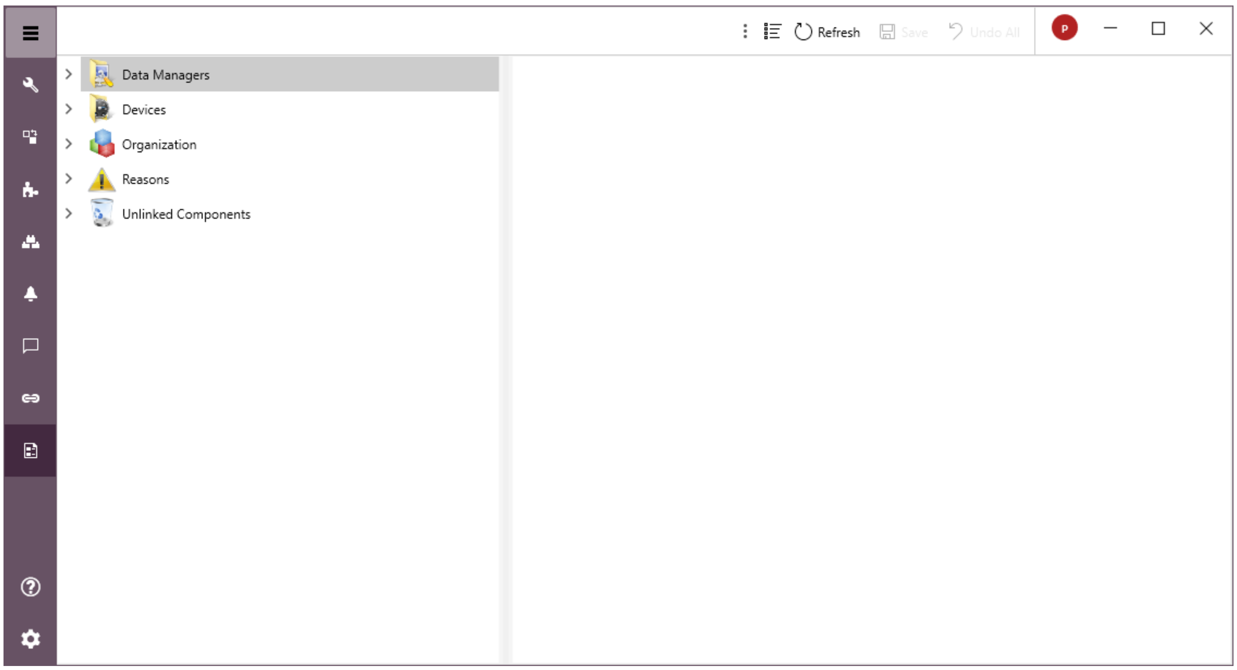
## Cancel All button

It is possible to cancel a Data Manager connection attempt or refresh operation that is taking too long to complete. To do this, click the **Cancel All** button at the top of the interface, which is activated by connection and refresh operations and deactivated when they complete.

# Advanced Tab

The **Advanced** tab contains the configuration for components not directly linked to stations.

Advanced tab




## Removing Components

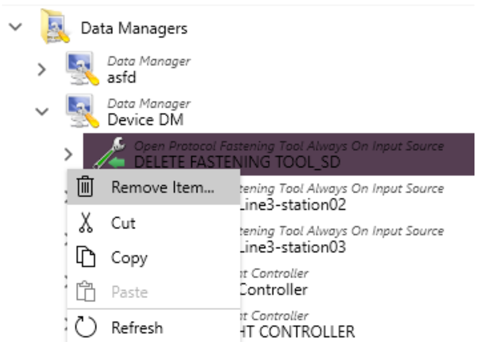
Most components can be removed from a hierarchy in which they currently reside. If all the relationships a component has are removed, that component will be located in the Unlinked Components folder.

To remove a component from a hierarchy, follow these steps.

1. Right-click the component and select **Remove Item...**.

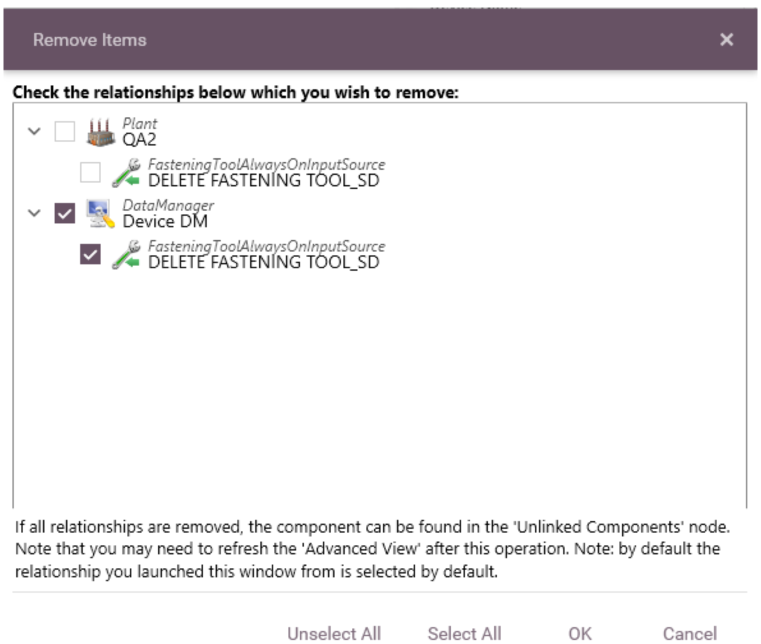
   Select Remove Items...




2. The **Remove Items** dialog opens. The relationship is selected by default, but all the other relationships of the item are also available for selection.

   Remove Items dialog with relationship pre-selected




3. Click **OK**. The component is removed from the indicated relationship(s). If all relationships were selected, the component can be found in the Unlinked Components folder.

## Data Managers Folder

The **Data Managers** folder organizes the Data Managers in PINpoint, and allows the user to create new ones and modify the properties of existing ones.

# Devices Folder

The **Devices** folder contains folders for each type of device configured in the system.

The folders are:

- Input Sources
- Output Sources
- Controllers

# Organization Folder

The **Organization** folder provides access to a variety of components and allows the user to create and modify them and their related sub-components.

## *Endpoints*

Endpoints contain the information and credentials required for the PINpoint system to connect to another system so that the information can be reused. Endpoint credentials are encrypted in the PINpoint database.

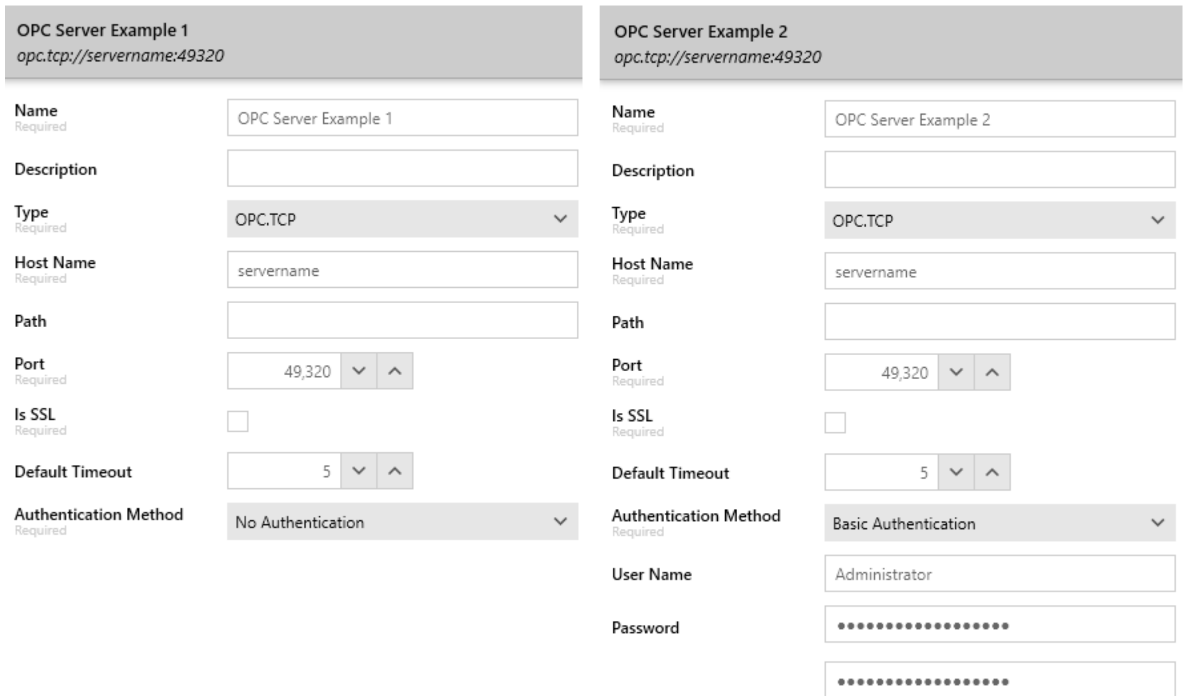
Endpoints can be used by multiple devices. A single endpoint connection containing the credentials to an OPC server can be used by several OPC tag item controllers.

Endpoints are used to store credentials in the PINpoint system securely so that they can be used by a custom web service. If PINpoint is required to build a custom web service to send information to a 3rd party the connection information can be stored securely in an endpoint using SmartBuild and then retrieved by the custom web service which has already authenticated with the PINpoint system.

Endpoints support multiple different connection types and authentication methods. The properties are detailed in the appendix.

An example of setting up a connection to an OPC UA server with and without authentication.




## Custom Assembly Defaults

Custom assemblies are custom code used by certain operations to fulfill customer needs. Custom assemblies are uploaded in the *Advanced tab, Organization*, *Custom Assemblies* folder. Custom assemblies are downloaded from the server when the SmartScreen client loads the Process for the Build Item. Custom assemblies are selected for each operation using the dropdown list on the operation when configuring the process.

The custom assembly defaults folder allows users to select which custom assembly will be configured for each operation type when a new operation is created.

## Reason List Defaults

The default reasons hierarchy selection for certain items like operations and stations can be setup in this section.

## Unlinked Components Folder

If an item is deleted or removed from a station it will appear in this folder. Unlinked components can be relinked by cutting and pasting them under their intended location.

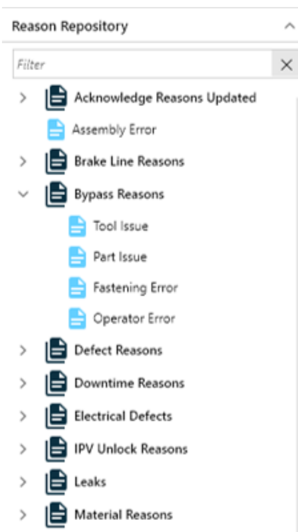
# Repositories

The advanced tab has repositories for item types. There is a repository for reasons and images. The repositories are found at the bottom of the window of the advanced tab. Each repository has 3 sections; The left pane contains item and item groups, the middle pane contains hierarchies, and the right pane contains properties for the selected item. The purpose of the repository is to allow items to be created once and referenced multiple times in a hierarchy. Hierarchies can be referenced by operations which use them.

## *Creating Items*

Items are added by right clicking in the left pane and creating a new item. Items can exist alone or be grouped together in the left pane. A group containing items is always used as a group and a single item from within that group cannot be used alone.

The left pane of the repository shows the items and item groups. Assembly Error is a reason. Bypass Reasons is a group of reasons.



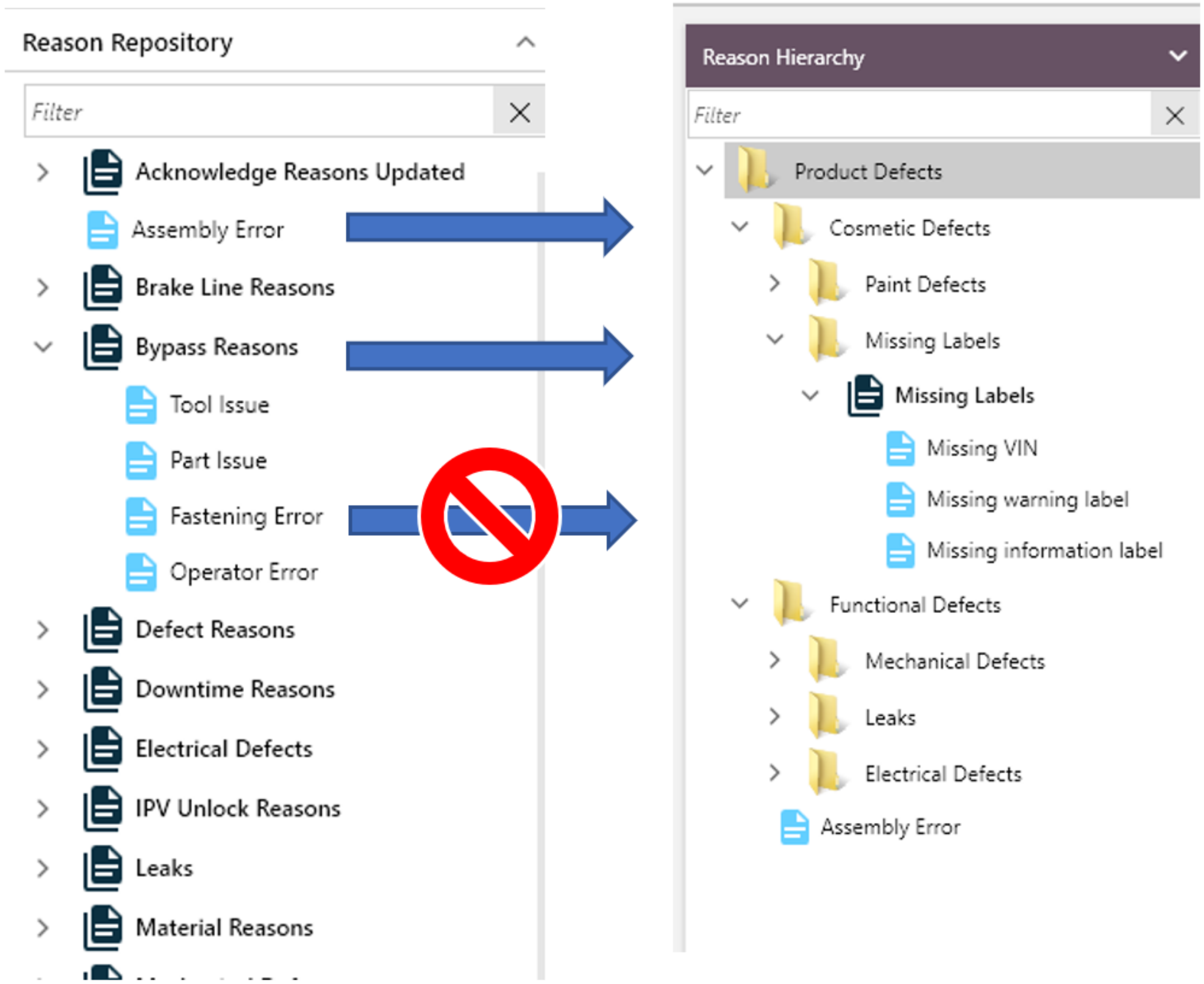

## *Hierarchy*

A hierarchy is a folder structure which is created to allow items, or groups of items, to be referenced. Items and item groups can be referenced multiple times in the hierarchy. Hierarchies can be customized to meet the needs of the user. To create a folder right click and create a new folder. Items are dragged and dropped into the hierarchy.

A Hierarchy of defect reasons can be created for each station. This would allow the users to select from reasons which are relevant to the process at that station. For example, a station performing mechanical assembly would not need electrical defect reasons.

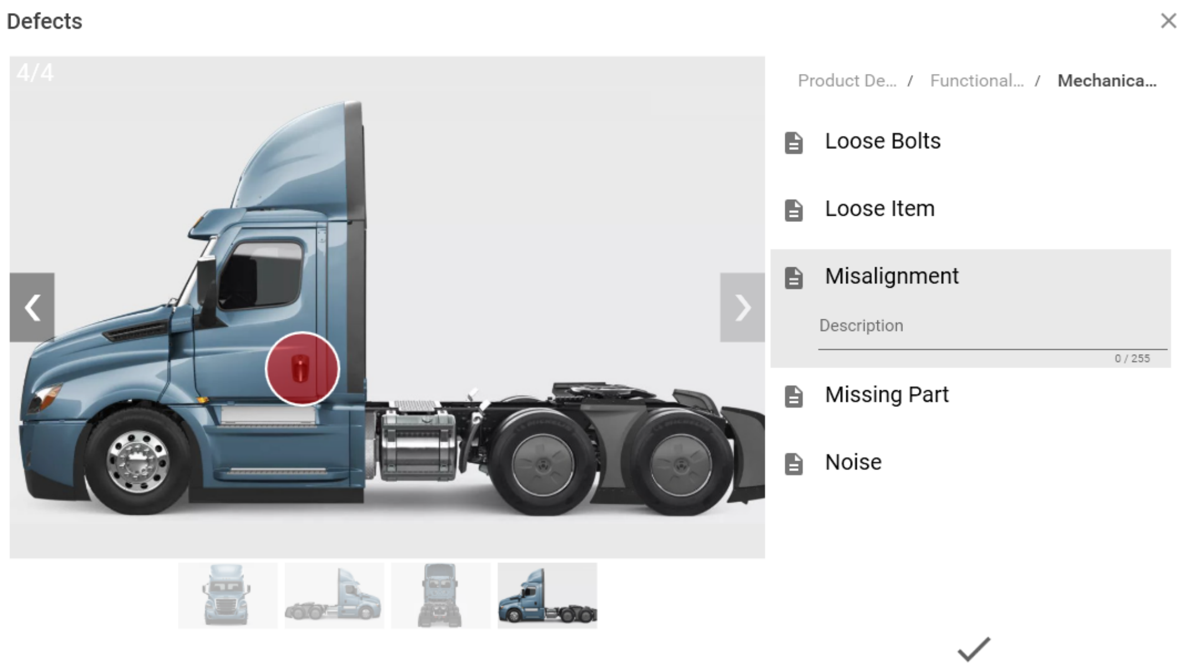
Once a hierarchy is created any part of it can be referenced so the user can navigate the hierarchy. This reference is used as a starting point for the user on the SmartScreen client when they use it.

An example of a reason hierarchy. Items and Item groups can be referenced but items from within groups cannot.




An example of a defect being entered which shows a reason group being used as the starting point. The image group is shown as a film strip below the defect image.

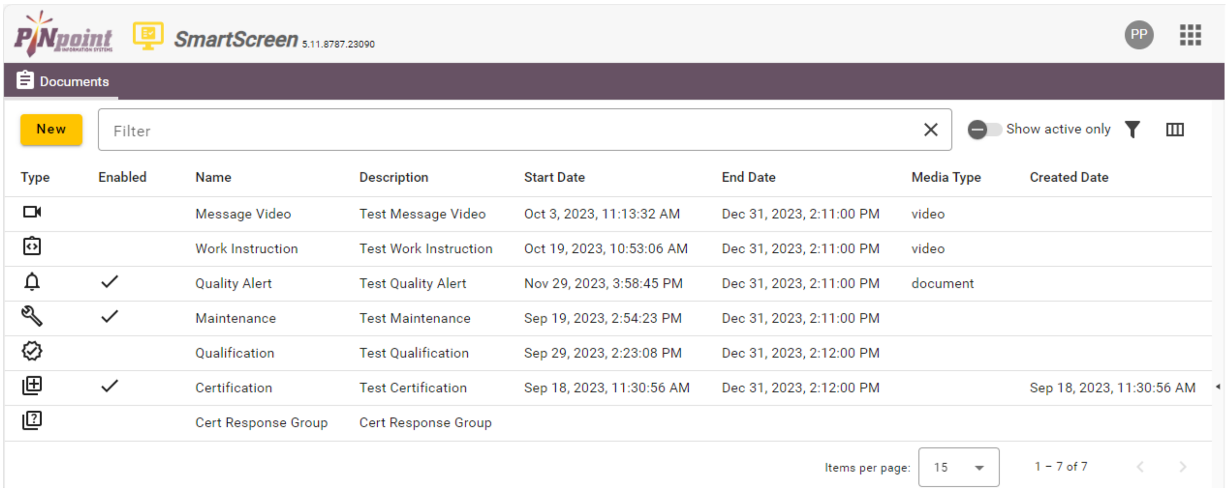

Defects
4/4
Product De... / Functional... / Mechanica...
Loose Bolts
Loose Item
Misalignment
Description
0 / 255
Missing Part
Noise

# SmartScreen Web App

The SmartScreen Web App allows users to create documents and target them at stations in the facility. Users can view a list of all the documents. Selecting a document allows the user to edit it in the editing pane.

The SmartScreen Web App




Active Items are Documents that will be displayed because they are enabled and are valid in the current time frame. Inactive documents are will not be displayed to operators. All documents are displayed in the same table but not all documents have the same properties. Only a certification has a created date.

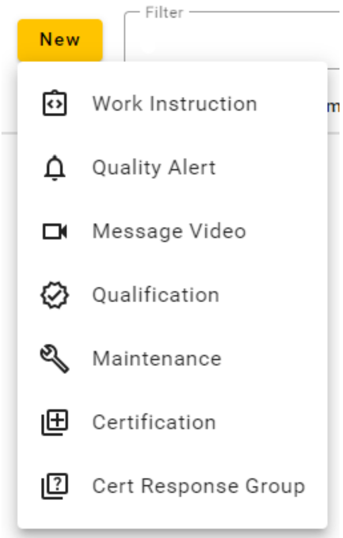
## Create a new document

To create a new document:

1. Select New
2. Select the Document Type

   Selecting the documents Type

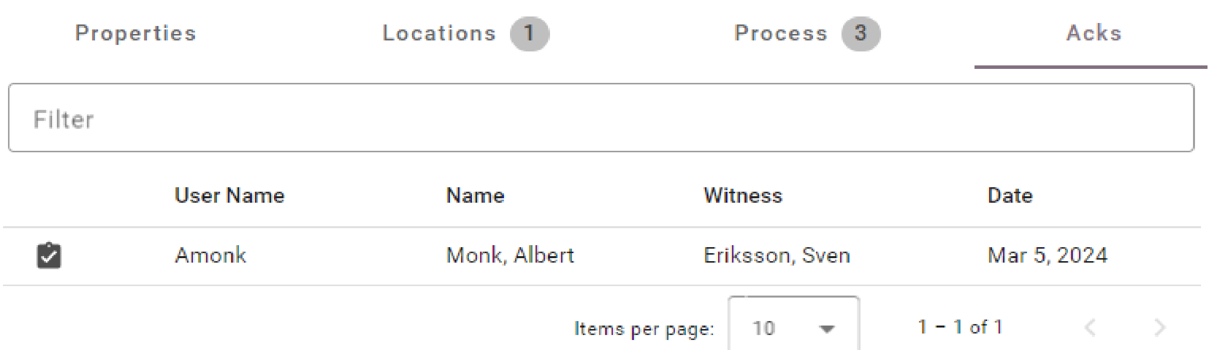



3. Enter the properties on the properties tab. See: "SmartScreen Web App Document Properties" on page 489
4. Save

## Viewing Document Acknowledgments

The Acks tab on a document shows the history of document acknowledgments. The icon indicates that the document was acknowledged. Rows without the icon show that the document was viewed. The witness is the trainer who was logged in when the document was acknowledged.

The acks tab showing a document acknowledgment




# Document Types

The following document types can be created.

Documents types

| Term | Definition |
|---|---|
| Work Instruction | Work Instructions are documents or videos intended to describe the process. |
| Quality Alert | Quality Alerts are documents or videos intended to be used for describing critical production issues or process changes. |
| Message Video | Message Videos are intended to provide information or instructions. |
| Qualification | A Qualification prevents operators from logging in to the SmartScreen client unless they are in the qualification's list of qualified users. |
| Maintenance | A Maintenance item is a set of tasks that station operators are requested to perform, aside from production tasks, for station maintenance. The tasks are displayed on the SmartScreen client when the operator logs in, and appear according to their scheduled times. |
| Certification | A Certification is a checklist which must be completed by an operator and acknowledged by their team lead and supervisor during the log in process. Certifications are displayed to all users logging into the system on a station where those Certifications are enabled. |
| Cert Response Group | A Certification Response Group contains the responses to the Certification Items. |

## Work Instructions and Quality Alerts

Work instructions and Quality alerts have the same set of properties. They allow a PDF document, video, or a URL to be presented to operators. They allow a question to be presented to operators which operators can respond to. They are able to demote operators levels to level 2.

## Message Videos

Message videos are similar to work instructions and quality alerts however they do not allow a question to be presented to the operator and cannot demote operators.

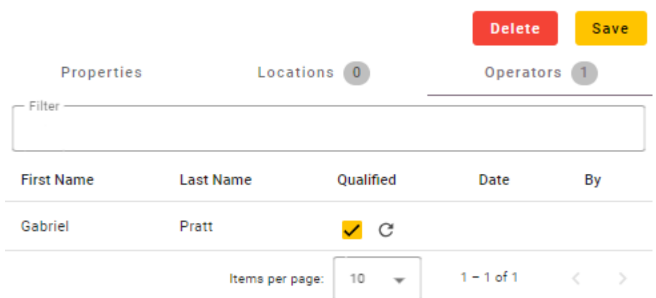
# Qualification

Qualifications allow administrators to set skills requirements outside of the PINpoint system and then enforce that the operators who access specific PINpoint Stations are qualified to do so. On a Qualification the locations tab determines where the qualification applies and the operators tab determines who is qualified at those locations.

## *Qualifying and Re-qualifying operators*

Once Qualifications are created in the system operators need to be qualified. On the Operators tab selecting the qualified check box for operators gives them the qualifications required to perform certain functions at specific stations. Selecting the Requalify operators icon next to the check box will requalify operators whose qualifications have expired.

The Operators Tab showing how to qualify and requalify an operator

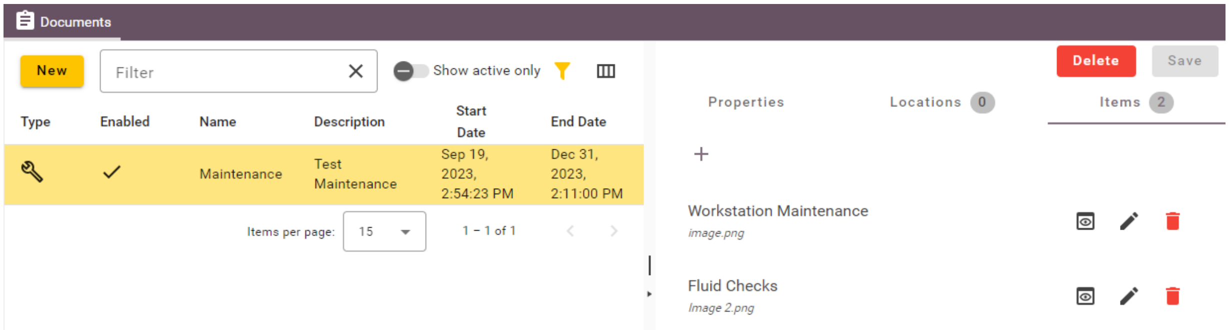



# Maintenance

A Maintenance document is a set of tasks that station operators are requested to perform, aside from production duties, for station maintenance. The tasks are displayed on the SmartScreen client when the operator logs in and appear according to their scheduled times.

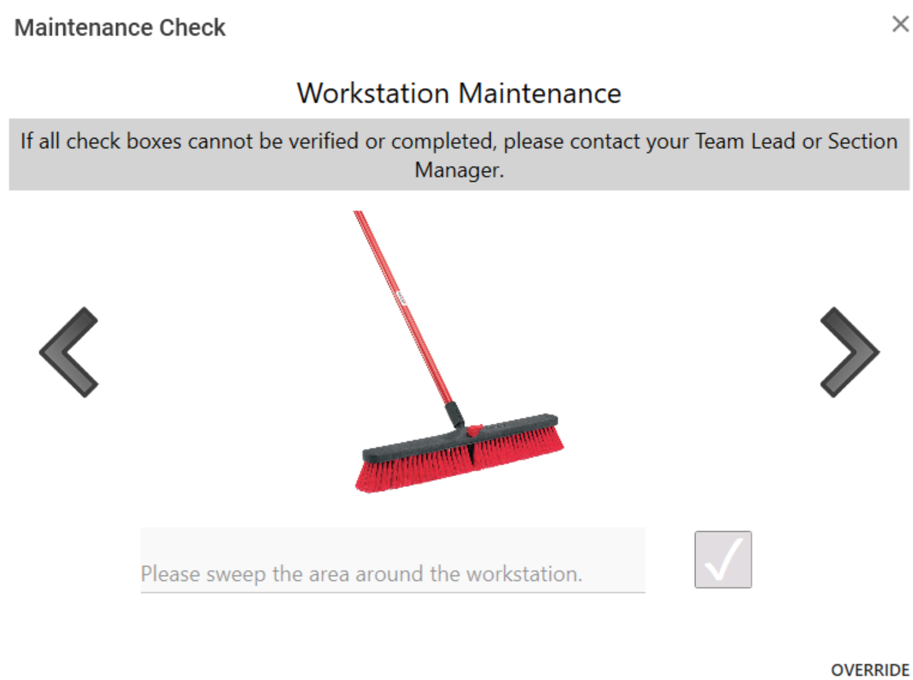
Maintenance example




A maintenance item requires at least one image and a description of the maintenance an operator is expected to perform.

A Maintenance document displayed on the SmartScreen client during login.



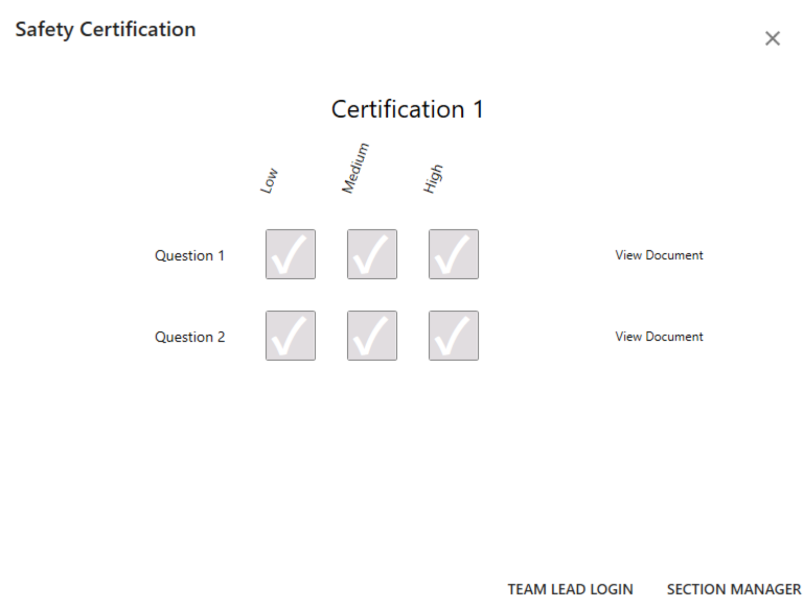

## Certifications

A Certification is a checklist which must be completed by a new (Level 1) or decertified (Level 3) operator and acknowledged by their team lead and supervisor during the log in process. Certifications are displayed to all users logging into the system on a station where those Certifications are enabled.

There are two types of Certifications: Safety and Operator. Safety Certifications deal with operator's understanding of safety standards and procedures at the station. Operator Certifications deal with the operator's understanding of the process at the station.

There are two parts to a Certification. The Certification contains Items which appear as the rows, and the Certification Response Group contains the responses to the Certification Items and appear as the columns.

Example of a Certification checklist on SmartScreen Client




While creating or editing a Certification, there is the option to click the **Preview** button to display how the Certification will appear to the operator on the floor. A PDF document can be added to provide more detail on the Certification item. In the **Plant Properties** the number of days not worked before a user is required to view a Certification can be changed.

Users should setup the Certification first by adding the Certification items. Once the rows are set up, the Certification response group should be set up to create a set of columns. Then the user should open the Certification again and assign the response group which will give the Certification both rows and columns. The type of the Certification and the Certification response group must match or they cannot be used together.

## *Cert Response Groups*

A Certification Response Group provides the responses available to operators when Certifications are displayed at station Clients. The Items in a cert response group are the column options a user can select when responding to a certification item.

Setting a Response to be Mutually Exclusive means that when it is pressed by an operator, it will de-select any other Response in the same row. Only this Response will be returned.

# Reports

PINpoint provides a variety of reports to document the operations and performance of production lines and their particular stations, and the ability to choose which details to display, and how the information is displayed.

PINpoint reports are available in a few main categories:

- **Product Reports**, which focus on a particular work order item, represented by a serial number, as it progresses through production
- **Operations Reports**, which focus on the values recorded for various types of operations
- **Andon Reports**, which focus on Andon Events and their impact on production
- **Analyze Reports**, which provide tools to finely or broadly examine the relationship of Events, Lines, Production, and time periods.
- **Analytics Reports**, which provide tools to examine cubed data
- **Operator Reports**, which provide information about operators

## Product Reports

Product Reports are designed to provide information, about a specific work order item, identified by serial number. These reports can be downloaded in either PDF or Excel format, and can be directly printed.

### Product Report

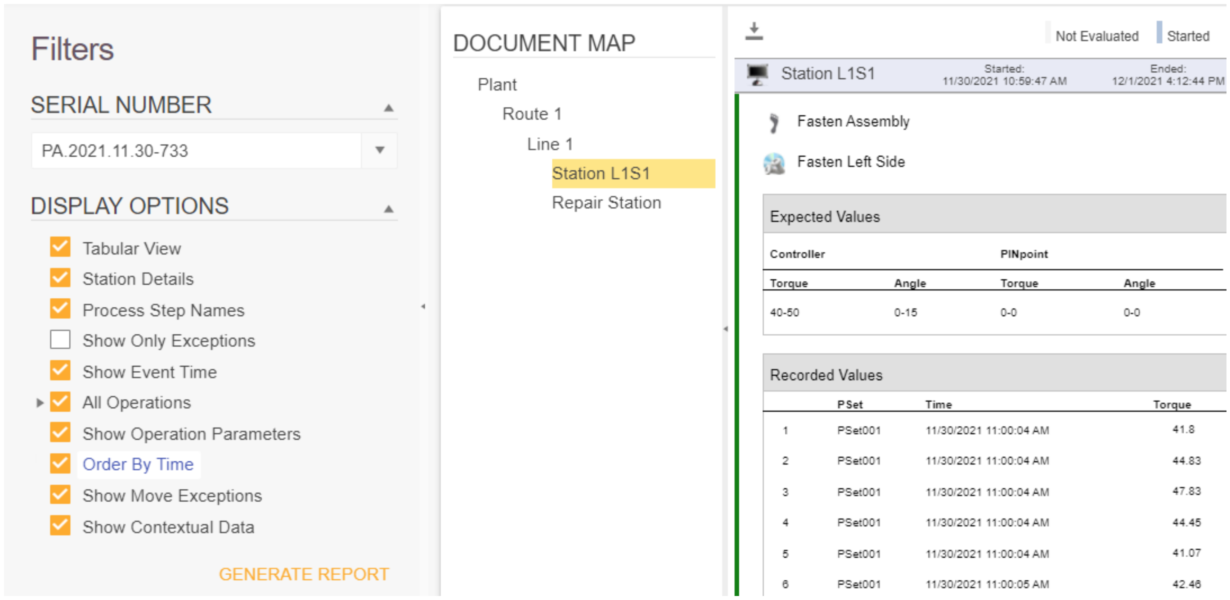
A **Product Report** provides a view of the status and history of a Work Order Item and all related build items, identified by a serial number.

Product Report Display Options

| Attribute | Description |
|---|---|
| All Operations | Specific operation types can be returned. By default all operation types are returned in the report. |
| Order By Time | This changes the layout of the report so that events are listed in chronological order. The default layout lists events by station and then chronological order. |

| Attribute | Description |
|---|---|
| Process Step Names | Selecting this option presents operations headed by the name of the Process Step to which they belong. |
| Show Event Time | Selecting this option presents the time at which an operation took place. |
| Show Move Exceptions | A Move Exception is recorded when a Build Item is moved outside of the normal flow of the route.<br>A Move Exception will be recorded if:<br>A Serial Number is loaded out of sequence on the SmartScreen client<br>A manual move is done on the Tracking app by reordering the items within a queue<br>A PLC indicates to PINpoint to load something which is unexpected<br>A Move Exception contains the timestamp, the move type, and the from/to locations. This data will also be stored in the production cube for further analytics. |
| Show Only Exceptions | Selecting this option presents specific data about an operation only when it throws an exception; otherwise, the operation displays "[no exception]".<br>This option is disabled by default. |
| Show Operation Parameters | Selecting this option presents the **Expected Values** for the operation (if any) for comparison to the actual **Recorded Value** results of the operation. |
| Station Details | Selecting this option presents:<br>the time the build item started and ended at the Station<br>its expected duration<br>how long the build item actually took to complete (assuming it has been completed at the report is generated). |
| Tabular View | Selecting this option presents the requested information in tables with category headers. De-selecting this option presents the requested information in declarative statements as ordinary text. |

Product Report view



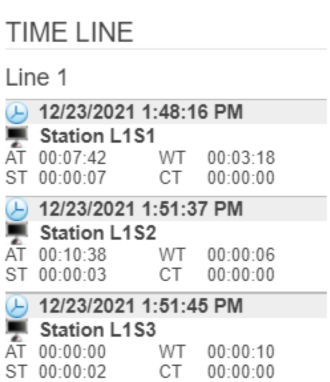

## *Navigating the Report*

### Line Digest

The top section of the presentation area contains a digest of information at each Station, including:

- Station name
- Operator
- Start Time
- Time Categorized as: AT (Available Time), WT (Working Time), ST (Suspended Time), CT (Completed Time). Waiting is not shown because it does not apply to a build item.

Station Digest Information



It is possible for the digest to display information for a serial number across multiple lines if the serial number was built on multiple routes which used different lines, or if the build items were on multiple lines.

## Defect Entry Table

At the beginning of every Product Report is the Defect Entry table (provided there are defects to report). This highlights the details of the defects reported, and the details of their resolution, if any. As elsewhere in PINpoint, resolved defects are represented by a green medical bag icon, and unresolved defects by a red one.

Defect Entry table

Defect Entry

| # | Type | Origin | Time | Reason | Description | Operator | Image |
|---|---|---|---|---|---|---|---|
| 1 | Ad hoc | Station L1S1 \ Inspection Operation | 11/11/2021 1:28:41 PM | Product Defects\Cosmetic Defects\Paint Defects\Paint Defects\Paint Missing | | Harry Dubois | Truck\Outside\Outside\Truck right side.png |
| | Resolution | Station L1S1\ Inspection Operation | 11/11/2021 1:30:30 PM | Acknowledge Reasons Updated\Replaced Part | | Harry Dubois | |
| 2 | Ad hoc | Station L1S1 \ Inspection Operation | 11/11/2021 1:47:57 PM | Product Defects\Functional Defects\Leaks\Leaks\Oil Leak | | Harry Dubois | Truck\Outside\Outside\Truck Back.png |
| 3 | Verification Operation | Station L1S1 \ Verification Operation \ New Verification Operation | 11/11/2021 2:05:29 PM | Product Defects\Cosmetic Defects\Paint Defects\Paint Defects\Paint Scratch | | Harry Dubois | Truck\Outside\Outside\Truck Front.png |
| 4 | Verification Operation | Station L1S1 \ Verification Operation \ New Verification Operation | 11/11/2021 2:05:30 PM | Product Defects\Functional Defects\Mechanical Defects\Mechanical Defects\Noise | | Harry Dubois | Truck\Outside\Outside\Truck Front.png |
| 5 | Verification Operation | Station L1S1 \ Verification Operation \ New Verification Operation | 11/11/2021 2:05:30 PM | Product Defects\Functional Defects\Mechanical Defects\Mechanical Defects\Missing Part | | Harry Dubois | Truck\Outside\Outside\Truck Front.png |
| 6 | Verification Operation | Station L1S1 \ Verification Operation \ New Verification Operation | 11/11/2021 2:05:30 PM | Product Defects\Assembly Error | | Harry Dubois | Truck\Outside\Outside\Truck Front.png |

## Station Section

Station sections are provided in the report in the order in which they occur on the Line(s) involved. Each Station section features a table for each of its Process Steps, providing the details of the process of that Step and its ultimate status, including bypasses and the reasons for them.

Station section

| RZR-ST01 | Started: | Ended: | Working: | Completed: | Suspended: |
|---|---|---|---|---|---|
| | 12/1/2021 11:08:19 AM | 12/1/2021 11:08:31 AM | 00:00:12 | 00:02:10 | 00:00:07 |

Cargo Box Install

Documents

Recorded Values

| Time | Document Name | Operator |
|---|---|---|
| 12/1/2021 11:08:27 AM | Cargo Box Install | Jarda Smrz |

Cargo Box Secure

Expected Values

| Controller | | PINpoint | | | |
|---|---|---|---|---|---|
| Torque | Angle | Torque | Angle | PSet | Rundowns |
| 15-20 | 200-300 | 0-0 | 0-0 | PSet001 | 6 |

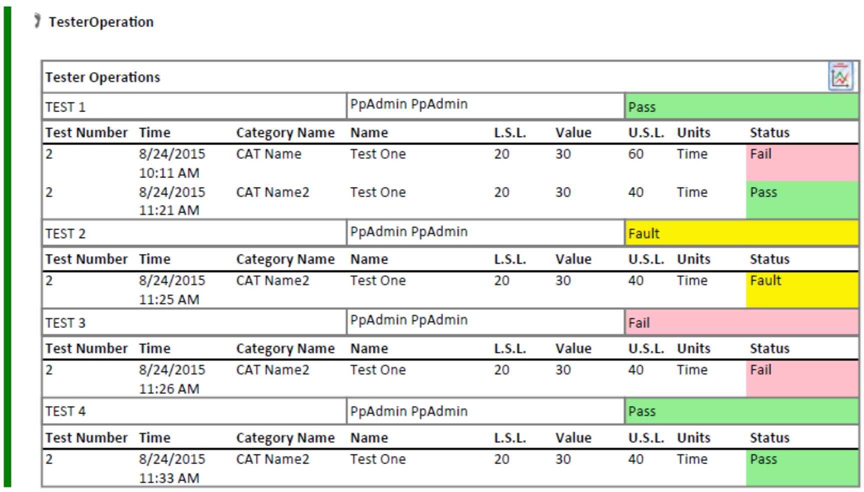
Recorded Values

| | PSet | Time | Torque | Angle | Controller | Operator |
|---|---|---|---|---|---|---|
| 1 | PSet001 | 12/1/2021 11:08:22 AM | 15.25 | 246 | ✓ | Jarda Smrz |
| 2 | PSet001 | 12/1/2021 11:08:22 AM | 16.69 | 214 | ✓ | Jarda Smrz |
| 3 | PSet001 | 12/1/2021 11:08:22 AM | 18.8 | 244 | ✓ | Jarda Smrz |
| 4 | PSet001 | 12/1/2021 11:08:22 AM | 19.26 | 276 | ✓ | Jarda Smrz |
| 5 | PSet001 | 12/1/2021 11:08:23 AM | 15.02 | 256 | ✓ | Jarda Smrz |
| 6 | PSet001 | 12/1/2021 11:08:23 AM | 17.63 | 269 | ✓ | Jarda Smrz |

## Tester Operation Step Table

A special sub-category of Step table is the Tester Operation Step table. This shows the outcome of Tester Operations conducted at a Station, including the measured results of those tests and their ultimate status. The graph icon at the upper right of the table, when clicked, provides a view of the metrics of the Test Operations in a the form of a graph.

Tester Operation Step table



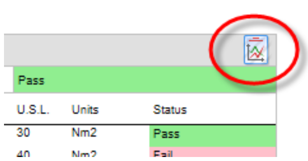
TesterOperation

Tester Operations

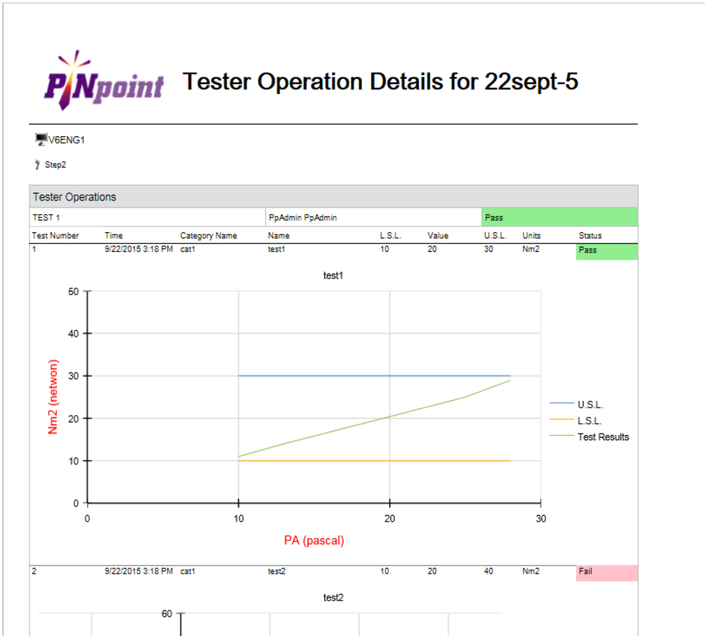
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| TEST 1 | | | PpAdmin PpAdmin | | | Pass | | |
| Test Number | Time | Category Name | Name | L.S.L. | Value | U.S.L. | Units | Status |
| 2 | 8/24/2015 10:11 AM | CAT Name | Test One | 20 | 30 | 60 | Time | Fail |
| 2 | 8/24/2015 11:21 AM | CAT Name2 | Test One | 20 | 30 | 40 | Time | Pass |
| TEST 2 | | | PpAdmin PpAdmin | | | Fault | | |
| Test Number | Time | Category Name | Name | L.S.L. | Value | U.S.L. | Units | Status |
| 2 | 8/24/2015 11:25 AM | CAT Name2 | Test One | 20 | 30 | 40 | Time | Fault |
| TEST 3 | | | PpAdmin PpAdmin | | | Fail | | |
| Test Number | Time | Category Name | Name | L.S.L. | Value | U.S.L. | Units | Status |
| 2 | 8/24/2015 11:26 AM | CAT Name2 | Test One | 20 | 30 | 40 | Time | Fail |
| TEST 4 | | | PpAdmin PpAdmin | | | Pass | | |
| Test Number | Time | Category Name | Name | L.S.L. | Value | U.S.L. | Units | Status |
| 2 | 8/24/2015 11:33 AM | CAT Name2 | Test One | 20 | 30 | 40 | Time | Pass |

Clicking the Graph icon at the head of the Tester Step table opens the Tester Operation Details graphs for that serial number.

Tester Step Graph icon




Tester Operation Details graphs




## Product Quality Report

The **Product Quality Report** tracks the history of the product quality of a serial number. Each build item used to produce a serial number has an individual product quality. This report tracks the product quality for each build item for a serial number and displays events which affected the product quality. The product quality rules, which determine which actions will set the product quality yellow or red, are setup in the SmartBuild Hardware Tab.

An example of the Product Quality report.

# Product Quality Report

For PA0603022020

| | | | |
|---|---|---|---|
| **Part Number:** | PZ P1 | **Created Date:** | 03/02/2020 3:53:22 PM |
| **Status:** | Completed | **Started Date:** | 04/02/2020 1:26:30 PM |
| **Product Quality:** | Green | **Completed Date:** | 04/02/2020 1:32:28 PM |

| | |
|---|---|
| *04/02/2020 1:26:30 PM* | → Station L1S1 |
| *04/02/2020 1:27:00 PM* | Station L1S1 → R1 Q2 |
| *04/02/2020 1:27:54 PM* | R1 Q2 → Station L1S2 |
| **Station L1S2**<br>Bypass<br>*04/02/2020 1:28:06 PM by PpAdmin* | Tool Issue |
| Yellow | Bypassed |
| **Station L1S2**<br>Acknowledgment<br>*04/02/2020 1:29:21 PM by PpAdmin* | Manually Repaired<br>Repaired by Supervisor |
| Green | |
| *04/02/2020 1:30:51 PM* | Station L1S2 → R1 Q3 |
| *04/02/2020 1:31:26 PM* | R1 Q3 → Station L1S3 |
| **Station L1S3**<br>Reject<br>*04/02/2020 1:31:49 PM by PpAdmin* | Quality Issue<br>Paint Issue |
| Red | Rejected |
| **Station L1S3**<br>Unreject<br>*04/02/2020 1:32:16 PM by PpAdmin* | Part Repaired |
| Green | |
| *04/02/2020 1:32:27 PM* | Station L1S3 → R1 Q4 |

# Operations Reports

The operations reports tab contains reports which show data recorded by specific types of operations. Operation reports do not summarize or analyze the data. The operation type reports all list data recorded against a specific report and present the data in a table. The *Document Report* and the *Process Configuration* report show specific information.

## Operation Type Reports

| Operation Report | Notes |
|---|---|
| Checkbox | The checkbox operation report shows all the values stored for every checkbox operation. There is an option *Show Final Values Only* which will show the value of the checkbox when the step was completed. |
| Fastening | The fastening operation report displays data recorded by fastening operations. |
| Inspection | The inspection operation report displays data recorded on inspection operations. |
| Scan | The scan operation report shows all the values stored for every scan operation. This report is useful for finding string data. Numeric data can also be viewed using the production analytics report or by connecting directly to the production cube because it can be summarized and filtered quickly. |
| Tester | The tester operation report shows tester overall result and individual result data in a table. |
| Verification | The verification operation report displays data recorded on verification operations. The image link can be opened to show the image with the location of the recorded defect. |

An example of the Fastening Operation Report.

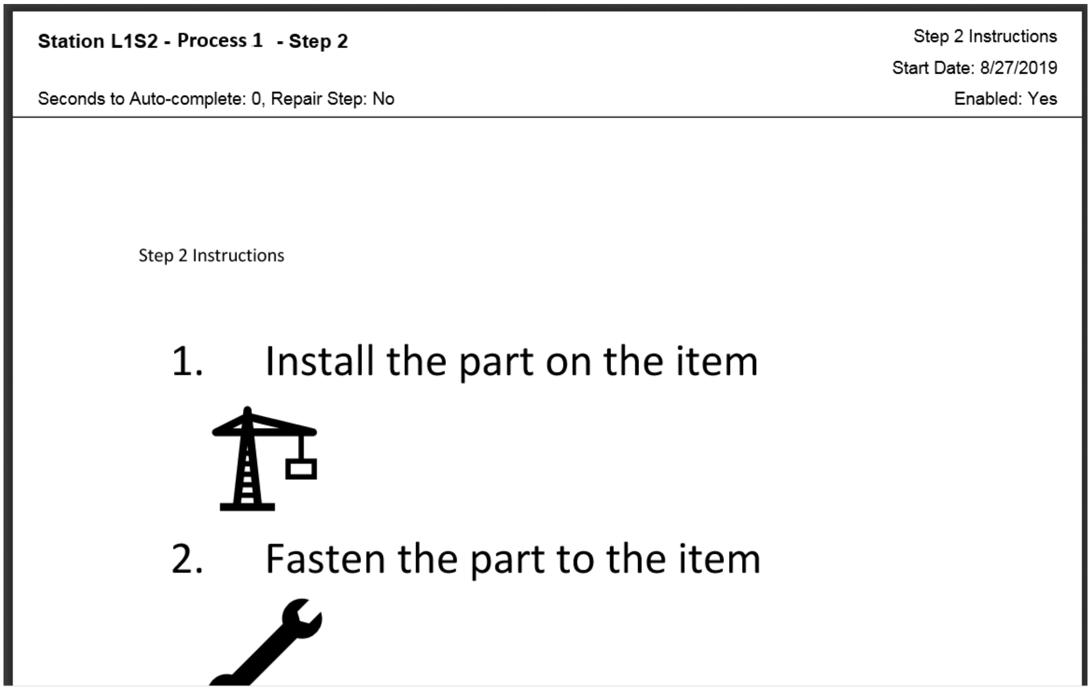
Export To Excel    Reset Column Settings

| Date | Serial Number | Process Na... | Value | Operator | Operation Name | Process Step | Station |
|---|---|---|---|---|---|---|---|
| 2/3/2025 13:44:36 | V6-20250203-0077 | Engine Block | True | Karl Magnusson | Mount Block on Fixture | Mount Block | EL10 |
| 2/3/2025 13:44:41 | V6-20250203-0077 | Head Gasket | True | Karl Magnusson | Place Engine Gasket | Head gasket | EL10 |
| 3/28/2025 14:33... | V6-20250306-0134 | Engine Block | True | Karl Magnusson | Mount Block on Fixture | Mount Block | EL10 |
| 3/28/2025 14:35... | V6-20250306-0135 | Engine Block | True | Karl Magnusson | Mount Block on Fixture | Mount Block | EL10 |
| 3/28/2025 14:35... | V6-20250306-0135 | Head Gasket | True | Karl Magnusson | Place Engine Gasket | Head gasket | EL10 |
| 3/28/2025 14:35... | V6-20250306-0136 | Engine Block | True | Karl Magnusson | Mount Block on Fixture | Mount Block | EL10 |
| 3/28/2025 14:35... | V6-20250306-0136 | Head Gasket | True | Karl Magnusson | Place Engine Gasket | Head gasket | EL10 |

## Document Report

The Document Report displays documents attached to process steps. It allows the report to be filtered by station and process.

The Document Report



**Station L1S2 - Process 1 - Step 2**

Step 2 Instructions

Start Date: 8/27/2019

Seconds to Auto-complete: 0, Repair Step: No

Enabled: Yes

Step 2 Instructions

1. Install the part on the item

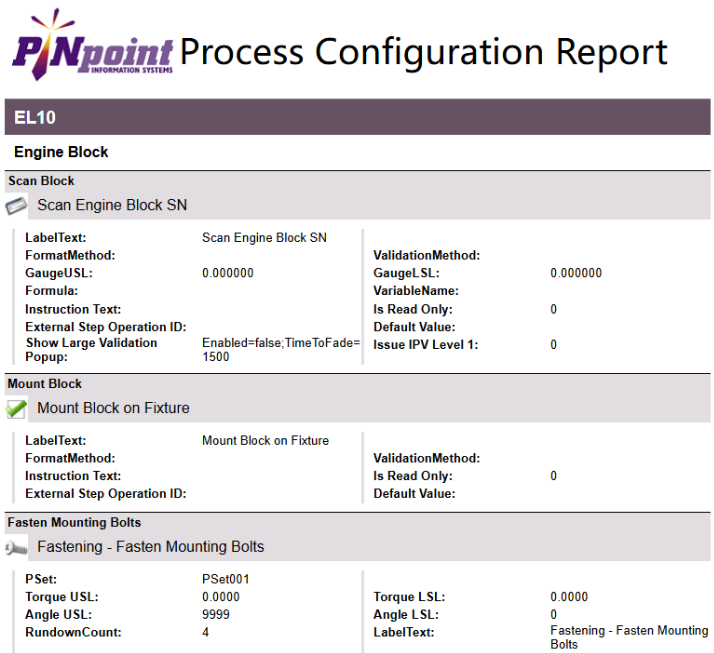
2. Fasten the part to the item

## Process Configuration Report

This report displays all of the current configuration information for the selected Processes at the selected stations. This is intended to help users compare configuration data across multiple processes and to export information from the PINpoint system to other users. This does not include the documents on each step.

The Process Configuration Report


Process Configuration Report

**EL10**

**Engine Block**

**Scan Block**

Scan Engine Block SN

| | | | |
|---|---|---|---|
| **LabelText:** | Scan Engine Block SN | | |
| **FormatMethod:** | | **ValidationMethod:** | |
| **GaugeUSL:** | 0.000000 | **GaugeLSL:** | 0.000000 |
| **Formula:** | | **VariableName:** | |
| **Instruction Text:** | | **Is Read Only:** | 0 |
| **External Step Operation ID:** | | **Default Value:** | |
| **Show Large Validation Popup:** | Enabled=false;TimeToFade=1500 | **Issue IPV Level 1:** | 0 |

**Mount Block**

Mount Block on Fixture

| | | | |
|---|---|---|---|
| **LabelText:** | Mount Block on Fixture | | |
| **FormatMethod:** | | **ValidationMethod:** | |
| **Instruction Text:** | | **Is Read Only:** | 0 |
| **External Step Operation ID:** | | **Default Value:** | |

**Fasten Mounting Bolts**

Fastening - Fasten Mounting Bolts

| | | | |
|---|---|---|---|
| **PSet:** | PSet001 | | |
| **Torque USL:** | 0.0000 | **Torque LSL:** | 0.0000 |
| **Angle USL:** | 9999 | **Angle LSL:** | 0 |
| **RundownCount:** | 4 | **LabelText:** | Fastening - Fasten Mounting Bolts |

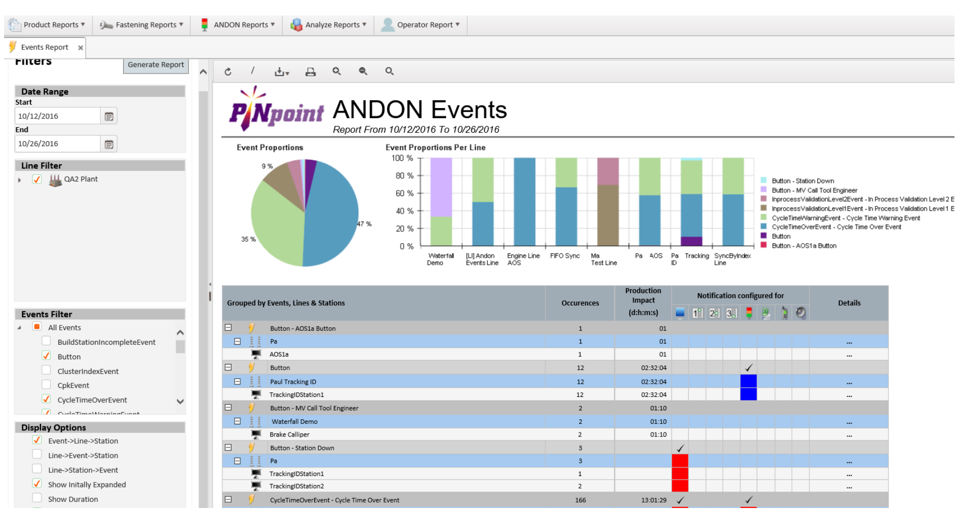
# Andon Reports

The Andon reports tab contains reports about the usage of Andon within the PINpoint system.

## Events Reports

The **Events Report** provides users a summary of events generated at a line and station level for a given date range.

SAMPLE EVENTS REPORT



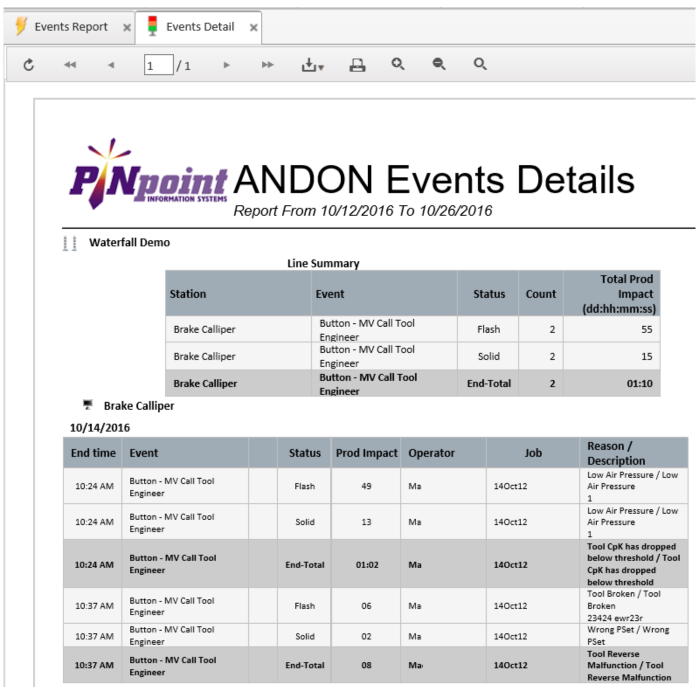
## *Description*

- The Display Option **Show Duration** differs from the **Production Impact** in terms of production time. All non-production time (e.g. Breaks, lunches, weekends...) as defined in the **Scheduler** will be included in the **Duration**, but not the **Production Impact.**
- Events which have Notifications are shown in grid format on the report. The report icons displayed represent the BigScreen station background, BigScreen station items (1-3), Stacklight, e-mail, text and sound configurations.
- Clicking the ellipsis link in the **Details** column will generate the Andon Events Details report for that line or station.

## *Events Details Reports*

The **Events Details Report** provides a detailed look at specific events for a given line or station. The report is accessible by clicking on the **Details** on the **Events Report** or the **Stacklight Events** report.

SAMPLE EVENTS DETAILS REPORT


Events Report
Events Detail
1 / 1

PINpoint INFORMATION SYSTEMS ANDON Events Details

*Report From 10/12/2016 To 10/26/2016*

Waterfall Demo

Line Summary

| Station | Event | Status | Count | Total Prod Impact (dd:hh:mm:ss) |
|---|---|---|---|---|
| Brake Calliper | Button - MV Call Tool Engineer | Flash | 2 | 55 |
| Brake Calliper | Button - MV Call Tool Engineer | Solid | 2 | 15 |
| **Brake Calliper** | **Button - MV Call Tool Engineer** | **End-Total** | **2** | **01:10** |

Brake Calliper

10/14/2016

| End time | Event | | Status | Prod Impact | Operator | Job | Reason / Description |
|---|---|---|---|---|---|---|---|
| 10:24 AM | Button - MV Call Tool Engineer | | Flash | 49 | Ma | 14Oct12 | Low Air Pressure / Low Air Pressure 1 |
| 10:24 AM | Button - MV Call Tool Engineer | | Solid | 13 | Ma | 14Oct12 | Low Air Pressure / Low Air Pressure 1 |
| **10:24 AM** | **Button - MV Call Tool Engineer** | | **End-Total** | **01:02** | **Ma** | **14Oct12** | **Tool CpK has dropped below threshold / Tool CpK has dropped below threshold** |
| 10:37 AM | Button - MV Call Tool Engineer | | Flash | 06 | Ma | 14Oct12 | Tool Broken / Tool Broken 23424 ewr23r |
| 10:37 AM | Button - MV Call Tool Engineer | | Solid | 02 | Ma | 14Oct12 | Wrong PSet / Wrong PSet |
| **10:37 AM** | **Button - MV Call Tool Engineer** | | **End-Total** | **08** | **Ma** | **14Oct12** | **Tool Reverse Malfunction / Tool Reverse Malfunction** |

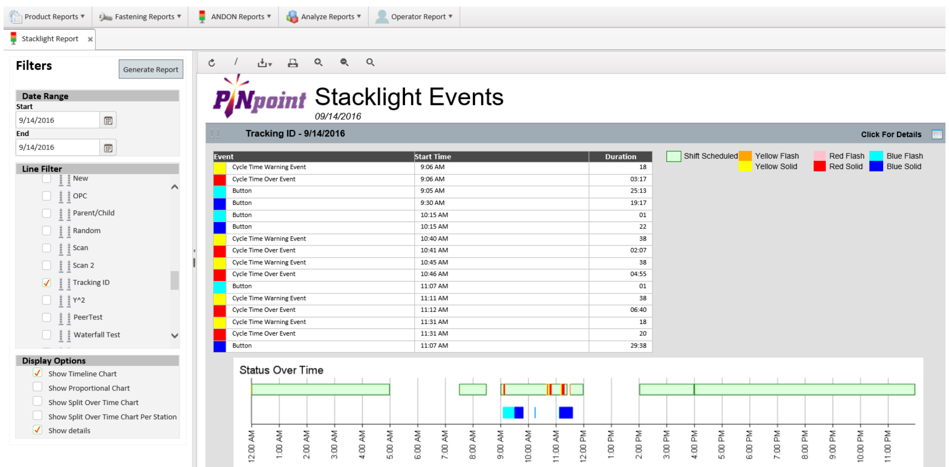
## *Description*

- The **Status** column represents the state of the event. Three-state events (Off, Flashing, On) will display a row for **Flash**, **Solid** and **End Total.** Two-state events (Off, On) will display the **End Total** row only.
- The **End-Total** row will display the **Prod Impact** sum of the **Flash** and **Solid** times.
- A **Prod Impact** with a blank cell means the event occurred during non-production time.

## Stacklight Events Report

The **Stacklight Events Report** provides a graphical view of the times the stacklights for a line are flashing or solid in a given day. The Details icon can be clicked and triggers the same report which can be accessed on the **Andon Events** report.

SAMPLE STACKLIGHT EVENTS REPORT




# Analyze Reports

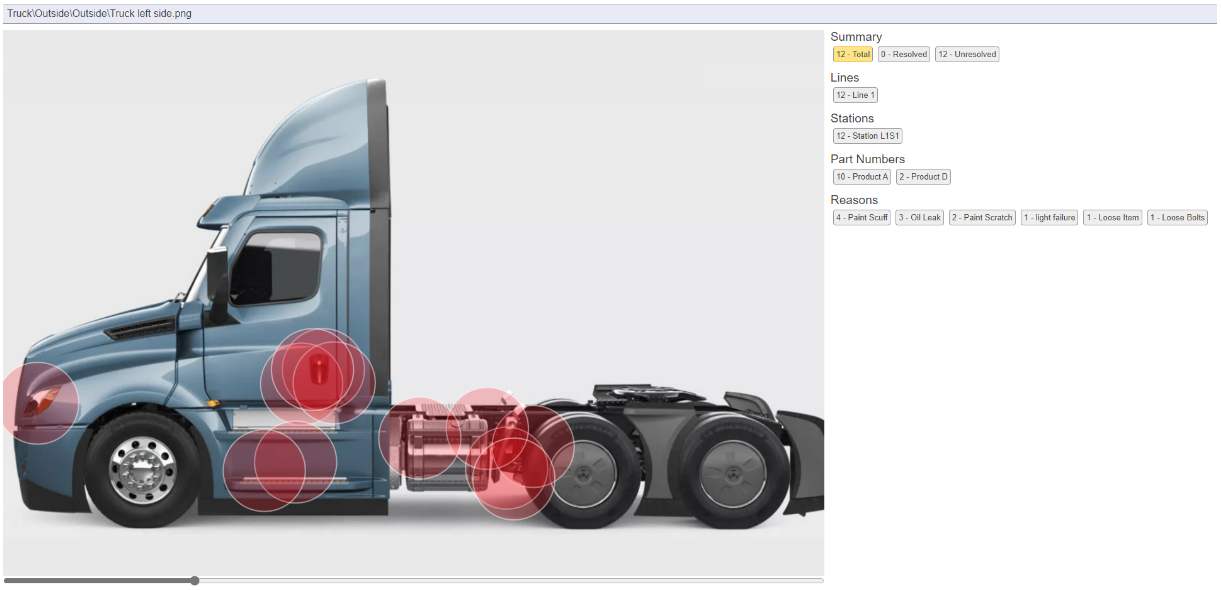
The **Analyze Reports** tab contains reports which access cube data to summarize or provide analysis of the data. There are several reports in this section and there are 3 reports pages for each cube further explained in the **Analytics Reports** section.

## Defect Heatmap Report

The Defect Heatmap Report summarizes the defects which were recorded using the position on the image they were recorded. This report lists the images with defects recorded against them and allows the user to filter the defects which are displayed. This report provides a visualization of the location of defects.

Selecting a different defect status, line, station, part number, or reason, will filter the report and only show those hot zones.

The Defect Heatmap Report




## Fastening Summary Report

The **Fastening Summary Report** displays a summary and analysis of the fastening data. Rundowns are grouped by shift, PSET, Step and the statistics about the rundowns is generated. A Fastening Detail report for the selected row can also be generated which shows each rundown which was summarized.

This data can also be accesses in the Fastening Cube and in the Fastening Operation Report but the summary will need to be performed by the user.

Fastening Summary Report

# Fastening Report

*Report From 09/01/2021 To 11/30/2021*

| PBLine1 | Torque | | | | | | | Angle | | | | | | | Rundowns |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total (All Shifts) | | | | | | | Total (All Shifts) | | | | | | | Total (All Shifts) |
| | Counts | | | Statistics | | | | Counts | | | Statistics | | | | |
| | In Spec | Low | High | Mean | Std | Cp | CpK | In Spec | Low | High | Mean | Std | Cp | CpK | # |
| PB Global Fastener | 71 | 21 | 14 | - | - | - | - | 96 | 10 | 0 | - | - | - | - | 106 |
| PSet001 [τ (111.00 - 120.00) ∠ (100.00 - 110.00) located at IP: 192.168.12.34] | 4 | 5 | 5 | 110.74 | 80.85 | 0.02 | 0.0 | 4 | 10 | 0 | 45.5 | 49.26 | 0.03 | -0.37 | 14 |
| PSet001 [τ (1.00 - 2.00) ∠ (1.00 - 2.00) located at IP: pbednar1] | 23 | 0 | 0 | 1.0 | 0.0 | 0.0 | 0.0 | 23 | 0 | 0 | 1.0 | 0.0 | 0.0 | 0.0 | 23 |
| PSet001 [τ (20.00 - 30.00) ∠ (30.00 - 40.00) located at IP: pbednar1] | 1 | 0 | 0 | 22.17 | 0.0 | 0.0 | 0.0 | 1 | 0 | 0 | 31.0 | 0.0 | 0.0 | 0.0 | 1 |
| PSet007 [τ (1.00 - 10.00) ∠ (20.00 - 30.00) located at IP: 192.168.12.34] | 16 | 8 | 0 | 3.61 | 2.88 | 0.52 | 0.3 | 24 | 0 | 0 | 24.33 | 3.24 | 0.51 | 0.45 | 24 |
| PSet007 [τ (8.50 - 9.50) ∠ (1.00 - 100.00) located at IP: pbednar1] | 2 | 4 | 1 | 5.04 | 4.74 | 0.04 | -0.24 | 7 | 0 | 0 | 44.0 | 15.32 | 1.08 | 0.94 | 7 |
| PSet007 [τ (5.00 - 10.00) ∠ (15.00 - 20.00) located at IP: pbednar1] | 12 | 1 | 0 | 6.78 | 2.66 | 0.31 | 0.22 | 13 | 0 | 0 | 17.46 | 1.66 | 0.5 | 0.49 | 13 |
| PSet007 [τ (20.00 - 30.00) ∠ (30.00 - 40.00) located at IP: pbednar1] | 7 | 3 | 0 | 18.2 | 12.72 | 0.13 | -0.05 | 10 | 0 | 0 | 33.9 | 3.14 | 0.53 | 0.41 | 10 |
| PSet002 [τ (11.00 - 20.00) ∠ (1.00 - 10.00) located at IP: 192.168.12.34] | 6 | 0 | 8 | 120.83 | 94.89 | 0.02 | -0.35 | 14 | 0 | 0 | 5.36 | 1.34 | 1.12 | 1.09 | 14 |
| PBL1Station1 Fastener1 | 118 | 72 | 6 | - | - | - | - | 167 | 19 | 10 | - | - | - | - | 196 |
| PSet001 [τ (111.00 - 120.00) ∠ (100.00 - 110.00) located at IP: 192.168.12.34] | 2 | 0 | 0 | 117.51 | 1.69 | 0.89 | 0.49 | 2 | 0 | 0 | 102.5 | 3.54 | 0.47 | 0.24 | 2 |
| PSet004 [τ (36.00 - 40.00) ∠ (30.00 - 35.00) located at IP: 192.168.12.34] | 5 | 0 | 0 | 37.98 | 1.23 | 0.54 | 0.54 | 5 | 0 | 0 | 32.0 | 1.58 | 0.53 | 0.42 | 5 |
| PSet007 [τ (1.00 - 10.00) ∠ (20.00 - 30.00) located at IP: 192.168.12.34] | 21 | 2 | 0 | 5.68 | 2.3 | 0.65 | 0.63 | 23 | 0 | 0 | 25.04 | 3.01 | 0.55 | 0.55 | 23 |
| PSet007 [τ (.00 - .00) ∠ (.00 - .00) located at IP: pbednar1] | 1 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 1 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 1 |
| PSet007 [τ (2.00 - 20.00) ∠ (1.00 - 100.00) located at IP: pbednar1] | 29 | 35 | 2 | 6.5 | 7.39 | 0.41 | 0.2 | 40 | 16 | 10 | 47.17 | 45.49 | 0.36 | 0.34 | 66 |
| PSet007 [τ (8.50 - 9.50) ∠ (1.00 - 100.00) located at IP: pbednar1] | 13 | 20 | 2 | 5.92 | 11.03 | 0.02 | -0.08 | 32 | 3 | 0 | 43.43 | 20.38 | 0.81 | 0.69 | 35 |
| PSet007 [τ (1.00 - 2.00) ∠ (1.00 - 2.00) located at IP: pbednar1] | 24 | 6 | 0 | 0.8 | 0.41 | 0.41 | -0.16 | 30 | 0 | 0 | 1.0 | 0.0 | 0.0 | 0.0 | 30 |
| PSet007 [τ (5.00 - 10.00) ∠ (10.00 - 15.00) located at IP: pbednar1] | 2 | 8 | 0 | 1.49 | 3.3 | 0.25 | -0.35 | 10 | 0 | 0 | 11.9 | 1.52 | 0.55 | 0.42 | 10 |
| PSet007 [τ (5.00 - 10.00) ∠ (15.00 - 20.00) located at IP: pbednar1] | 11 | 1 | 0 | 6.58 | 2.6 | 0.32 | 0.2 | 12 | 0 | 0 | 17.67 | 1.15 | 0.72 | 0.67 | 12 |
| PSet007 [τ (1.00 - 10.00) ∠ (45.00 - 90.00) located at IP: pbednar1] | 1 | 0 | 2 | 9.57 | 3.38 | 0.44 | 0.04 | 3 | 0 | 0 | 68.33 | 17.47 | 0.43 | 0.41 | 3 |
| PSet007 [τ (.00 - 5.00) ∠ (5.00 - 10.00) located at IP: pbednar1] | 9 | 0 | 0 | 2.07 | 1.61 | 0.52 | 0.43 | 9 | 0 | 0 | 6.67 | 1.22 | 0.68 | 0.45 | 9 |
| PBL1Station1 Fastener2 [multi-spindle] | 12 | 2 | 0 | - | - | - | - | 12 | 2 | 0 | - | - | - | - | 14 |
| PSet001 [τ (40.00 - 50.00) ∠ (100.00 - 120.00) located at IP: pbednar1] | 12 | 2 | 0 | 39.09 | 16.72 | 0.1 | -0.02 | 12 | 2 | 0 | 92.71 | 39.71 | 0.08 | -0.06 | 14 |

## *Fastening Summary Report Definitions*

Fastening Summary Reports definitions

| Attribute | Description |
|---|---|
| Include Process Steps | Selecting this option displays the name of the Process Steps for each operation in the report results. |
| Group By PSet | Selecting this option groups rundowns by Tool and PSet. Results grouped this way enable users to run statistics across Process Steps in instances where Tool and PSet are the same. |
| Torque | The measure of rotating force around an axis. Most often used in assembly as an indirect measurement of clamp force.<br>By default, this option returns results for *all* the following information on torque operations:<br>**Show Counts:** If selected, this returns information on the number of oper- |

| Attribute | Description |
|---|---|
| | ations that meet torque specifications, or are relatively low or high.<br>**Show Percentages**: If selected, this returns the percentage of torque operations that meet torque specifications, or are relatively low or high.<br>**Show Statistics**: If selected, this returns a set of quantified statistics across the range of torque operations. |
| Angle | Degrees of rotation around an axis most often used in assembly to determine bolt rotation after a pre-torque threshold has been met.<br>By default, this option returns results for *the first two* of the following information on fastening angle metrics:<br>**Show Counts**: If selected, this returns information on the number of fastening angle operations that meet angle specifications, or are relatively low or high.<br>**Show Percentages**: If selected, this returns the percentage of fastening angle operations that meet angle specifications, or are relatively low or high.<br>**Show Statistics**: If selected, this returns a set of quantified statistics across the range of fastening angle operations. |
| Rundown Counts | Selecting this displays a column totaling all the Fastening Operations for all shifts for the Line(s) and Date Range selected. |
| Include NOK Rundowns | Selecting this causes the report to include counts of operations with torque and angle values that are outside the range of specifications. This option affects the **Torque**, **Angle**, and **Rundown Counts** returns. This option is equivalent to filtering with the "Rundown In Spec.Is In Spec" dimension when using Fastening Analytics. |

## Details Type Reports

Details Reports list information in a table.

| Details Report | Notes |
|---|---|
| Defect Details | The Defect Detail Report displays a list of all the defects stored. This includes ad hoc defects and defects entered on the inspection and verification operation. |

| Details Report | Notes |
|---|---|
| Exception Details | The Exception Details report lists all exceptions recorded. |
| Station Time Details | The Station Time Details report lists the value of each of the time buckets. This information is also presented in the Dashboard's Sawtooth diagram on the Line View. |

An Example of a Detail type Report. The Defect Detail Report

Export to Excel

| Defect ID | Time | Line | Station | Serial Number | Part Number | Type | Step | Operation | Operator | Reason |
|---|---|---|---|---|---|---|---|---|---|---|
| 13422 | 11/8/2021 1:53:25 PM | Line 1 | Station L1S1 | PA.2021.11.08-710 | Product A | Ad hoc | New Process Step | | PpAdmin PpAdmin | Oil Leak |
| 13423 | 11/8/2021 1:53:36 PM | Line 1 | Station L1S1 | PA.2021.11.08-710 | Product A | Ad hoc | New Process Step | | PpAdmin PpAdmin | light failure |
| 13424 | 11/8/2021 1:54:00 PM | Line 1 | Station L1S1 | PA.2021.11.08-711 | Product A | Ad hoc | New Process Step | | PpAdmin PpAdmin | Loose Item |
| 13425 | 11/8/2021 1:54:11 PM | Line 1 | Station L1S1 | PA.2021.11.08-711 | Product A | Ad hoc | New Process Step | | PpAdmin PpAdmin | Loose Bolts |
| 13426 | 11/8/2021 1:54:25 PM | Line 1 | Station L1S1 | PA.2021.11.08-711 | Product A | Ad hoc | New Process Step | | PpAdmin PpAdmin | Paint Scuff |
| 13427 | 11/8/2021 1:54:41 PM | Line 1 | Station L1S1 | PD.2021.11.08-012 | Product D | Ad hoc | Product D | | PpAdmin PpAdmin | Paint Scuff |
| 13428 | 11/8/2021 1:54:57 PM | Line 1 | Station L1S1 | PD.2021.11.08-012 | Product D | Ad hoc | Product D | | PpAdmin PpAdmin | Oil Leak |
| 13429 | 11/9/2021 12:30:21 PM | Line 1 | Station L1S1 | PA.2021.11.09-714 | Product A | Inspection Operation | Step 1 | Hose Clamp 2 | PpAdmin PpAdmin | Loose Clamp |
| 13430 | 11/9/2021 1:36:28 PM | Line 1 | Station L1S1 | PA.2021.11.09-718 | Product A | Inspection Operation | Step 1 | Hose Clamp 8 | PpAdmin PpAdmin | Loose Clamp |
| 13431 | 11/9/2021 1:43:28 PM | Line 1 | Station L1S1 | PA.2021.11.09-718 | Product A | Inspection Operation | Step 1 | Hose Clamp 8 | PpAdmin PpAdmin | Missing Clamp |
| 13432 | 11/9/2021 2:37:31 PM | Line 1 | Station L1S1 | PA.2021.11.09-719 | Product A | Verification Operation | Verification Operation | New Verification Operation | PpAdmin PpAdmin | Assembly Error |
| 13433 | 11/9/2021 2:37:31 PM | Line 1 | Station L1S1 | PA.2021.11.09-719 | Product A | Verification Operation | Verification Operation | New Verification Operation | PpAdmin PpAdmin | Paint Scuff |
| 13434 | 11/9/2021 2:37:31 PM | Line 1 | Station L1S1 | PA.2021.11.09-719 | Product A | Verification Operation | Verification Operation | New Verification Operation | PpAdmin PpAdmin | Assembly Error |

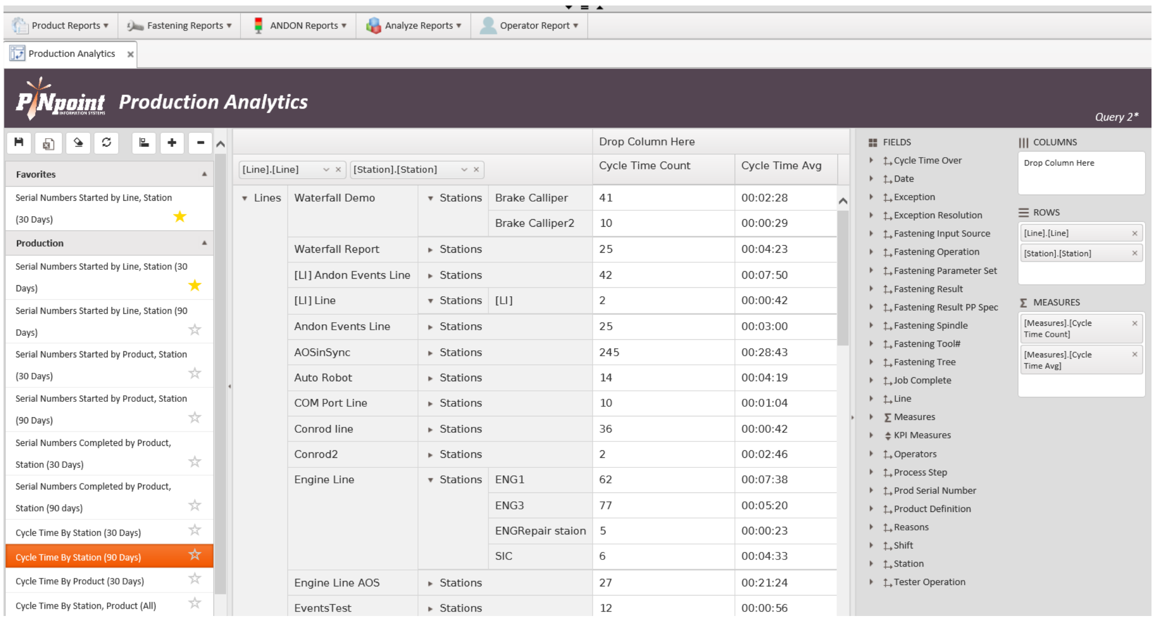
# Analytics Reports

## Production, Andon, and Fastening, Analytics Report

The Analytics Reports provide users with the ability to create a custom report that meets their needs. Production Analytics data includes cycle times, bypasses, defects and serial number count data. Andon Analytics data includes event counts and durations, and resolution reasons. Other than fastening data, Fastening Analytics includes lock counts, tightening errors, resolution reasons and durations. Reports can be created with many parameters including by Date, Shift, Line, Station, Operator, Part Number and Serial Number.

The PINpoint Analytic reports available in the web portal are ideal for smaller sets of data. To report on large volumes of data, consider using a Business Intelligence tool such as Microsoft Excel. Please refer to *"Connect Excel to a Cube" on page 357* *to learn how to connect to a PINpoint cube using Excel.*

The production analytics report showing average cycle times

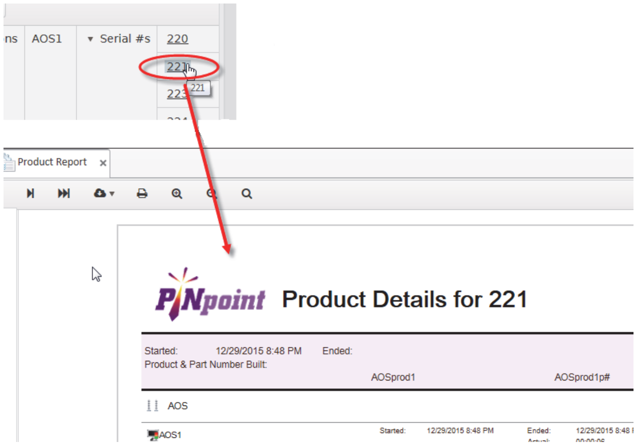



## Description

- Pre-configured reports are included by PINpoint on the left side
- Saving new custom reports can only be done with a user who has the ReportingWebEditor role defined in the Security app.
- The top left includes options to save the report, export to Excel, clear the report, refresh the data, show totals, expand and collapse all.
- To create a simple report, expand the Measures field (on the right-side) and drag the preferred metric to the Measures box. Similarly, drag any of the other fields to the Rows box. Once familiar with the usage of the report, experiment by dragging a field to the Columns. Alternatively, fields can also be dragged to the report area.
- Within the report data, the rows and columns can be expanded or collapsed by clicking the black triangle. To expand or clear all levels, click the Expand All or Collapse All button in the top left of the report.
- Filters can be applied for the Rows and/or Columns by selecting that field's down arrow at the top of the report.
- Serial Numbers and Operator IDs serve as links to a Product Report for that serial number, and the Operator Report for that Operator.

A link in the analytics report data brings users directly to the product report for the serial number.




# Analytics Reports

## *Overview*

Each of the analytics reports uses a data cube to help users quickly access summary data. Raw data from the SmartScreen client is recorded in the database. The raw data is summarized in a data warehouse and then data which can be summed, averaged and aggregated is processed into the data cube. Cubes contain dimensions and measures to allow the end user to sort the data.

This type of data can be viewed on the PINpoint Reports app, with Microsoft Excel or Power BI, or by using any other application which can connect to our data cube. Any of the calculated values require the data is properly filtered or the calculations may not be accurate.

## *Measures*

Measures are data categories which have mathematical operations performed on them. Measures can be summaries of data. Some examples are; Rundowns (the amount of rundowns), Torque % Good (the percentage of rundowns with a good torque). To find relevant information, data from a measure can be filtered by a dimension such as date or time.

## *Dimensions*

Dimensions list each of the recorded data types for an event. When an event, such as a login, is recorded several categories of data are recorded with it, such as the time, station, and operator. A dimension is a group of all the different values which were recorded. The station dimension will contain each station setup in SmartBuild which has recorded data. The input source dimension will contain the name of each input source which has recorded data.

Dimensions are used to group the data from measures. For example the station dimension will split the data in the measure rundown into which station it was recorded at. Dimensions can also be used as filters. If the data was filtered by a date or time dimension the report will show when those rundowns were recorded.

## Notes on terminology

Many of the terms for dimensions come from the data stored directly in the database which means it often needs to be converted. TF stands for Time Format. There are several dimensions which record time that have a corresponding dimension which converts that value to a standard Time format. For Example: Response Duration (value is in seconds) and Response Duration TF (value is in h:mm:ss).

Some PINpoint terminology is abbreviated: Work Order (WO), Work Order Item (WOI), Build Item (BI), Cycle State (CS), BigScreen (BS).

Cycle State references the time categorization model. See: *"5 Bucket Model" on page 367*

In the database the data is stored as an identification number which references a name in another table. This information exists in the cube but is not typically useful to the end user. Some dimensions are listed as an ID but there is typically another value which is more relevant. For example Line will return the name but Line ID only returns the number.

The EventID is unique for each record of raw data recorded but is not available for every measure.

A session is considered the time between when an operator logs in and when they log out.

All Durations are adjusted to remove non-production time.

## Descriptions of Dimensions & Measures

Production Cube Measures

| Measure | Description |
|---|---|
| % Overall Test Fail | The percentage of Tester operation tests which complete with an overall result status of Fail. The total amount of tests includes resets. |
| % Overall Test Fault | The percentage of Tester operation tests which complete with an overall result status of Fault. The total amount of tests includes resets. |
| % Overall Test Ignore | The percentage of Tester operation tests which complete with an overall result status of Ignore. The total amount of tests includes resets. |
| % Overall Test Pass | The percentage of Tester operation tests which complete with an overall result status of Pass. The total amount of tests includes resets. |
| % Test Fault | The percentage of Tester operation tests which completed with a status of Fault. |
| % Test Ignore | The percentage of Tester operation tests which completed with a status of Ignore |

| Measure | Description |
|---|---|
| BI Adjusted Duration | The total duration adjusted to remove non-production time. |
| BI Adjusted Duration TF | The total duration adjusted to remove non-production time. |
| BI Duration | The duration of the build item between build item start until build item complete. |
| BI Duration TF | The duration of the build item between build item start until build item complete. |
| Build Items | The amount of build items. |
| Bypasses | The amount of bypasses. |
| CS Duration | The cycle states total duration. |
| CS Duration Avg TF* | The cycle states average duration for each distinct build item. |
| CS Duration Avg* | The cycle states average duration for each distinct build item. |
| CS Duration TF | The cycle states total duration. |
| CT Average | The average cycle time. |
| CT AvgExcOutliers | The average cycle time excluding outliers. Cycle times above or below 2.698 standard deviations from the mean are excluded and a new set of data is used to create an average. 2.698 sigma is a standard determined from 1.5 X IQR. |
| Cycle States | The amount of cycle states. |
| Defects | The amount of defects. |
| Exceptions | The amount of exceptions (exceptions are the sum of bypasses, defects, and resets). |
| Line Actual | The actual production from the station which is configured to contribute |

| Measure | Description |
| --- | --- |
| | to line metrics. Build Items must have a product quality of yellow or green. |
| Line Availability | The availability calculated for the line. |
| Line Good | The amount of Build Items with a status of green which are produced from the station which is configured to contribute to line metrics. |
| Line OEE | The OEE calculated for the line. |
| Line Performance | The performance calculated for the line. |
| Line Quality | The quality calculated for the line. |
| Line Target | The target for the line set on the scheduler app per shift. |
| LoadHistorical | The amount of times the Load Historical option was recorded |
| Move Exceptions | The amount of move exceptions. |
| NoOfOverallTests | The number of Tester operation tests recorded. The number of overall tests includes resets. |
| Oper Produced | The amount of Build Items an operator produced. |
| Oper Produced Good | The amount of Build Items with a product quality of good the operator produced. |
| Oper Session Target | The amount of Build Itemsan operator should have produced during their session. |
| Other Exceptions | The amount of other exceptions. |
| OverCycle Count | The amount of Build Items which caused an over cycle event to be recor-ded. |
| OverCycle Duration | The total duration of time recorded over the intended cycle time. |
| OverCycle Duration Avg* | The average cycle time duration recorded when the Build Items were over cycle time. |

| Measure | Description |
|---|---|
| OverCycle Duration (Max) | The maximum cycle time recorded for stations which went over the cycle time. |
| OverCycle Duration (Min) | The minimum cycle time recorded for stations which went over the cycle time. |
| Performance | The performance calculated during an operator session. |
| Process Step | The time spent on a process step |
| Quality | The quality calculated during an operator session. |
| Rebuild | The amount of times a rebuild was recorded. |
| Reject | The amount of times a reject was recorded. |
| Resets | The amount of times a reset was recorded. |
| Resolved Bypasses | The amount of times a bypass was resolved. |
| Resolved Defects | The amount of times a defect was resolved. |
| Resolved Exceptions | The amount of times an exception was resolved. |
| ScanOps | The amount of times data was entered into a scan operation. |
| Station Actual | The amount of Build Items which departed the station with a product quality of yellow or green. |
| Station Availability | The availability calculated for the station. |
| Station Good | The amount of Build Items which departed the station with a product quality of green. |
| Station OEE | The OEE calculated for the station. |
| Station Performance | The performance calculated for the station. |

| Measure | Description |
|---|---|
| Station Quality | The quality calculated for the station. |
| Station Target | The target calculated for the station. This is inherited from the shift on the scheduler app. |
| StepACK | The amount of times a step was acknowledged. |
| Unreject | The amount of times a reject status was removed. |
| Unresolved Bypasses | The amount of times a bypass was recorded. |
| Unresolved Defects | The amount of times a defect was recorded. |
| Unresolved Exceptions | The total amount of exceptions which were recorded. |
| Value | The sum of all the scan operations. Only numeric data is considered. |
| Value Cp | The process capability for a scan operation. The gauge limits for a scan operation must be defined for this calculation. |
| Value Cpk | The process capability index for a scan operation. The gauge limits for a scan operation must be defined for this calculation. |
| Value Mean | The mean value recorded in a scan operation. |
| Value Median | The median value recorded in a scan operation. |
| Value Std Dev | The standard deviation calculated from scan operation data. |
| WO Adjusted Duration | The total duration for all work order items in a work order excluding non-production time. |
| WO Adjusted Duration TF | The total duration for all work order items in a work order excluding non-production time. |
| WO Duration | The duration of the work order between creation and completion. |

| Measure | Description |
|---|---|
| WO Duration TF | The duration of the work order between creation and completion. |
| WO Queued Duration | The duration of time the work order spent as queued. |
| WO Queued Duration TF | The duration of time the work order spent as queued. |
| WOI Adjusted Duration | The total duration for the work order item excluding non-production time. |
| WOI Adjusted Duration TF | The total duration for the work order item excluding non-production time. |
| WOI Duration | The work order item duration between creation and completion. |
| WOI Duration TF | The work order item duration between creation and completion. |
| WOI Features | The amount of features (parts) a work order item has. |
| Work Order Items | The amount of work order items a work order has. |
| Work Orders | The amount of work orders. |

** Calculated based on data returned.*

Production Cube Dimensions

| Group | Dimension | Description |
|---|---|---|
| BI Date Category | | |
| | BI Date Category | The build item state category the timestamp is sorted into |
| Break | | |
| | Break.Flag | The true or false flag indicating if the time period is a break |

| Group | Dimension | Description |
| --- | --- | --- |
| Build Items | | |
| | BI Status | The status of the build item:<br>Completed<br>Empty<br>Pending<br>Ready for work<br>Rejected<br>Started |
| | Build Item ID | The list of build item ID’s |
| | Is On Hold | The hold state of the build item |
| Completed In Shift | | |
| | Schedule ID | The schedule ID of the shift where the serial number was completed |
| | Shift | The name of the shift where the serial number was completed |
| Contextual Data | | |
| | Hierarchy Contextual Data | The list of contextual data items |
| | Name CD | The name of the contextual data item |
| | Value CD | The value of the contextual data items |
| Cycle State | | |
| | Cycle State | The cycle state from the 5 bucket model:<br>Available |

| Group | Dimension | Description |
|---|---|---|
| | | Complete<br>Suspended<br>Waiting<br>Working |
| Exception | | |
| | Exception Category | The type of exception:<br>Bypass of a single step<br>Bypass of the entire station<br>Part is defective<br>Reset - part is defective and supervisor/quality person acknowledged it |
| | Exception Description | The description entered for each exception recorded |
| Exception Resolution | | |
| | Resolution Category | The type of exception being resolved |
| | Resolution Description | The description entered for each exception resolved |
| | Resolved Date | The timestamp of each resolution |
| Line | | |
| | Line | The line name from SmartBuild |
| | Line ID | The line ID |
| Location | | |
| | Location | The location name on the line. This can be a station |

| Group | Dimension | Description |
|---|---|---|
| | | or a queue. |
| | Location ID | The location ID |
| | Type | The type of location:<br>Queue<br>Station |
| Move Exception Category | | |
| | Name | The name of the Move Exception |
| Operations | | Line<br>Location<br>Location ID<br>Type<br>Operation<br>ScanOp Gauge LSL ScanOp Gauge USL TCurrent Level The level of the operator |
| | Operation | The name of the operation in SmartBuild if numerical data was recorded on SmartScreen |
| | ScanOp Gauge LSL | The value of the Gauge LSL for the scan operation in SmartBuild |
| | ScanOp Gauge USL | The value of the Gauge USL for the scan operation in SmartBuild |
| Operator Level | | |
| | Current Level | The level of the operator |
| Operator Ses- | | |

| Group | Dimension | Description |
|---|---|---|
| sion | | |
| | First Name | The first name of the operator |
| | Last Name | The last name of the operator |
| | Login Date | The login date for this session |
| | Login Session ID | The session ID |
| | Logout date | The logout Date for this session |
| | Operator ID | The operator ID |
| Operators | | |
| | Operator | The operator |
| | Operator ID | The operator ID |
| | User Name | The user name |
| Over Cycle | | |
| | Over Cycle.flag | The flag is true if the cycle time recorded is over the cycle time set in the scheduler app |
| Partial Cycle Times | | |
| | Partial Cycle Times.flag | The flag is true if an operator only completed part of the cycle time |
| Process step | | |
| | Process Step | The process step name |
| | Process Step Description | The process step description |

| Group | Dimension | Description |
|---|---|---|
| Part | | |
| | Description | The Description of the Part |
| | Part ID | The ID of the Part |
| | Part Number | The part number |
| Process | | |
| | Process ID | The process ID |
| | Process Name | The name of the Process |
| Product Quality | | |
| | Product Quality | The Product Quality:<br>Green<br>Red<br>Yellow |
| Reasons | | |
| | Reason | The reason selected from the list in the advanced tab |
| Rejected-rebuild status | | |
| | Category | The reject status:<br>Rebuild<br>Reject<br>Unreject<br>Unknown |
| Part Num-berRoute | | |

| Group | Dimension | Description |
| --- | --- | --- |
| | Route | The Route from the SmartBuild build tab |
| | Route ID | The Route ID |
| Shift | | |
| | Cycle Time | The cycle time from the scheduler app |
| | Goal | The Goal from the scheduler app |
| | Shift | The shift from the scheduler app |
| | TAKT | The takt time from the scheduler app |
| Station | | |
| | Station | The station name in SmartBuild |
| | Station ID | The station ID |
| | Station Type | The station type:<br>Andon Only Station<br>Automated Station<br>Normal Station<br>Repair Station |
| Tester | | |
| | Tester OP Details | The tester operation details |
| | Tester Overall Res-ults | The overall result. |
| | Tester Results | Pass, Fail, Fault, Reset, or Ignore |
| | Tester Units | The units |

| Group | Dimension | Description |
|---|---|---|
| | Time | The duration of the test |
| WOI features | | |
| | Features Serial Number | The serial numbers which have features (multiple parts) |
| Work Order Items | | |
| | Serial Number | The serial number |
| | WOI Status | The work order item status:<br>Completed<br>Queued<br>Rejected<br>Started |
| Work Orders | | |
| | WO Status | The work order status:<br>Completed<br>Provisioned<br>Started |
| | Work Order | The work order number |

Andon Cube Measures

| Measure | Description |
|---|---|
| BigScreen Count | The amount of events sent to the BigScreen |
| BS Item1 Count | The amount of events sent to the BigScreen destined for the Item 1 category |

| Measure | Description |
|---|---|
| BS Item2 Count | The amount of events sent to the BigScreen destined for the Item 2 category |
| BS Item3 Count | The amount of events sent to the BigScreen destined for the Item 3 category |
| Destination Events | The amount of events which send any type of notification |
| Email Count | The amount of events which sent an email |
| Event Count | The amount of Andon events recorded |
| Event Duration | The duration an event was active |
| Event Duration - Prod Impact | The duration an event was active during scheduled production time |
| Event Duration - Prod Impact TF | The duration an event was active during scheduled production time |
| Ex Destination Count | The amount of events sent to external destinations (OPC devices) |
| Sound Count | The amount of events which triggered a sound |
| Stack Light Count | The amount of events which triggered a stack light |
| Text Count | The amount of events which sent a text message |

Andon Cube Dimensions

| Group | Dimension | Description |
|---|---|---|
| Build Items | | |
| | BI Status | The status of the build item:<br>Completed<br>Empty<br>Not Set<br>Pending<br>Ready for work<br>Rejected<br>Started |
| | Build Item ID | The build item ID used by the tracking manager |
| | Serial Number | The serial number |
| | Work Order Item ID | The work order item ID |
| Event Color | | |
| | Color | The color of the event |
| Event Details | | |
| | Date Time | The date time record for each event |
| | EventID | The event ID is unique for each recorded event |
| | Reason Description | The description for the reason the event occurred. Entered by the user at the station when the event was recorded |
| | Time | The time component of the timestamp |
| | Value | The value of each event |

| Group | Dimension | Description |
|---|---|---|
| Event State | | |
| | Event State | The state stored for each event:<br>Flash<br>Solid<br>End-Total (sum of Flashing and Solid) |
| Events | | |
| | Event | The event name in SmartBuild |
| | Event Type | The type of event in SmartBuild |
| Line | | |
| | Line | The line name |
| | line ID | The line ID |
| Notification Destinations | | |
| | Destination Type | The destination type for the event:<br>BigScreen Action<br>Data Writer Action<br>Email Action<br>Sound Action<br>Stack Light Action<br>Text Message Action |
| | Device | The device |
| | Device Action | The notification in the SmartBuild notifications tab. A list of all notifications other than stack light notifications. |

| Group | Dimension | Description |
|---|---|---|
| | Source Event | The source event which caused the notification |
| Operators | | |
| | Operator | The operator name |
| | User Name | The user name |
| Process | | |
| | Process ID | The Process ID |
| | Process Name | The name of the Process |
| Reasons | | |
| | Reason | The reason selected from the advanced tab |
| Shift | | |
| | Shift | The shift name from the scheduler app |
| Station | | |
| | Station | The station name |
| | Station ID | The station ID |
| | Station Type | The station type:<br>Andon Only Station<br>Automated Station<br>Normal Station<br>Repair Station |

Fastening Cube Measures

| Measure | Details |
|---|---|
| Angle % Good* | The percentage of rundowns with an angle within specifications |

| Measure | Details |
|---|---|
| Angle % Good* | The percentage of rundowns with an angle within specifications |
| Angle % Over* | The percentage of rundowns with an angle greater than the specifications |
| Angle % Under* | The percentage of rundowns with an angle lower than the specifications |
| Angle Cp* | The process potential for the angle component of a rundown |
| Angle Cpk* | The process capability for the angle component of a rundown |
| Angle In Spec | The amount of rundowns with an angle within the specifications |
| Angle Max* | The maximum angle value returned |
| Angle Mean* | The mean angle |
| Angle Median* | The median angle |
| Angle Min* | The minimum angle value returned |
| Angle Over Spec | The amount of rundowns with an angle greater than the specifications |
| Angle Std Dev* | The standard deviation of the angle component of a rundown |
| Angle Under Spec | The amount of rundowns with an angle lower than the specifications |
| Errors | The amount of errors returned by the tool controller for each rundown. There can be more than one error returned per rundown. |
| Locks | The amount of times a rundown caused the tool to be locked |
| ResolutionDuration | The duration between when a tool was locked and when it was unlocked |
| ResolutionDurationTF | The duration between when a tool was locked and when it was unlocked |

| Measure | Details |
|---|---|
| Resolutions | The amount of resolutions for a locked tool which were recorded |
| ResponseDuration | The duration between when the tool was locked and when an LCA logged in. |
| ResponseDurationTF | The duration between when the tool was locked and when an LCA logged in. |
| Rundowns | The amount of actual rundowns, manual rundowns and resets. This count includes removals. |
| Rundowns in Spec | The amount of rundowns within the specifications |
| Rundowns Out Of Spec | The amount of rundowns outside of the specifications |
| Torque % Good* | The percentage of rundowns with a torque within specifications |
| Torque % Over* | The percentage of rundowns with a torque greater than the specifications |
| Torque % Under* | The percentage of rundowns with a torque lower than the specifications |
| Torque Cp* | The process potential for the torque component of a rundown |
| Torque Cpk* | The process capability for the torque component of a rundown |
| Torque In Spec | The amount of rundowns with a torque within the specifications |
| Torque Max* | The maximum torque value returned |
| Torque Mean* | The mean torque |
| Torque Median* | The median torque |
| Torque Min* | The minimum torque value returned |
| Torque Over Spec | The amount of rundowns with a torque greater than the specifications |

| Measure | Details |
| --- | --- |
| Torque Std Dev* | The standard deviation of the torque component of a rundown |
| Torque Under Spec | The amount of rundowns with a torque lower than the specifications |

*Calculated based on the data returned.

Fastening Cube Dimensions

| Group | Dimension | Description |
| --- | --- | --- |
| Build Items | | |
| | BI Status | The status of the build item:<br>Completed<br>Rejected<br>Started |
| | Build Item ID | The build item ID |
| | Serial Number | The serial number for the build item |
| | Work Order Item ID | The work order for the build item |
| Controller Result | | |
| | Controller Result | The overall result of the rundown recorded from the message sent by the tool controller for each run-down. |
| Error | | |
| | Error Code | The error code recorded from the rundown |
| | Error Description | The error description |
| | Error Type | The error type:<br>AddTighteningError |

| Group | Dimension | Description |
|---|---|---|
| | | TighteningError |
| Input Source | | |
| | FT Tool Address | The tool address from SmartBuild |
| | Input Source | The tool name from SmartBuild |
| | Port Number | The tool port number from SmartBuild |
| Line | | |
| | Line | The line name |
| | Line ID | The line ID |
| Lock Type | | |
| | Lock Type | The level of lock. Level 1 can be cleared by an operator. Level 2 requires a supervisor. |
| Operators | | |
| | Operator | The operator name |
| | User Name | The user name |
| Parameter Set | | |
| | P Set Name | The Pset Name on the step in SmartBuild |
| Pinpoint Result | | |
| | Pinpoint Result | The rundown result determined by PINpoint:<br>OK<br>NOK<br>Manual<br>Reset |

| Group | Dimension | Description |
|---|---|---|
| Process Step | | |
| | Process Step | The process step name |
| | Process Step Description | The process step description |
| Process | | |
| | Process ID | The process ID |
| | Process Name | The process name |
| Reasons | | |
| | Reason | The reason from SmartBuild |
| Removed Run-downs | | |
| | Is Remove | Set to TRUE if one of the following occurs:<br>If the user selects reverse on the SmartScreen client and if a rundown is recorded for the Reverse PSet.<br>If a manual rundown is recorded from the SmartScreen client which decrements the count.<br>If the station is configured to count a rundown with zero torque and zero angle as a removal and if a run-down has a value of zero for both torque and angle. |
| Rundown | | |
| | Angle LSL | The lower specification limit for an angle. If Use Con-troller Limits is true then this value is supplied by the tool controller in the rundown packet. If Use Con-troller Limits is false then this comes from the set-tings on the fastening operation. |
| | Angle USL | The upper specification limit for an angle. If Use Con-troller Limits is true then this value is supplied by the |

| Group | Dimension | Description |
|---|---|---|
| | | tool controller in the rundown packet. If Use Controller Limits is false then this comes from the settings on the fastening operation. |
| | Overall Result | The overall result of the rundown determined by PINpoint. listed as OK/NOK/MANUAL. Older data may state UNKNOWN for a reset. |
| | Rundown Date | The date a rundown was recorded |
| | Rundown ID | The rundown ID |
| | Torque LSL | The lower specification limit for a torque. If Use Controller Limits is true then this value is supplied by the tool controller in the rundown packet. If Use Controller Limits is false then this comes from the settings on the fastening operation. |
| | Torque USL | The upper specification limit for a torque. If Use Controller Limits is true then this value is supplied by the tool controller in the rundown packet. If Use Controller Limits is false then this comes from the settings on the fastening operation. |
| Rundown In Spec | | |
| | Is In Spec | Whether or not a rundown was within the specifications |
| Shift | | |
| | Shift | The shift from the scheduler tab |
| Spindle | | |
| | Spindle | The spindle number recorded for the rundown |
| Station | | |

| Group | Dimension | Description |
| --- | --- | --- |
| | Station | The station name from SmartBuild |
| | Station ID | The Station ID |
| | Station Type | The station type:<br>Andon Only Station<br>Automated Station<br>Normal Station<br>Repair Station |
| Tool# | | |
| | Tool# | The tool serial number returned in the rundown. Some controllers may not provide the serial number in the rundown packet. By default the tool serial number will have characters stripped out and will only include numbers. |
| Controller Limits Used | | |
| | Controller Limits Used | Whether or not the fastening operation was set to use controller limits at the time of the rundown. |

### *Relationship Between the Dimensions and the Measures*

The following tables show the relationship between the dimensions and the measures in each of the cubes.

The Production Cube

| Measures / Dimensions | BI Station | Build Item Dates | Cycle States | Cycle States | Exception Resolutions | Exceptions | Fact Contextual Data Map | Move Exceptions | Multi Oper Sessions | Oee | Process Step | Scan Opeartions | Serial No Status | Tester Operation Detail | Tester Operations | Tracking | WOI Features | Work Orders |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BI Date Category | | ✓ | | | | | | | | | | | | | | ✓ | | ✓ |
| BI Date | | ✓ | | | | | | | | | | | | | | ✓ | | ✓ |
| Break | | | ✓ | ✓ | | | | | | | | | | | | | | |
| Build Items | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Completed In Shift | | | | | | | | | | | | | | | | ✓ | | ✓ |
| Contextual Data | | | ✓ | | | ✓ | ✓ | ✓ | | | | | ✓ | | | ✓ | | |
| Current Location | | | | | | | | | | | | | | | | ✓ | | ✓ |
| Cycle State | | | ✓ | ✓ | | | | | | | | | | | | | | |
| Date | | | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Defect Type | | | | | ✓ | ✓ | | | | | | | | | | | | |
| Exception | | | | | ✓ | ✓ | | | | | | | | | | | | |
| Exception Resolution | | | | | ✓ | ✓ | | | | | | | | | | | | |
| From Location | | | | | | | | ✓ | | | | | | | | | | |
| Line | ✓ | | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Move Exceptions Category | | | | | | | | ✓ | | | | | | | | | | |
| Operation | | | | | | | | | | | | ✓ | | ✓ | ✓ | | | |
| Operator Level | | | ✓ | ✓ | | | | | ✓ | | | | | | | | | |
| Operator Session | | | ✓ | ✓ | | | | | ✓ | | | | | | | | | |
| Operators | | | ✓ | ✓ | ✓ | ✓ | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Over Cycle | | | ✓ | ✓ | | | | | | | | | | | | | | |
| Over Cycle Reason | | | ✓ | ✓ | | | | | | | | | | | | | | |
| Over Cycle Reason Desc | | | ✓ | ✓ | | | | | | | | | | | | | | |
| Part | | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | | | ✓ | | | ✓ | ✓ | ✓ |
| Partial Cycle Times | | | ✓ | ✓ | | | | | | | | | | | | | | |
| Process | | | | | | ✓ | | | | | ✓ | ✓ | | ✓ | ✓ | | | |
| Process Step | | | | | ✓ | ✓ | | | | | ✓ | ✓ | | ✓ | ✓ | | | |
| Product Quality | | | | | ✓ | ✓ | | | | | | | ✓ | | | ✓ | | ✓ |
| Reasons | | | | | ✓ | ✓ | | | | | | | ✓ | | | | | |
| Reject-Rebuild Status | | | | | | | | | | | | | ✓ | | | | | |
| Route | | | ✓ | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ |
| Scan Operation | | | | | | | | | | | | ✓ | | | | | | |
| Shift | | | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Station | ✓ | | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Tester Op Details | | | | | | | | | | | | | | ✓ | | | | |
| Tester Overall Result | | | | | | | | | | | | | | | ✓ | | | |
| Tester Result | | | | | | | | | | | | | | ✓ | | | | |
| Tester Units | | | | | | | | | | | | | | ✓ | | | | |
| Time | | ✓ | | | | | | | | | | | | | | ✓ | | ✓ |
| To Location | | | | | | | | ✓ | | | | | | | | | | |
| WOI Features | | | | | | | | | | | | | | | | | ✓ | |
| Work Order Items | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Work Orders | | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

The Fastening Cube

| Dimensions \ Measures | Fastening | Erros | Locks | Lock Resolution |
|---|---|---|---|---|
| Build Items | ✓ | ✓ | ✓ | ✓ |
| Controller Result | ✓ | | | |
| Date | ✓ | ✓ | ✓ | ✓ |
| Error | | ✓ | | |
| Input Source | ✓ | ✓ | ✓ | ✓ |
| Line | ✓ | ✓ | ✓ | ✓ |
| Lock Type | | | ✓ | ✓ |
| Operation | ✓ | ✓ | ✓ | ✓ |
| Operators | ✓ | ✓ | ✓ | ✓ |
| Parameter Set | ✓ | ✓ | | |
| PINpoint Result | ✓ | | | |
| Process | ✓ | ✓ | ✓ | ✓ |
| Process Step | ✓ | ✓ | ✓ | ✓ |
| Reasons | | | | ✓ |
| Removed Rundowns | ✓ | | | |
| Rundown | ✓ | ✓ | ✓ | ✓ |
| Rundown In Spec | ✓ | | | |
| Shift | ✓ | ✓ | ✓ | ✓ |
| Spindle | ✓ | | | |
| Station | ✓ | ✓ | ✓ | ✓ |
| Time | ✓ | | | |
| Tool# | ✓ | ✓ | ✓ | ✓ |
| UseControllerLimit | ✓ | | | |

The Andon Cube

| Dimensions \ Measures | Andon Events | Destinations |
|---|---|---|
| Build Items | ✓ | ✓ |
| Date | ✓ | ✓ |
| Event Color | ✓ | ✓ |
| Event Details | ✓ | ✓ |
| Event State | ✓ | ✓ |
| Events | ✓ | ✓ |
| Line | ✓ | ✓ |
| Notification Destinations | | ✓ |
| Operators | ✓ | ✓ |
| Part | ✓ | ✓ |
| Reasons | ✓ | ✓ |
| Shift | ✓ | ✓ |
| Station | ✓ | ✓ |

## Fastening Analytics Notes

The settings for the fastening operation when the rundown was recorded determine aspects of the data. The setting **Use Controller Limits** plays a large part in determining what the peripheral data will be. This section contains some guides about how the data is stored.

How Use Controller Limits affects fastening data

| | **Tool Setting: Use Controller Limits** | | | |
|---|---|---|---|---|
| | **TRUE** | | **FALSE** | |
| Dim/Measure | **Rundown** | Manual/Reset | Rundown | Manual/Reset |
| Angle In/Over/Under SpecAngle % Good/Over-/UnderRundowns In SpecRundowns Out of SpecTorque In/Over/Under SpecTorque % Good/Over-/UnderIs In Spec | The value is based on the LSL/USL received in the run-down packet. | Manual/Reset is stored with a Torque & Angle value of 0. The LSL/USL in SmartBuild will be used to determine if these are In/Over/Under specifications. | The value is based on the LSL/USL in SmartBuild. | Manual/Reset is stored with a Torque & Angle value of 0. The LSL/USL in SmartBuild will be used to determine if these are In/Over/Under specifications. |

| | Tool Setting: Use Controller Limits | | | |
|---|---|---|---|---|
| | TRUE | | FALSE | |
| PINpoint Result | **Single-Spindle**: OK if the PSet in run-down packet matches expected PSet.<br>**Multi-Spindle**: NOK | Set to Manual/Reset | OK if both the Torque & Angle are within SmartBuild limits and the PSet in the rundown packet matches expected PSet. | Set to Manual/Reset |
| Angle LSL<br>Angle USL<br>Torque LSL<br>Torque USL | Set to the limits received in the run-down packet from the controller. | Set to .00 | Set to the SmartBuild Fastening Operation limits. | Set to the SmartBuild Fastening Operation limits. |

How each dimension will display the data for a an actual rundown vs a manual entry/operation reset.

| Dim/Measure | Rundown | Manual/Reset |
|---|---|---|
| Controller Result | The overall result of the rundown recorded from the rundown packet | Set to OK |
| Overall Result | Controller Result AND PINpoint Result | Set to OK |
| P Set Name | The PSet in the rundown packet from the controller | Set to PSet000 |

## *Summarizing Cpk*

Process Capability (Cpk) is a measure and like all measures it can be summed based on the date and operation ranges selected by the user. The Cpk in the fastening cube is calculated for a specific fastening operation. When reviewing Cpk the selection should be narrowed down as much as possible. Cpk does not have any meaning if it is summarized for the line level since different fastening operations will have different upper and lower limits.

# Operator Report

The operator reports display information about specific operators.

The Card ID property for User's will not appear in any reports.

## Operator Report Definitions

The following definitions summarize concepts encountered in this section.

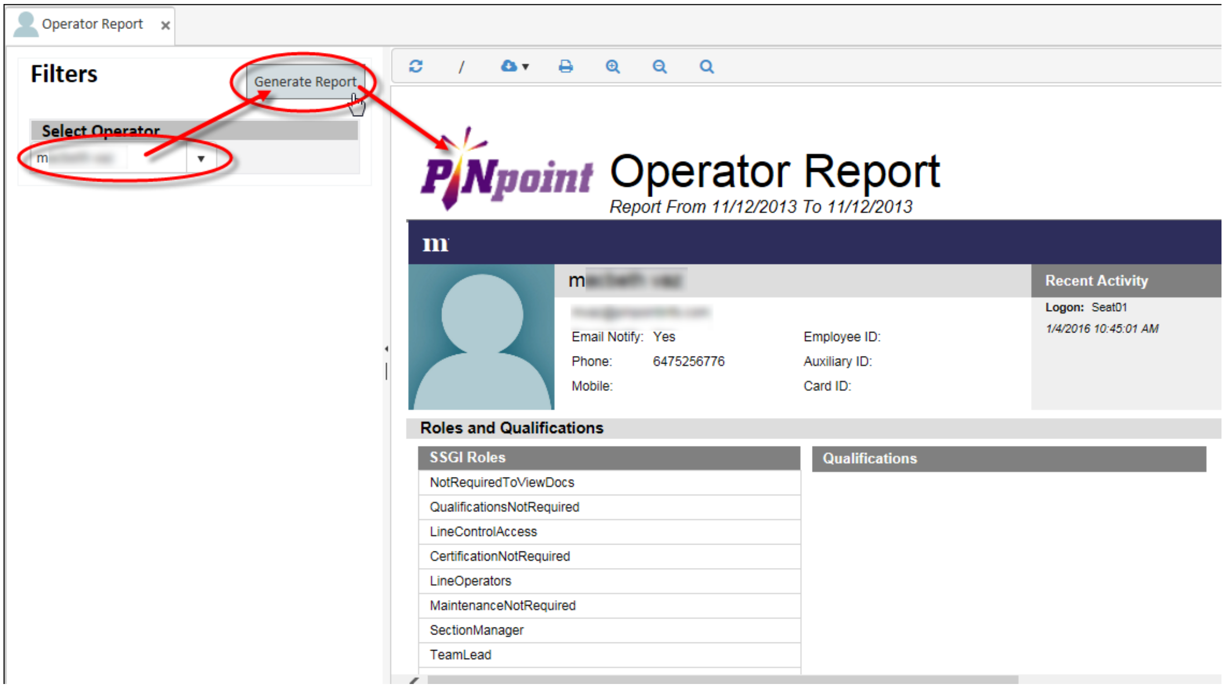
Analyze Reports definitions

| Term | Definition |
|---|---|
| Certifications | A checklist which completed by an Operator that demonstrate the Operator's understanding of crucial operations. |
| Qualifications | A defined skill set that the operator of a station must possess in order to be enabled to work there unsupervised. |
| Roles | A pre-configured set of permissions that enable a User to perform a set task or group of tasks in PINpoint applications. |

## Operator Report

The Operator Report displays information about the Roles, Qualifications, and Certifications a user has in PINpoint. The Recent activity section displays the last login times at each station for the operator.

Operator Report created




## Operator Metrics Report

The operator metrics report shows performance metrics for each operator and corresponding station. The display options show several different metrics and the results can be grouped into percentiles. This report is useful for determining how operators are performing relative to other operators on the same station and shift.

The Operator Metrics Report

By Average Cycle Time [12/04/2018 - 19/04/2018]

Export to Excel

| Operator | PB1 | PB2 | PB3 | PB4 | PB5 | PBAO... | PBAO... |
|---|---|---|---|---|---|---|---|
| Pa1 | 00:10:25 | | | | | 00:06:30 | |
| Pa2 | 00:00:26 | 00:03:03 | | | | 00:00:07 | 00:04:15 |
| Pa3 | | | 00:06:11 | | | | |
| Pa4 | | | 00:07:02 | 00:04:51 | | | |
| Pa5 | | | 00:01:04 | | 00:18:19 | | |
| Pa6 | 00:02:26 | | | | | 00:07:50 | |

# Operator Audit Report

The Operator Audit Report allows the user to find information about users which were configured in the security tab. Columns on this report can be added and filtered.

An example of the Operator Audit Report

Export to Excel

| Role Name | User Name | First Name | Last Name | Shift | Last Login Date |
|---|---|---|---|---|---|
| LineControlAccess | jc | Joe | Cowart | Day Shift | 19/04/2018 8:55:40 |
| LineControlAccess | sdb | Smokey | DaBear | Day Shift | 17/12/2018 14:30:31 |
| LineControlAccess | te | Tracie | Evenson | Day Shift | 17/06/2019 14:32:13 |
| LineControlAccess | nh | No | Ho | Day Shift | 23/01/2020 15:43:42 |
| LineControlAccess | jhou | Je | Ho | Day Shift | 24/01/2020 10:08:12 |
| LineControlAccess | vl | V | L | Day Shift | 20/06/2019 15:24:16 |
| LineControlAccess | pm | Paul | McAdory | Day Shift | 19/04/2018 8:16:05 |
| LineControlAccess | KO | Kay | Oluwadairo | Day Shift | 17/06/2019 14:36:26 |
| LineControlAccess | PpAdmin | PpAdmin | PpAdmin | Day Shift | 28/01/2020 15:41:33 |
| LineControlAccess | ms3 | John | Proudstar | Day Shift | 09/04/2019 12:02:10 |
| LineControlAccess | gs | Greg | Sisson | Day Shift | 19/04/2018 8:48:49 |
| LineControlAccess | t | Tony | Stark | Day Shift | 19/08/2019 13:37:10 |
| LineControlAccess | e | Kurt | Wagner | Day Shift | 27/01/2020 11:24:17 |

1   1 - 15 of 15 items

# LCA Audit Report

The LCA audit report displays which uses have LCA access at which station.

The LCA Audit Report

| Operator | Repair Station | Station L1S1 | Station L1S2 | Station L1S3 | Station L1S4 |
|---|---|---|---|---|---|
| AW | ✓ | ✓ | ✓ | ✓ | ✓ |
| Joe Cowart | | ✓ | ✓ | | |
| Kay Oluwadairo | ✓ | ✓ | ✓ | ✓ | ✓ |
| MS | | ✓ | ✓ | | |
| MA | ✓ | ✓ | ✓ | ✓ | ✓ |
| NH | ✓ | ✓ | ✓ | ✓ | ✓ |

# Maintenance Summary Report

This report lists all the active Maintenance items and how many times they have been completed or overridden.

An Maintenance Summary Report

| Name | Description | Start Date | Completed Count | Overrides Count |
|---|---|---|---|---|
| PB Line 2 OPM | PB Line 2 OPM Desc | 14/09/2018 5:00:00 | 69 | 0 |
| PBAOS1 OPM | | 13/04/2018 5:00:00 | 11 | 0 |
| OPM With 2 Maintenance | OPM With 2 Document | 29/05/2020 4:00:00 | 8 | 0 |
| PB1 OPM | PB1 OPM Description | 07/09/2018 5:00:00 | 5 | 0 |
| Operator Perform Maintenance 01 | Operator Perform Maintenance | 30/01/2020 0:00:00 | 1 | 0 |
| OPM- WEEK | OPM- WEEK | 31/01/2020 0:00:00 | 1 | 0 |
| OPM DAY 03 | | 04/02/2020 0:00:00 | 1 | 0 |
| OPM WEEK 02 | OPM WEEK 02 | 04/02/2020 0:00:00 | 1 | 0 |
| Test 3 | Test 3 | 25/01/2020 0:00:00 | 0 | 0 |
| Baseline OPM | | 26/10/2018 5:00:00 | 0 | 0 |
| PB13 OPM | | 21/05/2019 4:00:00 | 0 | 0 |
| PB13 OPM b | | 17/09/2019 4:00:00 | 0 | 0 |
| OPM-Month | OPM-Month | 03/02/2020 0:00:00 | 0 | 0 |
| OPM-Year | OPM-Year | 02/02/2020 0:00:00 | 0 | 0 |
| OPM DAY 02 | OPM DAY 02 | 04/02/2020 0:00:00 | 0 | 0 |
| OPM-DAY 04 | OPM-DAY 04 | 06/02/2020 0:00:00 | 0 | 0 |
| OPM-DAY05 | OPM-DAY05-Not Show All operator | 03/02/2020 5:00:00 | 0 | 0 |

## Maintenance Operator Summary Report

This report lists all the Maintenance items which each operator has completed and the completion date.

An Maintenance Operator Summary Report

| Name | Start Date | Completed Date | Completed | Operator |
|---|---|---|---|---|
| PBAOS1 OPM | 13/04/2018 5:00:00 | 03/06/2020 0:15:39 | Yes | Pa |
| OPM With 2 Maintenance | 29/05/2020 4:00:00 | 03/06/2020 10:06:35 | Yes | SD07 Sd07 |
| OPM With 2 Maintenance | 29/05/2020 4:00:00 | 03/06/2020 10:06:35 | Yes | SD07 Sd07 |
| PBAOS1 OPM | 13/04/2018 5:00:00 | 03/06/2020 11:12:55 | Yes | Pa |
| Operator Perform Maintenance 01 | 30/01/2020 0:00:00 | 03/06/2020 14:16:27 | Yes | SD03 SD03 |
| Operator Perform Maintenance 01 | 30/01/2020 0:00:00 | 03/06/2020 14:16:27 | Yes | SD03 SD03 |
| Operator Perform Maintenance 01 | 30/01/2020 0:00:00 | 03/06/2020 14:16:27 | Yes | SD03 SD03 |
| OPM- WEEK | 31/01/2020 0:00:00 | 03/06/2020 14:16:29 | Yes | SD03 SD03 |
| OPM DAY 03 | 04/02/2020 0:00:00 | 03/06/2020 14:16:31 | Yes | SD03 SD03 |
| OPM WEEK 02 | 04/02/2020 0:00:00 | 03/06/2020 14:16:31 | Yes | SD03 SD03 |
| PBAOS1 OPM | 13/04/2018 5:00:00 | 03/06/2020 15:47:37 | Yes | Pa |
| PB1 OPM | 07/09/2018 5:00:00 | 03/06/2020 15:47:41 | Yes | Pa |
| PBAOS1 OPM | 13/04/2018 5:00:00 | 03/06/2020 23:07:45 | Yes | Pa |
| PBAOS1 OPM | 13/04/2018 5:00:00 | 03/06/2020 23:09:53 | Yes | Pa |
| PBAOS1 OPM | 13/04/2018 5:00:00 | 04/06/2020 0:31:05 | Yes | Pa |
| PB1 OPM | 07/09/2018 5:00:00 | 04/06/2020 0:31:16 | Yes | Pa |

## Certification Ack History Report

This report lists all the certifications which each operator has completed and the recorded answer to each certification question.

A Certification Ack History Report

| Certification 1 | | | |
|---|---|---|---|
| **Start Date:** | 06/05/2020 | **Certificate Type:** | Operator |
| **End Date:** | | **Response Group:** | Certificate 1 RG |
| **Enabled:** | Yes | **Description:** | Certification 1 |

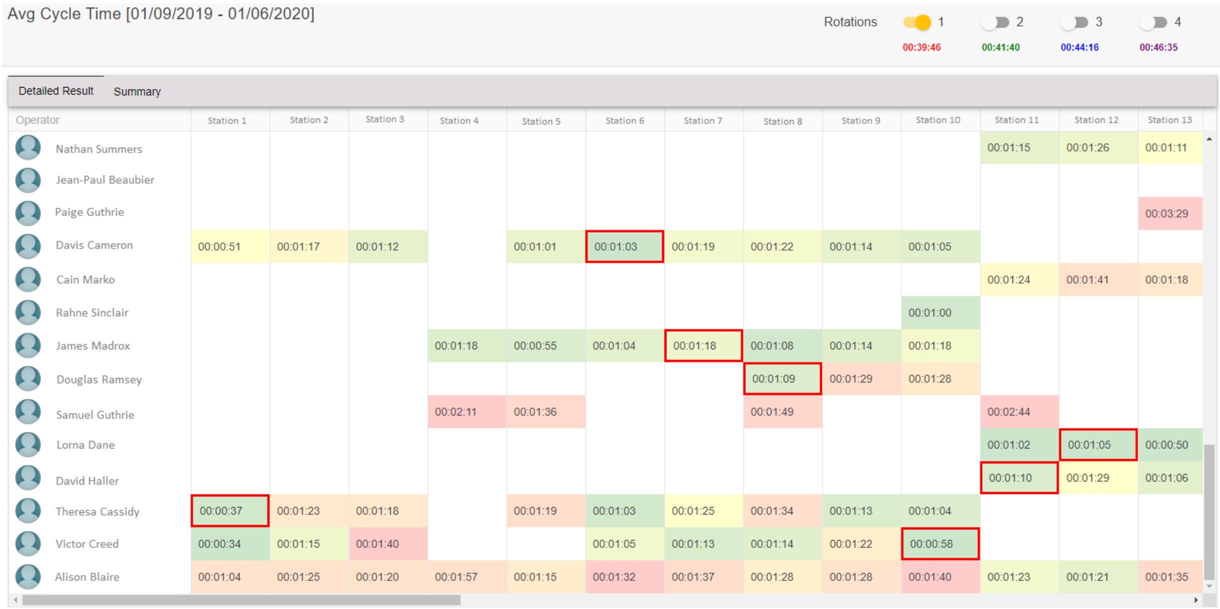
| Item Description: | None |
|---|---|
| Test 1 | ✓ 1 |
| Certification question 1 | ✓ 1 |
| Certification question 2 | ✓ 1 |
| Certification question 3 | ✓ 1 |
| Certification question 4 | ✓ 1 |
| Certification question 5 | ✓ 1 |
| Certification question 6 | ✓ 1 |

## Operator Station Placement

The operator station placement report analyzes the cycle times of the selected set of operators against the selected set of stations within the time frame. This report will analyze the data and present several rotations. Each rotation is a station assignment for operators based on their past performance at each station. This report is designed to help users find the optimal placement of operators on the line.

This report will generate an average cycle time for each operator at each station and then use those values to create a total average cycle time where each station is matched to a single operator. The rotations listed on the report are solutions for the lowest total average cycle time. The cycle time for a rotation is the sum of the average cycle time for each operator selected for each station.

The operator station placement report. Selecting the rotation will highlight which operator was selected for each station in red.



Avg Cycle Time [01/09/2019 - 01/06/2020]

| Rotations | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| | 00:39:46 | 00:41:40 | 00:44:16 | 00:46:35 |

Detailed Result Summary

| Operator | Station 1 | Station 2 | Station 3 | Station 4 | Station 5 | Station 6 | Station 7 | Station 8 | Station 9 | Station 10 | Station 11 | Station 12 | Station 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nathan Summers | | | | | | | | | | | 00:01:15 | 00:01:26 | 00:01:11 |
| Jean-Paul Beaubier | | | | | | | | | | | | | |
| Paige Guthrie | | | | | | | | | | | | | 00:03:29 |
| Davis Cameron | 00:00:51 | 00:01:17 | 00:01:12 | | 00:01:01 | 00:01:03 | 00:01:19 | 00:01:22 | 00:01:14 | 00:01:05 | | | |
| Cain Marko | | | | | | | | | | | 00:01:24 | 00:01:41 | 00:01:18 |
| Rahne Sinclair | | | | | | | | | | 00:01:00 | | | |
| James Madrox | | | | 00:01:18 | 00:00:55 | 00:01:04 | 00:01:18 | 00:01:08 | 00:01:14 | 00:01:18 | | | |
| Douglas Ramsey | | | | | | | | 00:01:09 | 00:01:29 | 00:01:28 | | | |
| Samuel Guthrie | | | | 00:02:11 | 00:01:36 | | | 00:01:49 | | | 00:02:44 | | |
| Lorna Dane | | | | | | | | | | | 00:01:02 | 00:01:05 | 00:00:50 |
| David Haller | | | | | | | | | | | 00:01:10 | 00:01:29 | 00:01:06 |
| Theresa Cassidy | 00:00:37 | 00:01:23 | 00:01:18 | | 00:01:19 | 00:01:03 | 00:01:25 | 00:01:34 | 00:01:13 | 00:01:04 | | | |
| Victor Creed | 00:00:34 | 00:01:15 | 00:01:40 | | | 00:01:05 | 00:01:13 | 00:01:14 | 00:01:22 | 00:00:58 | | | |
| Alison Blaire | 00:01:04 | 00:01:25 | 00:01:20 | 00:01:57 | 00:01:15 | 00:01:32 | 00:01:37 | 00:01:28 | 00:01:28 | 00:01:40 | 00:01:23 | 00:01:21 | 00:01:35 |

The summary view lists the rotations and which operators should be assigned to each station.

Avg Cycle Time [6/22/2018 - 6/29/2020]

| Rotations | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| | 00:11:51 | 00:20:42 | 00:51:03 | 00:33:40 |

Detailed Result Summary

Export to Excel

| Station | Rotation 1 | Rotation 2 | Rotation 3 | Rotation 4 |
|---|---|---|---|---|
| MS ST01 | Shiro Yoshida | Jack Matthews | Jack Matthews | Ma |
| MS ST02 | Ma | John Proudstar | Shiro Yoshida | |
| MS ST03 | John Proudstar | Shiro Yoshida | | |

## Notes

This report will not find the lowest achievable cycle time for a line because the report assumes that the line is balanced and that no station can be considered to be a bottleneck.

This report will not create rotations based on which shift an operator is on. All users selected are evaluated in the report. The shift filter will filter the data for the operators based on which shift it was recorded in.

The report contains a filter for the minimum amount of units built by an operator. It is important to filter the report so that the minimum amount of units built creates a large enough sample size for the report to generate an average cycle time for each operator at each station. If the amount is too low then it is possible for an outlier to be considered a valid data point. For example: If a user only built 1 unit at the station during testing and completed the unit in 2 seconds this user would be considered the best operator for that station.

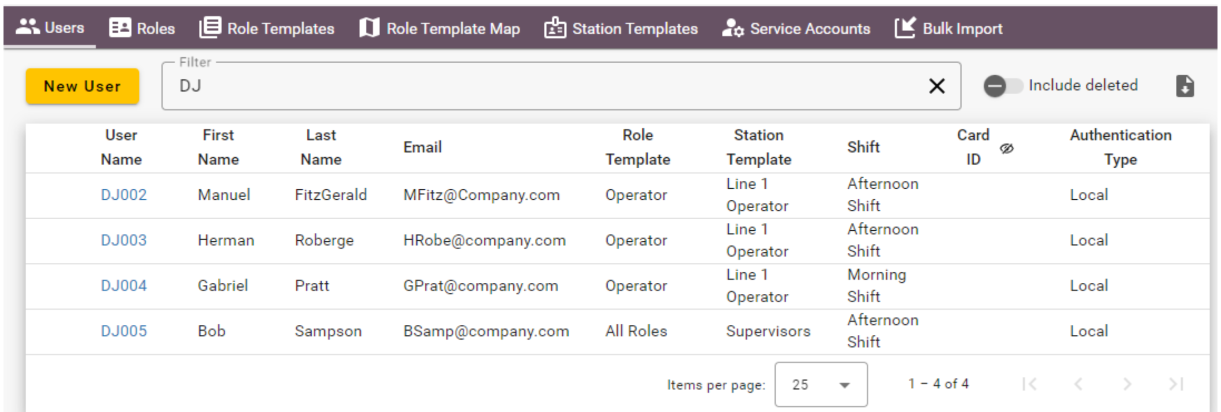
# Security

The **Security** app enables administrators to manage users, templates, and service accounts.

## Users Tab

The **Users** tab is used to create, modify, delete, and anonymize, users. In order to use these functions a user must have the required role. Roles and functions are detailed in the Roles tab. A list of users can be exported from the Users tab.

The users tab showing the search filter, deleted users filter, and export button at the top right.




### Authentication Type

PINpoint allows local and external authentication to be used. The login window will present the user with the configured login options.

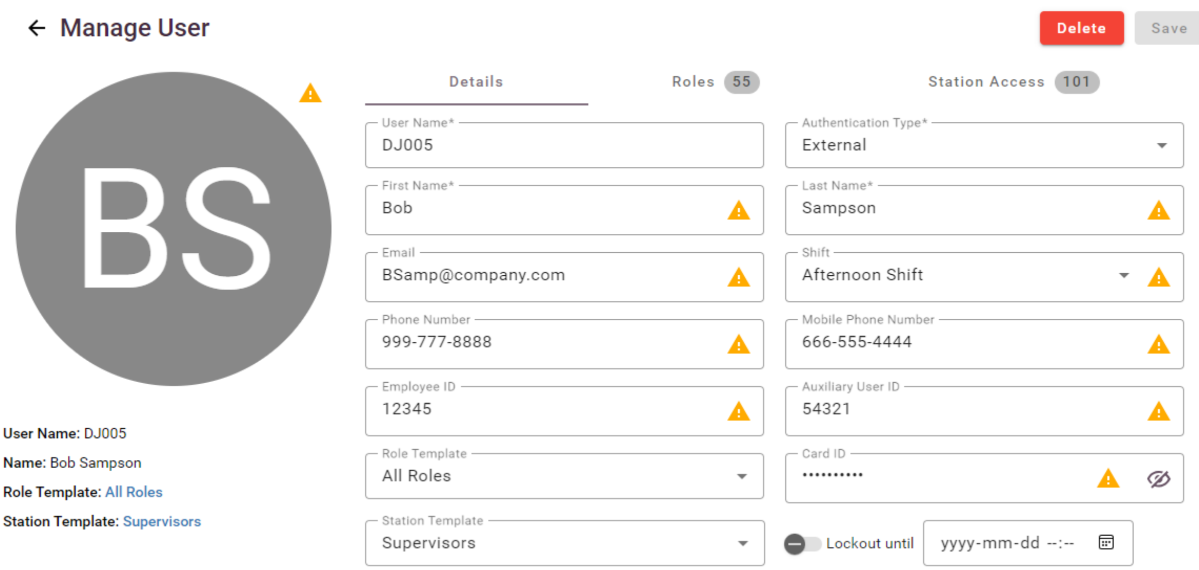
Local authentication is user authentication managed by PINpoint. Local account passwords are stored in the PINpoint database.

External authentication is user authentication managed by an external identity provider (IdP). The PINpoint system allows an external identity provider to be used to authenticate users using the OIDC protocol. An IdP connection must be configured by PINpoint.

When a user selects the option to Login with the IdP then PINpoint will redirect the user to the IdP login page. The user will enter their credentials on the IdP and then be redirected back to PINpoint. If the login is successful then PINpoint will update the user's properties in PINpoint with the mapped properties from the IdP and then the user will be logged in. External account passwords are not stored in the PINpoint database.

User account types can be changed to facilitate installing or removing an IdP. Changing an account type from local to external will remove the password from the PINpoint database.

A user with properties. The properties which are mapped to an external identity provider are marked with an icon.

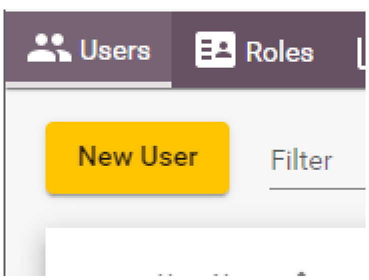



## Create a User

To create a new user, follow these steps.

1. Click on New User.

   Create User button




2. Configure the following properties and save the user.

   Create User properties

| Attribute | Description |
|---|---|
| User Name | **Required** to create the user. Enter a name for the User. |

| Attribute | Description |
|---|---|
| | The user name can be changed after creation. |
| First Name | **Required** to create the user. Enter the first name of the person using this User ID. |
| Last Name | **Required** to create the user. Enter the last name of the person using this User ID. |
| E-mail | Enter the person's work email address. |
| Phone Number | Enter the phone number at which the person can be reached during work hours, if applicable. |
| Mobile Phone Number | Enter the phone number of the person's cell phone, if applicable. |
| Employee ID | Enter the person's employee ID |
| Auxiliary User ID | Enter a secondary user ID |
| Card ID | If the user is provided with a security access card, enter its number here. |
| Shift | (optional) Use the drop-down list to select which shift this user is assigned to.<br>Shifts are created and maintained in Portal > Scheduler.<br>The shift of a user is only used for Automatic Log offs and the Operator Audit report. |
| Initial Level | Required only during user creation.<br>Choose the Level for the new User:<br>**Not Authorized**: this is Level 0.<br>**New User**: this is Level 1 and is the default.<br>**Standard User**: this is Level 2.<br>**Decertified User**: this is Level 3.<br>**Power User**: this is Level 4. |

| Attribute | Description |
| --- | --- |
| Locked Out Until | If true, the user will be unable to login until the specified date. |
| Password | Required to create the user. Enter an initial password for the new user. Password complexity can be controlled in the security app configuration. Contact a PINpoint representative to enable and customize these features. If a password is changed using the csv import or manually on the website then the user must enter a new password on the next login. |
| Confirm Password | Required to create the user. Use this field to confirm the string entered as the new user's password. |
| Upload an Image | Click the browse button and navigate to an image file depicting the person. |
| Role Template | The role template assigned to the user. The user can either have a role template which is a set of roles, or a individual roles from the role list. |
| Station Template | The station template assigned to the user. The user can either have a station template which is a set of station access levels, or individual station access levels from the station access list. |
| Authentication Type | **Required.** Local users are managed entirely in PINpoint.<br>External users have details which are imported from an External Identity Provider.<br>Changing an account from using local authentication to external authentication will delete the password from the PINpoint system. |

## Line Control Access (LCA)

Users are given LCA access at specific station in the user station access list, or if the user has a station template. If a user has LCA access they can log in to the LCA slot on the SmartScreen client. The abilities granted to a user are setup as roles.

## Delete and Anonymize

Deleting a user will mark the user as deleted. The data stored against the user will not be deleted and will reference the user name. The user can be restored or anonymized once they have been deleted.

Anonymizing a user will permanently remove the user information of the user. The user name will change to *Anonymous#*. The data stored against the user will refer to the new user name.

# Roles Tab

The **Roles** tab is used to view the Roles and what permissions each role grants. Each role lists the number of Users who have the role.

Role definitions

| Role | Description | Group |
|---|---|---|
| AddUserOnly | Allows the ability to add a user without setting the roles. | Security |
| AllowAcknowledgeAndon | Allows a user to activate an andon button if the andon button requires it. | SmartScreen Client Supervisors |
| AllowAcknowledgeFasteningLock | Allows a SmartScreen supervisor to acknowledge a level 2 fastening lock. | SmartScreen Client Supervisors |
| AllowAcknowledgeProductQuality | Allows a SmartScreen supervisor to acknowledge product quality. | SmartScreen Client Supervisors |
| AllowAddRemoveLatchBypass | Allows a SmartScreen supervisor to add or remove a Latch bypass on a station or a step. | SmartScreen Client Supervisors |
| AllowAddRemoveStepBypass | Allows a SmartScreen supervisor to add or remove a bypass on a step or all steps. | SmartScreen Client Supervisors |
| AllowAdjustFasteningCount | Allows a SmartScreen supervisor | SmartScreen Cli- |

| Role | Description | Group |
|---|---|---|
| | to manually adjust fastening counts for fastening operations. | ent Supervisors |
| AllowApproveDefects | Allows a user to approve a defect that has advanced to the **Resolved** status. | SmartScreen Cli-ent Supervisors |
| AllowChangeReadOnly | Allows a LCA to modify the value of a read-only operation. | SmartScreen Cli-ent Supervisors |
| AllowCreateDefects | Allows a user to create a defect. An LCA does not require this role to create a defect. | SmartScreen Cli-ent Supervisors |
| AllowManageConnections | Allows a SmartScreen supervisor to manage connections. | SmartScreen Cli-ent Supervisors |
| AllowRejectUnreject | Allows a SmartScreen supervisor to reject or unreject a Build Item on the SmartScreen Client. | SmartScreen Cli-ent Supervisors |
| AllowResetOperations | Allows a SmartScreen supervisor to reset operations on a step or all steps. Users with this role will be able to unlock locked tools when resetting operations. | SmartScreen Cli-ent Supervisors |
| AllowResolveDefects | Allows a user to resolve a defect. An LCA does not require this role to resolve a defect. | SmartScreen Cli-ent Supervisors |
| AllowToolCalibration | Allows a user to calibrate tools on the SmartScreen client. | SmartScreen Cli-ent Supervisors |
| AllowUnlockIPV | Allows a SmartScreen supervisor to acknowledge IPV level 2 locks if the IPV lock requires it | SmartScreen Cli-ent Supervisors |
| CertificationNotRequired | A user with this role is not required to view certifications | SmartScreen Cli-ent |

| Role | Description | Group |
|---|---|---|
| | when they login. | |
| ConfigurationEditor | Allows the user to view and edit the Configuration web app and shared filtered views. | Configuration |
| ConfigurationViewer | Allows the user to view the Configuration web app and store personal filtered views. | Configuration |
| DashboardReclassifier | Allows the user to perform reclassification actions on the Dashboard web app. | Dashboard Website |
| DashboardViewer | Allows the user to access and view the Dashboard web app. | Dashboard Website |
| MaintenanceNotRequired | Users with this role are not required to view Maintenance items when they login. | SmartScreen Client |
| ManageTemplates | Allows the ability to add, edit, and delete security templates. | Security |
| ManageUserRoles | Allows the ability to set the user roles for users. A user with this role cannot add, edit, or delete users. | Security |
| ManageUsers | Allows the ability to add, edit, and remove users and set roles. | Security |
| NotRequiredToViewDocs | Users with this role are not required to view any documents when they login. | SmartScreen Client |
| OverCycleCategorizer | Allows a user to categorize over cycle time on the SmartScreen Client. | SmartScreen Client |

| Role | Description | Group |
|---|---|---|
| QualificationsNotRequired | Users with this role are not required to have be qualified at any station when they login. | SmartScreen Client |
| ReportingWebEditor | Allows the user to edit and save changes on the Analytics reports. | Reporting |
| ReportsViewer | Allows the user to access and view the Reports web app. | Reporting |
| SectionManager | Allows the user to assist with certifications. When another user views a certification during login they require a section manager to complete the certification with them. | SmartScreen Client |
| ShiftAdmin | Allows the user to create, update, and delete shifts on the Scheduler web app. | Scheduler |
| ShiftScheduleAdmin | Allows the user to the create, update, and delete shift schedule periods on the Scheduler web app. | Scheduler |
| ShiftScheduleViewer | Allows the user access to the shift schedule period view on the Scheduler web app. | Scheduler |
| ShiftViewer | Allows the user access to the shift view tab on the Scheduler web app. | Scheduler |
| SMARTBuildAdmins | Allows access to the SmartBuild administration group. | SmartBuild |
| SmartbuildAdvanced | Allows the user to access the Advanced View on the SmartBuild app. | SmartBuild |

| Role | Description | Group |
|---|---|---|
| SmartbuildBuildReadWrite | Allows the user to access the Build View on the SmartBuild app. | SmartBuild |
| SmartbuildDataManagerAdmins | Allows the user permission to manage the data managers on the SmartBuild app. | SmartBuild |
| SmartbuildHardware | Allows the user to access the Hardware View on the SmartBuild app. | SmartBuild |
| SmartbuildMessagingReadWrite | Allows the user to create, update, and delete messages on the SmartBuild app. | SmartBuild |
| SmartbuildNotificationReadWrite | Allows the user to create, update, and delete notifications on the SmartBuild app. | SmartBuild |
| SmartbuildProcess | Allows the user to access the Process tab on the SmartBuild app. | SmartBuild |
| SmartbuildReadOnly | Allows the user to view the SmartBuild app. | SmartBuild |
| SmartbuildReadWrite | Allows the user to create and modify items in the SmartBuild app. | SmartBuild |
| SmartScreenAdmin | Allows the user to view and modify configuration on the SmartScreen web app. | SmartScreen Website |
| SmartScreenViewer | Allows the user to view the SmartScreen web app | SmartScreen Website |
| TeamLead | Allows the user to assist with certifications. When another user views a certification during login they require a team lead to complete the certification with them. | SmartScreen Client |

| Role | Description | Group |
|---|---|---|
| TimeZoneAdmin | Allows the user to change Plant time zones on the Scheduler web app. | Scheduler |
| TimeZoneViewer | Allows the user to access the Plant time view tab on the Scheduler web app. | Scheduler |
| TrackingAllowRejectUnreject | Allows a User to reject or unreject a build item on the Tracking web app. | Line Tracking |
| TrackingBatchInsert | Allows the ability to insert batches of work order items using the Tracking web app. | Line Tracking |
| TrackingWebEditor | Allows the user to edit and delete build items on the Tracking web app. | Line Tracking |
| TrendsViewer | Allows the user to access and view the Trends web app. | Trends Website |
| UnplannedDowntimeAdmin | Allows the user to create, update, and delete downtime events. on the Scheduler web app. | Scheduler |
| UnplannedDowntimeViewer | Allows the user access to the downtime event view on the Scheduler web app. | Scheduler |

## Line Control Access (LCA)

Users must be set as an LCA at each specific station in the Security web app.

The following abilities can be granted to a user with the Line Control Access role at the SmartScreen client if they have logged into the LCA slot. Some of these abilities require specific roles in the security app. Some of these abilities can be granted to the operator in SmartBuild.

### When selecting an operator

Update the badge for a user with Card Update

## Build Items

- Use buttons on the Settings, Controls tab
- Station Bypass (Role)
- Load Build Items out of sequence on the Work Orders menu
- Select or type in the Serial Number if 'load by scanning only' is true
- Reject a Build Item (Role)
- Place a Build Item on hold
- Locate a Build Item if restricted
- Complete the rebuild window if restricted

## Tools

- Start and stop devices on the Settings, Connections tab (Role)
- Enable tools if they are disabled because the fastening operation is complete
- Acknowledge a locked tool which unlocks it (Role)
- Manually add Rundowns or Removals in the Fastening tab (Role)
- Change the tool direction

## Steps

- Move to any step
- Bypass a step completing it (Role)
- Latch bypass a step completing it (Role)
- Reset step to the original state (Role)
- Reset all the steps in a branch (Role)
- Adjust the values of any operation which is read-only
- Reprint a label
- Acknowledge steps that are bypassed (Role).

Operators are always allowed to acknowledge steps that are bypassed or incomplete at a repair station without an LCA.

## Maintenance

- Override a maintenance item if an operator cannot complete it

## Andon

- Clear andon button states if they are restricted to the LCA role

# Role Templates Tab

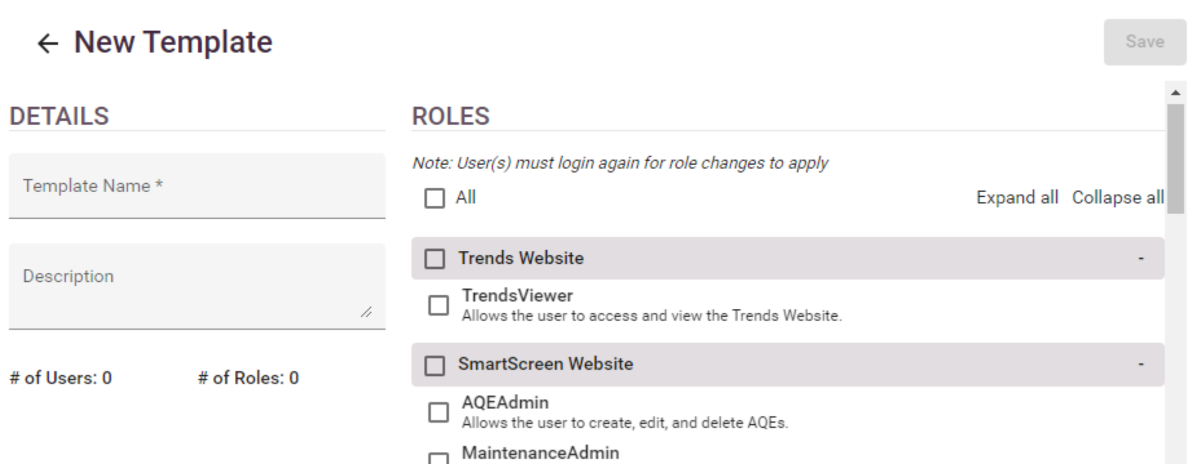
The **Role Templates** tab allows users to create, edit, and delete Templates. A Template is a set of roles that can be assigned to users instead of applying each role to each user.

## Create Template

To create a Template, follow these steps.

1. Click the **Role Templates** tab
2. Click the **New Template** button.
3. Enter the Template Name, Description and select the roles for the template.
4. Save

New Template Example




# Role Template Map

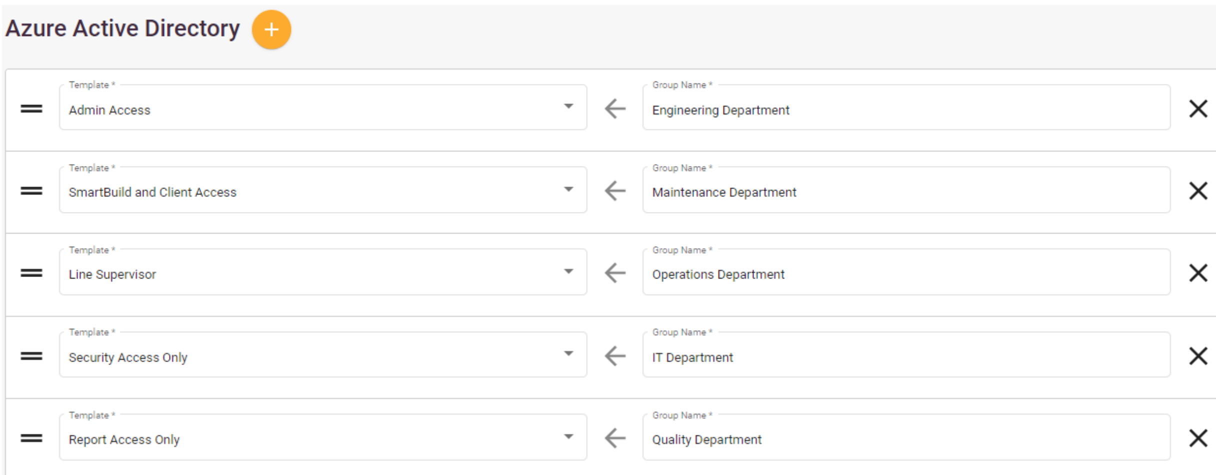
The Role Template Map allows an external user account to be assigned a Template in PINpoint during login. A user in an external identity provider may be assigned multiple Group Names. A user in

PINpoint may only have one Template. The Role Template Map is a ranked list of PINpoint templates and the Group Name from the external identity provider which maps to it.

PINpoint configures the claim mapping for an external identity provider during system setup. The Group Name to Role Template Map can be modified as needed. Changes will take effect immediately.

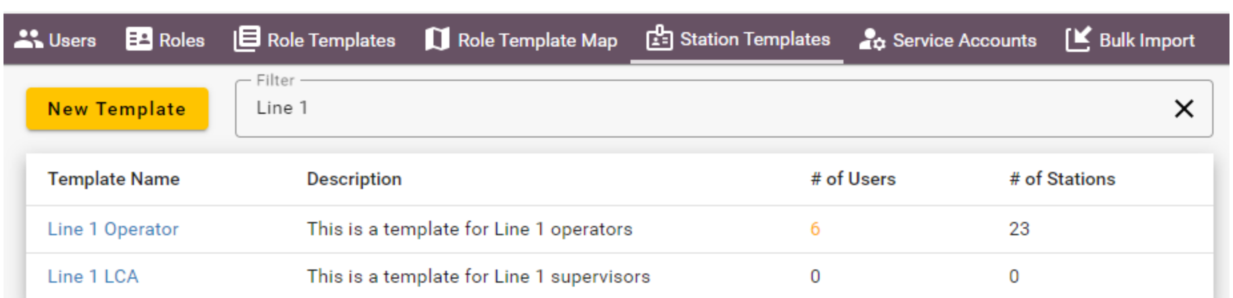
An example of a Role Template Map. In this example a user with a set of Groups listed on the right in the external identity provider will be assigned the highest ranked PINpoint Template listed on the left.




# Station Templates Tab

The **Station Templates** tab allows users to create, edit, and delete Station Templates. A Station Template is a set of station access levels that can be assigned to users instead of applying each access level to each user. Selecting the number of users assigned to a template shows the list of users assigned to the template.

Station Templates Tab



### Template Defaults

The template defaults for Trainer, LCA and station level, are access levels which will be granted to users of this template when new stations are added. The LCA access level only allows a user to login to the SmartScreen client as an LCA, the user must also have specific roles to perform actions after login.

### Changing User Levels

The station level assigned in a the template is the starting level for users. Changing and then saving the station level in a station template applies the station level to user's according to the following rules.

- If a user has a lower level than the template does at a station, and then station template is applied to the user, the user's level at that station will be raised to match the template.
- If a user has a higher level than the template does at a station, and then the station template is applied the user, the user's level will not be lowered to match the template.
- If the station level is Not Authorized and the station template is applied to the user then the user's station level will be changed to Not Authorized.

### Users Not Assigned To Station Templates

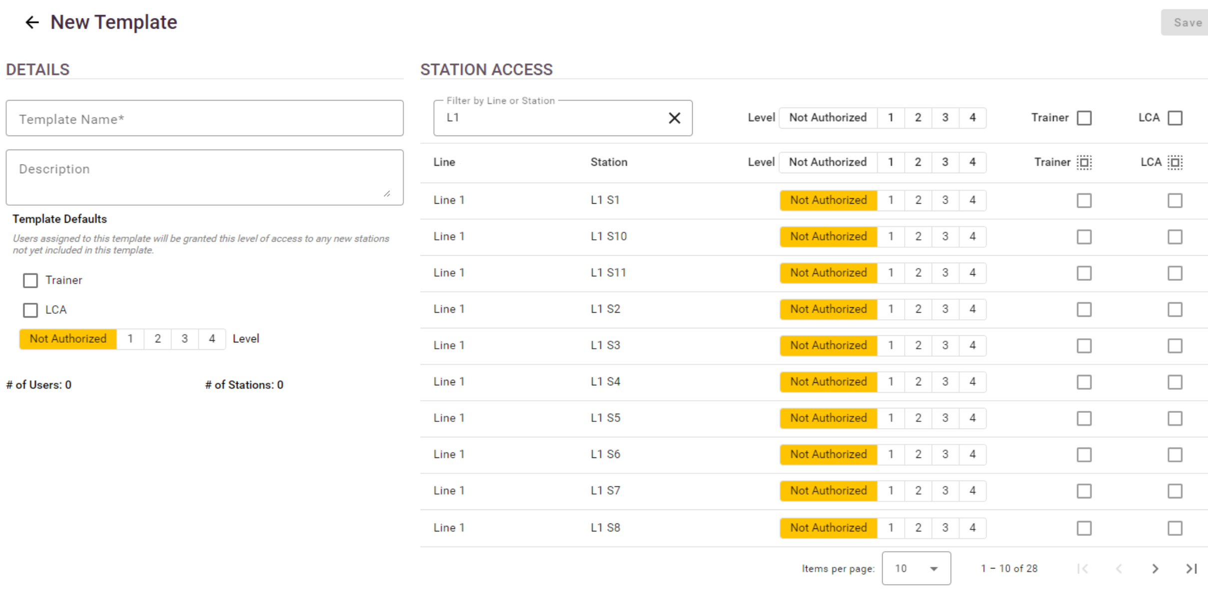
Users which are not assigned to a station template will begin at level 1 at all current stations. Users which are not assigned to a station template will be granted level 1 at any new stations.

## Create Template

To create a Station Template, follow these steps.

1. Click the **Station Templates** tab
2. Click the **New Template** button.
3. Enter the Template Name, Description and select the station access levels for the template.
4. Enter the Template Defaults.
5. Save

New Template Example




# Service Accounts

The Service Accounts tab allows service accounts to be added to the PINpoint System. Service Accounts are required to authenticate applications and services.

# Bulk Import

The Bulk Import tab allows users to be created, modified, deleted, and anonymized, by importing a spreadsheet.

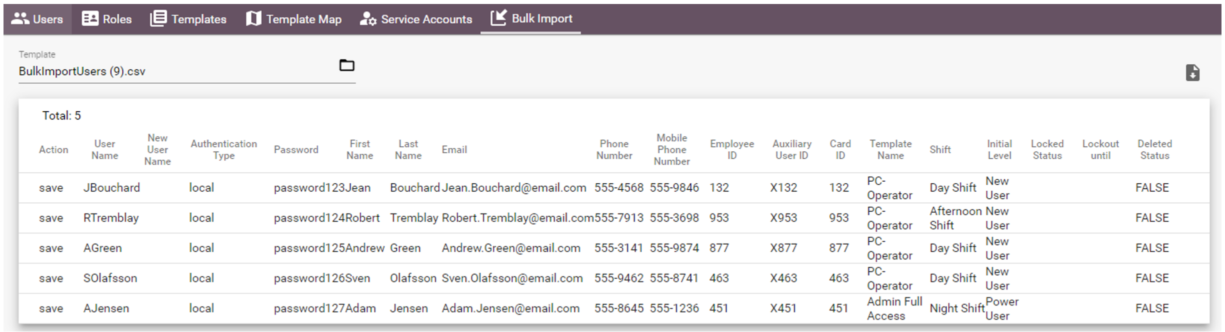
The template to upload users can be downloaded and edited in Microsoft Excel. On the Users tab the list of users can be exported and then edited and uploaded on the Bulk Import tab.

## Import Users

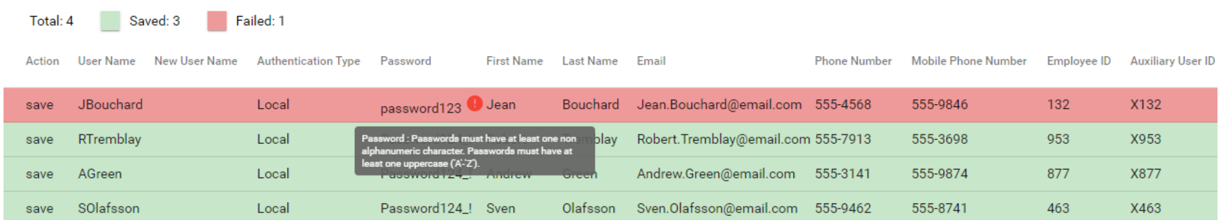
To import users select the file to import, review the preview, and then push the checkmark in the corner to validate and process the changes. An error will be displayed if the row cannot be imported.

An example of a bulk import preview.




An example of errors in the bulk import spreadsheet. Rows without errors will be saved.




Notes about the table used to import users

| Column | Note |
| --- | --- |
| Action | **Save** - Saves the changes to the user<br>**Anonymize** - Anonymizes the user by removing identifying information. This cannot be undone. This action will only be performed if the user is already deleted. |
| New User Name | The user name will be changed to this value on save. |
| Authentication Type | Changing an account from using local authentication to external authentication will delete the password from the PINpoint system. |
| Deleted Status | If this is TRUE the user will be deleted. If the user is already deleted and this is FALSE the user will be restored. |

# Operator Levels

Operator Levels are meant to reflect the relative competence a user has at a given station. Operator levels exist to ensure operators who need a trainer cannot login alone. If a user with Line Control Access logs in as an operator they do not require a trainer. A Trainer, and an LCA are roles which are set for each user at each station but they do not change when the user's level changes.

Operator Level definitions

| Term | Definition |
|---|---|
| Level 0<br><br>Not authorized | The user cannot login.<br><br>This is a special level which is manually set. |
| Level 1<br><br>New User | The user requires a trainer.<br><br>The user must view all certifications applicable to this station even if they have already viewed them.<br><br>This is a special level which is set when a user is created. |
| Level 2<br><br>Standard User | The user requires a trainer.<br><br>The user must view all new certifications applicable to them and to this station. |
| Level 3<br><br>Decertified User | The user does not require a trainer.<br><br>The user must view all certifications applicable to this station even if they have already viewed them. |
| Level 4<br><br>Power User | The user does not require a trainer.<br><br>The user must view all new certifications applicable to them and to this station. |

# Operator Levels and Training

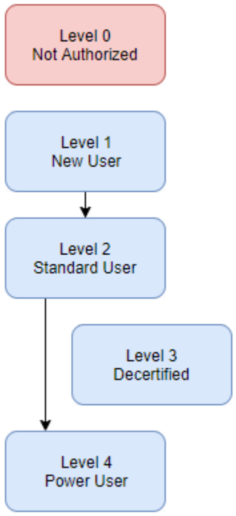
There are five possible levels for an operator when working at a SmartScreen client. Levels are assigned on a per station basis. An operator can have different levels at different locations. For example they can be level 2 at station X and level 4 at station Y. Levels are mutually exclusive for a given location.

Regardless of the level, the operator must view all unacknowledged training documents upon logging in for the first time, even if they are manually set to Level 4. New documents that are deployed also require viewing no matter what the operator’s current level is.

There are several factors that affect an operator’s level at a station. The very first time a user logs in to station they will immediately be increased from Level 1 to Level 2. The default level progression skips Level 3 as the following diagram shows. Level 0 can only be set manually.

The default user progression

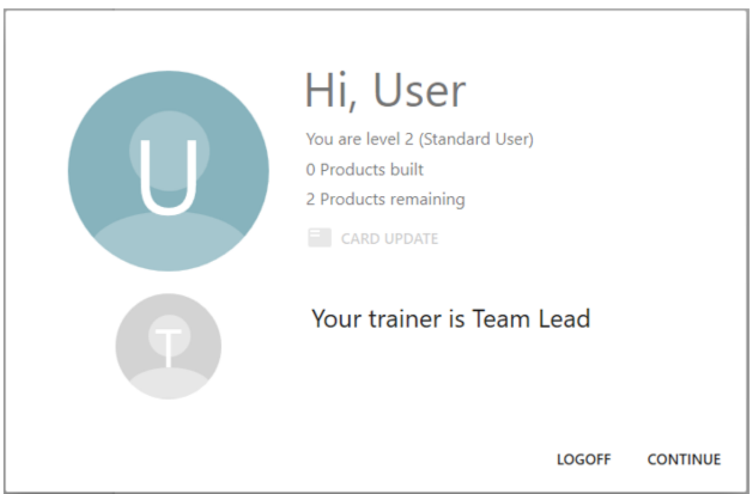
 




The fundamental reason Operator Levels exist is to control whether the operator requires a trainer to be logged in with them while they work. If **Trainer Concept Enabled** is true then trainers will be required to log in when a user requiring a trainer logs in. If **Trainer Concept Enabled** is false then trainers are not required, but user levels can still be reported on.

If the operator is level 1 or level 2, they will be prompted for a trainer when they attempt to login. The trainer must be present and type in their password or scan their card/badge.

The team lead login




Users must be set as trainers on a per station basis because they may have different experience levels at different location within the plant. Therefore, it is common for a given operator to have different trainers as they move around to different locations. Users can be set as trainers at specific stations in the security web app.

## Promotion

After some time, a standard user will want to be promoted to a power user so that they can login and work on their own without a trainer. There are three ways that this can happen in the system.

1. Manually from the Security web app.
2. Manually from a SmartScreen client, the station property **User Level Promotion Button Enabled** must be checked to make the promote button visible.
3. The system can promote users automatically based on the number of products built at the station. The plant setting **Auto Promotion/Demotion** must be checked and the station setting **Product Count For Power User Promotion** must be configured to promote the user after a certain amount of products built. The product count increases when the station is complete. When the count is reached, the operator's level will change the next time they login to that station. Products built are counted on a per station and apply to the user level at that station only.

## Demotion

To decrease the level back to 2 and make the operator require a trainer again. There are several options to demote an operator to level 2:

1. The station property **Product Count for Power User Demotion** will demote a user based on the amount of products completed at a station, with 100% completed products being counted towards the total. When the count is reached, the operator's level will change the next time they login to the station.
2. The station property **Day Count for Power User Demotion** is based on a number of elapsed days. This allows the user level to be changed on a cycle, for example every 90 days the operator will be demoted to level 2 and require a trainer again. The number of days is measured against the last time that the operators level changed at that station. The system does not consider holidays or the last time the user logged in to the station, so the cycle should always be static.
3. Another way for operators to be demoted to level 2 is to deploy a station document (Quality Alert, Work Instruction, or Message Video) with the option **Demote Operators to Level 2** checked. Upon logging in, not only will they need to view the document, but a trainer will also be required, and the cycle will start again. This feature ensures that when there is a change to the process at a station the operator must view the new instructions.

## Certifications

Certifications are checklists which a user must view periodically. They must be completed by the operator and verified by their team lead and section manager. Certifications must be completed for each station an operator works at.

A Level 1 user is required users to view all certifications. Level 2 users do not need to view certifications even if they are required to see them, unless the certifications are newly added and have never been viewed, because they log in with a trainer.

Level 3 exists to facilitate the operator viewing certification documents again while **not** requiring a trainer to login. When the user is decertified (changed to level 3), they will be prompted to view certifications upon logging in, and then will be immediately increased back to level 4 afterwards. Users are rarely at level 3 for very long, typically just while they are actively being certified.

When an operator is decertified, they are set to level 3 only at the station that they have attempted to login in to. Since certifications can be assigned to the plant, line, or station, the operator will need to view all certifications relevant to that location. For example, the operator will need to view the station certifications AND the line certifications again since they both apply to that station. A Level 3 user is required to view the same certifications as a new (level 1) user would have to. Note that these settings will demote the operator regardless of the Auto Promotion property.

The plant setting **Days Not Worked for Demotion** can be used to ensure that all operators have current certifications. A user will be demoted from Power User to Decertified User if they have not logged into a station in this many days. The user level is changed during login. This changes the user's level per station. Care should be taken around extended holidays to avoid all operators being demoted to level 3 and requiring recertification after they return from the break.

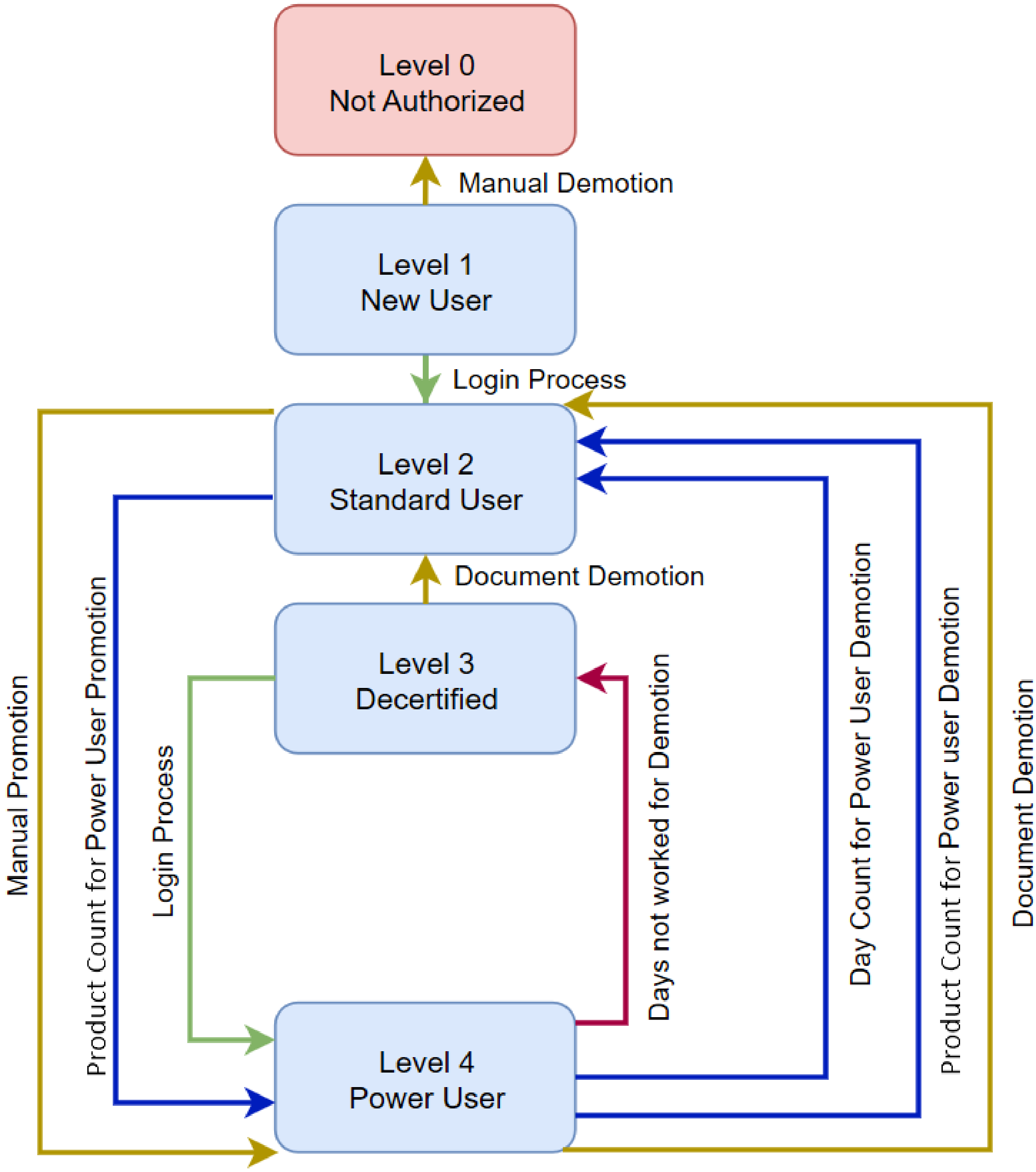
The logic to find the amount of days is: Find the last time the user logged into that station as an operator. Count the number days between then and now. Compare if said number is greater than what’s specified in the plant setting **Days Not worked For Demotion** and demote the user at that station.

## User Level Diagram

Users can be manually promoted or demoted to any level using the Security web app.

The User Level diagram details how users are promoted and demoted. See the table for the location of each setting:




### *List of settings which affect user level promotion and demotion:*

#### SmartBuild

| Plant Settings Properties List | |
|---|---|
| Auto Promotion/Demotion | If true then the station settings *Day Count for Power User* |

| Plant Settings Properties List | |
|---|---|
| | *Demotion, Product Count for Power User Demotion, Product Count for Power User Promotion* will change a user's level when they login at the SmartScreen client. |
| Days Not Worked For Demotion | A user will be demoted from Power User to Decertified User if they have not logged into a station in this many days. The user level is changed during login. This changes the user's level per station. |

| Station Properties List | |
|---|---|
| Day Count for Power User Demotion | A user will be demoted from Power User to Standard User this many days after their user level was last changed. The user level is changed during login. This changes the user's level per station. This requires that the plant setting *Auto Promotion/Demotion* is set true. |
| Product Count for Power User Demotion | A user will be demoted from Power User to Standard User this many serial numbers after their user level was last changed. The user level is changed during login. This changes the user's level per station. This requires that the plant setting *Auto Promotion/Demotion* is set true. |
| Product Count for Power User Promotion | A user will be promoted from Standard User to Power User this many serial numbers after their user level was last changed. The user level is changed during login. This changes the user's level per station. This requires that the plant setting *Auto Promotion/Demotion* is set true. |
| Trainer Concept Enabled | If this is true then the station will require a trainer to login with users who require one. If this is false then the station will not require a trainer to login with users who require one. |

## SmartScreen

| Document |
|---|

| Document | |
|---|---|
| Demote Operators to Level 2 | If this is true users who are affected by this document will be demoted to level 2 when they login. The purpose of this is to require users to view a document with a trainer when the document is deployed. |

# Scheduler

The **Scheduler** tab is used to set up shifts and shift schedules for both reporting and user management. The scheduler allows the user to create shifts and plan schedules for production and then use those schedules to automatically log off users at designated times.

The scheduler is split into the following tabs:

- Schedules
- Settings

## Schedules

The **Schedules** tab allows the user to assign Shifts to Lines, to define time-usage within a Shift, and to assign production targets to the Line for that shift. The tab enables the user to create and define new Shifts (of the types defined in the **Settings** tab; see "Line Auto Logoff" on page 251) and their start and end times.

### Schedules Tab Definitions

The following definitions summarize concepts encountered in this section.

Schedules tab definitions

| Term | Definition |
|---|---|
| Shift | A Shift is an actual work period between a Start and End time, which is itself divided into Time Periods, and can have Targets applied to it. |
| Time Period | A Time Period is a division of the time of a Shift, and can be set to one of the following categories:<br>Production<br>Break/Lunch<br>Unassigned<br>Downtime<br>Overtime<br>PM Time<br>A Shift may be divided into multiple Time Periods, but its time must be |

| Term | Definition |
|---|---|
| | allotted to at least one.<br>Time periods must be divided into 5 minute increments when entered. The minimum amount of time which can be split is 15 minutes however the minimum time period is 1 minute when manually adjusted. |
| Goal | The amount of items which must be produced during a shift. If the takt time is entered this is calculated. |
| Projected | The amount of products to be built during the shift. This is based on the amount of products completed and the amount of takt time cycles remaining. See Performance calculations for more information. |
| Takt | The ideal cycle time for a station during a shift. This represents the perfect cycle time for a station if there were no losses. If the goal is entered this is calculated. |
| Cycle Time | The cycle time for a station is a percentage of the takt time. This represents the cycle time the operator is expected to achieve. This can be calculated using a percentage of the takt time or it can be entered manually. It cannot be greater than the takt time. |

## Cycle Time

The cycle time for a station is intended to aid users in determining if a station has fallen behind the intended production goal and requires attention. The cycle time value in the PINpoint system is used to visualize this in many different areas of the reports and the dashboard.

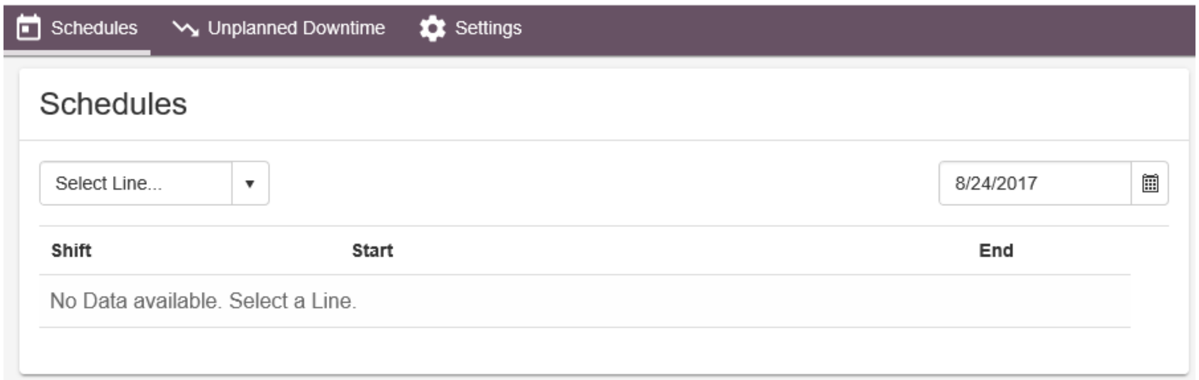
The cycle time for a station is used to trigger Cycle Time Warning events and Cycle Time Over events. The Cycle Time value on the scheduler tab is calculated from the takt time (or from the goal) for a shift at a line. The cycle time for a station can also be configured in the SmartBuild Process Tab by selecting a process and then selecting a station which is linked underneath it and setting a value for the Cycle Time Target. A station can have multiple active steps and the cycle time can be recorded for more than one step at a time if the station configuration property Count Cycle Time on All Steps is enabled.

The Cycle Time configured on the scheduler tab will determine the axis on charts on the Dashboard app. The Cycle Time value on the scheduler app is used on the SmartScreen client unless the process for the build item currently loaded at a station has the Cycle Time Target in the Process Tab set. If a build item loads more than one process then the Cycle Time Target for each process will be summed.

# Viewing Shifts

By default, Scheduler opens to a pane that presents Shifts. It can also be accessed from the other panes by clicking the Scheduler link in the tab's menu bar.

Schedules tab

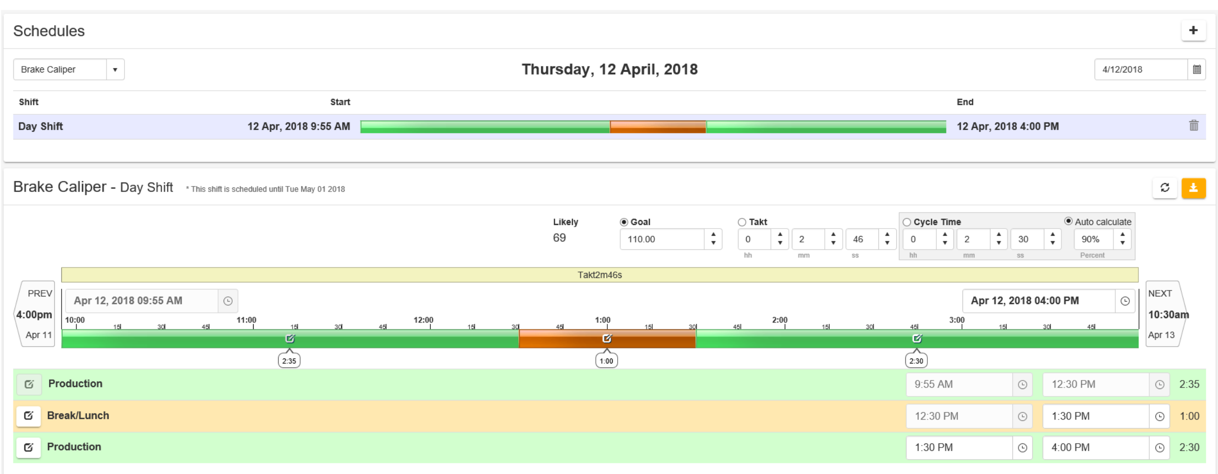



To view Shifts, follow these steps.

1. Click on the **Portal > Scheduler** button. The **PINpoint Scheduler** app opens.
2. Click the **Select Line...** drop-down menu and select the Line the desired Shifts. If necessary, type a string into the search field and click the magnifying glass icon to narrow the available options to Lines that match the search string.

   The Shifts for the Line selected are displayed.

Shifts displayed



# Add Shift

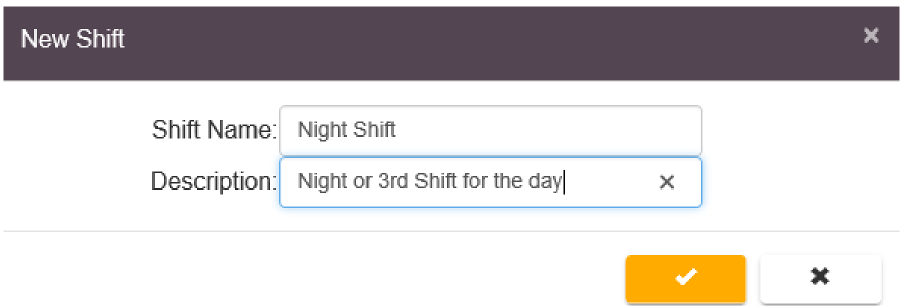
Shifts are added to the Schedule and set up in the Scheduler tab, but they are actually created in the Scheduler's Settings tab.

To begin the process of adding a Shift to a day, follow these steps.

1. Click on the **Portal > Scheduler** button. The **PINpoint Scheduler** app opens.
2. Click the **Add Shift** button.

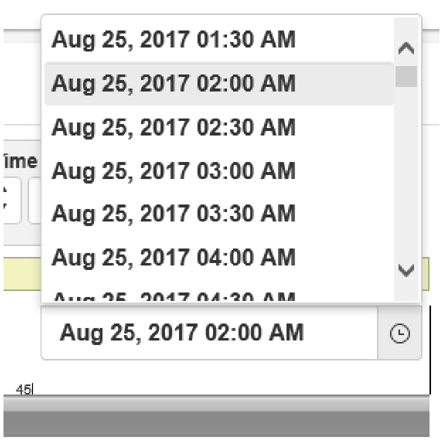
   The **Add Shift** dialog opens.

   Add Shift dialog

3. Use the **Shift** drop-down menu to select which shift type to add to the Line's schedule.
4. Use the **Start** drop-down menu to select the start time for the Shift.
5. Click the **Save** button. The new Shift is displayed in the list of Shifts.
6. By default, the length of the new Shift is one hour. Click the **End Time** drop-down menu to designate the end time and length of the Shift.

   Select End Time

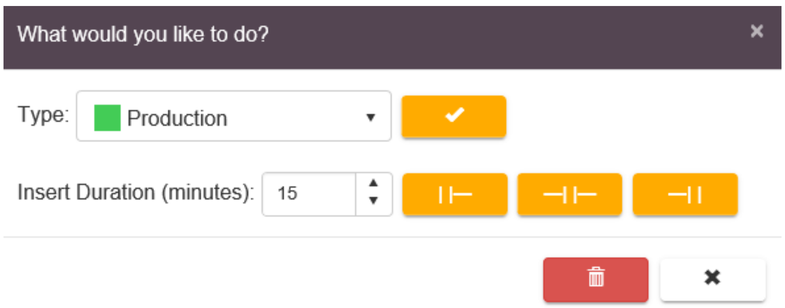
7. By default, the new time is added to the Shift as a separate Time Period. To unify the two Time Periods, click the **Edit Shift** icon of the single-hour Time Period.

   Edit Shift button

   The **What would you like to do?** dialog opens.

   What would you like to do? dialog

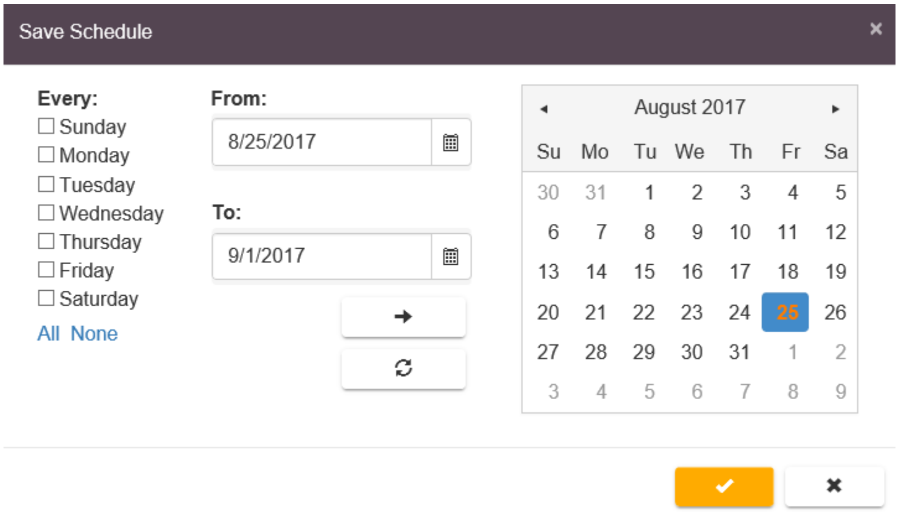
   


8. Click the **Delete** button. The Time Period is deleted and its time is merged into the other Time Period.
9. Click the Edit Shift button of the unified Time Period. The **What would you like to do?** dialog opens.
10. Click the **Type** drop-down menu and select **Production.**
11. Click the **Change** button (green with a white check mark). The Shift is now designated Production time, and can be further subdivided into Time Periods if desired. See "Add Time Period" on page 247 to do so.
12. Click the **Save Options** button.

    Save Options button

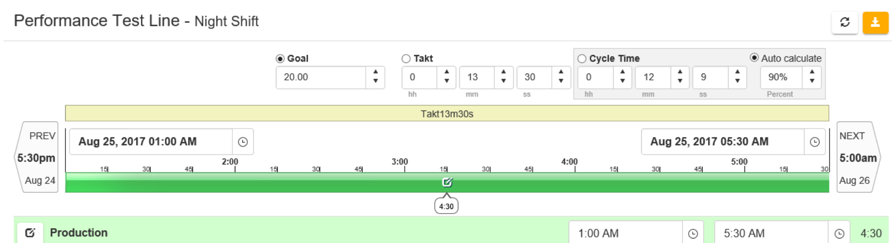
    

    Save Schedule dialog




13. To simply save the new Schedule without determining its application into the future or particular days, click the **Save** button. This can be changed later after the Schedule has been divided into Time Periods.

    Schedule created

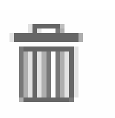



## Delete Shift

To delete a Shift, follow these steps.

1. Click on the **Portal > Scheduler** button. The **PINpoint Scheduler** app opens.
2. Click the **Select Line...** drop-down menu and select the Line and Shifts. If necessary, type a string into the search field and click the magnifying glass icon to narrow the available options to Lines that match the search string.
3. Select the Shift and click its **Delete** button.

    Delete button



The **Delete Shift** dialog opens.

4. Click the **Delete** button to confirm the deletion. The Shift is removed from the list of the day’s Shifts.

   Removing a Shift applies only to the day selected. To apply if into the future, click the Save Options button and select a date range.

## Add Time Period

Time Periods define the expected activities for particular segments of time during a Shift. By default, when creating a Shift, all of its time is allotted to Production (represented in green). Most Shifts, however, will include segments for breaks and for setup and cleanup between Shifts. Some Shifts include Overtime periods beyond the typical eight-hour workday. All of these can be designated by dividing the Shift up into Time Periods.

Rules for Time Periods:

- Time Periods in the same Shift cannot overlap.

To create a Time Period, follow these steps.

1. Click on the **Portal > Scheduler** button. The **PINpoint Scheduler** app opens.

2. Click the **Select Line...** drop-down menu and select the Line and Shifts. If necessary, type a string into the search field and click the magnifying glass icon to narrow the available options to Lines that match the search string.

3. Click the **Edit Shift** button found at the center of Shift.

   The **What would you like to do?** dialog opens.

4. Use the Type drop-down menu to select the Time Period type and create in the Shift.

5. Enter a value in the **Insert Duration (minutes)** field. This is the amount of time in the Shift to be allotted to the new Time Period.

6. Click one of the three blue buttons to determine where in the Shift the new Time Period should be created: at the beginning of the Shift, in the middle of the Shift, or at the end of the Shift. Note that the precise location of the Time Period can be adjusted once it has been created (see "Edit Time Period" below). The new Time Period is created at the point in the Shift designated.

## Edit Time Period

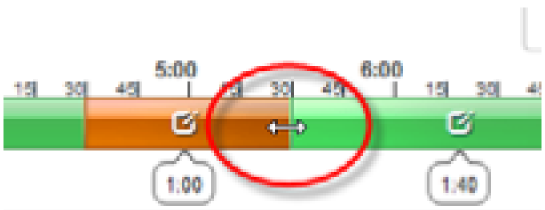
To edit a Time Period, follow these steps.

1. Click on the **Portal > Scheduler** button. The **PINpoint Scheduler** app opens.

2. Click the **Select Line...** drop-down menu and select the Line and Shifts. If necessary, type a string into the search field and click the magnifying glass icon to narrow the available options to Lines that match the search string.

3. Hover the mouse pointer over the dividing line between Time Periods and click-drag the divider to change the amount of time alloted to the Time Period. The length of the neighboring Time Period is automatically adjusted to match.

   Edit Time Period cursor

4. Click the **Save Options** button to apply the change either to the just the current day, or as a change to all subsequent Shifts into the future up to the date designated (see "Copying Current Day Forward" on the facing page).

## Delete Time Period

To delete a Time Period, follow these steps.

1. Click on the **Portal > Scheduler** button. The **PINpoint Scheduler** app opens.

2. Click the **Select Line...** drop-down menu and select the Line and Shifts. If necessary, type a string into the search field and click the magnifying glass icon to narrow the available options to Lines that match the search string.

3. Select the Time Period and click its **Edit** button.

   The **What would you like to do?** dialog opens.

4. Click the **Delete** button. The Time Period is removed from the Shift.

5. Click the **Save Options** button to apply the change either to the just the current day, or as a change to all subsequent Shifts into the future up to the date designated (see "Copying Current Day Forward" on the facing page).

## Add/Edit a Goal

Each Shift can have a Goal set for it. This can be accomplished in either of two ways:

- Provide the number of units to build for that shift, and the system will calculate the maximum takt time required per unit (production time divided by build count).
- Provide the maximum takt time per unit built and the system will calculate the number of items the line can produce during the Shift (production time divided by takt time, with the result rounded down to the nearest round number).

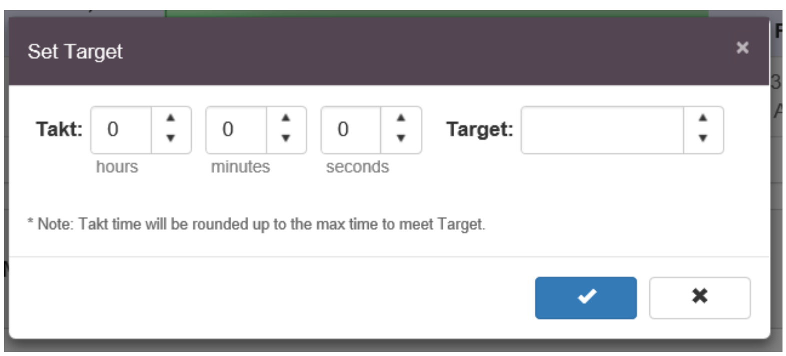
To add a Goal to a Shift, or edit an existing one, follow these steps.

1. Click the **Select Line...** drop-down menu and select the Line and Shifts.
2. Click on the Shift.

   Edit Goal button


   The **Set Target** dialog opens.

   Set Target dialog




3. Enter the target takt time or goal build count.
4. Click the **Save Options** button to apply the change either to the just the current day, or as a change to all subsequent Shifts into the future up to the date designated (see "Copying Current Day Forward" below).

## Copying Current Day Forward

Copying the current day forward makes it easy to propagate any or all of the Shifts set up for a particular day (including their Time Periods and Shift Targets) and apply them moving forward into the future.

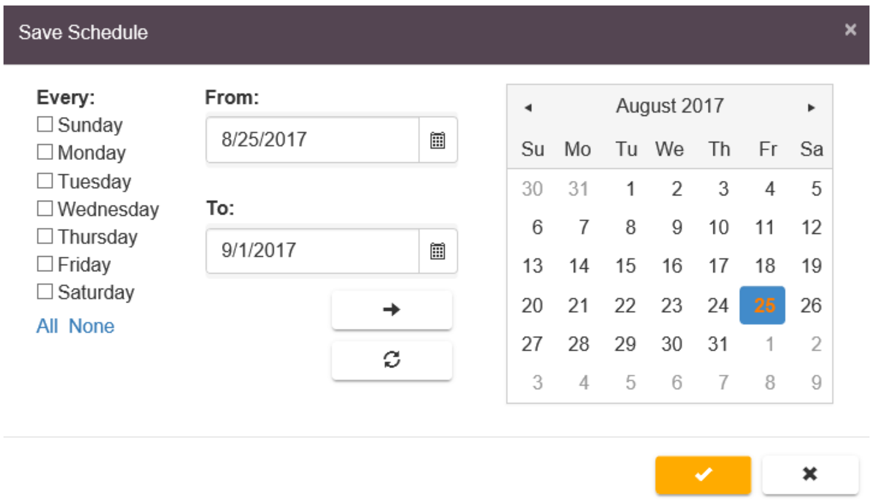
To apply the Shifts and their settings forward into the future, follow these steps.

The follow procedure requires that unsaved changes exist in the selected Shift in order to actuate the **Save Options** button. If necessary, make a small change to some aspect of the Shift and then make a change reversing it in order to actuate the button.

1. When changes are made to a Shift that need to apply into the future, click the **Save Options** button.

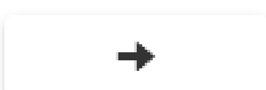
   The **Save Schedule** dialog opens.

   Save Schedule dialog


2. In the **Every:** section, check the days of the week to which that the changes in the Schedule should apply.
3. If necessary, click the calendar icon in the **From:** section and select the date at which the changes in the Schedule should apply. The default is the day following the current date.
4. Click the calendar icon in the **To:** section and select the date at which the changes in the Schedule should cease to apply.
5. Once the date range is selected, click the **Copy Forward** button. The selected days now appear in gold on the associated calendar.

   Copy Forward button

6. Click the **Save** button (blue with white check mark). The changes in the Schedule are copied forward through the date range selected.

# Settings

The Settings tab of the Scheduler interface enables users to create, edit, and delete Shifts; to create and edit Auto Line Logoff Events, and to set the time zone for a facility.

## Shifts

The **Shifts** pane allows the user to create new shifts, edit the names and descriptions of existing ones, and delete non-default Shifts. System default Shifts are:

- Morning Shift
- Afternoon Shift

Shifts pane


The Shifts pane allows the user to create Shifts, but not to assign or edit time periods to them. Defining the time periods of a Shift is done in the **Schedules** tab.

### *Shifts pane Definitions*

Shifts pane definitions

| Term | Definition |
|---|---|
| Shift | A Shift is a work period between a Start and End time, which is itself divided into Time Periods, and can have Targets applied to it. |

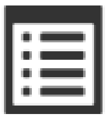
## Line Auto Logoff

The **Line Auto Logoff** pane allows the user to automatically logoff Client operators at set times. This can be programmed to run based on the shift schedule previously defined or based on a specific time. The logoff will occur on every shift in the future.

There are two kinds of Logoffs that can be created. One is based on the periods of an existing shift schedule, and the other is based on specific times.

Line Auto Logoff Button



## Line Auto Logoff Pane Definitions

Line Auto Logoff pane definitions

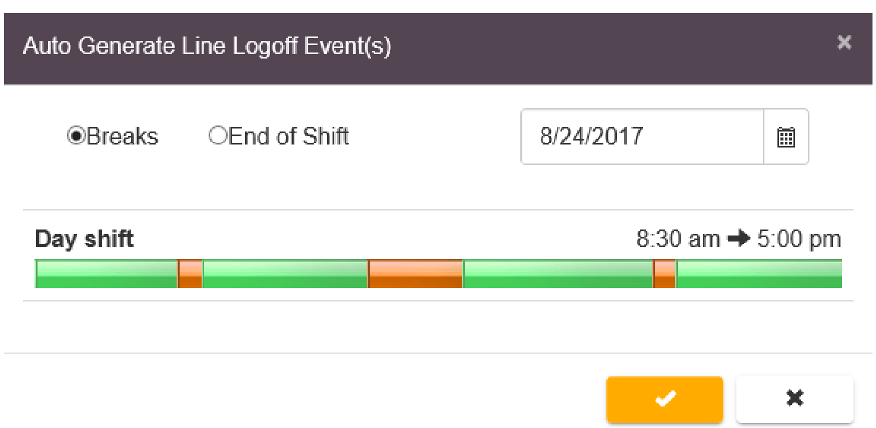
| Term | Definition |
| --- | --- |
| Logoff Event | Line Auto Logoff Schedule events are designed to logoff users at specific times without reference to periods in the shift schedule. |

## Auto Generate from Shift Schedule

To automatically create Logoff Events for a shift based on its scheduled breaks or shift end time, follow these steps.

1. Click on the **Portal > Scheduler** button.
2. Click **Settings**.
3. In the **Line Auto Logoff** pane, use the drop-down menu to select the Line. Existing auto logoff events, if any, are displayed.
4. Click the **Auto Generate** button.

   Auto Generate Line Logoff Event(s) dialog



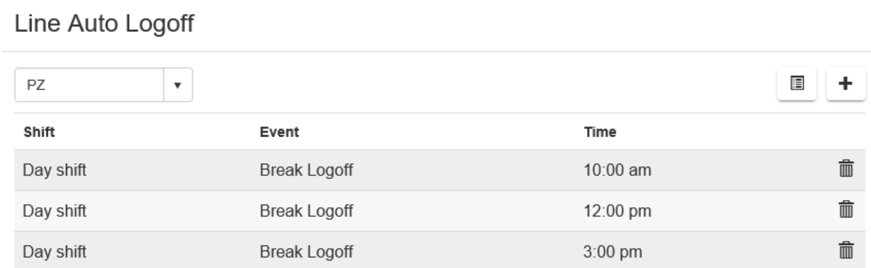

 

5. Use the radio buttons to designate whether logoff events should be automatically generated by the starts of break periods (**Breaks**), or the time the shift ends (**End of Shift**).

6. If necessary, use the calendar drop-down menu to select the start date for the auto logoff event(s).

7. Click the **Save** button. The new automatically-created logoff events appear in the list.

   New Auto Logoff Events




## *Manually Creating an Auto Logoff Event*

To manually create an Auto Logoff Event, follow these steps.

1. Click on the **Portal > Scheduler** button.

2. Click **Settings**.

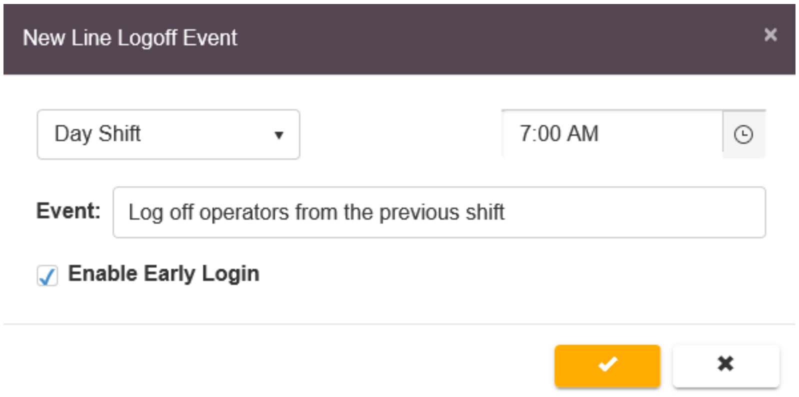
3. In the **Line Auto Logoff** pane, use the drop-down menu to select the Line. Existing auto logoff events, if any, are displayed.

4. Click the **New** button.

   The **New Line Logoff Event** dialog opens.

   New Line Logoff Event dialog




5. Use the drop-down menu to select the shift for which the event will be created.
6. Use the clock drop-down menu to select the time for the Auto Line Logoff Event.
7. In the **Event** field, type a name for the new Auto Line Logoff Event.
8. Set **Enable Early Login:** If true then users from this shift who log in before the shift starts will not be logged off.
9. Click the **Save** button. The new automatically-created logoff event appears in the list.

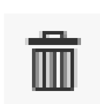
   The Automatic logoff will not work unless the check box is activated for each station in the hardware tab for each Station.

## *Delete a Line Auto Logoff Schedule Logoff Event*

To create a Line Auto Logoff Schedule Logoff Event, follow these steps.

1. Click on the **Portal > Scheduler** button.
2. Click **Settings**.
3. In the **Line Auto Logoff** pane, select the Logoff Event and click its **Delete** button.

   Delete button

4. Click **Delete** to confirm the deletion. The Logoff Event is removed from the list of Logoff Events.

# Plant Time Zone

The **Time Zone** pane provides the ability to change the time zone setting for a plant in the PINpoint system. The time zone can only be changed if the Tracking Data Manager is shut down. The time zone should only be changed if the time zone is incorrect and the time zone setting is required for configuring a schedule. The time zone will be set to the application server time by the Tracking Data Manager when it starts up if it is set incorrectly.

Time Zone pane


## *Time Zone pane Definitions*

Time Zone pane definitions

| Term | Definition |
|---|---|
| Time Zone | The time zone for the plant where the SmartScreen client is run. |

## *Edit Time Zone*

To change the time zone of your facility, follow these steps.

1. Click on the **Portal > Scheduler** button.
2. Click **Settings**.
3. In the **Plant Time Zone** pane, click the **Edit** button.
4. Use the drop-down menu to select the appropriate time zone.
5. Click the **Save** button. The view updates to display the plant's new time zone.

   The time zone cannot be changed while the tracking manager is running. The time zone should be set to the time zone of the actual location of the plant where the SmartScreen client is run. The time zone will be set to the application server time zone by the tracking data manager when it starts up if it does not match.

# Tracking

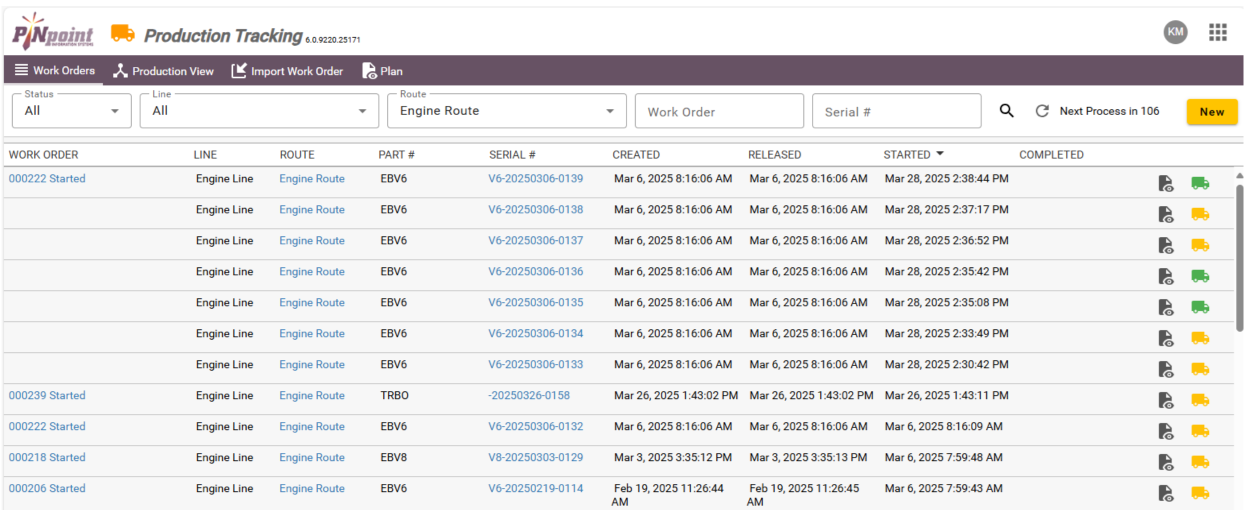
Tracking allows users to plan the production of work orders and move items around the line. It requires the configuration in SmartBuild to be complete in order to function.

**NOTE**: Before Reading this section please read: "Tracking Overview" on page 376

## Work Orders

The work orders tab shows a list of all work orders and their state and allows users to create a new work order. Work orders and work order items can be modified as long as they have not been loaded at a station. A work order can only be deleted if all the items within it have been deleted. Work order items can be deleted or rejected from this tab. Defects can be viewed and resolved. Bypasses and bypass reasons can be viewed.

A Sample Of The Work Orders Tab.




Icons found on the Tracking Work Orders Tab

| Icon | Description |
|---|---|
|  | The quality icon. |
|  | This item has defects. Select to view the defects which were recorded at the SmartScreen client and resolve them. |

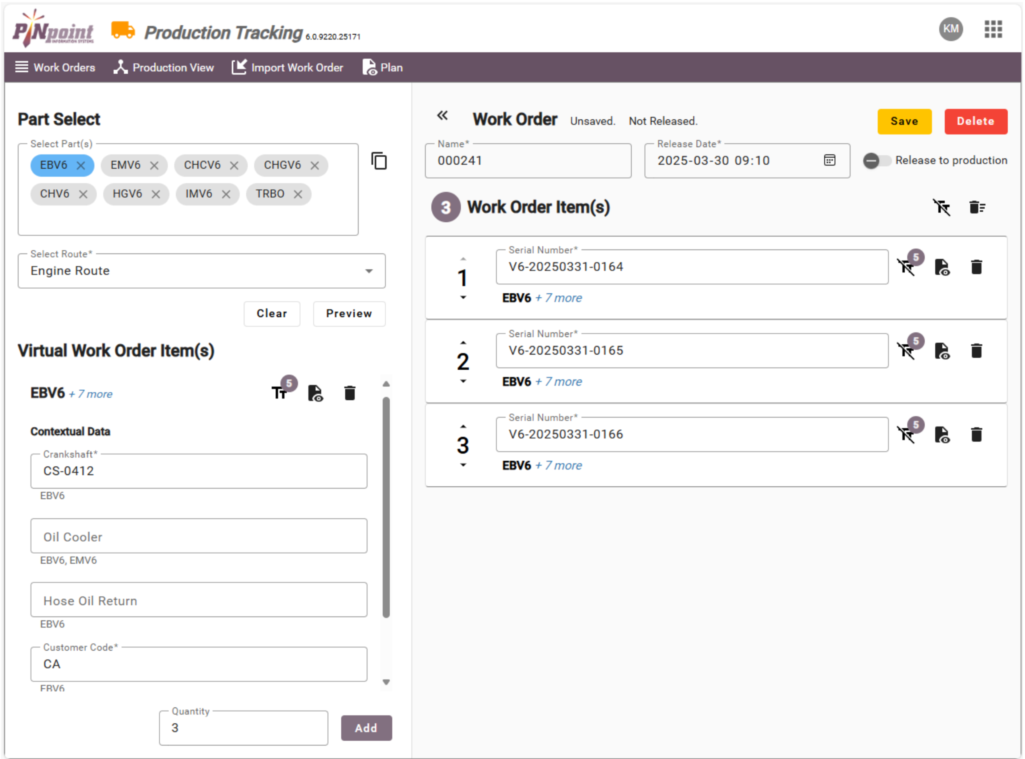
 

| Icon | Description |
|---|---|
| | The defects for this item have been resolved. |
| | This item has steps which were bypassed at the SmartScreen client. Select to view the bypassed steps. |
| | The bypassed steps were un-bypassed at the SmartScreen client. Select this icon to view the record. |
| | The bypassed step has been acknowledged as complete on the repair station. |
| | Information. There is important information about this item. Hover or select on the icon to read the message |
| | This item is not rejected. Select to reject this item. |
| | This item is rejected. Select to un-reject this item. |
| | Delete. Select to delete the item. |
| | Reactivate. Select to Reactivate the deleted item. |
| | The Plan Icon. Selecting this opens the Plan for the work order item. |
| | Bill Of Materials. Select to show or hide the sub work order items created when using the Bill of Materials feature. |
| | Contextual Data. Select to show or hide the contextual data items and values. |

## Creating Work Orders

A work order is a list of work order items with the information required to build them and the date when they should begin being produced.

Creating New Work Order




Work Order Items are added by using the left pane to create a virtual work order item and then adding the work order item to the work order in the right pane.

The part numbers can be entered manually or pasted into the Part Select box. The route selection is based on the routes the parts are enabled on. When the user selects Preview the virtual work order item will be displayed with a list of the contextual data items which are used. The quantity is the amount of work order items which are required.

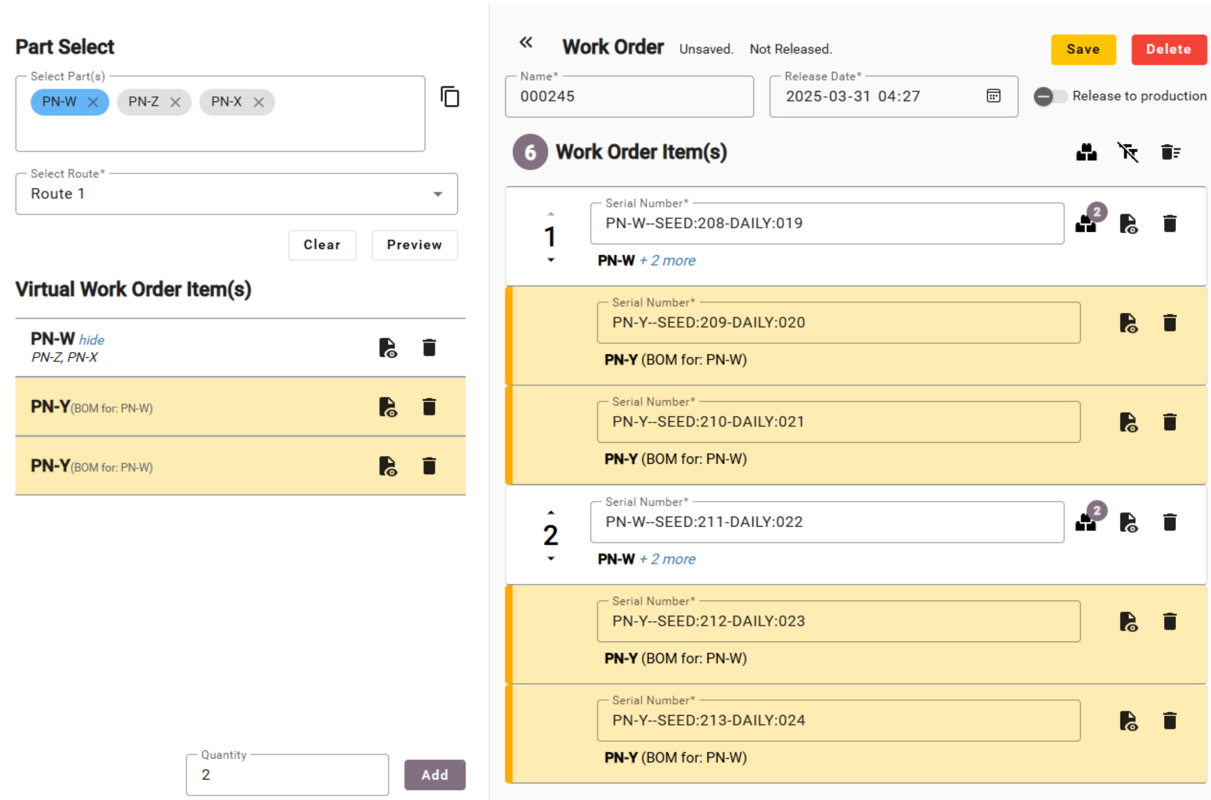
Selecting Add creates the Work Order Items in the Work Order on the right pane. On the right pane the user can modify the serial numbers, modify the contextual data item values, set the release date, and choose to release the work order. Work Order Items can be reordered using the arrows or entering the order value by selecting the number.

## Work Orders with Bill Of Materials Items

If a Part in the Parts list exists in the Bill of Materials tab then the hierarchy in the Bill of Materials tab will be used to create Sub Work Order Items. Parts in the Bill of Materials tab with child Part Numbers will add the Children to the work order as sub work order items, but the Parent Part will not create a sub work order item.

The Bill Of Materials Icon will list the total number of Sub Work Order Items which are created by the Bill of Materials configuration. Changing the order of a Work Order Item in the Work Order will reorder the sub work order items at the same time.

A work order with sub work order items generated because of the Bill Of Materials has a hierarchy of PN-X -> PN-Y (Quantity 2)

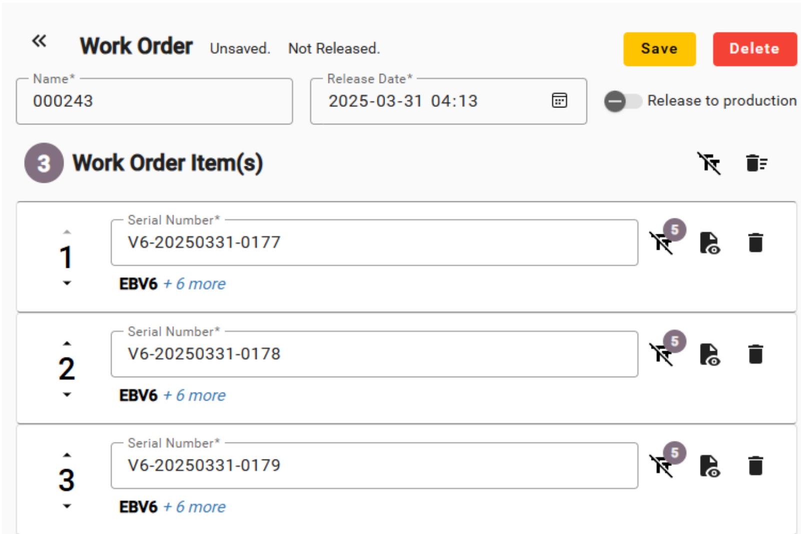



## Releasing a Work Order

Releasing a work order to production is the act of telling the tracking system that when the release date passes the work order can be provisioned. A work order will not be provisioned unless **Release to Production** is true and the **Release Date** has passed. Provisioning a work order is the act of creating build items on the route so they can be tracked around the production line.

The work order items are not added to the queue on their specific route until the work order is released. The work order name and release date and time can be modified before it is released.

This Work Order Is Not Yet Released. Items Which Are Not Yet Started Can Be Deleted By Clicking On The Delete Icon.




## Deleting Work Orders

Work orders items can be deleted from the work order as long as they are not loaded at a station. If a work order item is loaded at a station the icon to delete the work order item will be grayed out. Work orders can be deleted if none of the items are loaded at a station. If any of the work order items are loaded at a station the icon to delete the work order will be grayed out.

## Reactivating Inactive (Deleted) Work Order Items

Work Order Items which are inactivated by the tracking inactivation routine, or deleted by the user, are made inactive in the database. Work order items which are inactive can be reactivated on the work orders tab by clicking on the icon. This icon appears when the item is found in the work orders tab after searching for a work order.

Build items which are reactivated will be placed in the location where they were archived or deleted from. If that location no longer exists they will be placed in the end queue. If they were on a composite route then they will be returned to the beginning of the route segment instead of the route's end queue. If the route has changed drastically and the location the item should return to cannot be determined then an error will be logged by the tracking manager.

## Customizing Serial Number Numbering

When a work order is created the tracking manager will use the Serial Number Controller for the route to generate a serial number for each Work Order Item. Serial Numbers will be enforced to be unique based on the setting **Serial Number Unique per Serial Number Controller**. See: *"Plant Properties List" on page 453 for details.*

# Managing Product Quality for a Work Order Item

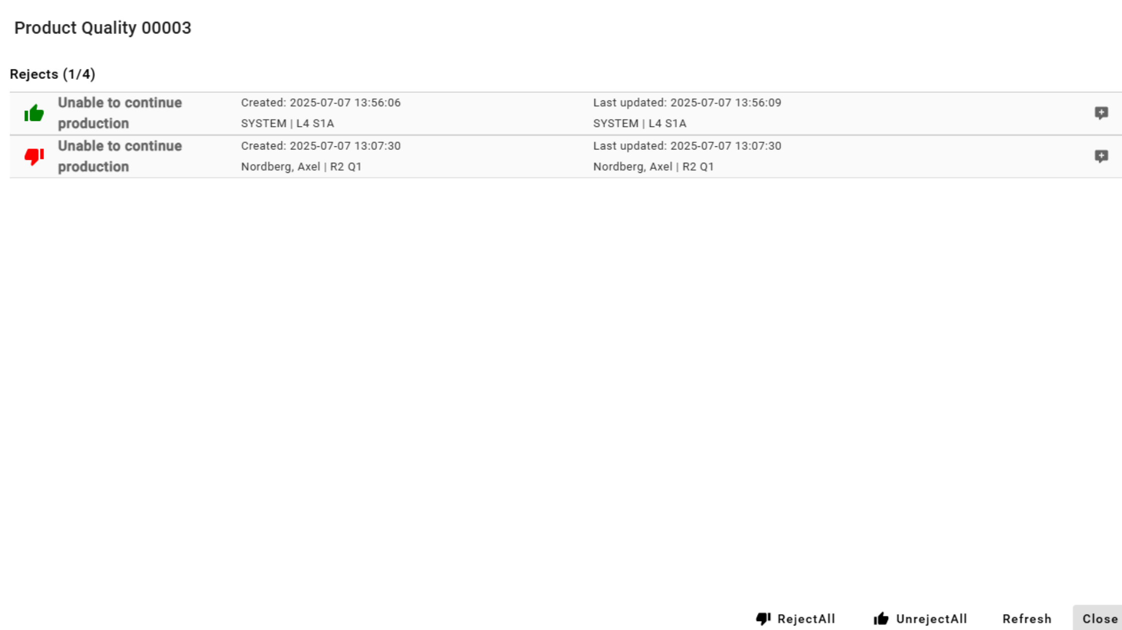
A work order consists of work order items that, in turn, consist of build items. This section discusses managing product quality for a work order item. Managing product quality for a build item is discussed under "Managing Product Quality for a Build Item" in the "Production View" section that follows.

Managing product quality for a work order item encompasses:

- Viewing the quality items (defects, bypasses, etc.) entered for the build items in it.
- Rejecting or unrejecting enmasse its build items.
- Changing defect statuses
- Adding notes

These actions are done on the work order item's **Product Quality** page. To display this page: click its parent work order on the **Work Orders** tab and select its **Product Quality** truck.

The **Product Quality** page consists of rows. Each row can be clicked to expand or collapse the information visible.




At the right end of a row, there may be one or more icons. A *notes* icon can be clicked to add a note. An *arrow* icon can be clicked to change the status of a defect, provided the status for the defect can be changed. A link icon can be clicked to view a production advisory.

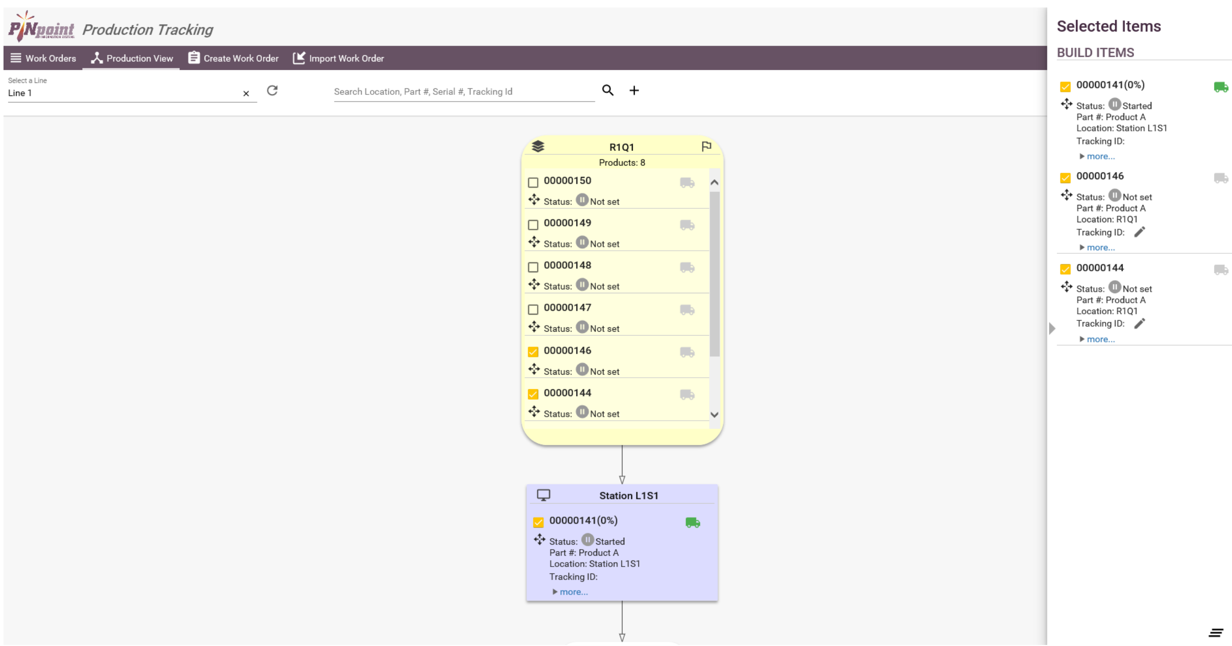
(See "Quality Settings" on page 17 for information on defect status types, production advisories, and external states--all of which can affect when a defect status may be changed.)

At the bottom of the page are, depending on the page's quality issues, **Reject All** and/or **Unreject All** buttons.


# Production View

The production view shows the queues and stations for a route. If only one route exists for a line then the line name is shown. If more than one route exists for a line then the line list shows line and route. Build Items can be moved, rejected, unrejected, and the tracking ID can be changed from this tab.

The production view shows the route and all build items currently on it. Items move from top to bottom.



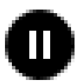

Selecting a serial number expands the information about the build item that is visible. Selecting the **Product Quality** truck displays a **Product Quality** page specific to the build item, a page that can be used to view the build item's history of quality-related activiites, add a defect or shortage, or reject the build item.

## Moving items

To move an item select the move button next to an item and then select the destination. Click on the pin to select many items and then click on the Bulk Move button to move all of them.

*Moving Items Icon Legend*

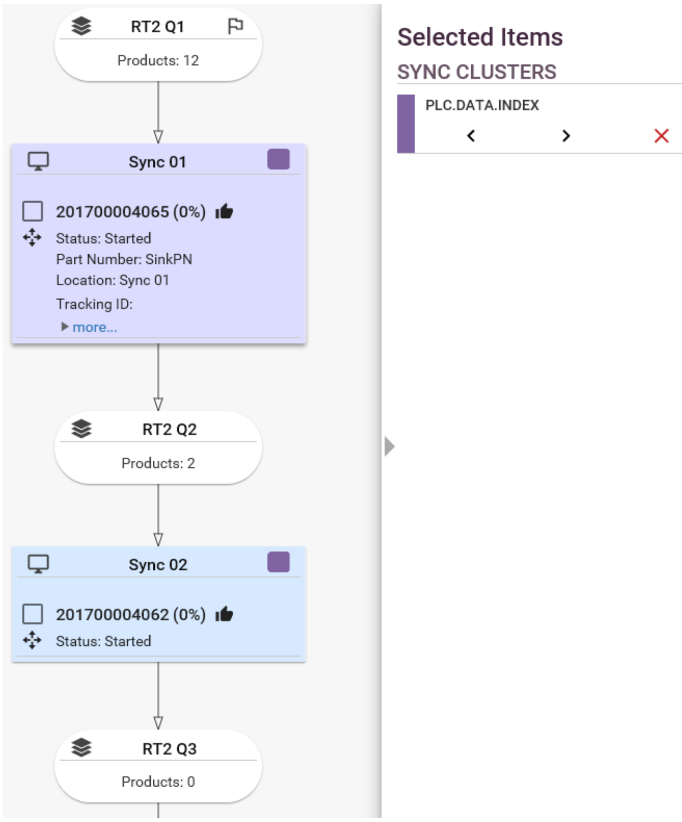
| | |
|---|---|
|  | Move |
|  | Bulk Move |
|  | The hold icon can be activated to put an item on hold. Items on hold will be moved to the queue but will not automatically be loaded into the station. |

- Only Build Items within the same queue can be moved.
- Multiple Build Items can be moved with the Bulk Move button.

## Sync Clusters

A sync cluster is a section of the route where the movement of all the stations is synchronized. The sync clusters in the build tab show stations which move together. This includes all directly connected queues before and after stations. If the value of the sync cluster tag changes the items within the cluster will advance to the next position. The arrows can be used to modify the position of items in the sync cluster.

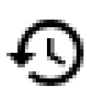
An Example Of A Sync Cluster




## Composite Route

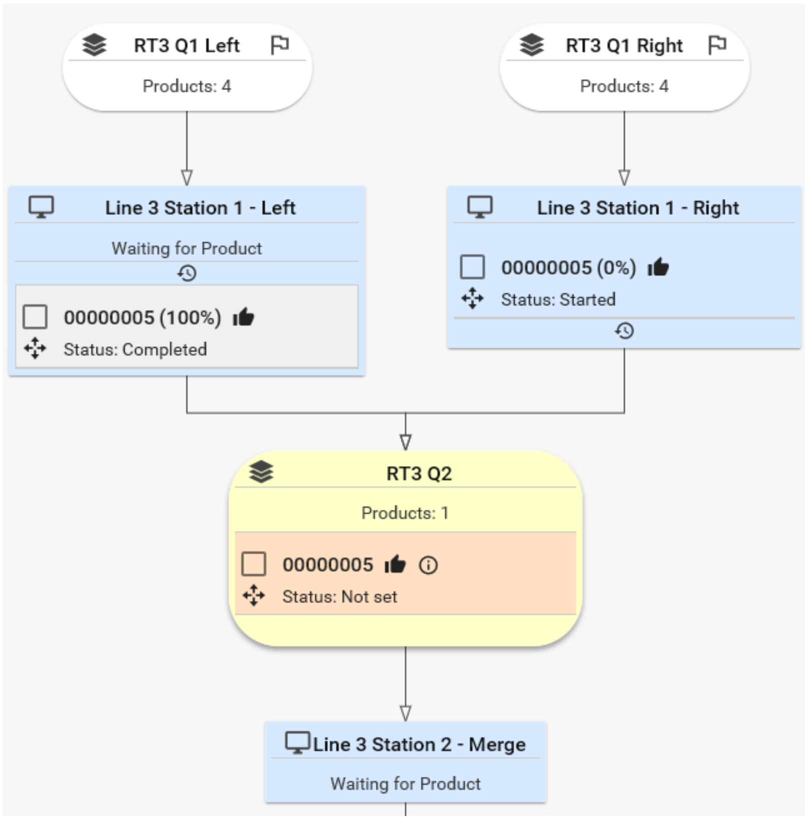
A composite route is the term for a route which merges one or more build items into a single build item. If any station on the route has the rule *Load Depends on Child Build Item* set to *At least one child is complete* or *All children are complete* then it is a composite route. In a composite route stations have a graveyard queue. Items can be moved from the inbound queue to the graveyard queue at a station.

*Composite Route Icon Legend*

| | |
|---|---|
|  | Graveyard. Click on this icon to see the list of build items in the graveyard queue. Items in a graveyard queue do not continue to the next queue in the route. |

In This Example The Build Item Is Complete At 'Line 3 Station 1 - Left', But Is Not Complete At 'Line 3 Station 1 - Right'. The Build Item In 'RT3 Q2' Will Not Show Up Until Both Are Complete



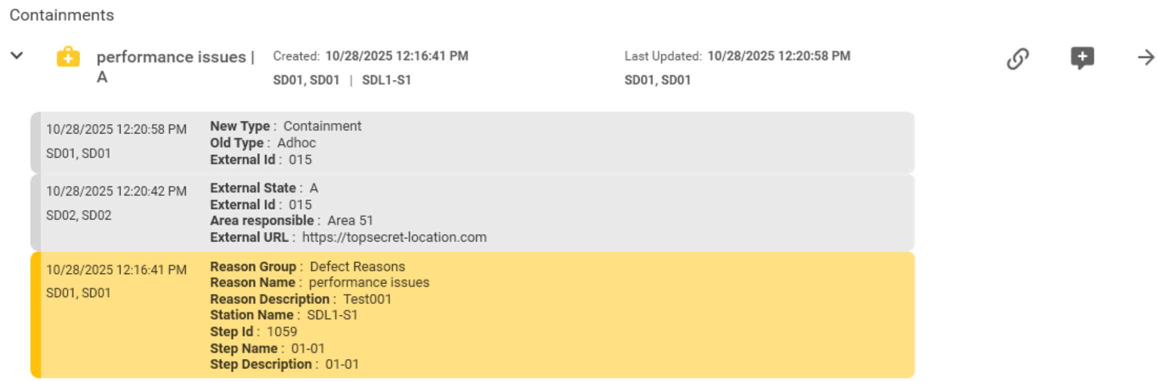

## Managing Product Quality for a Build Item

Product quality can be managed for a build item individually. This includes:

- Viewing its quality items (defects, bypasses, etc.).
- Adding a defect or shortage for it
- Rejecting it
- Changing defect statuses
- Adding notes

These actions are done on the build item's **Product Quality** page, which is displayed by selecting a line in **Production View** and clicking the build item's **Product Quality** truck.

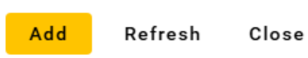
The **Product Quality** page consists of rows. Each row can be clicked to expand or collapse the information visible. (The below image is expanded.)




At the right end of a row, there may be one or more icons. A *link* icon can be clicked to view a production advisory. A *notes* icon can be clicked to add a note. An *arrow* icon can be clicked to change the status of a defect, provided the status for the defect can be changed.

(See "Quality Settings" on page 17 for information on defect status types, production advisories, and external states--all of which can affect when a defect status may be changed.)

At the bottom of the page is an **Add** button, which can be used to add a defect or shortage to the build item or reject it.




# Import Work Order

The import work order tab allows users to import work orders from a .csv file. The app will allow users to verify the information uploaded before any work orders are created in the system. Multiple work orders can be submitted at once. Specific routes can be targeted. Custom work order names can be used. There is a button on the app to download a template .csv file with headers for each column.

An example of the format of the .csv file that the tracking app accepts. The header row comes from the template file.

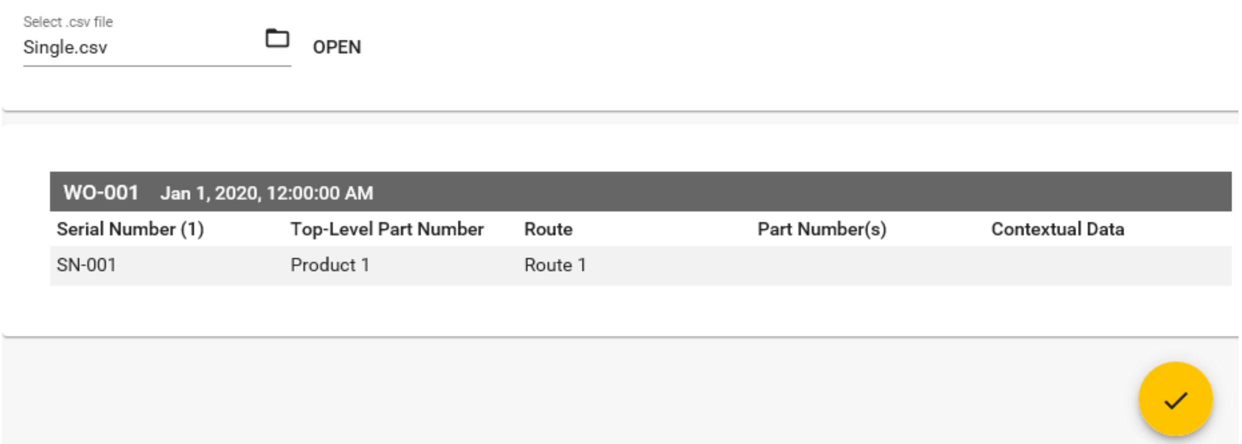
| Work Order Number | Release Date | Release to production | Serial Number | Quantity | Route | Top-Level Part Number | Part Number(s) | Contextual Data Name | Contextual Data Value |
|---|---|---|---|---|---|---|---|---|---|
| WO-003 | 10/20/2020 | TRUE | SN-004 | 1 | Route 1 | Product A | Product B | DataItem1 | Datavalue1 |
| | | | | | | | Product C | DataItem2 | Datavalue2 |
| | | | | | | | Product D | DataItem3 | Datavalue3 |
| | | | | | | | Product E | DataItem4 | Datavalue4 |
| | | | | | | | Product F | DataItem5 | Datavalue5 |
| WO-003 | | | SN-005 | 1 | Route 1 | Product A | Product B | DataItem1 | Datavalue1 |
| | | | | | | | Product C | DataItem2 | Datavalue2 |
| | | | | | | | Product D | DataItem3 | Datavalue3 |
| | | | | | | | Product E | DataItem4 | Datavalue4 |
| | | | | | | | Product F | DataItem5 | Datavalue5 |
| | | | | | | | Product G | DataItem6 | Datavalue6 |

The first row in the .csv file is not imported. The header row from the template file should be maintained when uploading a new .csv file.

When the .csv file is uploaded it will display the work order for review. The yellow check box will submit the work order. The serial number can be automatically generated if the field is left empty.

The CSV file has been uploaded for review




## Notes About Scheduling Work Orders

All of the following notes also apply if the work order is submitted using the API. If there is no release date the work order will be released immediately. If there is a release date but *Release to Production* is true then the work order will be released immediately. If the release date is the same as the date the work order is created the work order will be released immediately. If the work order already exists but no work order items have been started then it will be edited when the work order is submitted.

The time can be specified in the release date field of the .csv but the first row determines the release date of the entire work order. Work Order Items within a work order cannot have a different release date.

The Release Date can be either 18/12/2021 14:00:00 or 18/12/2021 02:00 PM

An example of a work order with 2 release dates. Only the first row is valid.

| WorkOrder | ReleaseDate | ReleaseToProduction | SerialNumber |
|---|---|---|---|
| WO-MS1 | 4/08/20 2:00 PM | FALSE | MS-200331-09 |
| | 4/11/20 | FALSE | MS-200331-10 |

An example of how to structure the .csv so that there are 2 work orders and 2 release dates.

| WorkOrder | ReleaseDate | ReleaseToProduction | SerialNumber |
|---|---|---|---|
| WO-MS1 | 4/08/20 2:00 PM | FALSE | MS-200331-09 |
| WO-MS2 | 4/11/20 | FALSE | MS-200331-10 |

## Importing Work Order Items with Features

When features are used the features should be listed on a separate line.

An example of an imported work order with features

| WO-002 Oct 20, 2019, 12:00:00 AM | | | | |
|---|---|---|---|---|
| **Serial Number (2)** | **Top-Level Part Number** | **Route** | **Part Number(s)** | **Contextual Data** |
| SN-002 | Product 1 | Route 1 | Product 2<br>Product 3<br>Product 4<br>Product 5<br>Product 6 | |
| SN-003 | Product 1 | Route 1 | Product 2<br>Product 3<br>Product 4<br>Product 5<br>Product 6<br>Product 7 | |

## Importing Work Order Items with Contextual Data

When contextual data is used it should be listed in the next column. If the contextual data item does not exist it will be created and linked to the top level Part. If the contextual data item exists but it is not linked to the top level Part then it will get linked to the top level part. If the contextual data item exists but is already linked to a feature then it will not be linked to the top level Part.

An example of an imported work order with contextual data

| WO-003 Oct 20, 2019, 12:00:00 AM | | | | |
|---|---|---|---|---|
| **Serial Number (2)** | **Top-Level Part Number** | **Route** | **Part Number(s)** | **Contextual Data** |
| SN-004 | Product 1 | Route 1 | Product 2<br>Product 3<br>Product 4<br>Product 5<br>Product 6 | DataItem1 : Datavalue1<br>DataItem2 : Datavalue2<br>DataItem3 : Datavalue3<br>DataItem4 : Datavalue4<br>DataItem5 : Datavalue5 |
| SN-005 | Product 1 | Route 1 | Product 2<br>Product 3<br>Product 4<br>Product 5<br>Product 6<br>Product 7 | DataItem1 : Datavalue1<br>DataItem2 : Datavalue2<br>DataItem3 : Datavalue3<br>DataItem4 : Datavalue4<br>DataItem5 : Datavalue5<br>DataItem6 : Datavalue6 |

## Importing a CSV with multiple Work orders

It is possible to create more than one work order at a time if they are split up in the spreadsheet.

An example of a .csv imported with multiple work orders.

| WO-004 Oct 20, 2019, 12:00:00 AM | | | | |
|---|---|---|---|---|
| Serial Number (5) | Top-Level Part Number | Route | Part Number(s) | Contextual Data |
| SN-006 | Product 1 | Route 1 | | |
| SN-007 | Product 1 | Route 1 | | |
| SN-008 | Product 1 | Route 1 | | |
| SN-009 | Product 1 | Route 1 | | |
| SN-010 | Product 1 | Route 1 | | |

| WO-005 Oct 21, 2019, 12:00:00 AM | | | | |
|---|---|---|---|---|
| Serial Number (6) | Top-Level Part Number | Route | Part Number(s) | Contextual Data |
| SN-011 | Product 1 | Route 1 | | |
| SN-012 | Product 1 | Route 1 | | |
| SN-013 | Product 1 | Route 1 | | |
| SN-014 | Product 1 | Route 1 | | |
| SN-015 | Product 1 | Route 1 | | |
| SN-016 | Product 1 | Route 1 | | |

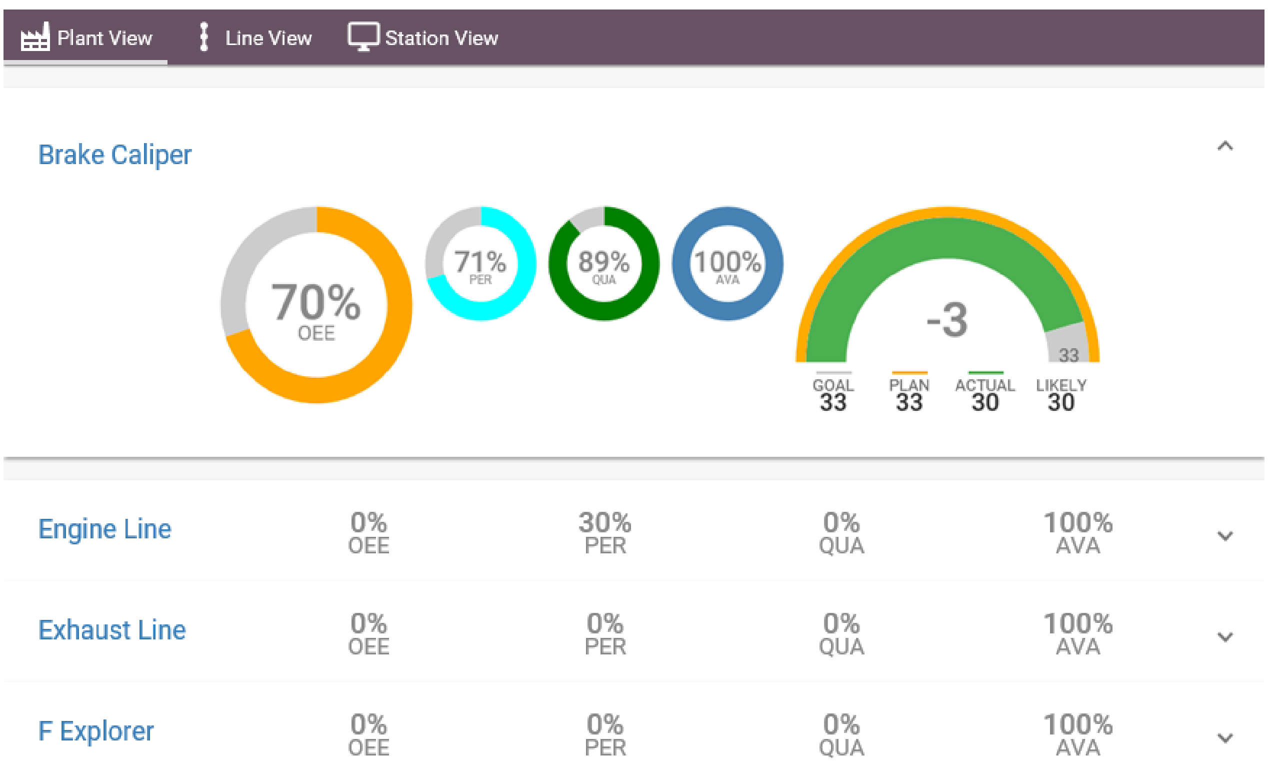
# Dashboard

The Dashboard displays real time statistics about the performance of each line and station. It shows statistics for Overall Equipment Effectiveness (OEE) and the Performance, Quality, and Availability metrics as well as information about time accumulated in the each of the buckets. All calculations are per shift.

## Plant View

The Plant View shows the OEE for each line configured in the plant. The Performance, Quality, and Availability, is split up and shown in the chart. The information updates when a build item departs a station which contributes to the line metrics or when the takt time elapses. The actual count on the plant view is a sum of all build items completed by the station which has *Contribute to Line Production Metrics* set true from the beginning of the last shift which was started until the current time.

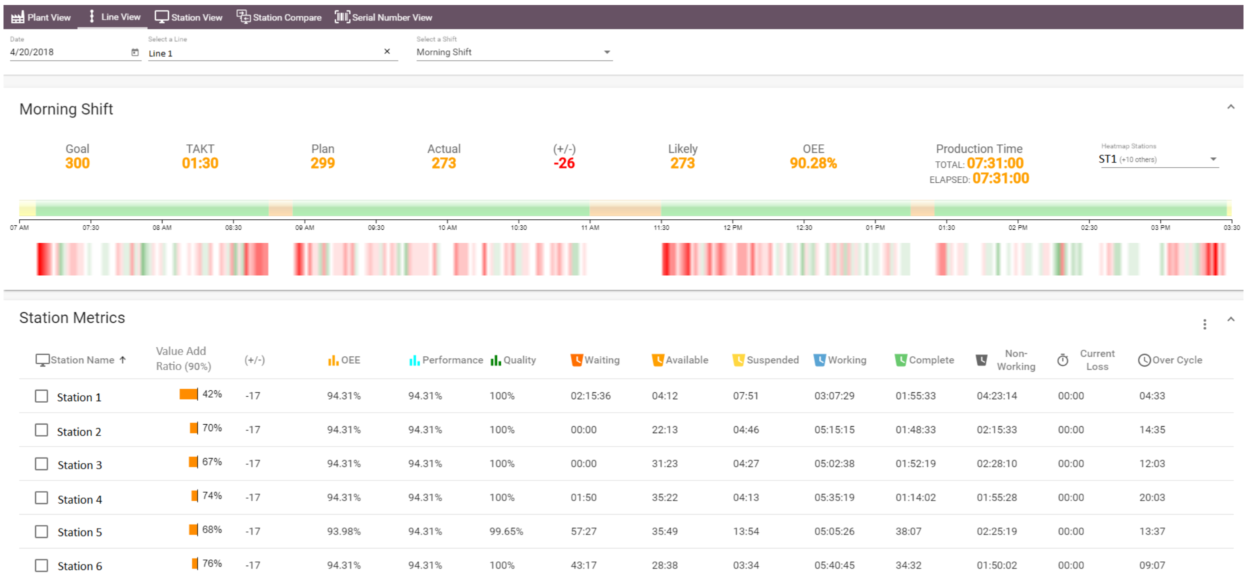
The Plant View



# Line View

The Line View tab shows the current shift schedule performance and time categorization information. The station metrics view displayed at the bottom can be customized.

The Dashboard's Line View

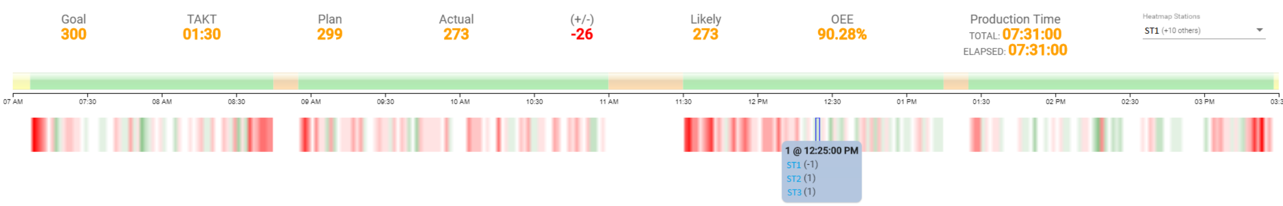



additional notations next to the station name which indicate a status for a station.

| Note | Description |
|---|---|
| 1 | Station that contributes to Line Metrics |
| 2 | Excluded from Metrics |
| 3 | Station has a Takt Time Multiplier shown in parentheses next to +/- value. For Example: (x1.5) would indicate the takt time has been multiplied by 1.5. |
| 4 | Station not on an active route. |

The heat map shows the rate of change of production during a shift. Green represents a takt period when station output has exceeded the plan and red represents a period when production fell behind the plan. The darkest shade of colour represents the greatest absolute (rate of change) value for the shift. White is reserved for breaks and periods when production output does not change. A build item is counted when it departs a station.

An Example of the Heat Map Showing Several Stations During a Shift

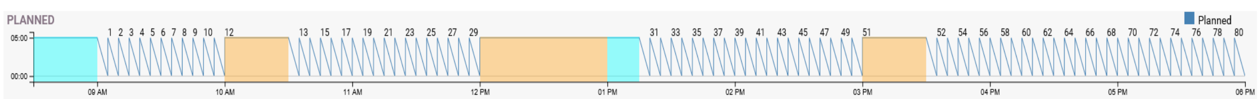



# Station View

The station view charts the performance of the station. It also allows the user to reclassify Performance Losses to Availability Losses.

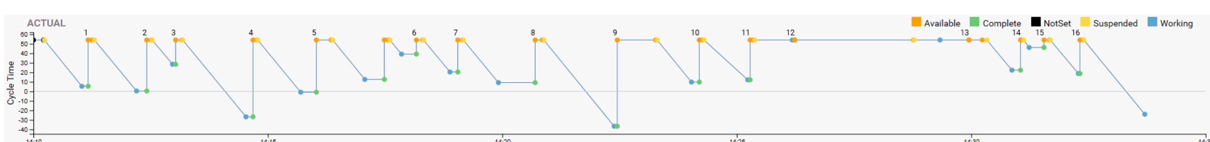
The Planned Chart shows the expected output from the station as a saw tooth. This accounts for availability losses and the chart adjusts the amount the station is expected to produce as breaks and availability loss time are added. For each new build item which is expected to be completed the chart counts from the takt time available until 0. Breaks are shown in yellow. PM Time is shown in blue. Availability Loss Time is shown in red once time has been reclassified. If the schedule is changed the chart will be updated.

The Planned Chart with a Saw Tooth Diagram




The Actual chart shows the time spent working on each unit. This charts the time spent at the station against the time remaining during each cycle. Normally, a build item will be loaded and the time will be accumulated in the working category until it is complete. This produces a line which trends downward until the build item is complete. When the next build item is loaded the line goes back up to the start of the cycle time. Ideally, this should follow the planned chart.

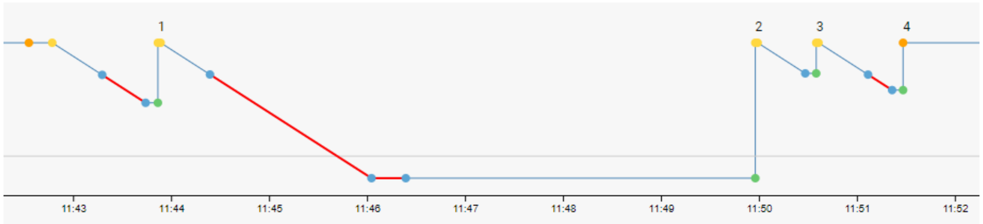
The Actual Chart




Working time which exceeds the cycle time is capped on the chart so that the chart does not grow out of proportion. The cycle time does not reset until the next shift begins. If a build item is over cycle at the end of a shift the cycle time chart will trend downwards until the next shift begins.

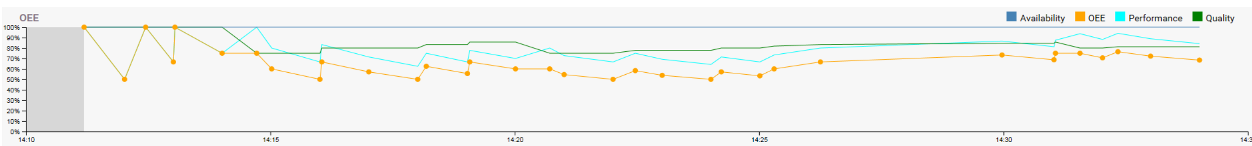
Different processes can have different cycle times. The actual chart will mark the point when the working time exceeded the cycle time and the line color will be red.

The Actual Chart showing over cycle time periods in red.



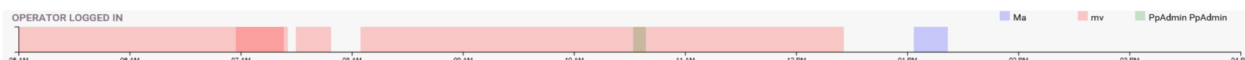

The OEE chart shows the OEE for the station. The Performance, Quality, and Availability, are charted against the OEE. Availability is 100% for the current shift. Performance Losses can be re-classified as Availability Losses after the shift.

The OEE Chart Showing the Performance for a Station Over Time.




The Operator Logged In chart shows which operators were logged in during the shift.

The Operator Logged In Chart




## Reclassifying Time

On the station view production time can be reclassified as an availability loss in shifts which have already elapsed. When time is reclassified the planned chart is updated to show the change. When reclassifying time, Availability decreases, Performance increases, and Line OEE is generally the same before and after the reclassification. In cases where a station has a TAKT multiplier, it is possible for the Line OEE to differ slightly before and after the reclassification because the Performance calculation takes the TAKT time multiplier into account and the Availability calculation does not.

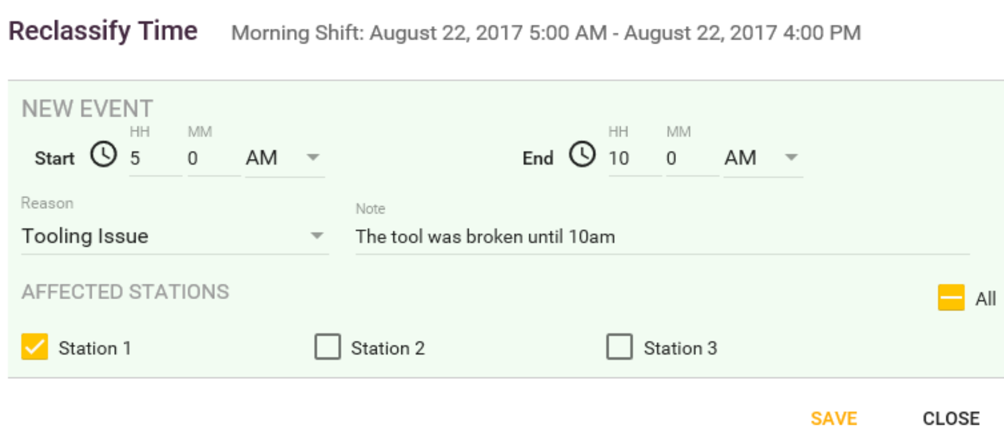
*Reclassify Time Icon*

| | |
|---|---|
|  | Reclassify Time |

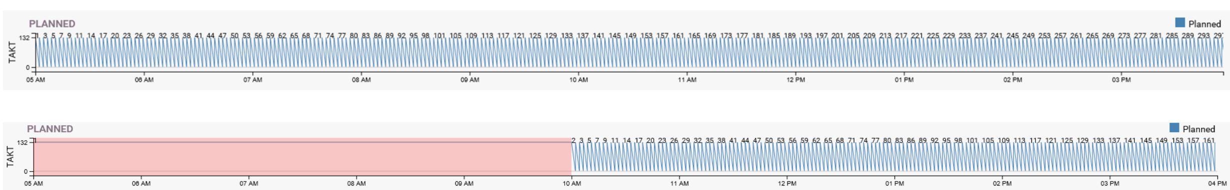
 

To reclassify time click the icon and enter the time, reason and affected stations. This will adjust the planned chart.

An Example of the Menu for Reclassifying Time. The reason list comes from the station config property *Reason List for Downtime.*



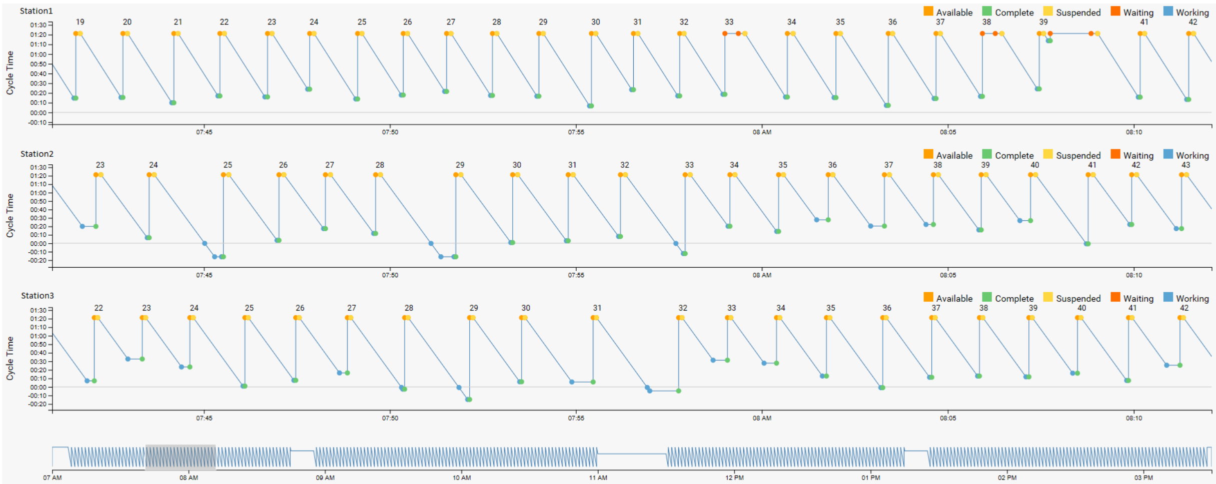

Before and After Reclassifying Time




# Station Compare

The Station Compare tab allows the user to compare the saw tooth diagram for multiple stations. This feature is useful when comparing the performance of two or three stations during a shift.

An Example of the Station Compare Feature

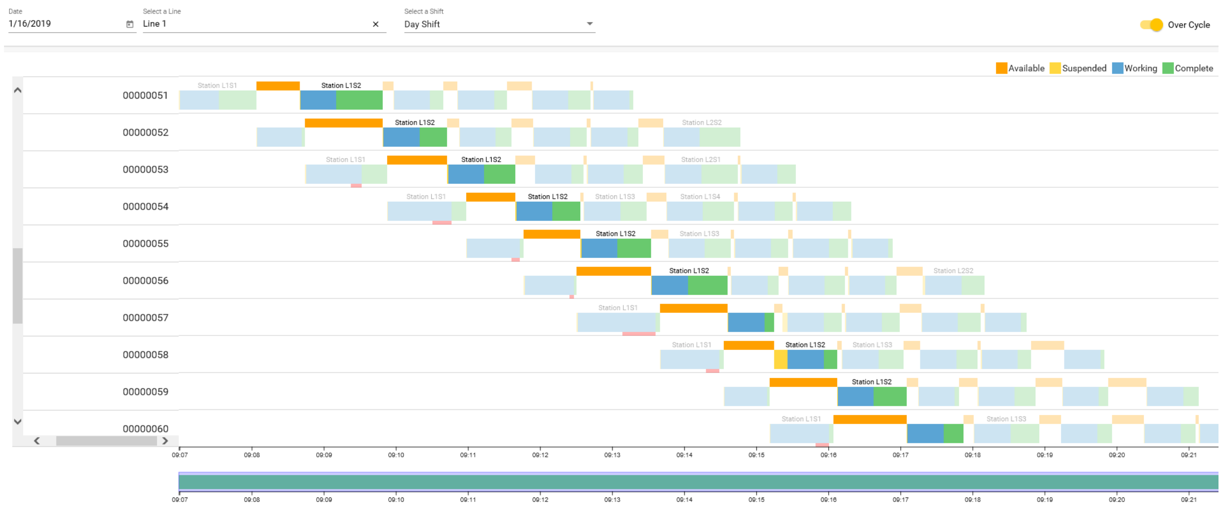



# Serial Number View

The Dashboard’s Serial Number View allows the user to see an overview of how serial numbers travel on the route. Users will be able to visualize trends in the chart and follow an individual serial number from the beginning of the line until the end. Each serial number is presented as a chart of the time spent at each location on the line. If the Over Cycle toggle is on, over cycle time for the station will be underlined in red. Clicking on a station name will highlight that station across serial numbers. Only completed serial numbers are shown. This is intended to be used on linear lines because composite routes may display the same serial number repeatedly.

Serial numbers are listed in chronological order based on the first time they appear in any one of the categories in the legend. A serial number should normally start as *suspended* because it was next build item in the queue for a station which previously had a build item loaded. The suspended state occurs because the station is unloading the previous build item and loading the new build item. A Serial number can also start as *available* which means the station did not have a build item loaded when this build item appeared in the queue for the station.

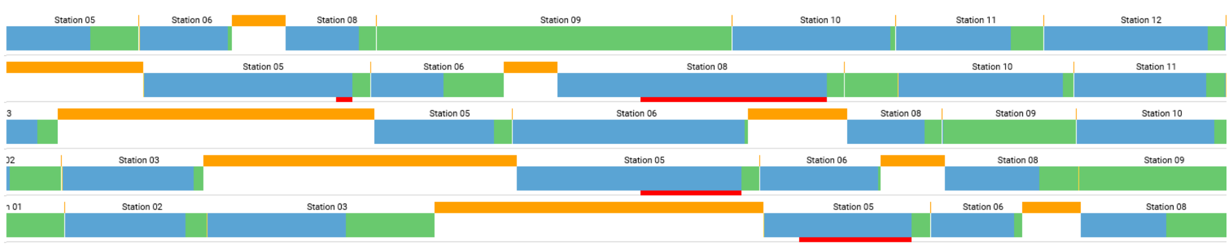
An Example of the Serial Number View with one station highlighted.




The Serial Number View will give the user the ability to spot anomalies within the data and view the impact on subsequent serial numbers. If a station is over cycle then the next serial number should show that it is available for longer than normal; if a station is not able to catch up quickly it may indicate a problem. However, if a station is able to catch up quickly it may have extra capacity.

The length of the available time on the chart may not indicate an issue. It may show a normal amount of travel time or the line may be designed to have a queue of serial numbers before certain stations. Each line will be different. If further investigation is needed the production analytics report will contain the relevant data.

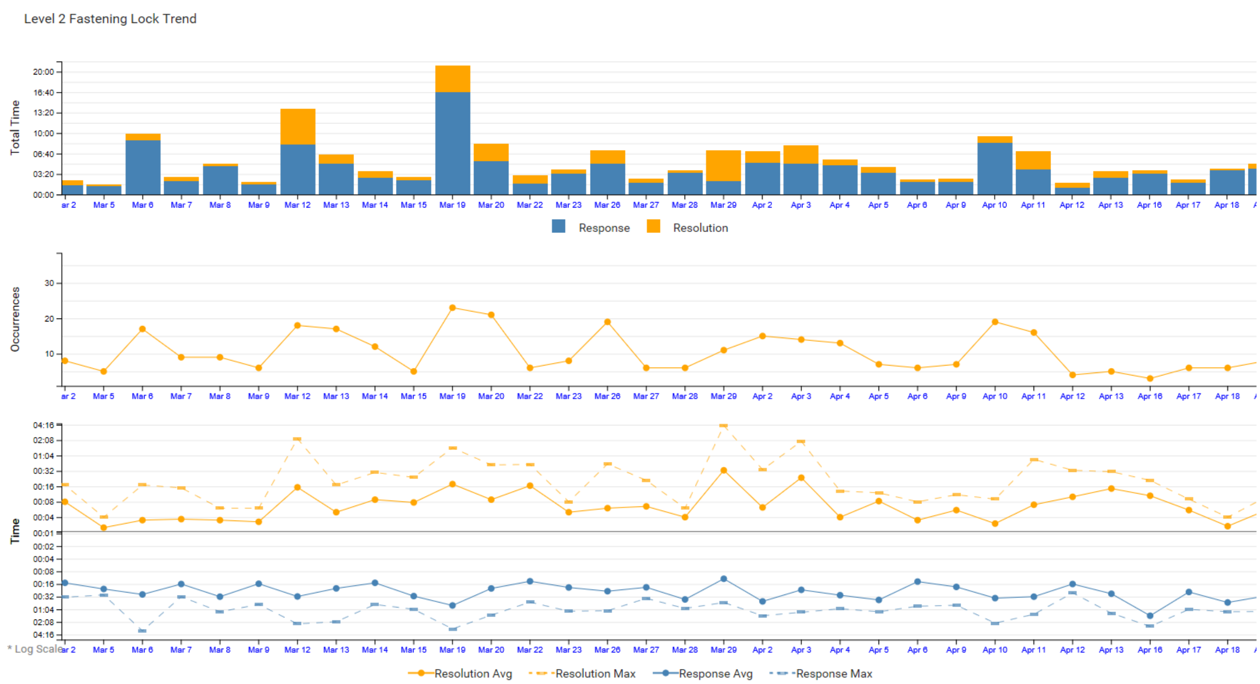
In this example serial numbers are often available for a long time before they are loaded at Station 05. Also shown is a longer than normal availability at station 08 when the previous serial number causes the station to go over cycle.



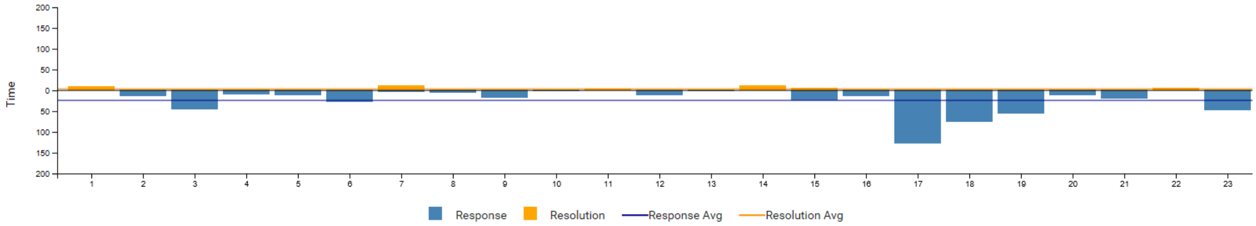
# Trends

The trends site allows users to track the performance metrics recorded by the system over a given timeframe. This site shows how time spent at a station changes over time. It also contains detailed information about the events which contributed to the chart. Trends are available for production information, over cycle time, fastening locks, Andon details, and time categorized using the "5 Bucket Model" on page 367.

A Chart Showing the Average Time Spent on Tool Locks. Clicking on a Date Shows More Information About Those Events



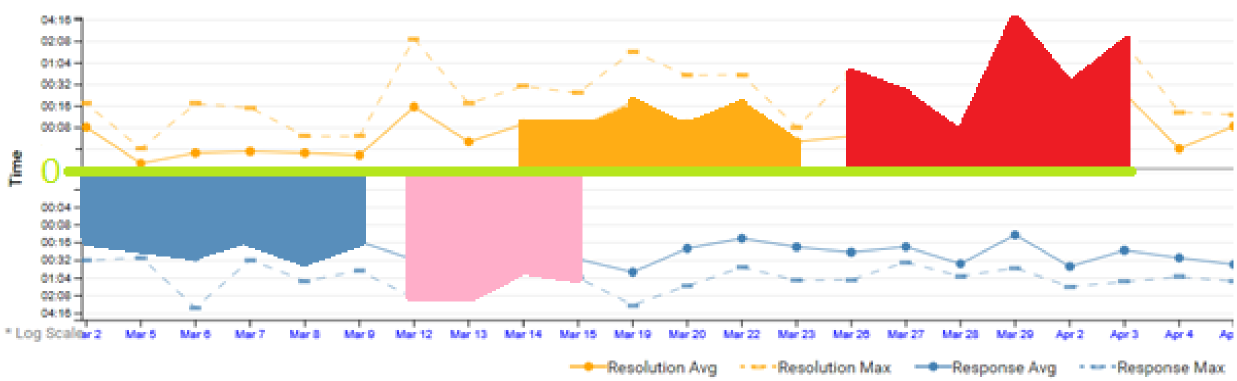

A Detailed Report of the Fastening Locks Which Occurred on the Previous Day




Shift Name, Serial No, Operator

| Occurrence | Response | Resolution | Response Avg | Resolution Avg | Shift Name | Serial No | Step Description | Operator | Reason Name | Reason Description |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 10 | 23 | 4 | Morning Shift | 1205641002813 | INSTALL DRIVE PULLEY | John Hardworker | Torque Tool Error | |
| 2 | 15 | 2 | 23 | 4 | Morning Shift | 1205641002810 | INSTALL DRIVE PULLEY | John Hardworker | Torque Tool Error | |
| 3 | 45 | 3 | 23 | 4 | Morning Shift | 1205641002801 | INSTALL DRIVE PULLEY | John Hardworker | Torque Tool Error | |
| 4 | 10 | 3 | 23 | 4 | Morning Shift | 1205641002813 | INSTALL DRIVE PULLEY | John Hardworker | Torque Tool Error | |
| 5 | 13 | 3 | 23 | 4 | Morning Shift | 1205641002819 | INSTALL DRIVE PULLEY | John Hardworker | Torque Tool Error | |
| 6 | 28 | 2 | 23 | 4 | Morning Shift | 1205641002817 | INSTALL DRIVE PULLEY | John Hardworker | Torque Tool Error | |
| 7 | 5 | 12 | 23 | 4 | Morning Shift | 1205641002840 | INSTALL DRIVE | John Hardworker | Torque Tool Error | |

An Example of a Resolution and Response Chart



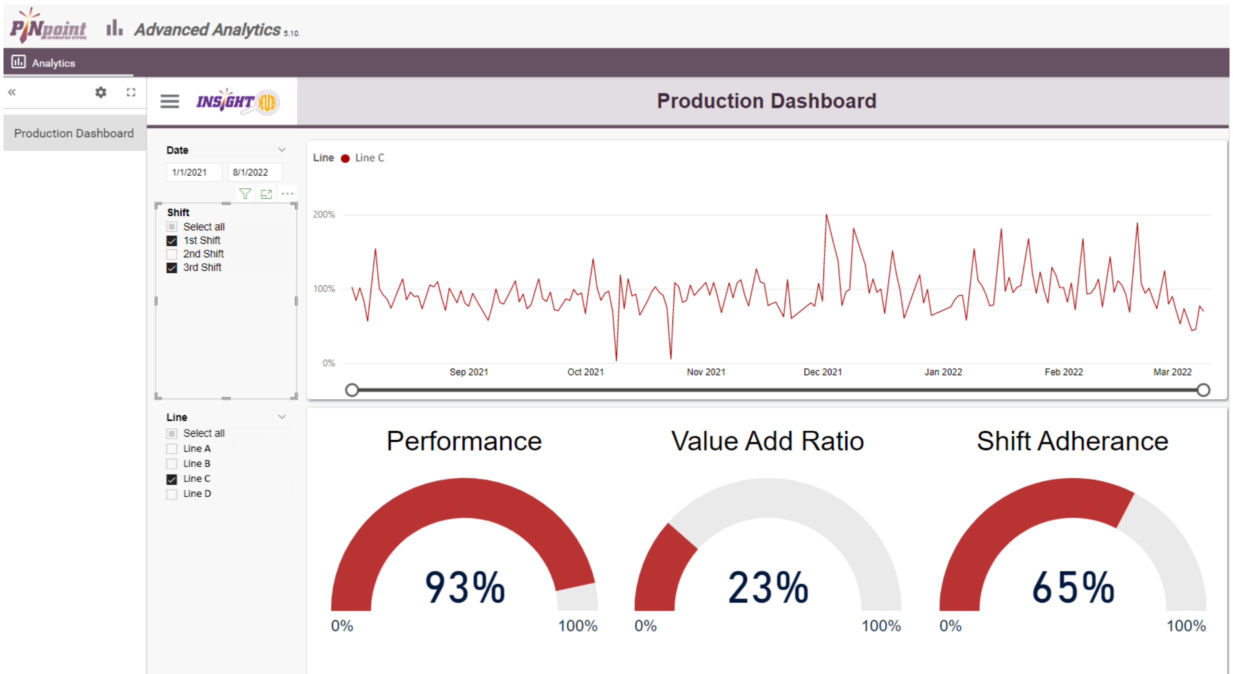

Responses, resolutions, maximums, and averages are graphed opposite from each other on the center line.

# Advanced Analytics

The Advanced Analytics app provides access to PINpoint's Insight Hub Dashboards through the PIN-point Portal

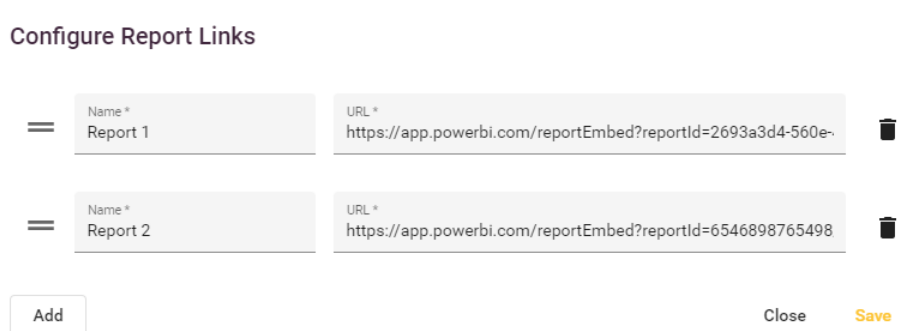
The Advanced Analytics app




## Advanced Analytics Reports

Reports can be added to the list by clicking on the settings icon and adding a name and link for the report. Report links must be able to be presented in an iFrame to be rendered. Reports can be reordered in this menu.

Adding a report to the advanced analytics app



# SmartScreen Client Setup

The **SmartScreen Client** application runs at each station and enables operators to complete the processes steps. It also displays work instructions and records time usage. The SmartScreen client is normally installed via the link on the PINpoint Portal or installed by local IT with an installer created by PINpoint for each facility.

## Launch Arguments

The SmartScreen client supports launch arguments in windows. Append these options to the end of the target field when launching the client from a shortcut in windows.

| Tag | Example | Description |
|---|---|---|
| Impersonate | "C:\Pinpoint\PinPoint.Client.SmartScreen.exe" -impersonate:Station1 | The key on the station config in SmartBuild is used to match the computer name with the station when the SmartScreen client loads. Using another key from SmartBuild allows the SmartScreen client to load as that station. |

# Working With SmartScreen Client

The SmartScreen Client is installed on a computer at a workstation. The SmartScreen client displays information to the operator to help them to maximize the production of high quality products. This section will explain how to use the SmartScreen client and what it's functions are.

## Logging Into the SmartScreen Client

This section is intended to guide a new user through the steps of logging into the SmartScreen Client for the first time. Certain steps in the procedure apply only to first-time log-ins and will not typically need to be executed afterward. These particular steps will be pointed out as applying to first-time users.

### Login Procedure

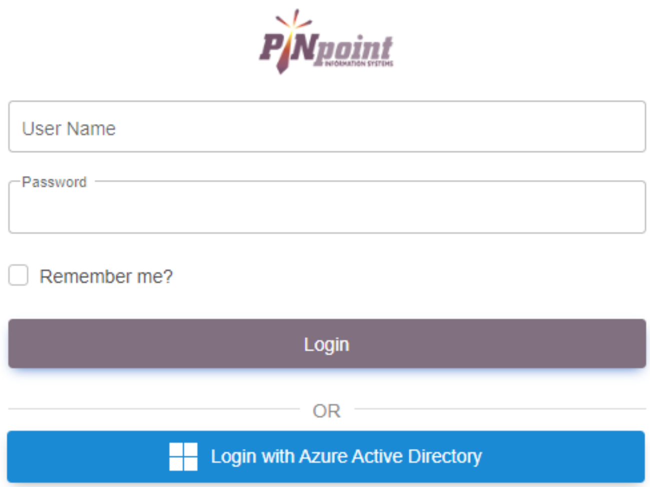
When the Client is loaded it will display the PINpoint splash screen. In the top left information about the station and the version number of the software is displayed.

The splash screen


1. Tap the screen or click the mouse to bring up the login window.

   Login screen




2. Users can either login using an account Local to PINpoint or an external identity provider. This is configured by the system administrator.

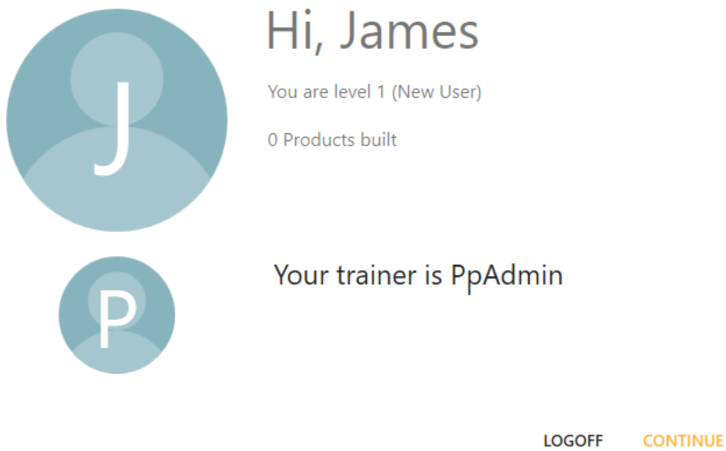
3. Click or press the on-screen Login button. The Welcome screen is displayed.

4. The Welcome screen displays the Operator's name and current level. When logging on for the first time, the user level is designated as "1 (New User)". This will only appear the first time. Subsequently, it will be displayed as 2 or higher. The Welcome screen also displays the qualifications the user is subject to when logging in, shown at the bottom right. A first-time login will typically be require viewing and acknowledging various items.

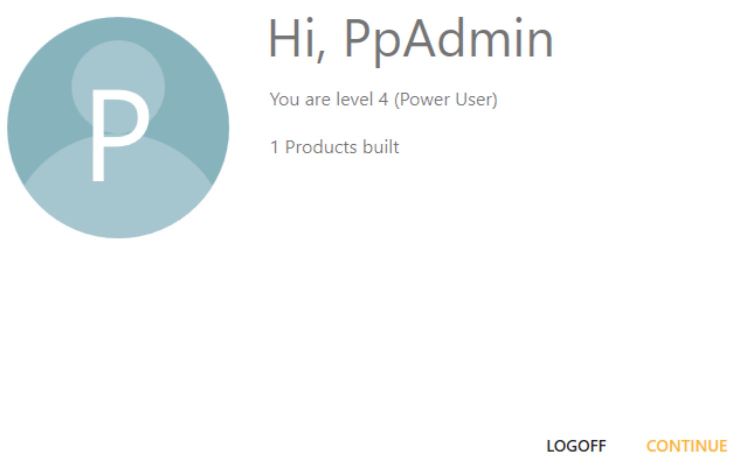
   The organization may have determined that inexperienced Operators must be accompanied by a Trainer. If so, there will be a **Trainer Login** button. If a Trainer is not required to continue there will be a **Continue** button

   Welcome Screen, Trainer required




Welcome screen, no Trainer required




5. Click **Trainer Login.** The Trainer who accompanies the new Operator must now enter his/her user and password combination and click Login.

6. Click **Continue.**

   If a user has outstanding Qualifications to fulfill, they will be shown the All Outstanding Qualifications screen and will not be permitted to log in. They will need to speak with their supervisor to fulfill their outstanding Qualification obligations.

7. The Document Summary screen is displayed, showing a list of documents and/or videos that must be viewed (and, if required, responded to) before the Days Remaining periods expire. Provided it has not, it is possible to Continue without selecting and viewing the items, but it is

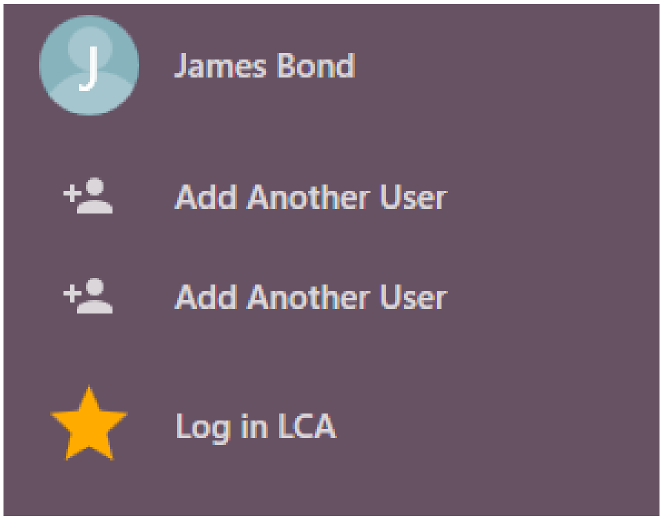
recommended to view the documents at this time. If there are no documents applicable to the user to view at login time, this step will not appear.

8. Click **Continue.** At this point, depending on the organization's preferences, the user may be shown the **Operator Certifications** dialog.
9. Click the **View Document** button associated with each row to view its document. The document is displayed.
10. Read the document and click the **Close** button. The document closes.
11. Click the appropriate responses.
12. At this point, the Team Lead and Section Manager must log onto the Client to acknowledge the Operator has viewed the document(s) and responded as required.
13. Click **Continue.** At this point, depending on your organization's preferences, the user may be shown the **Safety Certifications** dialog.
14. Click the **View Document** button associated with each row to view its document. The document is displayed.
15. Read the document and click the **Accept** button. The document closes.
16. Click the appropriate responses.
17. At this point, the Team Lead and Section Manager must log onto the Client to acknowledge the Operator has viewed the document(s) and responded as required.
18. Click **Continue.** The SmartScreen working interface is displayed.

## Logging In Multiple Operators

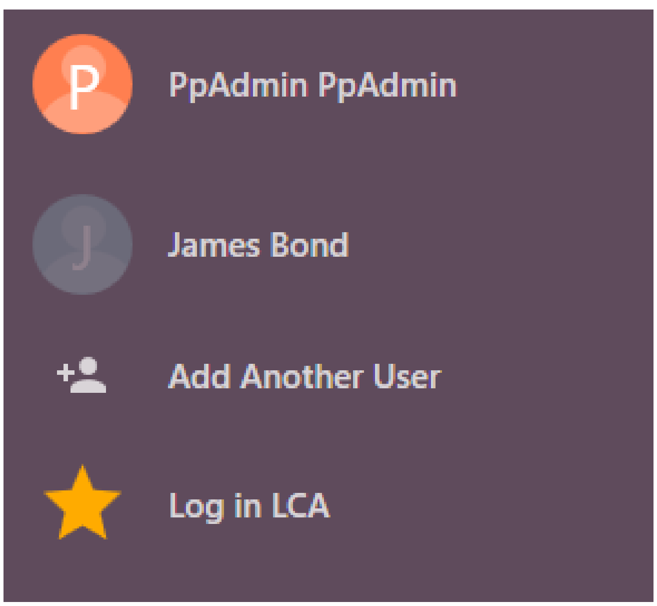
A Station can be configured to allow more than one Operator to be logged in at the same time. If this is configured then additional numbered Operator login slots will be visible in the Operator list.

Multiple Operator Login Slots



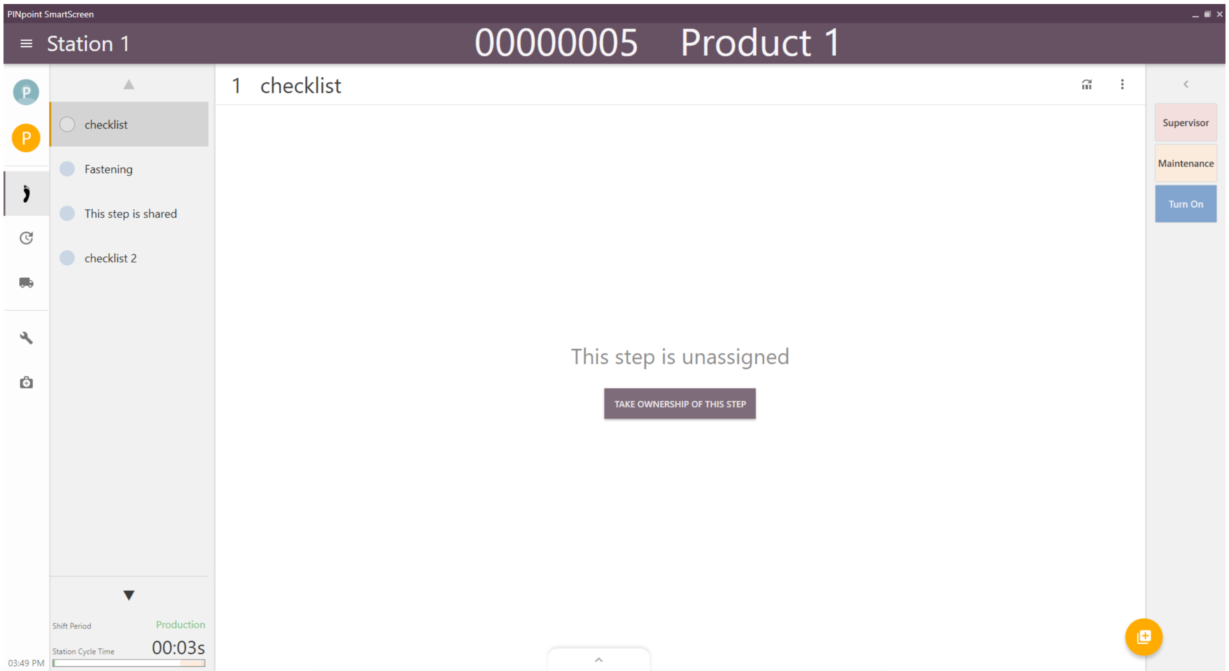

To log another Operator on, click one of the open slots. The login dialog opens and enables a new Operator to log onto the Client without the current Operator having to log off. Only one operator can be active at a time. When users deactivate themselves they are indicating that they are not using the SmartScreen Client.

Two Operators logged in simultaneously



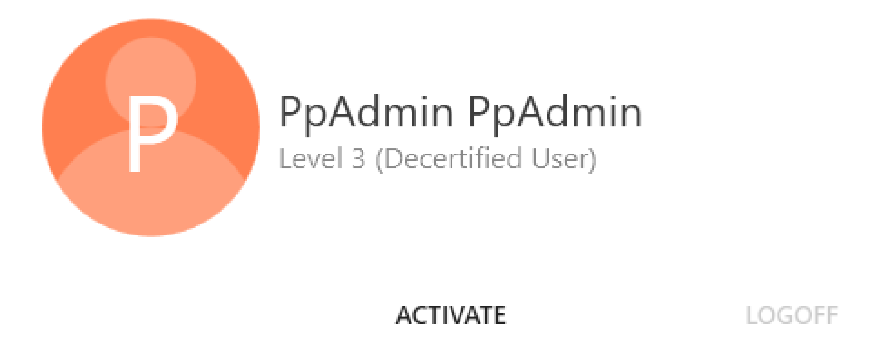

Whenever more than one Operator is concurrently logged in, a Step must be assigned to one of them before it can be performed.

Assigning the Step




To assign the Step to the currently active Operator, simply press the Assign button. To assign the Step to a different Operator, click that Operator's icon in the Operator list and make that Operator active by pressing the Activate button, and then press the Assign button.

Assign Operator




This Operator is then also required supply his/her password to proceed.

## Log In LCA

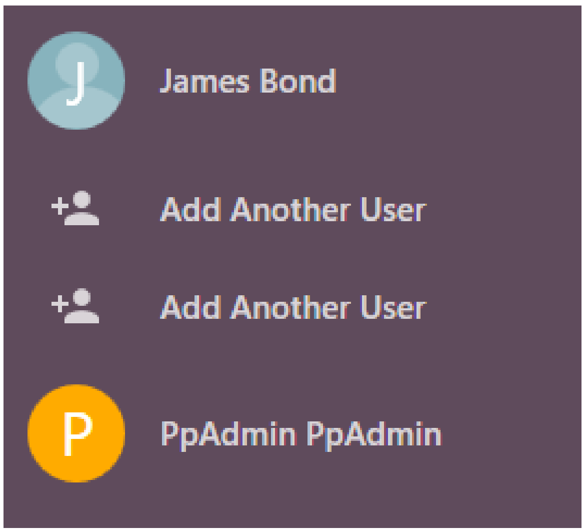
It is occasionally necessary to have a user with Line Control Access log into the Client. Line Control Access (LCA) is a security role assigned to a user on the Security app. For example, a certain pre-set number of bad rundown operations can cause the tool to be locked, and will require the LCA to log into the Client to unlock the tool so work can proceed.

The star icon is a user slot reserved for the LCA.

LCA login icon


Clicking this icon opens the login dialog. A user with LCA permissions must log in to proceed. Once an LCA is logged in, the LCA slot changes to reflect the current login of an LCA, and the LCA is able to perform the required administrative functions on the Client.

LCA currently logged in

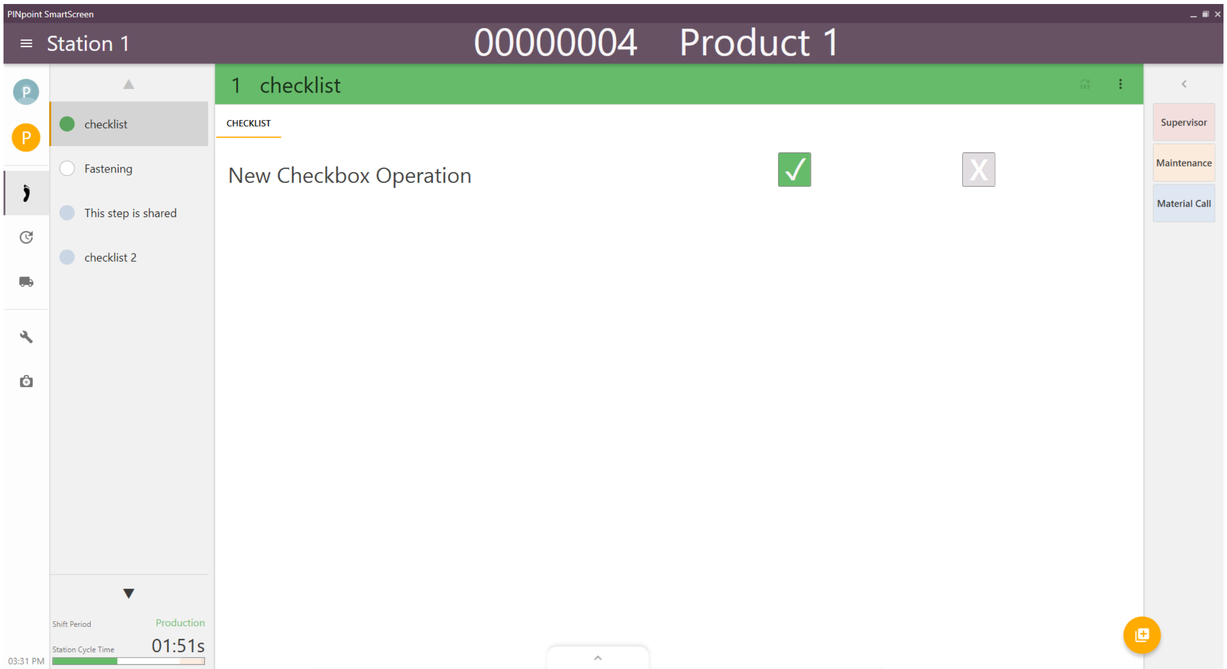



# SmartScreen Interface

This section is intended to familiarize users with the default layout of the SmartScreen Client and its various panels.

Once a user has successfully logged onto the SmartScreen Client, the work interface is displayed. The illustrations and sections below describe a typical SmartScreen environment. Please keep in mind that certain details may vary with regard to the choices and needs of your organization.

## The SmartScreen Client interface




# Title Pane

The title pane displays the Name of the station, The Serial number which is currently loaded, and the top level part number of the work order item. The top level part number can be hidden via the preferences menu. Contextual Data Items can be shown here.

Title Information panel

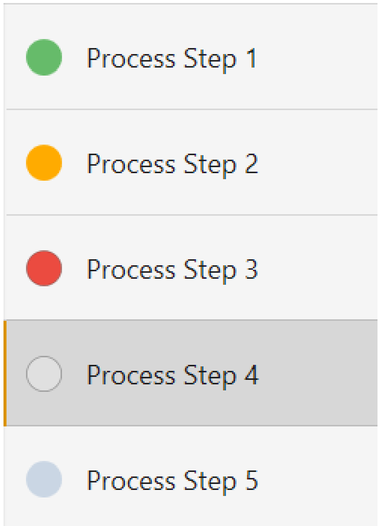

# Process Steps

The Process Steps pane displays the steps to be performed. These are configured in the SmartBuild Process tab, and are particular to a station.

An operator with Line Control Access is permitted to cycle through the various process steps, and can be given the role bypass a step if necessary. An operator without Line Control Access is required to successfully complete each step before progressing to the next, and must complete all steps before loading a new serial number.

At a repair station steps must be complete or acknowledged in order to get station complete.

Process Steps panel




The color of the step indicates its completeness, or else an issue with its completion that needs to be resolved:

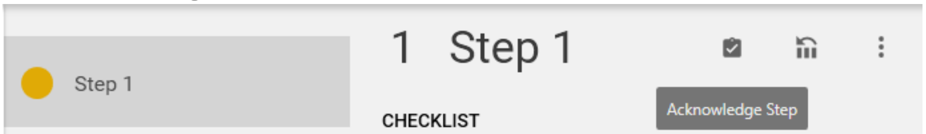
Process Step color meanings

| Color | Meaning |
|---|---|
| Blue | Not Started |
| White | Not Complete |
| Red | Incomplete because of errors |
| Yellow | Bypassed |
| Green | Complete |

## Acknowledging steps as completed

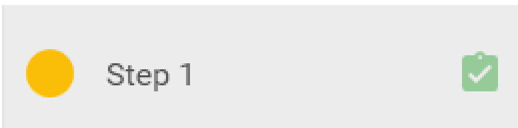
At a repair station all steps must be complete or acknowledged (as having been completed) in order to consider the station complete. If a process step is bypassed then it can be acknowledged as complete on a repair station.

The Acknowledge Button



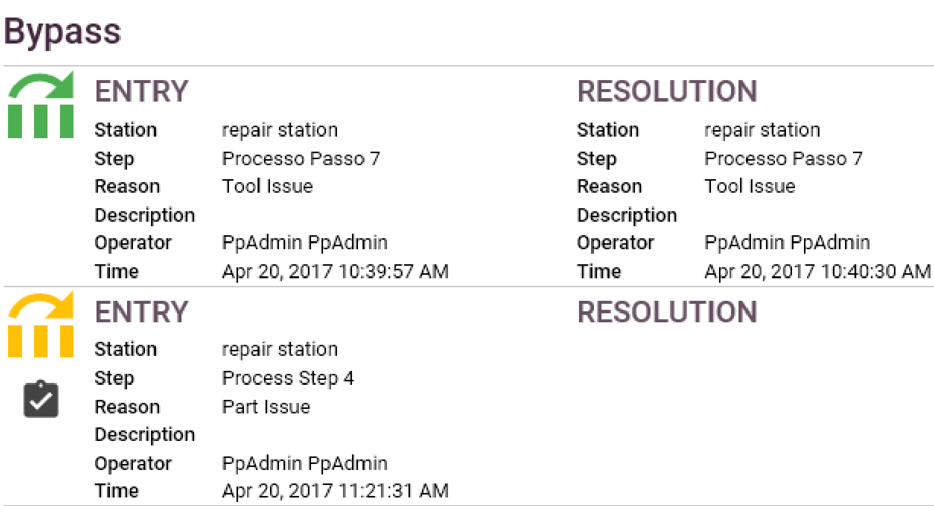

If a step is bypassed the bypass icon will move to the step.

Once Acknowledged The Symbol Appears On The Top




The symbol showing that a bypass has been acknowledged will appear in the tracking app.

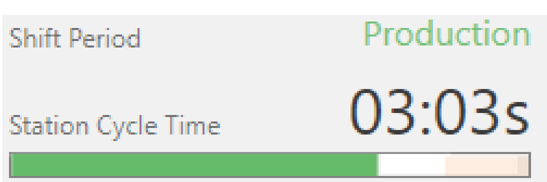
Acknowledge Symbol On the Tracking app popup




## Station Cycle Time Indicator

The cycle time gage displays the elapsed time at the station and the current shift period.

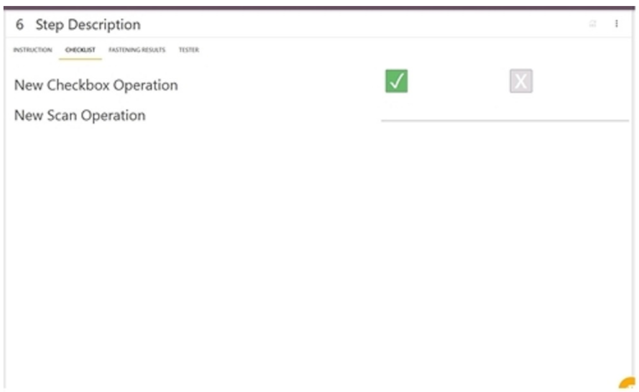
Station Cycle Time Indicator



## Main Work Area

The **Main Work Area** is divided into several tabs. These tabs provide instructions to the operator based on the operations assigned to the step. Each tab can be completed separately.

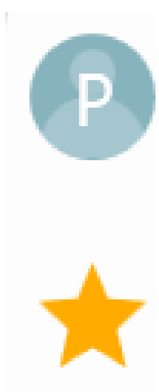
The main work area of the client




## Operator Panel

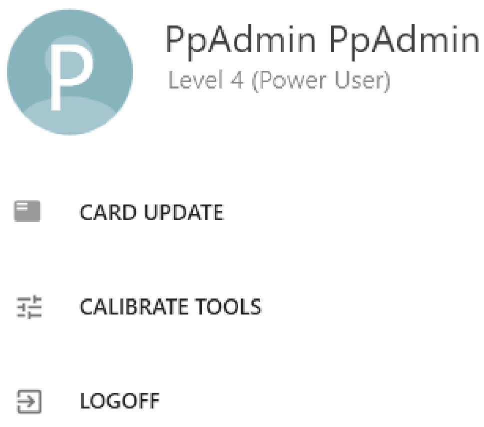
The Operator Panel displays the users who are logged into the client. The colour assigned to each operator is used to match the operator to a process step when Multiple Operators are used.

The Operator Panel



The Operator Panel has Options for Specific Users When They Are Selected

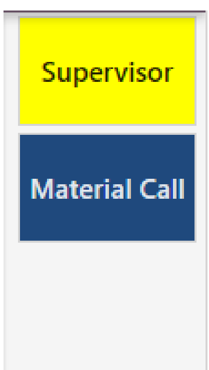
 




## Andon Buttons Panel

The andon button panel displays the buttons for the station.

Andon Buttons panel




Typical buttons available may include:

**Blue Material Call**: this button is generally configured to have three states: off (material available), blinking (material low), and solid (material out), and is usually configured to cause the blue Andon light to first blink, and then light solidly, when the Operator presses it to indicate to the LCA that material is running low, and has run out, respectively. Touching or clicking the button again resets it and the Andon lamp to their default “off” state.

**Call Torque Crib**: this button is generally configured to send a preset text message to the Torque Crib informing that person that assistance is required at your station; typically because there is a malfunction in the tool or because the tool has become locked due to multiple bad rundowns.

**Yellow Help Call**: the button is generally configured to activate the yellow Andon light and alert the LCA of a problem at the station requiring assistance.

**Red Alert Call**: the button is generally configured to activate the red Andon light and alert the LCA of a serious issue at the station or on the line.

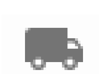
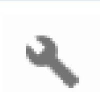
Buttons are not intended to, and do not, offer the functionality of emergency stop buttons or devices. They are intended solely for the purpose of communicating events, issues, and statuses to signaling devices and PINpoint for the purposes of tracking and reporting.

## Process Legend

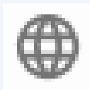
The Process Legend is divided into equal parts representing the number of steps in the current process, and display, from left to right, the status of the steps in the same colors displayed in the Process Steps.

## Buttons

The Buttons On The Menu:

| Button | Meaning |
|---|---|
|  | Menu |
|  | Process Steps |
|  | Performance |
|  | Quality |
|  | Serial Number |
|  | Settings |

| Button | Meaning |
| --- | --- |
|  | Web Viewer |

# Quality

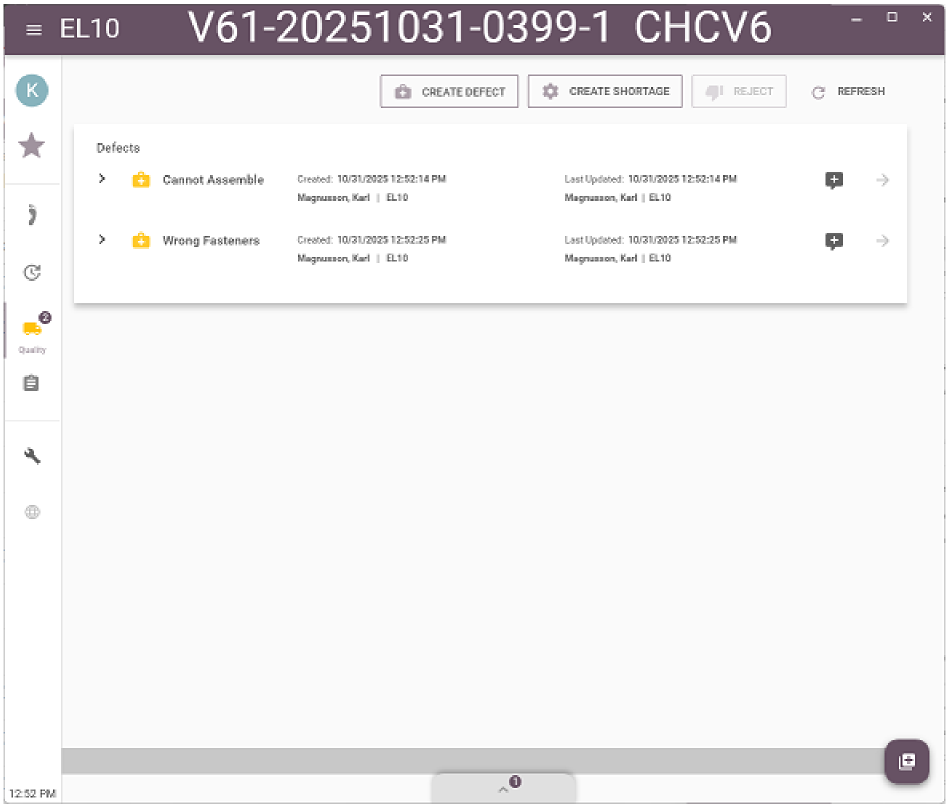
Clicking the **Quality** truck will display a list of the quality issues recorded. Shortages, defects, and other issues can be managed here.


Acknowledging all the items which are affecting the product quality as having been resolved will make the product quality icon green, provided the item is not of a defect type for which *approval* is required. If the item is a defect type for which approval is required, acknowledging it *resolved* makes that item's *medical bag* icon blue, indicating approval of the resolution is necessary. Once approved, the medical bag icon is turned green.

Defect types can be configured in **Configuration Web** to require approval. Defects that require approval go through a 3-status workflow: **Initialized** to **Resolved** to **Approved**. Defects that don't require approval go through a 2-status workflow: **Initialized** to **Resolved**.

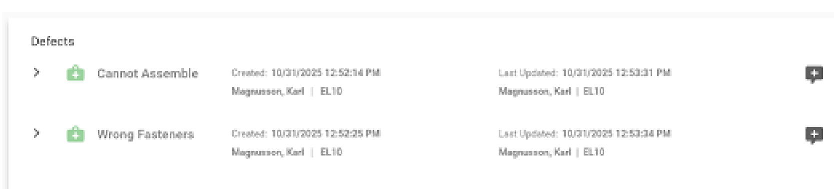
The ability to approve a defect requires the **AllowApproveDefects** role. Users assigned this role can approve defects others set to **Resolved** . For process integrity, however, they cannot approve defects they themselves set **Resolved**. Their **Resolved** defects must be approved by another user with the **AllowApproveDefects** role.

## Unresolved Product Quality Items




Unresolved quality items--items other than bypasses that aren't green--have an arrow on the far right. Clicking this arrow displays a simple form that can be completed to resolve the item.

## Resolved Product Quality Items




## Creating A Defect or Shortage, or Rejecting a Build Item

Above the list of quality issues are buttons that allow users to create a defect, create a shortage, or reject a build item. Clicking one of these buttons displays a simple form to complete.

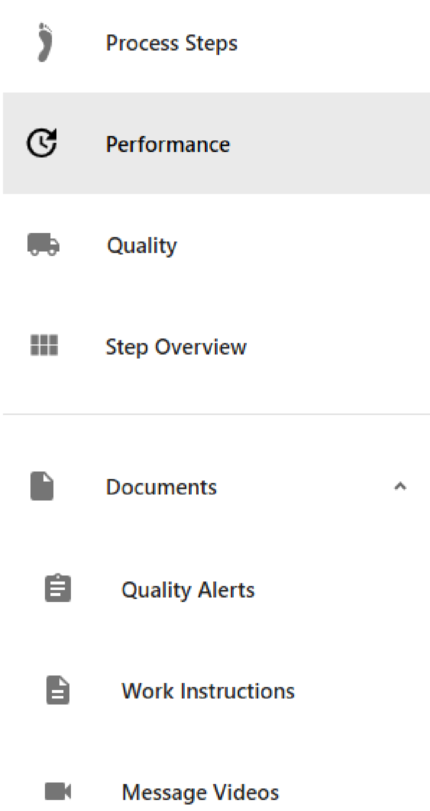
## Adding a Note

Each quality item, except for a bypass, has a *notes* icon on the right end. This icon displays a **Defect Notes** form that can be used to add notes.

## Documents

Documents are found on the expanded menu. Operators can view the documents which are relevant to the station here.

Documents In Performance Menu



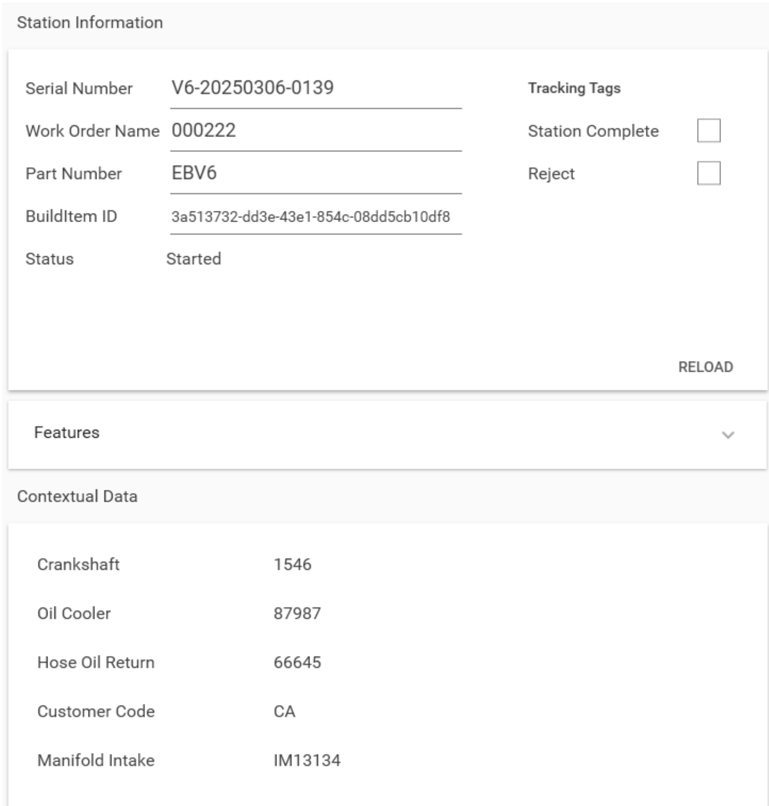

## Serial Number

The Serial Number tab displays information about the build item which is currently loaded.

The Reload button will download the latest process steps from SmartBuild and load them. It will also get any updates to the contextual data items for the work order item.

Serial Number tab With Contextual Data




The dialog will present the following indicators if a serial number is currently loaded at the station:

- **Station Complete:** This indicates that all process steps required to be done at the station have either been completed or has been overridden by some other status such as a bypass or rejection.
- **Empty:** This indicates that the pallet at the station is empty and that the empty OPC bit is enabled. The station will be considered complete and no steps will need to be completed. When this pallet is loaded at any another station a screen will display **Empty** over the main work area and the operator will not have to complete any steps.
- **Reject:** This indicates the build item at the station has been marked as rejected and that the rejected OPC bit is enabled. The station will be considered complete and no steps will need to be complete. When this build item is loaded at any other station the operator will not have to complete any steps. This is managed in the Control tab (see "Controls" below).
- **Contextual Data**: Displays a list of the contextual data associated with this serial number.

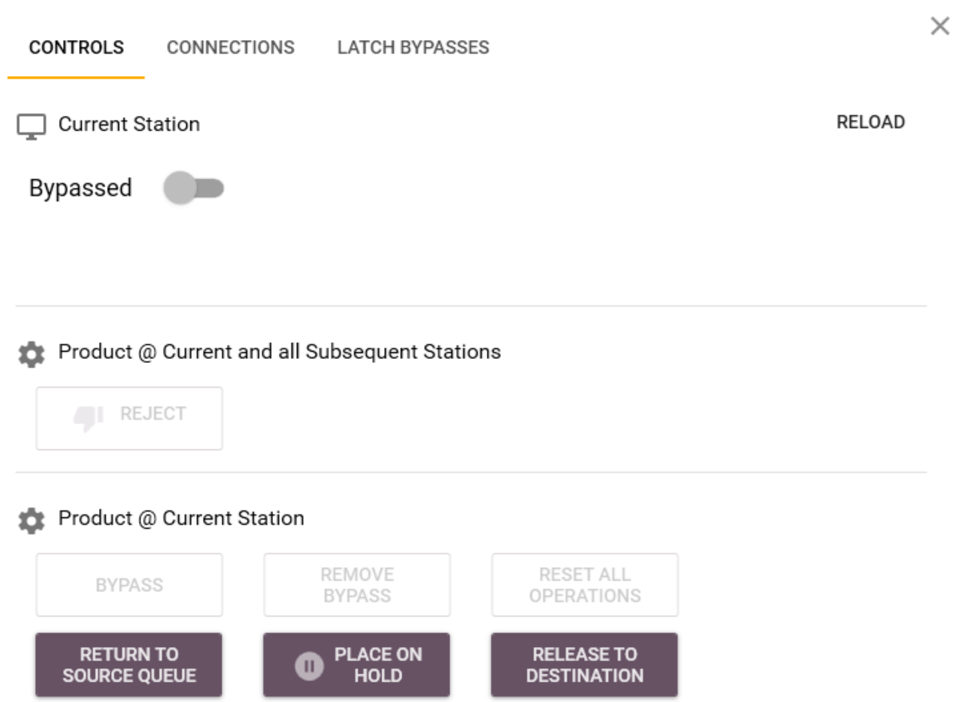
## *Settings*

The settings menu has **Controls**, **Connections**, and **Latch Bypasses** tabs.

### Controls

The Controls tab provides users with the ability to perform a variety of different overrides on the typical operation of the Station and its Process Steps. The Reload button will download the latest process steps from SmartBuild and load them. It will also get any updates to the contextual data items for the work order item.

Controls tab

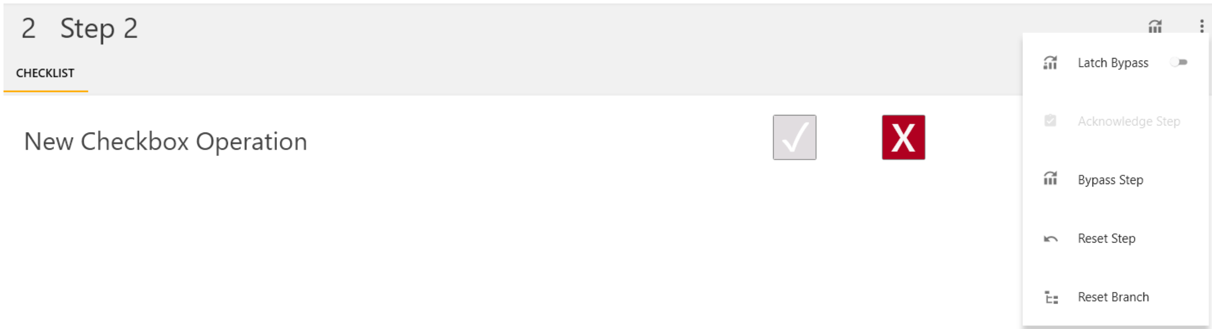



The following table describes the functions of each button.

Each of these functions, including **Release to Destination**, requires an LCA to be logged onto the Station, but **Release to Destination** also becomes available to non-LCA Operators when all Process Steps are complete.

Process Steps must be controlled using the controls on the steps. The menu is on the top right of the step.

The Process Step Controls Menu




Controls functions

| Function | Description | Conditions |
| --- | --- | --- |
| Current Station | | |
| Bypassed | This is a latch condition switch.<br><br>When activated it sets all Process Steps at the Station bypassed, which causes the station to be considered complete, making it possible for the build item to move to the next queue without any work being performed on it. Until the switch is deactivated, all the Process Steps for all build items which enter this station will automatically have their status set to Bypassed. Bypassed Process Steps are displayed in yellow.<br><br>When this switch is deactivated the Station resumes it normal operation. | Available whenever a build item is loaded at the Station. |
| Auto Empty | This is a latch condition switch. The purpose of this is to allow pallets, identified by the tracking ID, to be marked as empty so that any products on the line can be completed and removed from the line.<br><br>It is only available on the first station in a route or in the first station in a cluster of Sync-by-Index Tag stations (see "Synchronizing Tags" on page 57).<br><br>When activated it will assign an Empty item to a tracking ID when a tracking ID arrives at a station. If the switch is activated while a build item is currently loaded the Empty item will be loaded when the next tracking ID arrives or after an Index occurs. It will not affect the current build item. If | Available only at the first Station in a route or at the first Station in a Sync-by-Index cluster of Stations. |

| Function | Description | Conditions |
|---|---|---|
| | there are build items in the inbound queue of the Station they will remain in the queue and Empties will be loaded and assigned to the tracking id each time a new tracking ID arrives or with each Index until the switch is deactivated.<br><br>If the switch is activated while the station has a tracking ID but does not have any build items in the queue and Empty item is assigned to the tracking ID. | |
| Product @ Current and all Subsequent Stations | | |
| Reject | The **Reject** button is intended for instances in which issues with a Product are so great that they cannot easily be remedied at a typical station on the line. Selecting reject sets the status of the build item to be rejected. Process Steps at downstream stations are not displayed when a build item is rejected.<br><br>Users must enter a reason when rejecting a build item. | Available whenever a build item is present at the Station. |
| Empty | The **Empty** button allows an operator to send an Empty pallet down the line. The button becomes available whenever a Pending or Rejected build item is present at the Station. Empty removes the build item from the tracking ID. | Available only when a status of Pending exists or a Rejected build item is present. |
| Product @ Current Station | | |
| Bypass | **Bypass** sets the status of all incomplete Steps to Bypassed. The status of any previously-completed Step is unaffected. This sets station complete to true so that the pallet can be released.<br><br>Bypassed Process Steps are displayed in yellow.<br><br>Users must enter a reason when bypassing a step. | Available if there are any Process Steps that are incomplete. |
| Remove Bypass | Clicking the **Remove Bypass** button for a Product immediately sets the status of bypassed Process | Available if there are any Process Steps |

| Function | Description | Conditions |
|---|---|---|
| | Steps back to their previous status. The status of any previously-completed Process Step is unaffected. This enables the usual work performed at the station to resume.<br><br>When the button is clicked, a dialog is displayed requiring the selection of a Reason for the bypass removal from an established list of reasons. | with a status of Bypassed. |
| Reset All Operations | Clicking the **Reset All Operations** button changes the status of all Process Steps to Reset. The impact on the Operations belonging to a Process Step varies depending on the type of Operation. For more information, see the table "Effect of resetting Steps on Operations" on page 304.<br><br>Reset Process Steps are displayed in red. | Available if a Product is present and any Process Steps have Operations that can be reset. |
| Return to Source Queue | Clicking the **Return to Source Queue** button immediately unloads the build item from the station, regardless of the status of the Process Steps, and releases it to the inbound queue of the station. The Client returns to the Work Orders window and the build item returns to station’s inbound queue.<br><br>**Return to Source Queue** creates a Pending on a Sync-by-Index line. | Available whenever a Product is present at the Station. |
| Place on Hold | Clicking the **Place on Hold** button returns the build item to the inbound queue of the station. This is similar to the **Return to Source Queue** button, except that the build item is returned with an “on-hold” status and must be manually loaded by an LCA to be worked on. Once loaded again, the “on-hold” designation is removed from the build item.<br><br>In practice, to load and work on an “on-hold” build item, the current build item must be released or returned; an Empty or Pending build item must be created; and the “on-hold” build item must be selected and loaded.<br><br>**Place on Hold** creates a Pending on a Sync-by-Index line. | Available whenever a Product is present at the Station. |

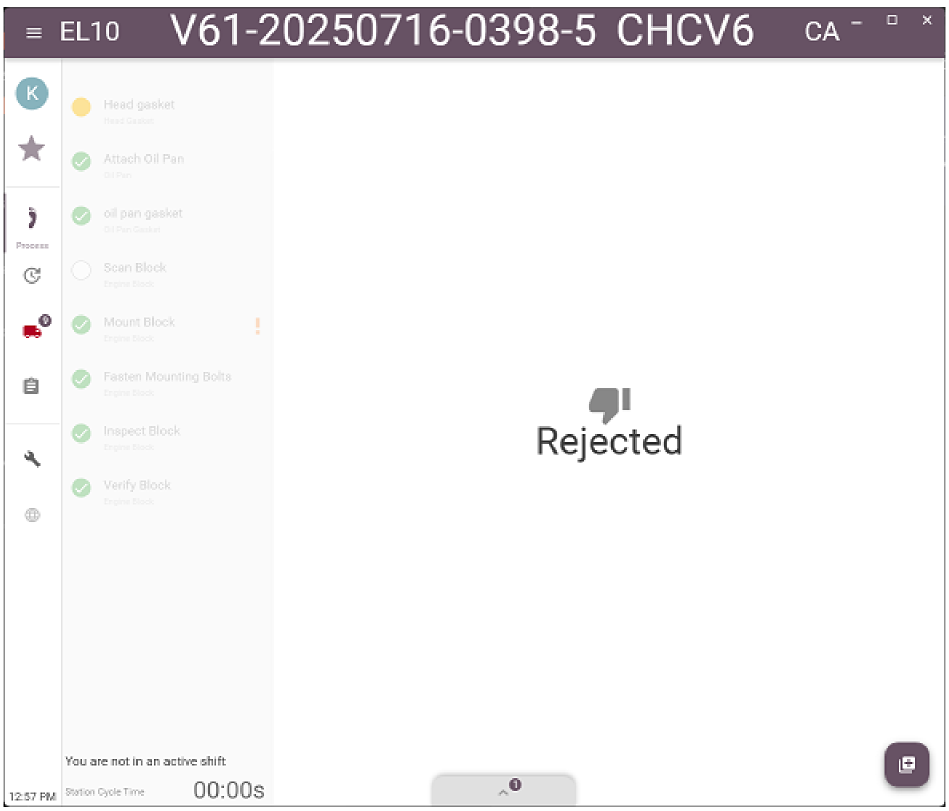
 

| Function | Description | Conditions |
|---|---|---|
| | If a station has *Adjoin Tracking ID* set true then placing an item on hold will disjoin the tracking ID. | |
| Release to Destination | Clicking the **Release to Destination** button immediately unloads the build item from the station, regardless of the status of the Process Steps, and releases it to the outbound queue of the station. SmartScreen returns to the Work Orders window.<br>**Release to Destination** creates a Pending on a Sync-by-Index line. | LCA: Available whenever a Product is present at the Station.<br>Standard Operator: Available when all Process Steps are complete. |
| Current Process Step | | |
| Latch Bypass | This sets the status of current Process Step to Bypassed. This step and all shared instances of it will be bypassed each time a new serial number arrives at this station. Bypassed steps will appear in the Latch Bypasses tab on the settings menu. | Available if the current Process Step is incomplete. |
| Acknowledge Step | This will set the step state to Acknowledged. Bypassed steps must be completed or acknowledged before the step is considered complete at a repair station. Operators are allowed to acknowledge bypassed steps at a repair station without an LCA. | Always Available |
| Bypass | This sets the status of current Process Step to Bypassed. The status of other Process Steps is unaffected. This enables the Operator to skip performing the work of the current Process Step and move on to the next Process Step.<br>Bypassed Process Steps are displayed in yellow.<br>When the button is clicked, a dialog is displayed requiring the selection of a Reason for the bypass from an established list of reasons. | Available if the current Process Step is incomplete. |
| Remove Bypass | This removes the bypass status and returns the Process Step back to its previous state. | Available if the current Process Step has a |

| Function | Description | Conditions |
|---|---|---|
| | When removing a bypass the user must enter a reason. | status of Bypassed. |
| Reset Step | This changes the status of the current Process Step to Reset. The impact on the Operations belonging to a Process Step varies depending on the type of Operation. For more information, see the table "Effect of resetting Steps on Operations" below. | Always Available |
| Reset Branch | This will reset every step in the entire branch. | Always Available |

## *Rejected part notification on SmartScreen Client*




The following table outlines the effect resetting a step has on the various types of Operations.

Effect of resetting Steps on Operations

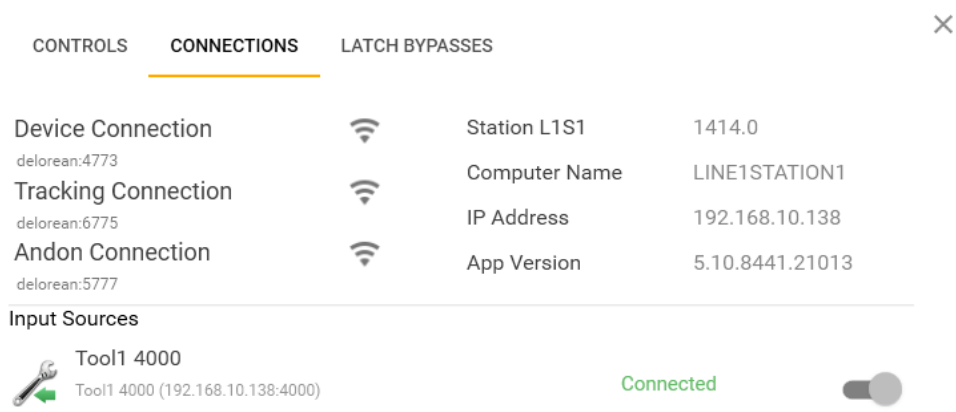
| Operation Type | Effect of Resetting Parent Step |
|---|---|
| Branch Decision | The Process Steps within the Branch Decision are reset. The impact on the Operations within those Steps varies with the type of Operation. |
| Fastening | A row is inserted to show when the operation was reset. The fastening operation must be made complete again if the plant property *Reset All Operations Includes Setting Fastening Count to 0* is true. Resetting a fastening operation acknowledges the Fastening lock. |
| Scan | Clears the scanned data and requires a renewed scan entry to complete the Step. |
| Check-box | Clears the check box and requires the check-box to be checked again to complete the Step. |
| Document | Requires the Operator to view the document again to complete the Step. |
| Pick Light | Resets the count and requires the Operator to re-pick the correct number of parts. |
| Tester | A row is inserted to show when the operation was reset. Requires the Operator to perform the Tester Operation again to complete the Step. Resetting a tester operation will clear the IPV lock. |
| Print | Requires the Operator to perform the printing Operation again to complete the Step. |

## Connections

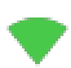
The connections tab displays the current status of the connections relevant to the SmartScreen client. Tools can be stopped and started by a supervisor on this menu. Stopped tools require the operator to acknowledge that they have done an operation when the tool is unavailable.

The Connections Tab



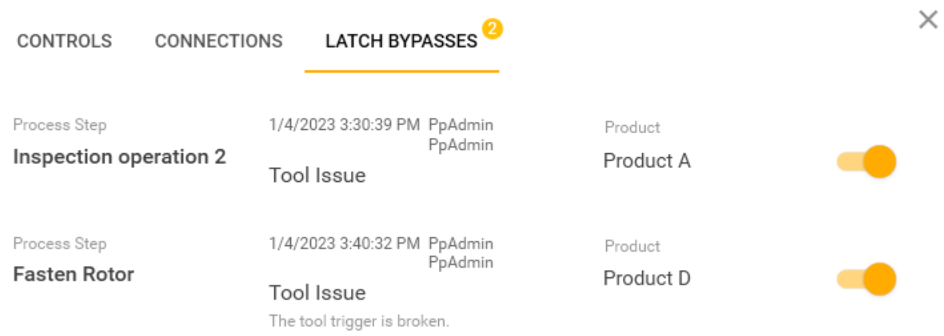

Icon Legend

| Icon | Meaning |
|---|---|
|  | The connection is in progress. |
|  | The connection has experienced an error. Please check the log file for more details. |
|  | The connection status is not set. The connection may have not been started or connection properties have not been defined (address, port). |
|  | Connected |

## Latch Bypasses

The Latch Bypasses tab shows all the latch bypassed process steps at this station on all processes.

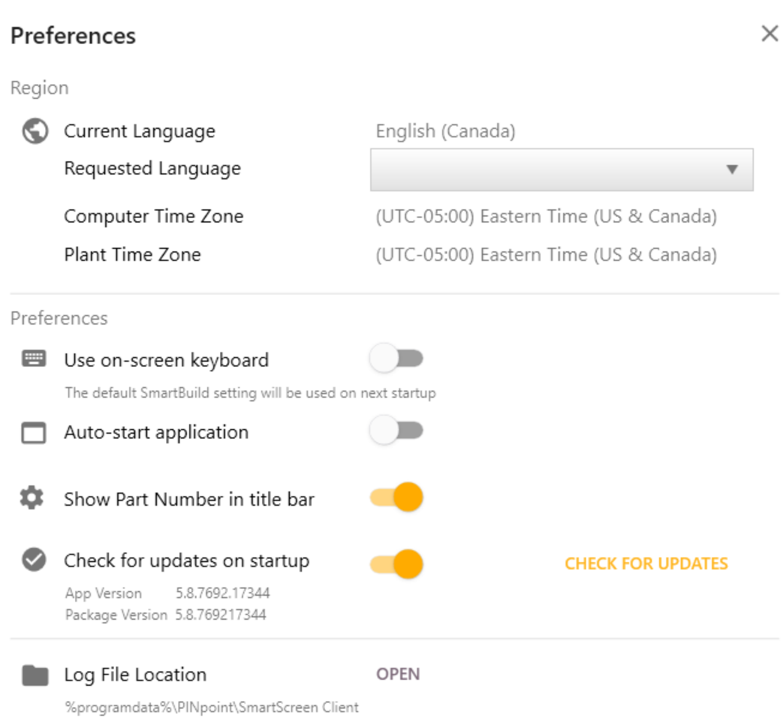
The Latch Bypasses Tab




## Preference

The preferences menu contains language, keyboard, and auto-update settings. The client can be setup to automatically update when a new client is available on the server. The updates can be deferred by toggling this setting to off on the updates menu. **Auto-start application** will launch the application when a user logs into windows.

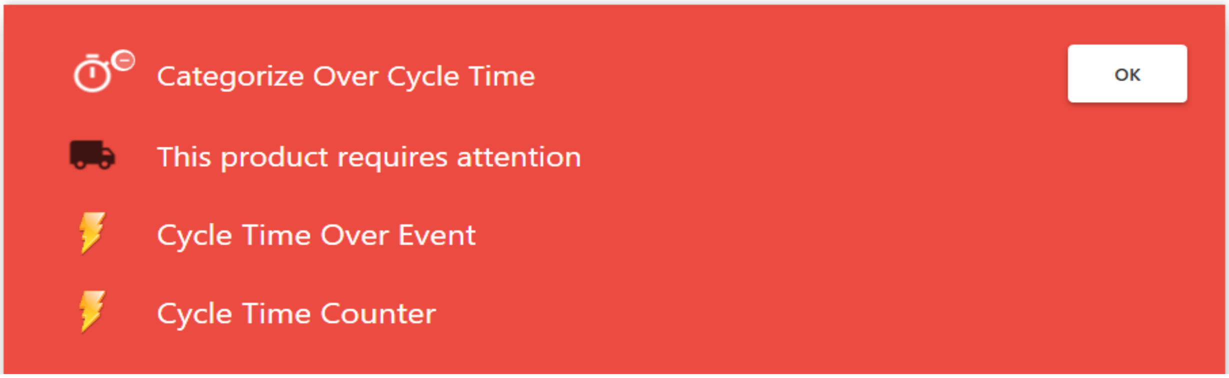
Preferences Tab




# Outstanding Events

When clicked, the **Outstanding Events** popup presents the **Outstanding Events** dialog listing the current events at the station. Users with appropriate permissions can use this dialog to resolve these events by clicking on the button associated with the event.

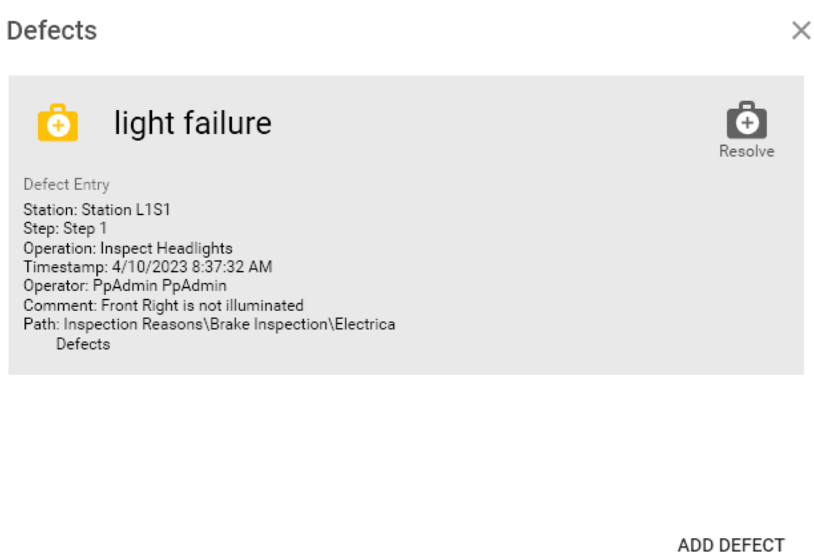
Outstanding Events




## Defects

The Defects button provides the Operator with the means to report a problem by selecting a location on an image and choosing a reason that describes it. It enables other Operators down the line from station that reported the defect to view (and potentially resolve) the issue.

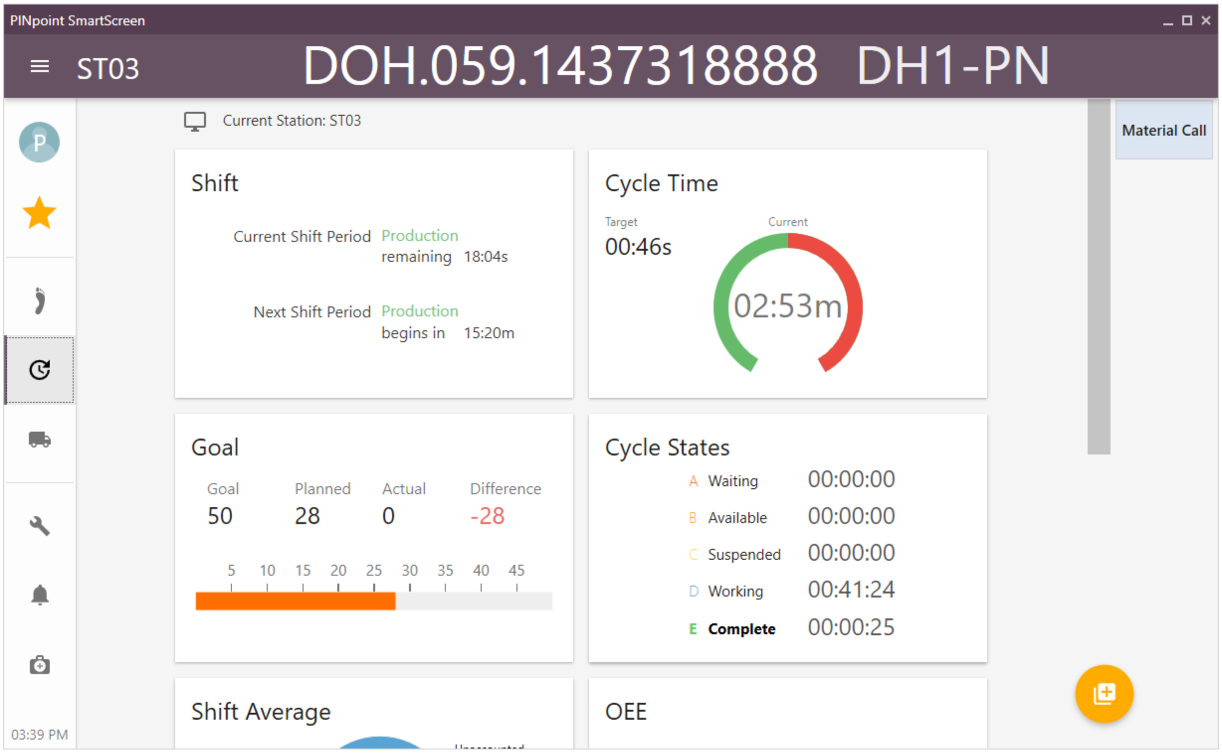
A Defect popup showing the information of the defect.




## Performance View

The performance view shows several charts about the performance of the station. For more information about how these are calculated see: "Performance Calculations" on page 370

The Charts on the Performance View




## *Web Viewer*

The Web Viewer button displays a URL and allows users to print it. The URL to display is setup under the line properties. The web viewer button is grayed out unless the address is configured on the properties for the line and a build item is loaded at the station. Variables can be appended to the URL. See the line properties for more information.

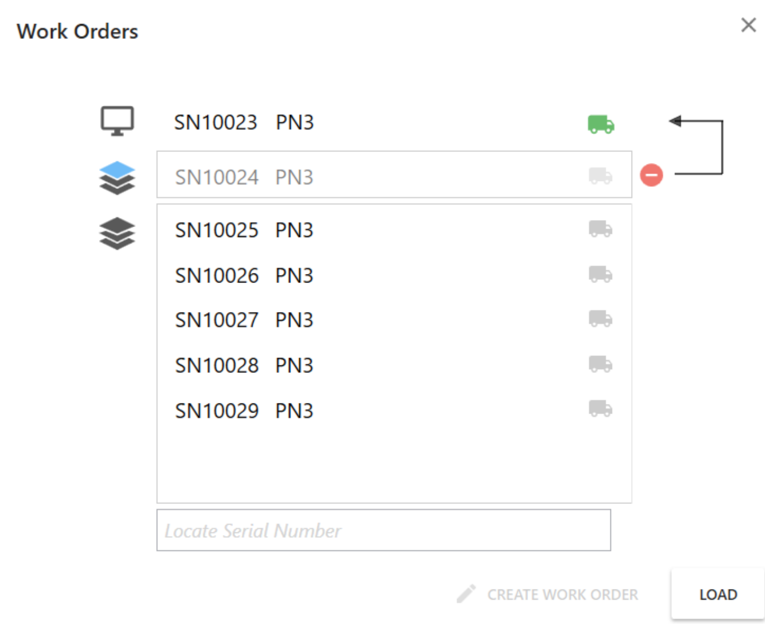
## *Work Orders*

The **Work Orders** button enables an operator to load the next build item when the previous build item is complete, or when it has been bypassed by an LCA.

Work Order Icon

Work Orders




# Loading Serial Numbers

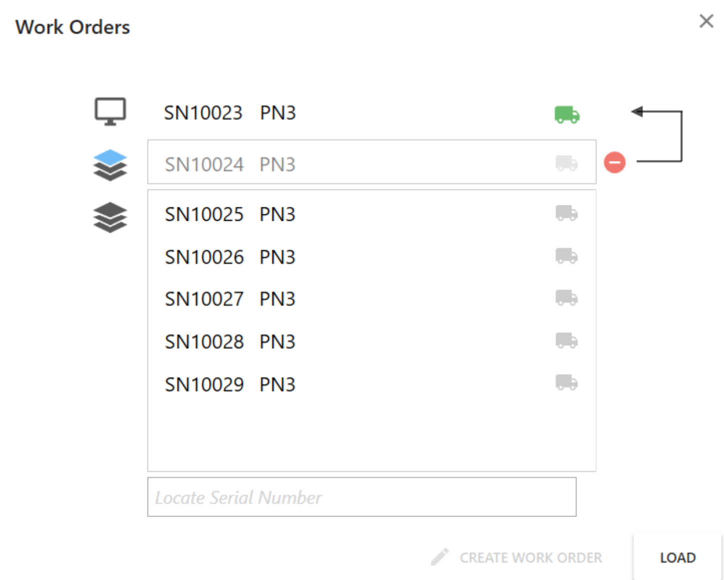
When Build Item is in the inbound queue of a station then the Serial number will appear in the work orders window so the operator can load it.

The following is the procedure to load a Serial Number at the Client:

1. Click the **Work Orders** icon at the lower right of the SmartScreen interface.
2. Click on a **Serial Number** to select it and click the **Load** button.

### Work Orders




The first Process Step is displayed, and work can now begin on the process steps.

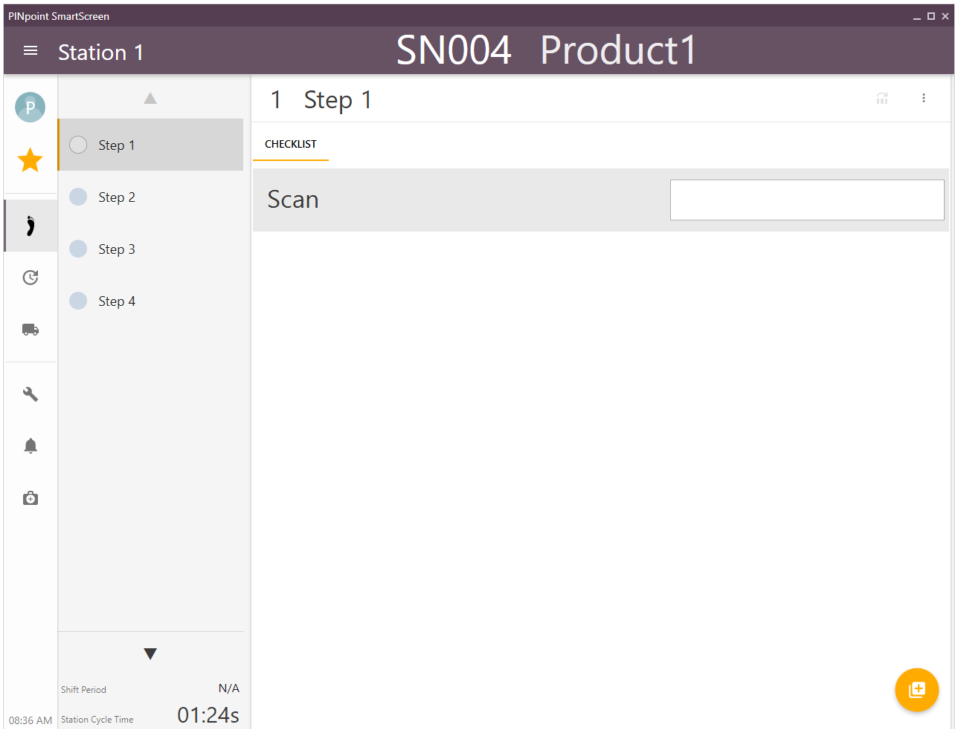
# Starting and Completing Serial numbers

This section provides an example of a typical operation at a Station, and how an Operator would proceed from Process Step to Process Step.

1. Load a Serial Number as per the steps outlined in "Loading Serial Numbers" on the previous page. When the first Process Step is displayed, work can begin. In this example, the first Process Step involves the use of a hand scanner to scan a barcode on the item.

Process Step one

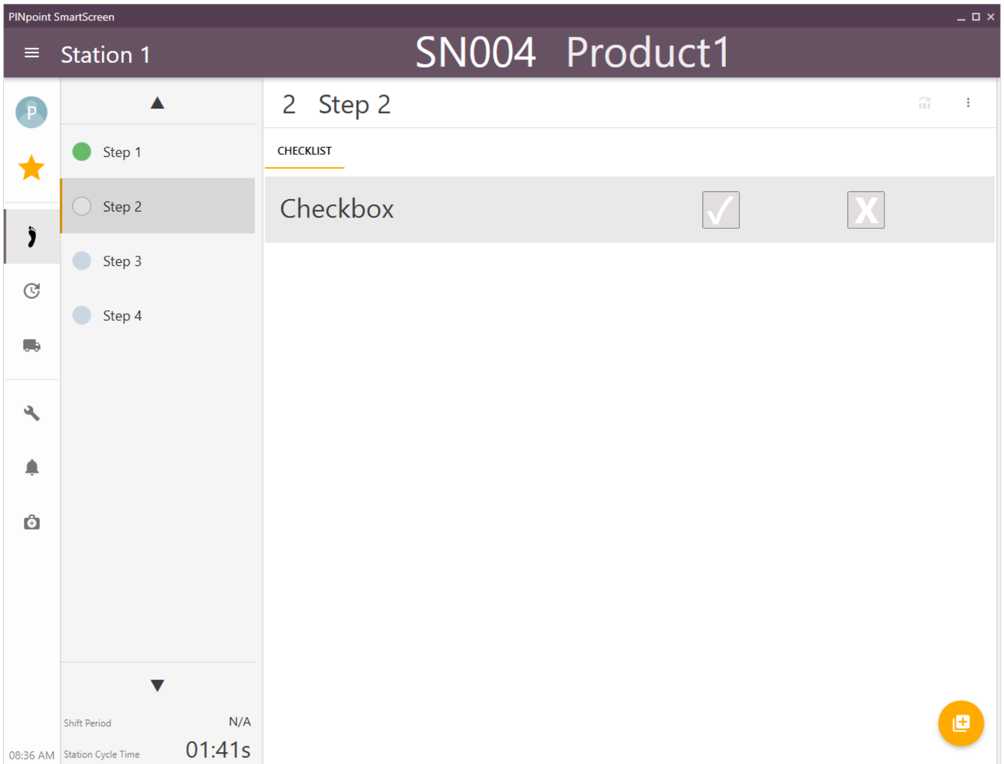



2. Perform the Process Step. When the step is successfully completed, the next Process Step loads.

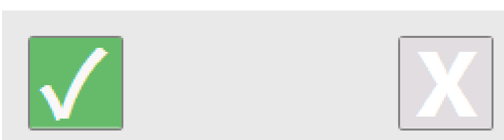
In this example, the second Process Step involves the proper placement and attachment of a part to the Product, and then clicking or pressing the screen to confirm this has been done.

Confirming process Step two




Click or press the confirmation icon

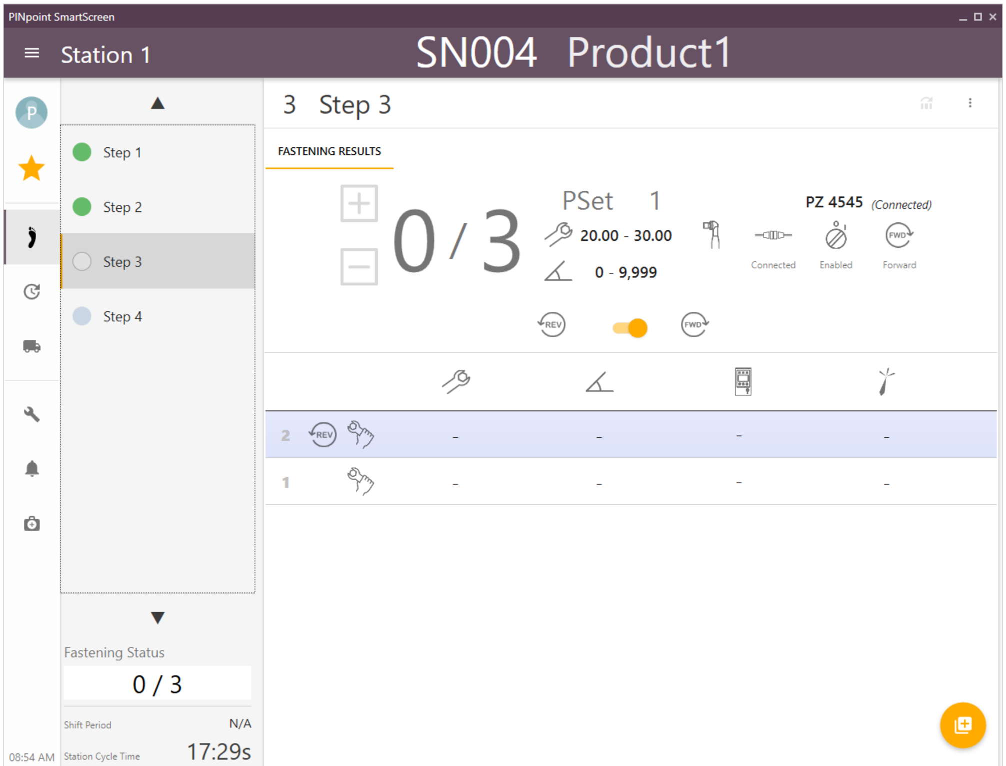


3. Perform the Process Step. When the step is successfully completed, the next Process Step loads.

In this example, the third Process Step involves the actual rundowns of fastening the gears to the frame of a bicycle. In the status screen of the step, shown in "Fastening Process Step status screen" below, information about the torque and angle requirements for the rundowns is displayed, as well as the number to be completed (4), and the number completed so far (0). The completion of this step is incumbent on the tool reporting to the Data Manager (and through it, to the Client) that the Operator has completed four rundowns within the specified tolerances.

Fastening Process Step status screen



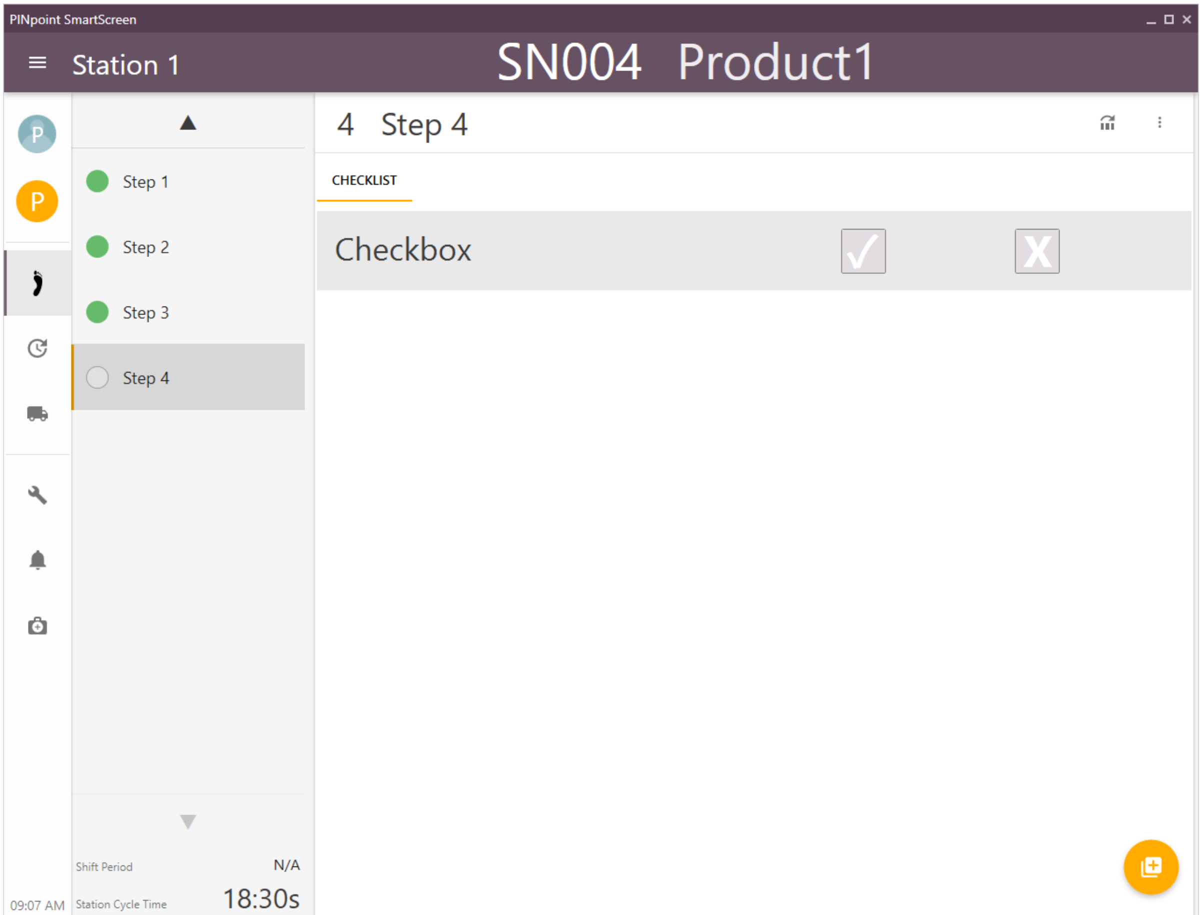

Successful rundown event screen

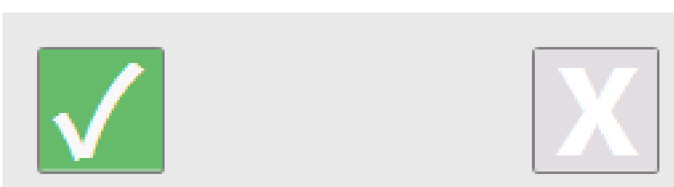
When the step is successfully completed, the next Process Step loads.

In this example, the fourth Process Step involves the Operator testing the quality of the work to ensure it meets standards before releasing the item to the Queue for the next Station, and then clicking or pressing the screen to confirm this has been done.

Work quality confirmation step

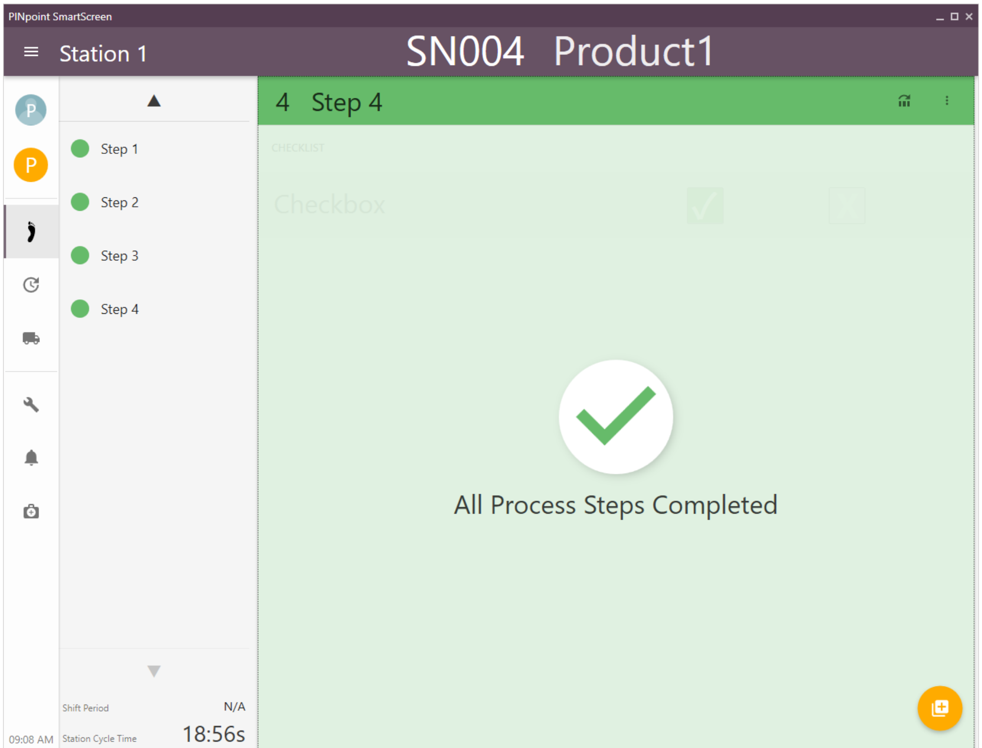



Click or press the confirmation icon



With the successful completion of the last Process Step, the Station has completed work on this Product. Note in "Work Completed" below that all bars are green and the status “Station Complete” is displayed at the bottom left of the work area. The Product is now released to the Queue of the next Station, and this Station can now load the next Product.

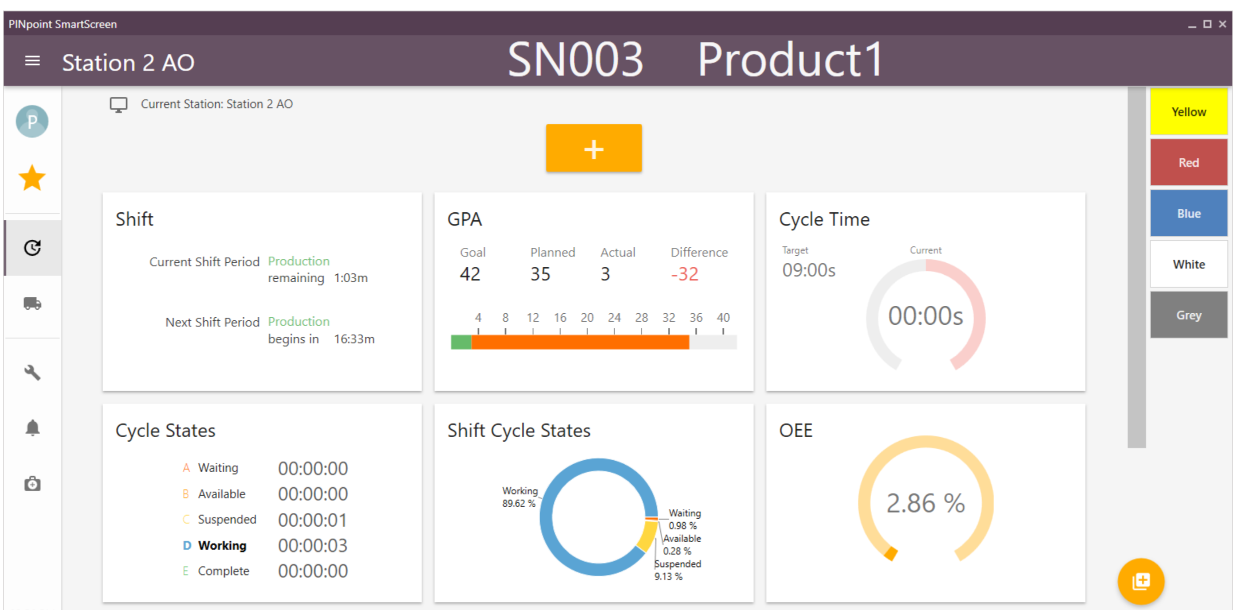
Work Completed




## Using an Andon Only Station

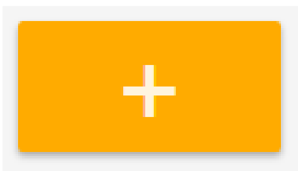
An Andon Only Station allows an operator to access Andon functions and view performance metrics without performing process steps. By default the performance view is shown.

The Andon Only Station



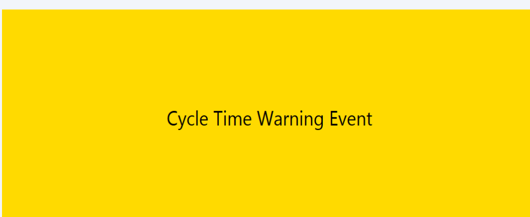
In order to allow the operator to signify that they have completed a product a plus button has been added to the screen. When this is activated the station is complete. The plus button is equivalent to achieving station complete if the station had steps. The plus button will normally release the product from the station. If the line is synchronized then all stations must be complete before the line will index.

The Plus Button

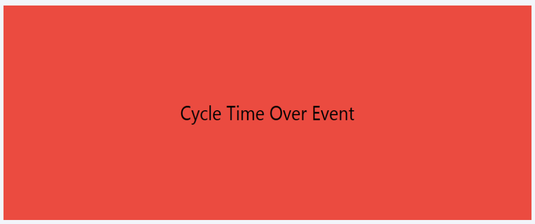
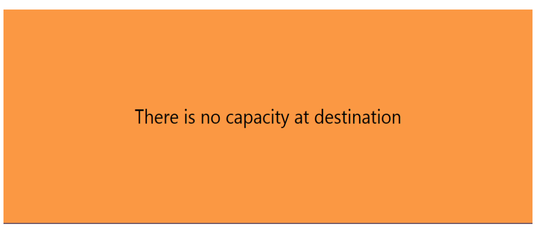
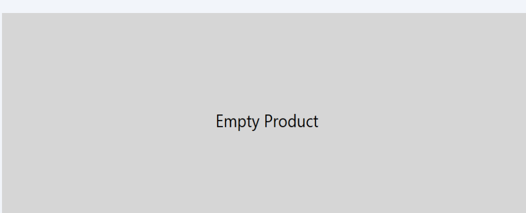


The Andon only station will display the following messages when action must be taken.

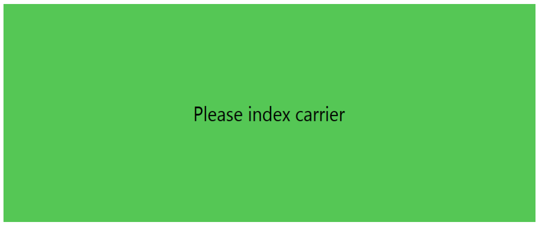
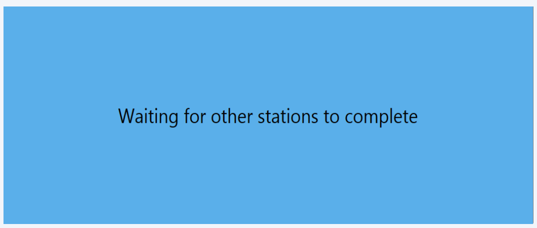
Client Auto Indexing messages

| Image | Color and Message | Description |
|---|---|---|
|  | Yellow<br>Cycle Time Warning Event | This message informs the Operator that TAKT time allotted to completing the Product is about to be exceeded. |
|  | Red<br>Pending product requires attention | This message is displayed to the Operator after the line indexes and the next Product is (or can be) presented to the Station, at which point the Operator can either classify the pending as an empty, or as a Product after a Work Order is scanned in. |

| Image | Color and Message | Description |
|---|---|---|
| | | To set the status to Empty, click the Settings button at the bottom of the Client, and in the Controls tab, select the Pallet Empty option. Note that this requires an LCA to be logged on. |
|   | Red<br>Cycle Time Over Events | This message informs the Operator that TAKT time allotted to completing the Product has been exceeded. |
|   | Orange<br>There is no capacity at destination | This message is displayed when PINpoint determines that the outbound Queue has reached its Destination Capacity maximum value, meaning that the space allotted to storing Products is currently full. |
|   | Grey<br>Empty Product | This message is displayed when the Product status has been set to Empty. |

| Image | Color and Message | Description |
|---|---|---|
|   | Green<br><br>Please index carrier | This message informs the Operator that the indexing signal has been received and the Product must be physically moved to the receiving Queue. |
|   | Blue<br><br>Waiting for other stations to complete | This message informs the Operator that other Stations in the same cell still have work pending completion, and so Auto Indexing cannot yet occur. |

## Creating Work Orders from the Client

It is possible to create Work Orders from SmartScreen Clients. Any Work Order created from the SmartScreen Client has the following limitations:

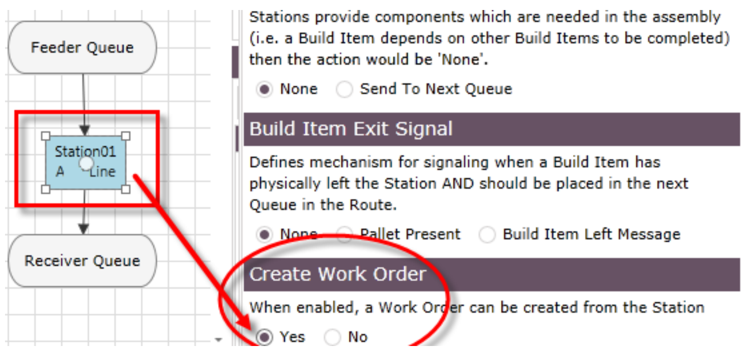
- The Work Order can only have a quantity of 1.
- The Work Order will be provisioned immediately on the route that the station is enabled on.
- The station creating the work order must be on a route where the Part is enabled.
- The same Part can be built on two different routes. The Part must be Default on one route and Enabled on the other route. The SmartScreen Client which initiates the Work Order creation must not be shared between the routes.
- The Work Order number is generated by the system and cannot be edited.
- The serial number may be specified by the SmartScreen Client.
- If the number set in the **Work Order Creation Limit** setting of the Station Configuration for the maximum number of Build Items in the Station's inbound Queue is already reached, operators will not be able to create a new Work Order. For more information, see "Station Config Properties List" on page 473.
- The Part for work order item created from the Station must be enabled on the Route.

- If a station has Create Work Order rule enabled, and uses a scanner, a Work Order is created if the serial number is not found in the queue when the operator scans it. The operator does not need to select anything on the screen.

To enable the creation of Work Orders from the Client at a Station:

1. On the **SmartBuild Build** tab use the drop-down menu to select the Route.
2. Select the Station which will create work orders.
3. Select the **Station Rules** tab.
4. In the **Create Work Order** section of the Station Rules tab, select **Yes**.

Create Work Order setting




5. Click the **Save** button.

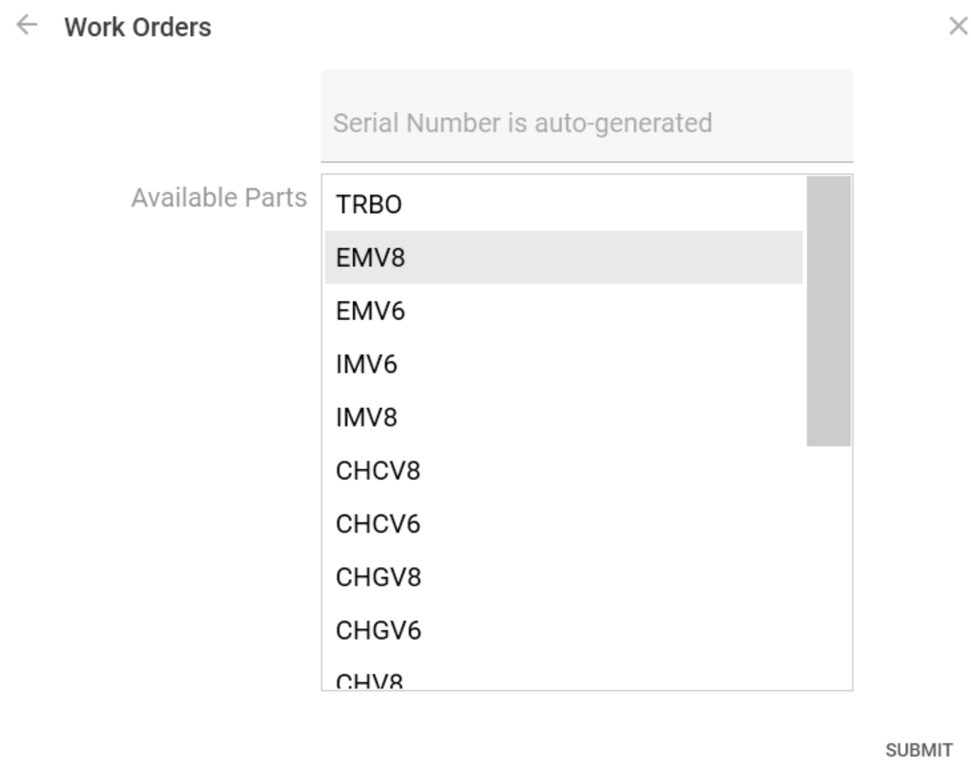
## *Creating a Work Order from the Client*

To create a Work Order from the Client, follow these steps.

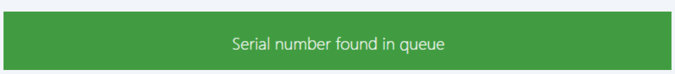
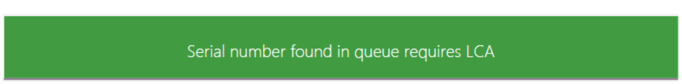
1. Select the **Work Orders** icon at the lower right of the SmartScreen interface.
2. Select **Create Work Order.**
3. Select a **Part** from the List
4. Select Submit

The work orders menu showing a list of parts. The user can select one to create a new work order.




Result messages for Work Order creation at the Client

| Result Message | Description |
| --- | --- |
|   | **Serial number found in queue:** This message is displayed immediately once the serial number has been scanned. A Product with the scanned serial number already exists in the Queue. The Product is highlighted in the Queue list and can by loaded by pressing the **Load Product** button. |
|   | **Serial number found in queue requires LCA:** This message is displayed immediately once the serial number has been scanned. A Product with the scanned serial number is available in the Station's inbound queue to be loaded, but requires and LCA to |

| Result Message | Description |
|---|---|
| | log in (for example, when the serial number scanned is not the next Product in the queue). |
| The serial number already exists or the Work Order item cannot be created | **Serial number already exists or the Work Order item cannot be created:** This message is displayed immediately once the serial number has been scanned. This message occurs when the serial number scanned already exists, but is not in the Station's inbound queue, and therefore no Work Order is created. |
| Work Order Submitted | **Work Order Submitted:** This message is displayed in the event that the serial number has been scanned, a Product has been selected, and the **Submit** button has been pressed, and when the Product is available to be loaded. |
| Data Manager Error: NoRoutingForProduct | **Data Manager Error: NoRoutingForProduct:** This message is displayed in the event that the serial number has been scanned, a Product has been selected, and the **Submit** button has been pressed. This message occurs when a Product is selected to be built whose route does not include this Station. This is necessary for a Work Order to be created from the Client.<br><br>This message will persist until it is dismissed by the Operator. |

## *Scanning a Serial Number and Selecting a Part*

When the Work Orders windows is open users may create a work order. Creating a work order on the SmartScreen client uses a few different properties to allow different workflows.

When scanning into the Work Orders window the data is always passed into the **Text Input Regex** and the returned data is used.

The first scan always creates the serial number by using the **Text Input Regex** and then the **Serial Scan Regex**.

- If Match **Part Barcode Prefix** is false and **Scan to Select Part In List** is false: The intention is that users will manually select the Part from the list.
- If Match **Part Barcode Prefix** is true and **Scan to Select Part In List** is false: The intention is that the Part will be selected by finding a Part with a matching **Serial Barcode Prefix.**
- If Match **Part Barcode Prefix** is false and **Scan to Select Part In List** is true: The intention is that the Serial Number will be parsed by the **Part Scan Regex** and the Part will be selected by finding a matching **Part Number.**
- If Match **Part Barcode Prefix** is true and **Scan to Select Part In List** is true: The intention is that the Part will be selected by finding a Part with a matching **Serial Barcode Prefix.** If one cannot be found the user can Scan a Part Number to select the Part.

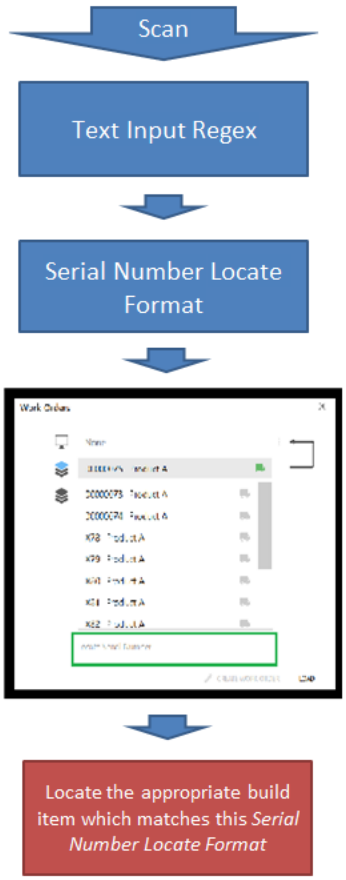
If the part is **Part Barcode Prefix** or the **Scan to Select Part** function finds only one matching part then the part will be automatically selected. If the **Part Barcode Prefix** finds multiple parts then the list of parts will be displayed and users can select or scan based on **Scan to Select Part in List** is true or false, the second scan will parse the data using the **Part Scan Regex.**

## Locate

The Locate Serial Number feature will find and load the appropriate build item which matches the serial number entered.

The typed or scanned text must match the **Text Input Regex** on the **Station Config.** The system will use this string to search for a build item which has a serial number which matches the **Serial Number Locate Format** field on the **Station Config**.

The flow data when it is scanned into the locate field

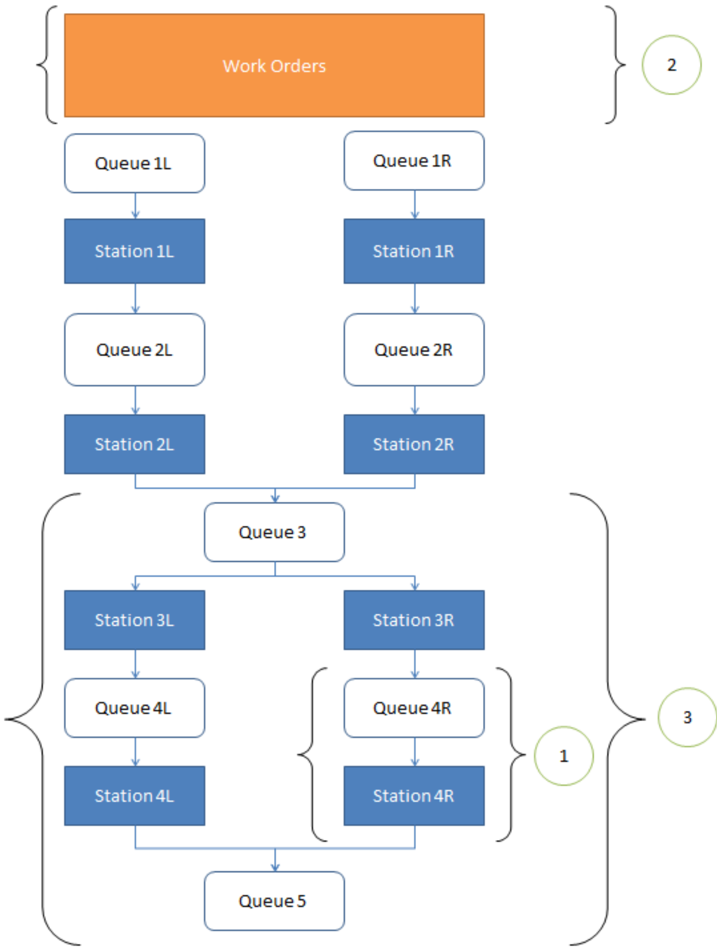



The system will search for a build item in this order:

1. In the queue for the station. If a build item is found it will be loaded immediately.
2. In the work orders. If a serial number is found then the work order will be provisioned immediately and the build items will be created at each start queue on the route.
3. In the local segment of the route. If a build item is found it will be loaded immediately even if the children from the previous segment of the route are not complete. If a work order was provisioned in the previous step then the build item will be found during this step.

A diagram of how the locate feature will look for the appropriate build item to load at a station

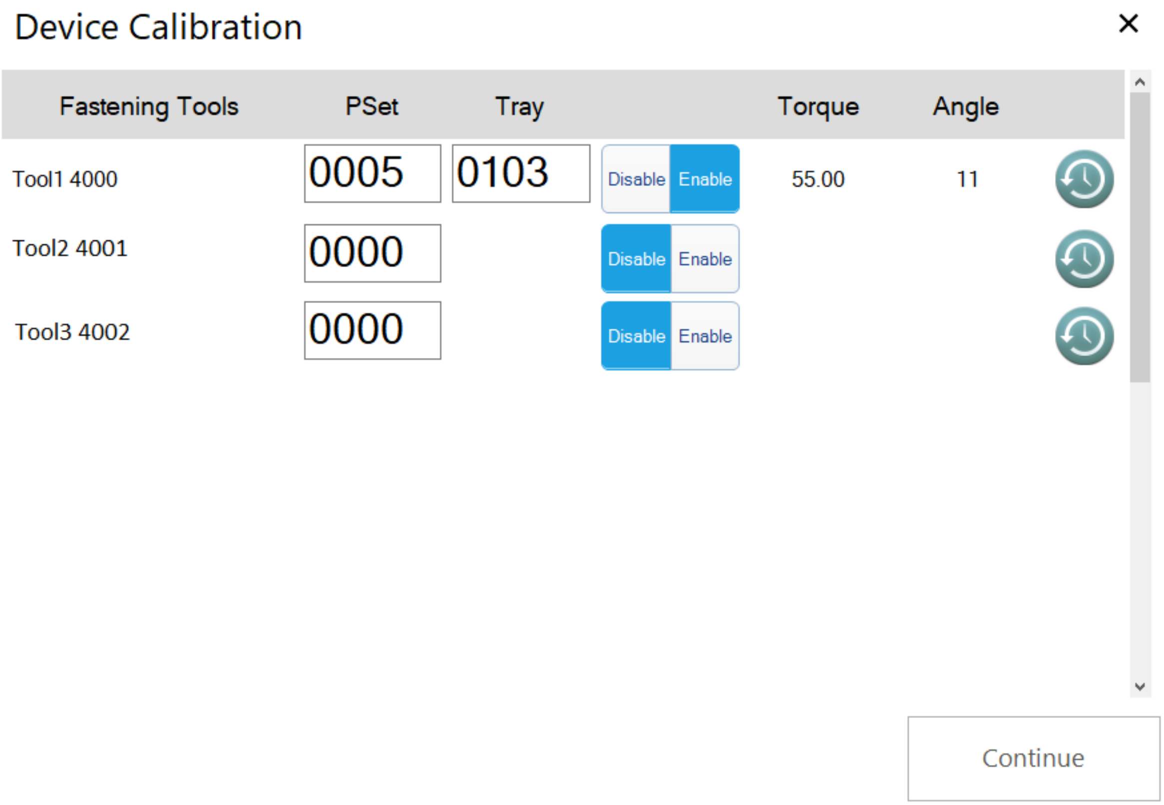
 




## Device Calibration

The Device Calibration window allows users to perform rundowns with a fastening tool and view results without loading a build item at the station. This functionality is intended to allow users to calibrate and test tools when the station is not in production. It can be accessed by clicking on the user's icon if the user has the role: AllowToolCalibration.

The Device Calibration Window. The clock icon will show a history of rundowns.


Device Calibration
Fastening Tools
PSet
Tray
Torque
Angle
Tool1 4000
0005
0103
Disable
Enable
55.00
11
Tool2 4001
0000
Disable
Enable
Tool3 4002
0000
Disable
Enable
Continue

# How to

Often, establishing and changing the larger aspects of the PINpoint system involves combining a number of smaller tasks. This section is designed to focus on common tasks and how to perform them.

## Open a Branch Based on Values Within a Range

The following is a technique to open a branch if the values entered are within the limits of some values. This requires 4 scan boxes to evaluate the values.

The formula to make the decision is **MAX(V,Mn)-MIN(V,Mx)**

Where

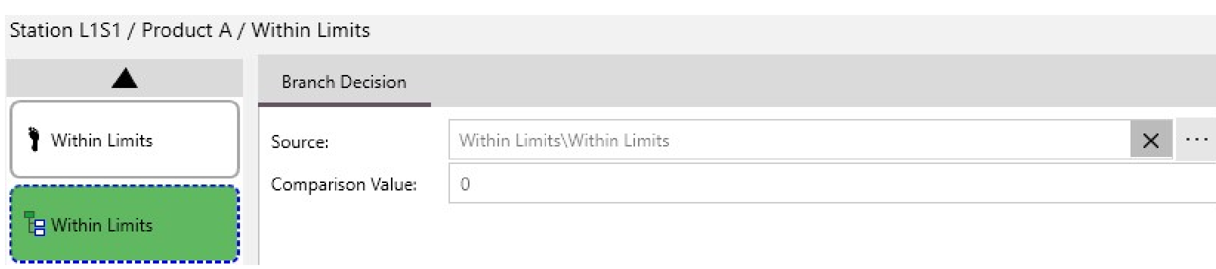
- V is the entered value
- Mn is the Lower Limit
- Mx is the Upper limit

This formula will return “0” if the value (**V**) is within the limits. **Mn<=V<=Mx**. A branch decision can be configured to activate if the value of this scan operation is 0.

Example:

An Example of How to Determine if a Value is Within Limits


An Example of How the Branch Decision Should Be Configured




To open a branch if values are outside of a range (**V<=Mn or V>=Mx**) the upper and lower portions need to be calculated separately. Keep the Lower limit (**Mn**), upper limit (**Mx**), and the value (**V**), and then add the calculations to determine if it is above or below the limits. The branch decision should still activate if the calculated value is 0

- To determine if a value is above the upper limit **V>=Mx** use the formula **MAX(V,MX)-V** and set the variable top. top is the greater of either the value entered or the upper limit, minus the value entered. This will return 0 if the value is greater than the upper limit of the range.

- To determine if a value is below the lower limit **Mn<=V** use the formula **V-MIN(V,MN)** and set it the variable bot. Bot is the value, minus the lower of either the value or the lower limit. This will return 0 if the value is lower than the lower limit.

- The formula to make the decision if the value is outside the limits is **MIN(top,bot)**. This will return the lower of the two values. If the value is below or above the range then the lowest of the 2 values will be 0.

An Example of How the Additional Calculations Should be Setup to Determine if a Value is Outside of a Range


# Set Up Training at Stations

The Trainer Concept is a feature which requires new Operators to work with a trainer before they are allowed to work independently. It requires that another Operator with the Trainer ability to be simultaneously logged into the Client until the new Operator successfully completes the number of Build Items required for promotion to working independently.

This section explains how to designate an Operator as a Trainer, and how to implement the Trainer Concept on a Station. It is broken down into the following tasks.

- Setting up a user as a Trainer
- Activating the Trainer Concept on a Station

## Setup a Trainer

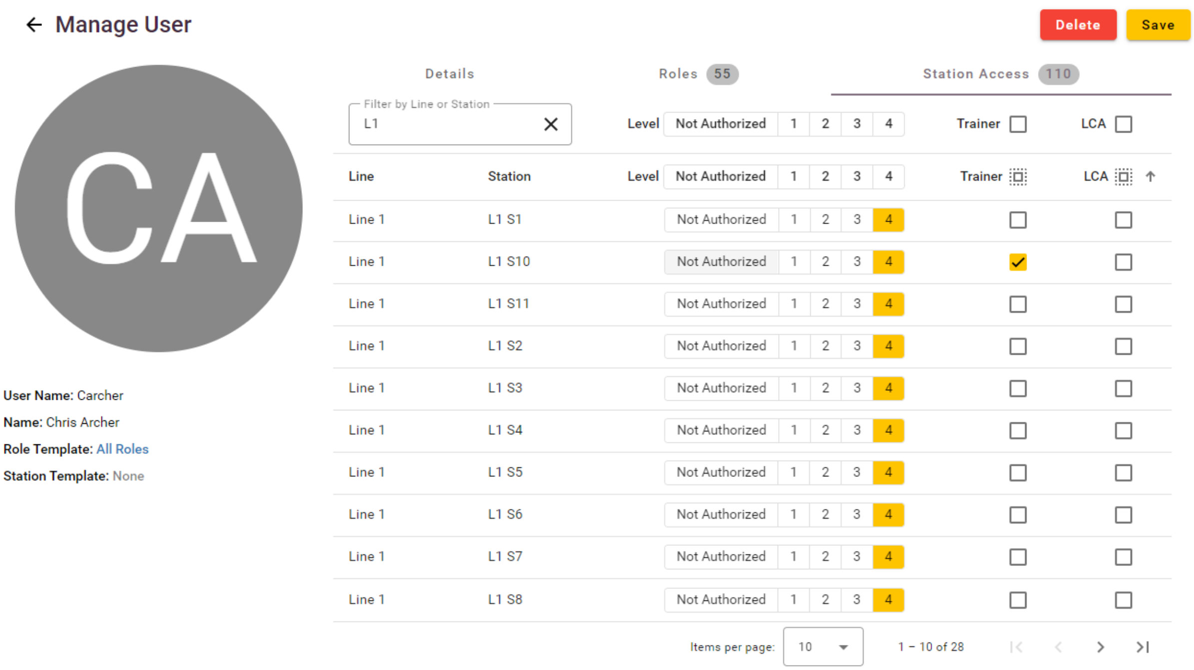
A Trainer is an user with enough experience to guide a new Operator through the process. A Trainer is a user with the trainer box checked for a station on the SmartScreen Operator Levels page. To create a Trainer, follow these steps:

1. In **Security**
2. Select a User

3. Select Station Access

   Operator Levels Results tab




4. Check the **Trainer** box for the desired station. To set the user as a Trainer for *all* displayed stations, select the trainer box above the column.
5. Save

## Activate the Trainer Concept at a Station

Once a Trainer is setup in PINpoint the Trainer Concept can be activated. To require users to login with a trainer at a station, follow these steps:

1. Open **SmartBuild**
2. Select **Hardware.**
3. Expand the Line and select the Station.
4. On the Station's **Details** pane check **Trainer Concept Enabled** to activate the Trainer Concept for this Station.
5. Click **Save**
6. Restart the SmartScreen Client

# Build a Line

A Line is a list of stations, BigScreens, and input sources.

This section explains how to build a Line and the Route. This is broken down into the following tasks.

- Creating a new Line
- Creating Stations for the Line
- Configuring the Stations
- Creating a new Route
- Creating Queues for the Route
- Building the Route by assembling Stations and Queues
- Creating a new Part
- Assigning a Part to a route
- Creating a new Process
- Assigning a Part to a Process
- Activating the Route for Tracking

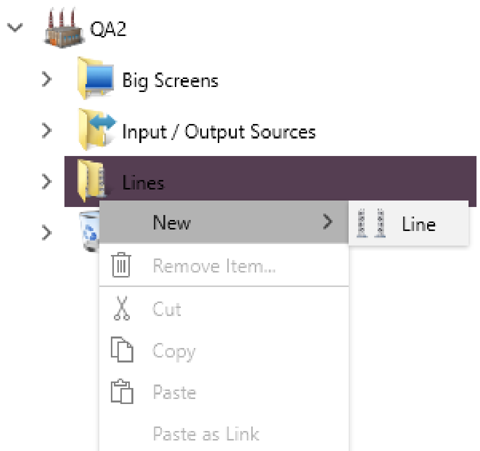
## Create a New Line

**Lines** are a collection of stations and tools.

To create a Line, follow these steps.

1. Open SmartBuild.
2. On the **SmartBuild Application**, select **Hardware.** The **Hardware** workspace opens and displays your facilities.
3. Expand the facility folder to view the **Lines** folder.
4. Right-click the **Lines** folder and select **New > Line.**

   Select New Line




5. Enter a unique name for the new Line and click **OK.** The new Line is created and appears in the hierarchy of the **Lines** folder.

6. Click the **Save** button located above the **Details** pane to save the new Line in the system. Optionally, change the following settings in the **Details** pane.

7. Click the **Save** button.

## Create a Station

To create a Station on a Line, follow these steps.

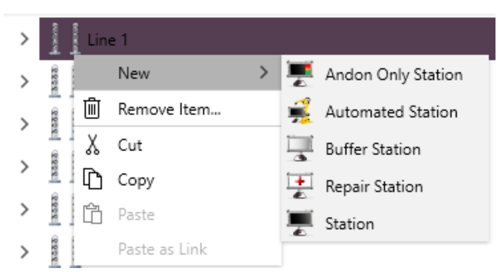
1. Open SmartBuild.

2. On the **SmartBuild Application**, select **Hardware.** The **Hardware** workspace opens and displays your facilities.

3. Expand the facility folder to view the **Lines** folder.

4. Right-click the Line to create a new Station and select **New > Station.** The **New Station** dialog opens.

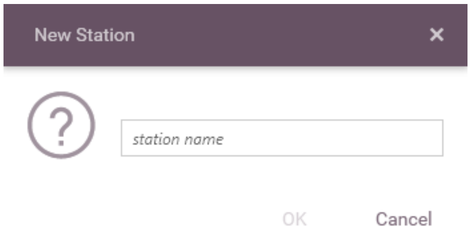
   Create new Station




5. Enter a unique name for the new station and click **OK.**

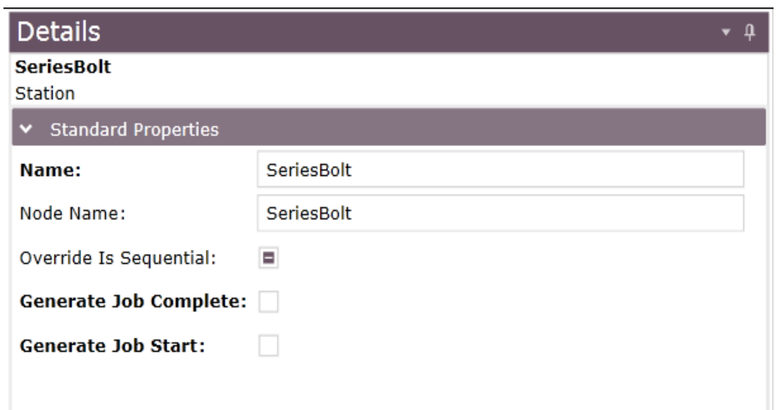
New Station dialog




The new station is created and appears in the line.

6. Click the **Save** button located above the **Details** pane to save the new station in the system.
7. Optionally, change the following settings in the **Details** pane:

   Station Details Pane




8. Click the **Save** button to save any changes made in the **Details** pane.

## Create a Station Configuration

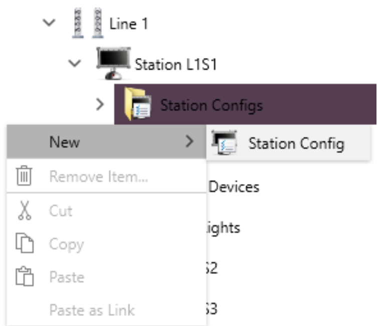
To create a Station Configuration for a Station, follow these steps.

1. Open SmartBuild.
2. On the **SmartBuild Application**, select **Hardware**. The **Hardware** workspace opens and displays your facilities.
3. Expand the facility folder to view the **Lines** folder.
4. Expand the Line containing the Station.
5. Click the folder of your new Station to expand its hierarchy.
6. Click the **Station Configs** item to make it active.

7. Right-click the **Station Configs** item and select **New > Station Config**.

   Create new Station Config


8. Enter a unique name for the new Station Configuration and click **OK**. The new Station Configuration is created and appears in the hierarchy of Station Configs.

9. Click the **Save** button located above the **Details** pane to save the new station in the system.

10. Click the **Save** button.

## Create a New Route

Routes are used to define the work flow of a Build Items as they progress from Station to Station. This includes the concept of Queues, Stations, and Station Rules.

Every Route must begin and end with a Queue. The beginning Queue is needed to serve the first Station and its Station Rules. The end Queue is needed to serve the last Station and its Station Rules. A Queue is also needed between every Station. It is not possible to directly connect Stations.

Before creating a Route, ensure the necessary Stations and Queues exist in the system.

To create a new Route, follow these steps.

1. Open SmartBuild.

2. On the **SmartBuild Application**, select **Build**. The **Build** workspace opens.

3. Click the **New Route** button. The **New Route** dialog opens.

4. Type a name for the Route and click **OK**. Now there will be a blank workspace in which to place elements in order to define the work flow.

   Optionally, change the following settings in the **Details** pane:

   - **Name**: By default, this is the name entered in the **New Route** dialog. Use this field to change the name.
   - **Default**: Place a check in this box to make this Route the default for the Line.
   - **Description**: Type a description of this Route in this field.

5. Click the **Save** button to save the new Route.

## Create a Queue

To create a Queue, follow these steps.

1. Open SmartBuild.
2. On the **SmartBuild Application**, select **Build.** The **Build** workspace opens.
3. Click the **Please Select a Route** drop-down menu and select a Route. The **Queues and Stations** pane becomes accessible, as does the **New Queue** button.
4. Click the **New Queue** button. The **New Queue** dialog opens.
5. Type a name for the new queue based on its function in the line.
6. Click **OK.** The new queue is displayed in the **Available Queues** list in the **Queues and Stations** pane.
7. Click the **Save** button to save the new Queue.

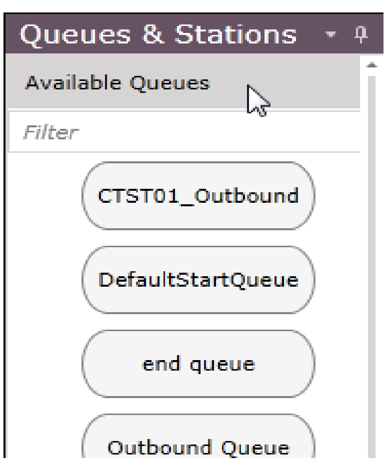
## Build a Route

A Route is created and managed in the SmartBuild Build tab.

### *Add Stations and Queues to the Route*

1. In the **Queues and Stations** pane, expand the **Available Queues** list.

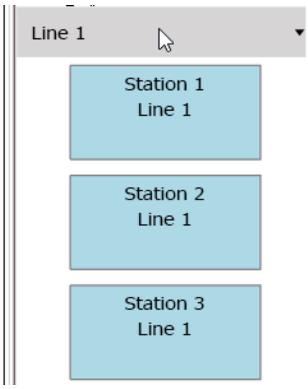
   Available Queues

2. Locate the Queue to start the build process and drag and drop it into the work area.

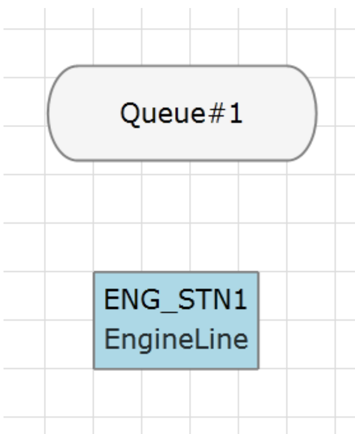
3. In the **Queues and Stations** pane, locate the Line and click on it to expand it. Its Stations are displayed.

   Expanding a Line

4. Drag and drop the first Station in the work flow into the work area.

   Placing a Station

Continue to add Queues and Stations to the work area until all the Stations in the current Line are represented, and the Queues necessary to define their relationships exist.

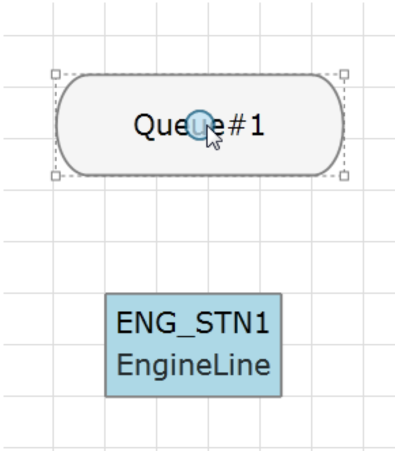
## Use the connectors

Connect the Queues and Stations in the order they occur in the Line. To do this, follow these steps.

1. Click the Queue or Station. A small circle is displayed in the center of the item.
2. Hover the mouse over the circle to activate it (the circle will change to a light blue color when active).

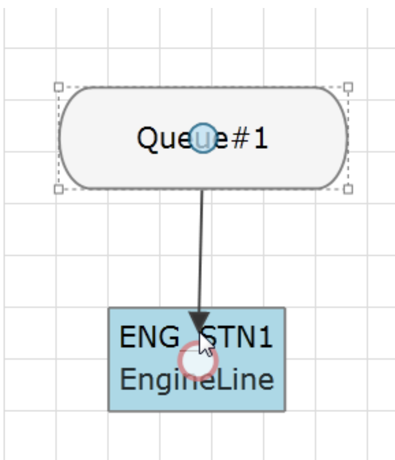
   Making the Queue's connector active




3. Click-drag the circle to item to connect it. A direction arrow will follow the drag and connect to any eligible item it is dragged to, indicating the process flow.

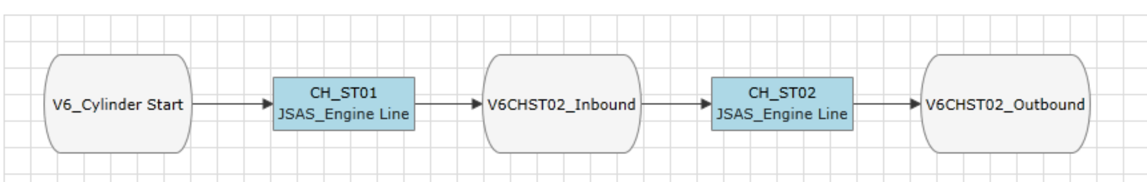
   Connecting the Queue to the Station




   It is possible for a Queue to receive from, or distribute to, multiple Stations (such as Stations running in parallel); but it is not possible for a Station to receive from, or distribute to, more than one Queue at a time.

4. Click the **Save** button.

   Completed Route example

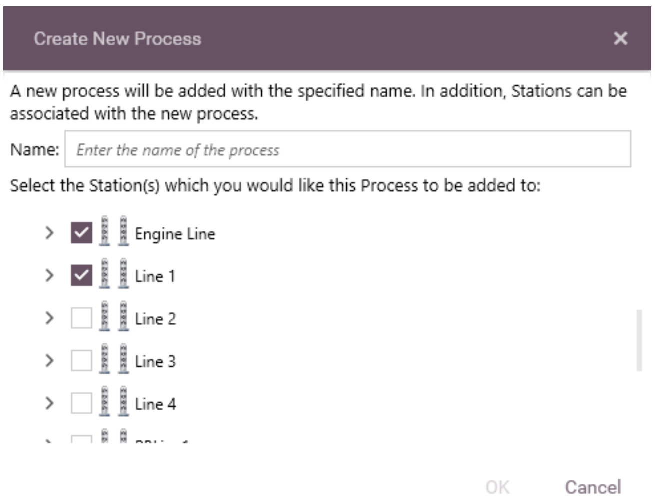


## Create a Process

To create a new Process:

1. In the **SmartBuild Process** tab select the **View by Process** tab.
2. Click the **Create New Process** button. The **Create New Process** dialog opens.
3. Enter the Name of the Process.

   Create New Process dialog




4. Expand the Plant icon and select the line or stations where the process steps will be created for this process.
5. Click **OK**.

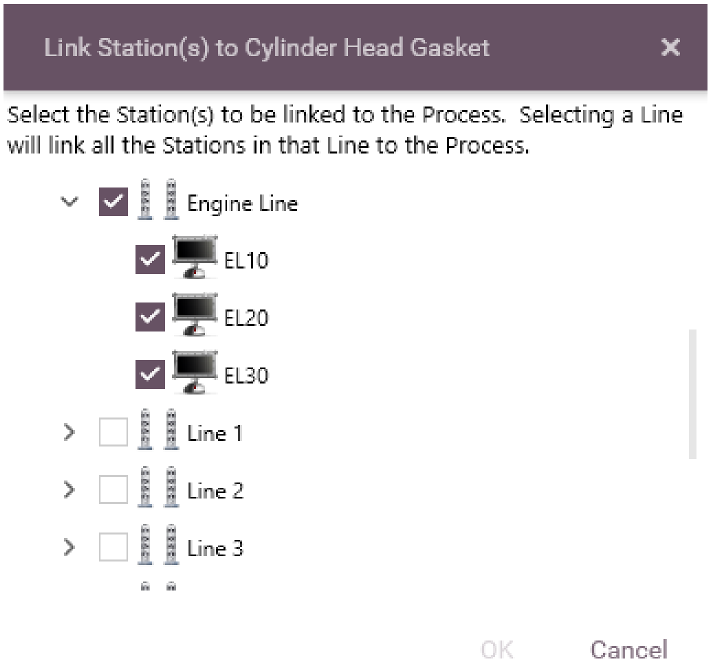
## Linking Stations to a Process

To link a station to a Process:

1. On the **SmartBuild Process tab** select the **View by Process** tab.
2. Select the Process.
3. Select the **Link Station(s)** button. The **Link Station(s) to [Process Name]** dialog opens.

   Link Station(s) to Process




4. Select the stations where the process will be used
5. Click **OK** & **Save**.

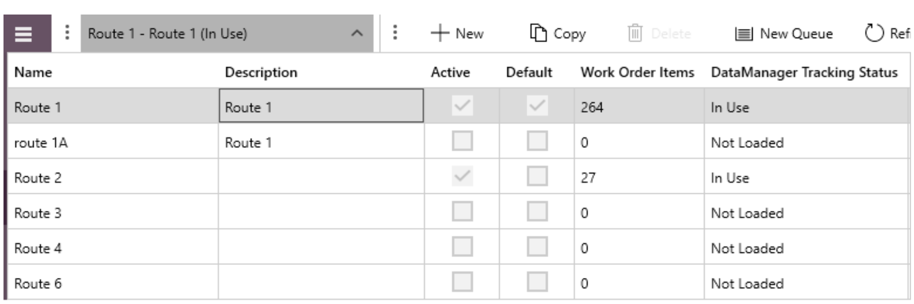
## Activate the Route for Tracking

In order for a route to be available for use in Work Orders, a Route must be set to **Active and Loaded**.

To set a Route's status to Active and Loaded:

1. On the **SmartBuild Build** tab select the Route selection drop-down menu to view the list of Routes.

   List of existing Routes

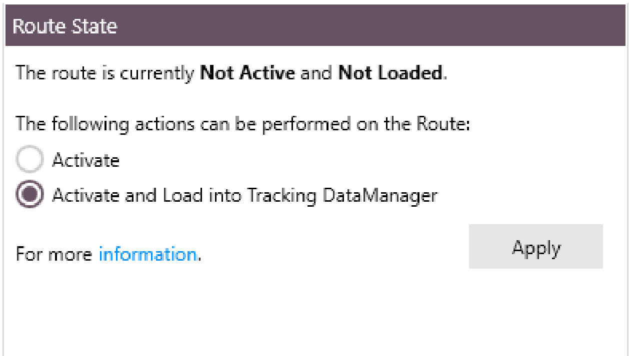



| Name | Description | Active | Default | Work Order Items | DataManager Tracking Status |
|---|---|---|---|---|---|
| Route 1 | Route 1 | ✓ | ✓ | 264 | In Use |
| route 1A | Route 1 | | | 0 | Not Loaded |
| Route 2 | | ✓ | | 27 | In Use |
| Route 3 | | | | 0 | Not Loaded |
| Route 4 | | | | 0 | Not Loaded |
| Route 6 | | | | 0 | Not Loaded |

2. Select the Route.

3. In the **Route State** set the status to **Activate and Load into Tracking Data Manager** and then select Apply.

   Route open

4. **Save**

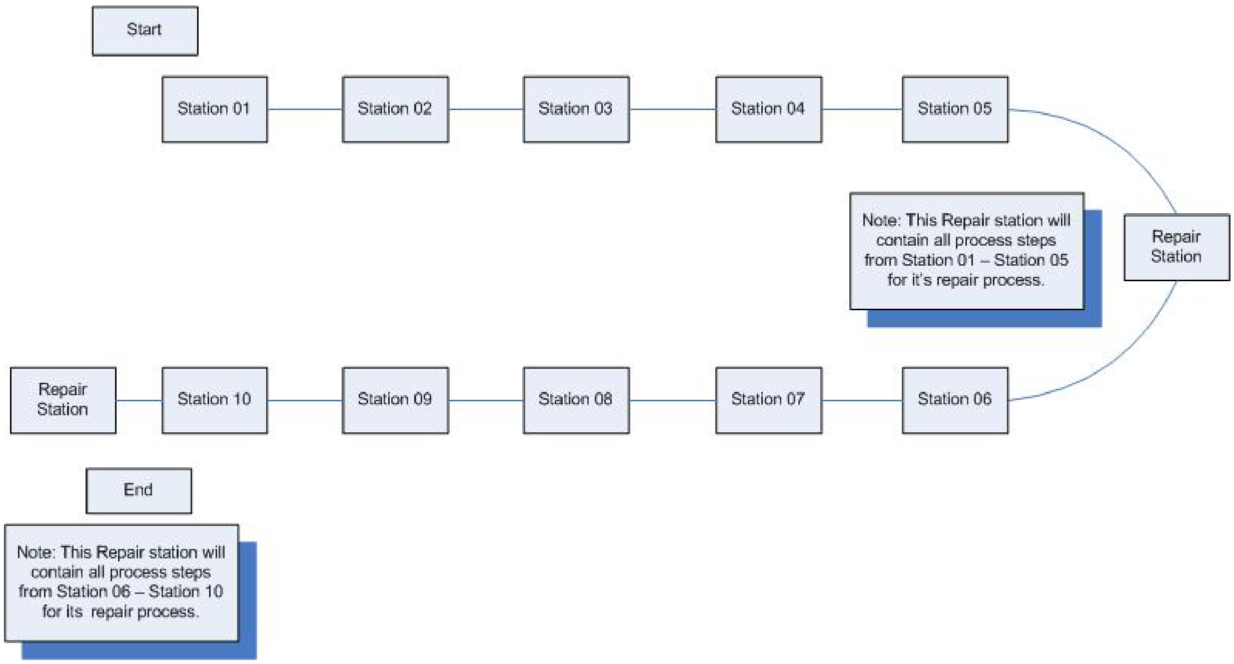
# Set Up a Repair Station

The function of the Repair Station is to allow items on the assembly line to be rebuilt/repaired if there is an issue with them that is flagged during the initial build process. During the rebuild process, any new torque values or values required in regards to completing the process steps and allow the part being built to pass inspection are added to the Serial/Part Number that was married to the item being built; and are never overwritten by the new Repair Station values. The information that is written to the Database by the Repair Station is provided in the PINpoint Reports suite and is identifiable via time stamp, as the data that is stored in the Database is primarily done by this method.

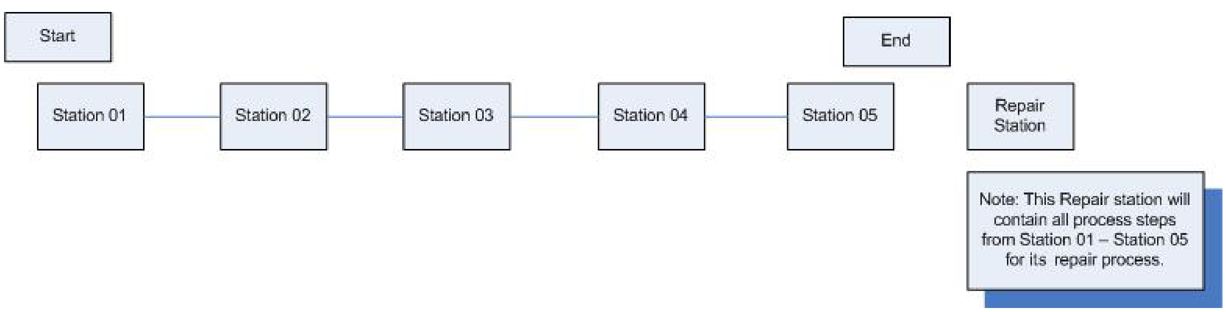
Repair Stations can be added anywhere on the line as desired/required by the assembly process. Below are typical Repair Station line diagrams, provided as a guide to give a visual representation of how they would be configured on the line.

The following diagrams illustrate where Repair Stations are typically located on an assembly line and the Stations that are contained within the Repair Stations' "Station" list.

Repair Station example 1




Repair Station example 2

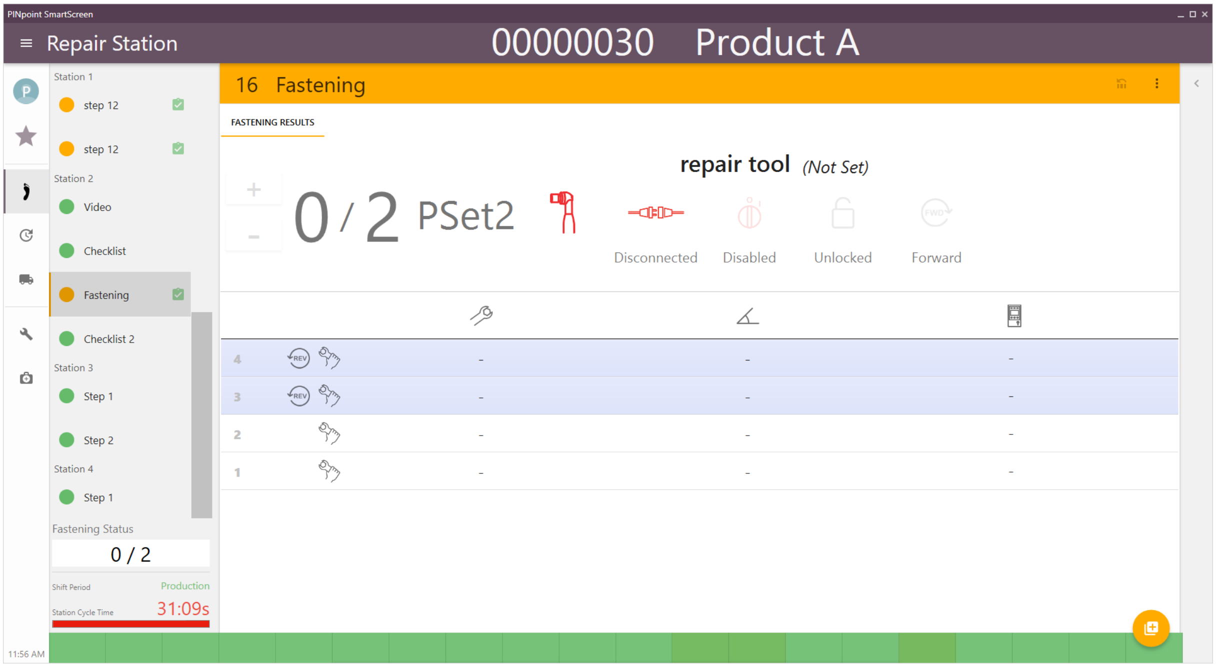



## Create a Repair Station

A repair station is used to repair issues with steps performed at other stations. A repair station is typically placed at the end of the route, or midway through the route, to verify that process steps at the previous stations have been completed. Steps which were not completed, or which were bypassed because of an issue, can be repaired at this station. A repair station contains the steps from all stations which are linked to it in the hardware tab. It also contains special repair steps which are only visible on the repair station. A repair station will only set station complete true when all steps are completed and all bypassed steps are acknowledged by an LCA. Tools can be setup at the repair station and they can be used on the fastening steps.

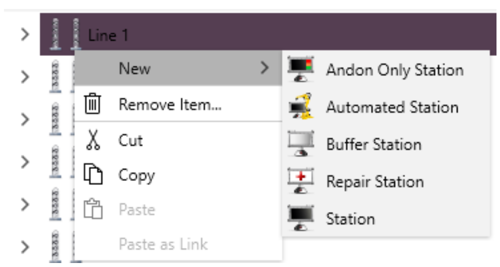
An Example of a Repair Station Where the Bypassed Steps Have Been Acknowledged




Repair stations are created in the hardware tab using the drop down.

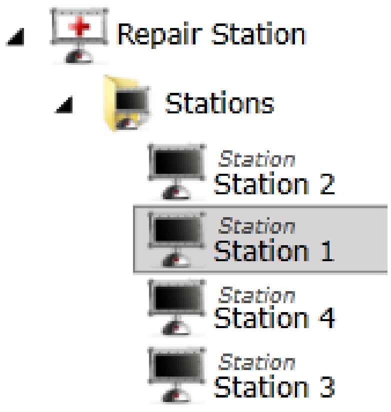
The Menu to Create a Repair Station




Stations must be dragged and dropped under a repair station. Steps from all stations which are listed in the stations folder underneath a repair station will be listed for the serial number which is loaded. The order of the steps on the SmartScreen client for a repair station is determined by the order of the station's in the Repair Station's Station folder.

Stations Underneath a Repair Station




## Add Tools to a Repair Station

Repair stations will load steps from other stations but they will not connect to the tools unless configured. Fastening tools which are intended to be used at a repair station must be setup in the following method:

1. Setup the tool under the input/output sources folder of the repair station
2. On the step set the repair PSet
3. On the step assign the repair tool

After this setup the repair station will control the repair tool when a build item arrives. The regular station will only use the tool attached to it.

## Add a Repair Step to a Station

Repair Steps are instructions displayed at Repair Stations only. Repair Stations do not appear in the **SmartBuild Process** tab. Repair Steps must be created and configured on regular Stations in the route. Repair Stations inherit the Process Steps of all Stations added to them, which includes any Repair Steps. Configuring a Step as a Repair Step prevents it from being displayed at a regular Station, but causes it to be displayed at any Repair Station that inherits it.

To create a Repair Step, follow these steps.

1. In the **SmartBuild Process** tab, select **View by Process** or **View by Station** and navigate to the Station.
2. Create a new Step in the Process pane.
3. Name the new Step
4. In the **Properties** pane check the **Repair Step**.
5. Click **Save**.

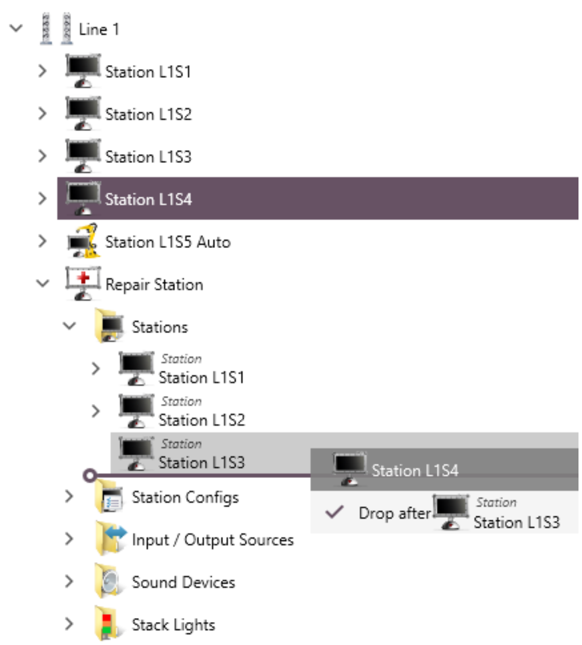
 

## Add Stations to a Repair Station

A Repair Station has a folder for Stations in its hierarchy. This is where the Stations added to the Repair Station are stored. Typically, the Stations that are added to the Repair Station are the Stations that precede where the Repair Station is located on the line. Stations are added to the Repair Station by click-dragging them into the folder.

To add a Station to the Repair Station, follow these steps.

1. Open SmartBuild.
2. On the **SmartBuild Application**, select **Hardware**. The **Hardware** workspace opens and displays your facilities.
3. In the **Line** hierarchy, expand the **Repair Station**.
4. Click-drag a **Station** to the Repair Station and drop it in the **Stations** folder.




5. Once all the stations have been added, click **Save** at the top of the **SmartBuild Menu** bar.

# Communicate with the PINpoint API

The PINpoint API allows another system to command the PINpoint system. This is used to submit and delete work orders, control aspects of the SmartScreen client, and query information from PINpoint. The PINpoint API document is available at Https://www.PINpointInfo.com/Manuals .

# Restart a Device

If a device is not behaving as expected the device manager's connection to a device can be restarted and the settings in SmartBuild can be reloaded.

## On the SmartScreen Client

1. On the Settings menu select Reload. This will reload the process and reinitialize the station's connection to the tool.
2. On the Settings menu select Connections. A list of tools is displayed. The device manager's connection to a tool can be stopped and started.
3. Shut down and then restart the SmartScreen Client. This will reinitialize the connection between the SmartScreen and the device manager.

### On SmartBuild

The following steps have impacts beyond the Station itself where the device issue is occurring.

1. In the **SmartBuild Connections** tab right-click on the device and select **Restart**. This restarts the connection to the device.
2. In the **SmartBuild Connections** tab right-click on the device and select **Reload and Restart**. This gets the settings from the database and then restarts the connection to the device.
3. In the **SmartBuild Connections** tab click the **Data Manager Device Refresh** button. This asks the Data Manager to check the settings in SmartBuild for all devices it already knows about and then update behavior to match.

# Setup Over Cycle Time Categorization

When analyzing a production line it may be beneficial to ask the operator to provide a reason when the station they are working at goes over the cycle time target. There is a method to categorize the cycle time recorded at a station. This is setup in the SmartBuild hardware tab on each station. When the station cycle time exceeds the cycle time target in the scheduler based on the *Over Cycle Categorization Trigger (%)* the operator will be forced to enter a reason before the station is considered complete.

There are also 2 events which can be used to activate a stack light based on the current cycle time. The *Cycle Time Over Event* is triggered when the *Over Cycle Categorization Trigger (%)* is true; It is setup on the station config. The *Cycle Time Warning Event* is triggered based on the *Cycle Time Warning Trigger (%)* on the station or the line properties.

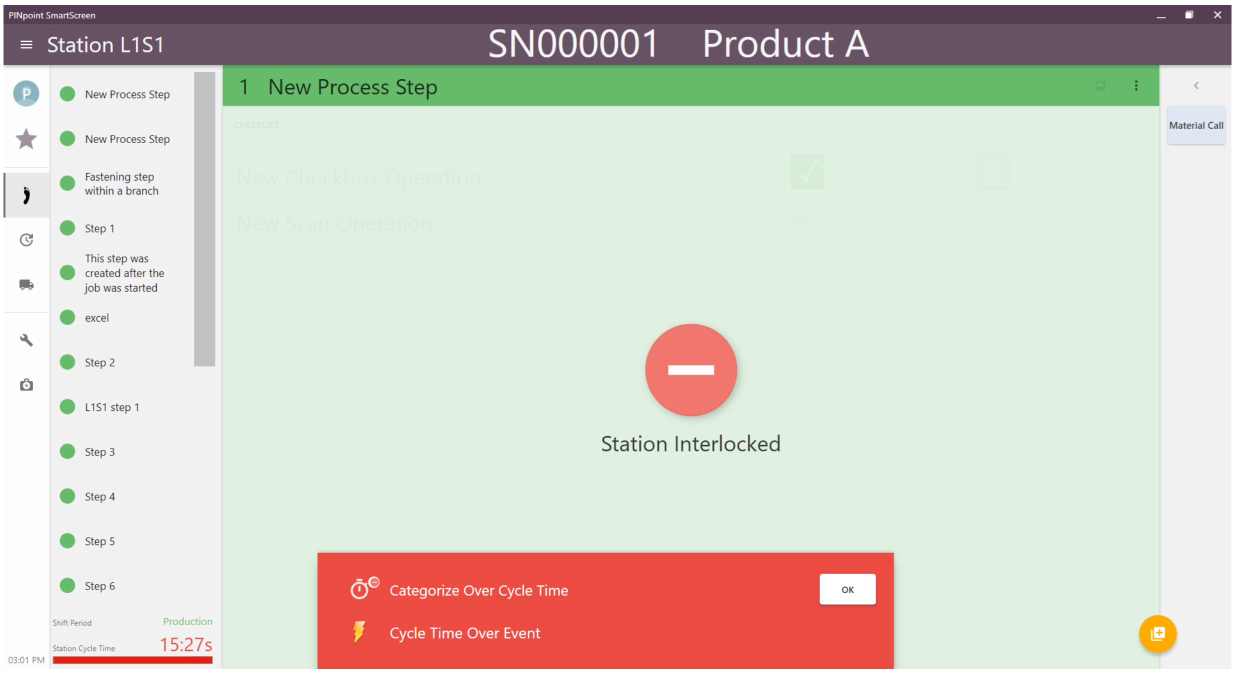
This is the method to force the operator to enter a reason to categorize over cycle time:

1. On the Scheduler tab setup a schedule and a cycle time target. This is a prerequisite and more information about how to do this can be found in the Scheduler section.

2. On the SmartBuild Hardware tab find the station and set the station config property *Over Cycle Categorization Trigger (%)* to the desired value. This property is used to calculate when the *Cycle Time Over* event should occur and it can be set to greater than 100% so that the operator only needs to categorize time which is above this threshold.

3. On the SmartBuild Hardware tab find the station and set the station config property *Over Cycle Categorization Required* to True. When this is true the reason list will appear. Reasons can be added to the *Over Cycle Reasons* list is in the SmartBuild Advanced tab.

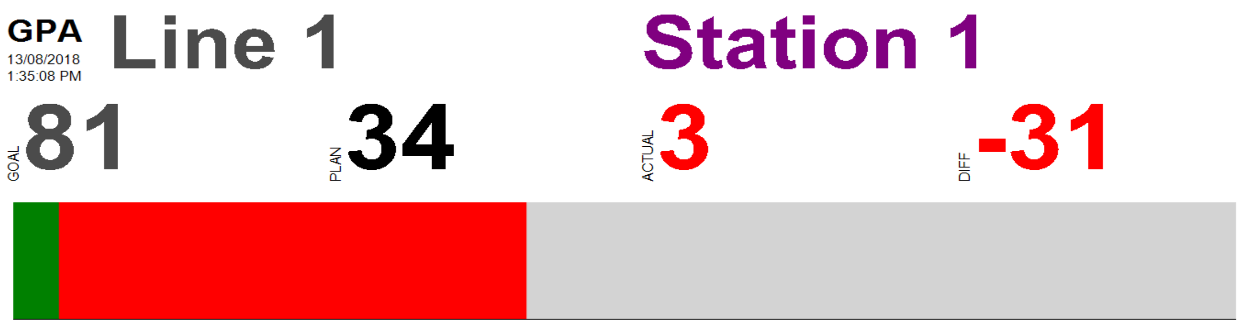
In this example the station is complete but the operator is required to categorize the over cycle time before the station complete value will be set.




# Set Up the GPA Report on the BigScreen

The GPA report data is calculated on a per line basis. There are two sources for the GPA graph data that must be setup. PINpoint needs to know how many units are to be completed over a span of time. Secondly, the number of units already completed in that span of time must be known. PINpoint then calculates the Plan, which is how many units should have been built already at this point in time. The Actual is the number of units already built and the Difference (DIFF) is the balance of what should have been produced and what has actually been produced.

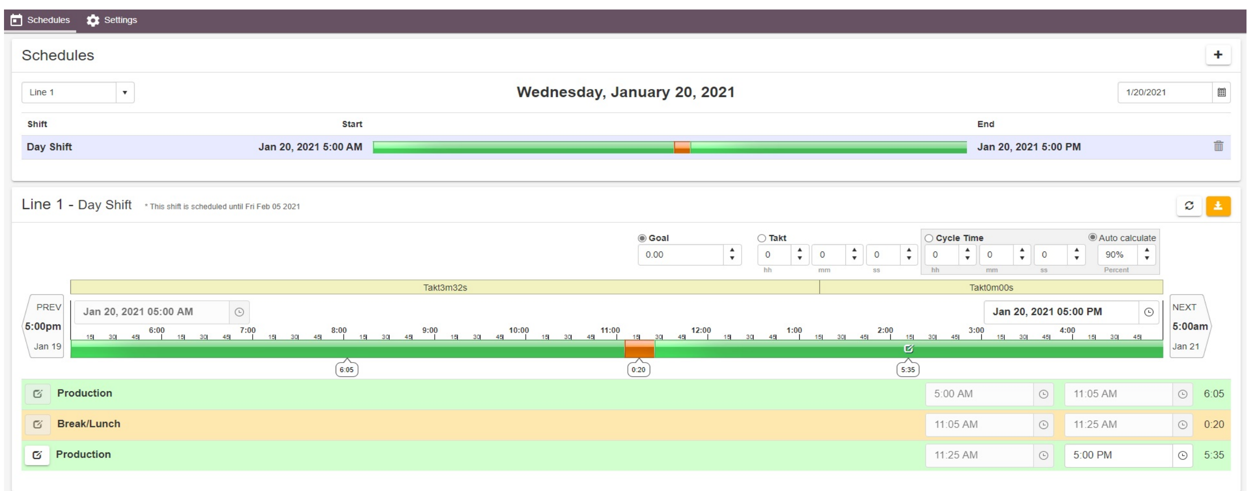
An Example of the GPA Chart on the PINpoint BigScreen




## *Step 1: Configuring the Build Count Goal*

The Goal number is set on the Scheduler app for the line in question:

Goal Number is Set in the Scheduler




Looking at this example of a line schedule there is currently no TAKT time or Goal Target set. Clicking on the button as shown will present a pop up window where either the Target number can be entered or the TAKT time:

Example of a Line Schedule Where There is Currently no TAKT time or Goal Target Set


Users can enter the Target number of units and the TAKT time will adjust accordingly. The TAKT time is calculated as the number of units divided by the total amount of time that is scheduled as production time.

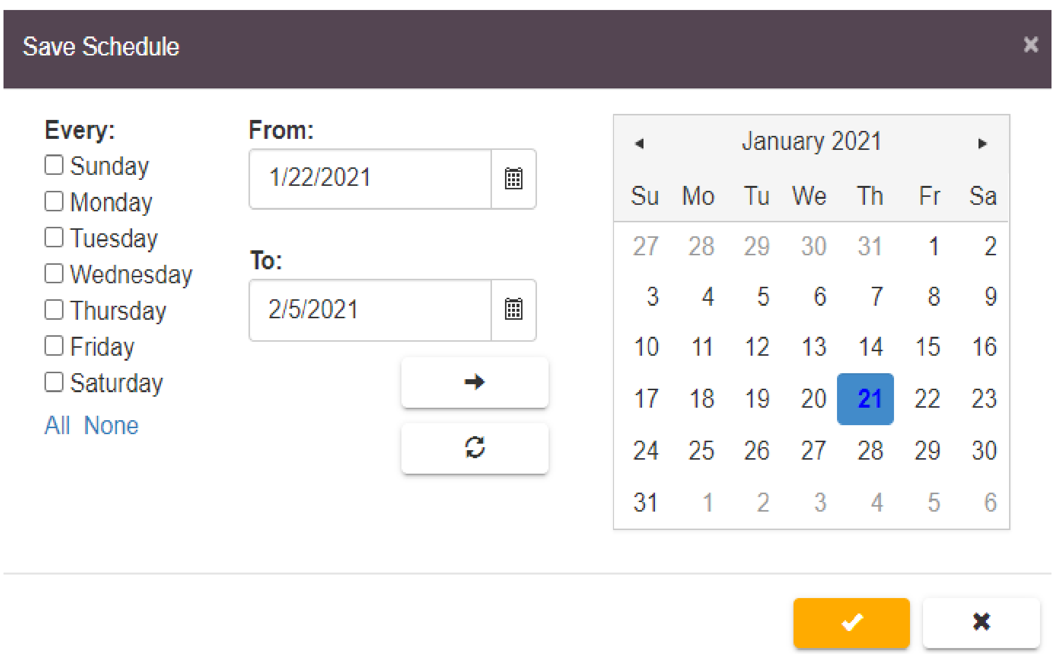
Conversely, setting a specific TAKT time will adjust the Target number of units accordingly. This is the reverse calculation of the TAKT time and is the whole number of units that can be built in the allotted time at the TAKT time per unit.

Clicking on the check mark will accept the changes for that day only. A message will appear that there are unsaved changes. To save the changes, click on the “Download” arrow as indicated below:

The Download Arrow in the Scheduler

Clicking on the Download button will present a popup window with options for this configuration to be copied forward to days in the future:

Save Schedule Window




Click the Check button to save the changes.

## *Step 2: Configuring the Actual Build Count*

To determine the number of units produced PINpoint relies on Station Complete events from an actual station. This station can be any station on the line. This is typically the last station on the line.

In SmartBuild designate a station to contribute to the production total. On the station Properties, there are two check boxes which must be set

- The *Exclude From Production Metrics.* This should be false.
- The *Contribute to Line Production Metrics* specifies that this station should be the one the report looks to for its actual number of units produced.

After setting these properties a restart of the SmartScreen client at that station will be required.

## Step 3: Create an Endpoint for the report

In SmartBuild under the Advanced tab add an endpoint for the report server.

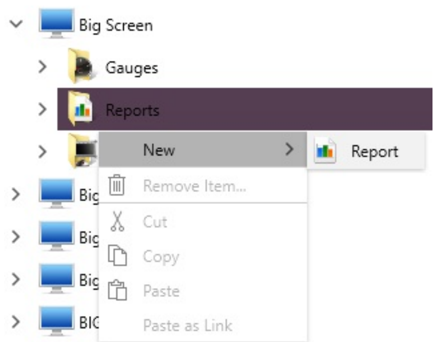
The Endpoint settings should be:

| Parameter | Description |
| --- | --- |
| Type | HTTP |
| Host Name | Webserver Name |
| Path | This should be the path to PINpoint.BI based on how the customer has it setup. If the customer's portal is "https://server-name.customer.com/PINpoint.Portal/" path would be "/PINpoint.BI/" |
| Port | 443 |
| Is SSL | True |
| Default Timeout | Blank |
| Authentication Method | Internal |

## Step 4: Configure a BigScreen to Display the GPA Graph

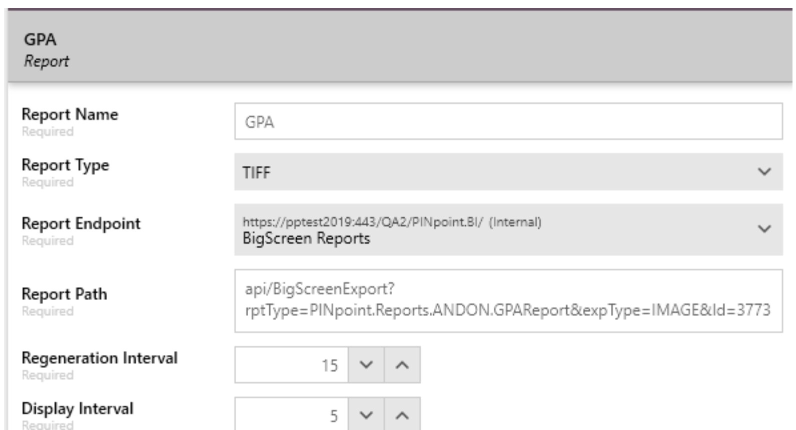
In SmartBuild under the Hardware tab select the BigScreen that will display the GPA graph. Expand the BigScreen so the contained folders are shown. Right click on the reports and create a new report:




After naming the report set the properties on the report:

An example of the GPA report configuration




The **Report Type** should be TIFF.

The Report Path will be similar to:

api/BigScreenExport?rptType=PINpoint.Reports.ANDON.GPAReport&expType=IMAGE&Id=LineID

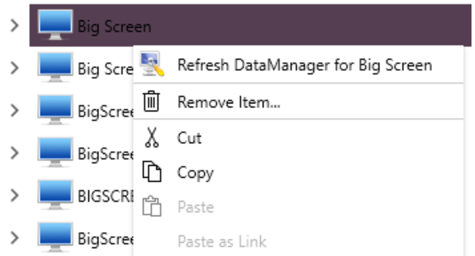
Once the path is added, the only part of the path that changes will be the LineID number which is at the end of the path. The line ID is found on the properties of the line in the Hardware tab. The Line will use the metrics from the station on the line which has contribute to line metrics set true. The station ID can be used in place of the ID to specify a different station.

The Regeneration Interval should be set to 1 (minute) and this will cause the BigScreen to be updated every minute.

The Display Interval should be set accordingly. The value is in seconds. If this report is the only report being show on the BigScreen then 60 seconds should be set as pictured.

### *Step 5: Update the BigScreen*

Right click the BigScreen in the Hardware tab and select **Refresh Data Manager For BigScreen** will cause that BigScreen to refresh its configuration.

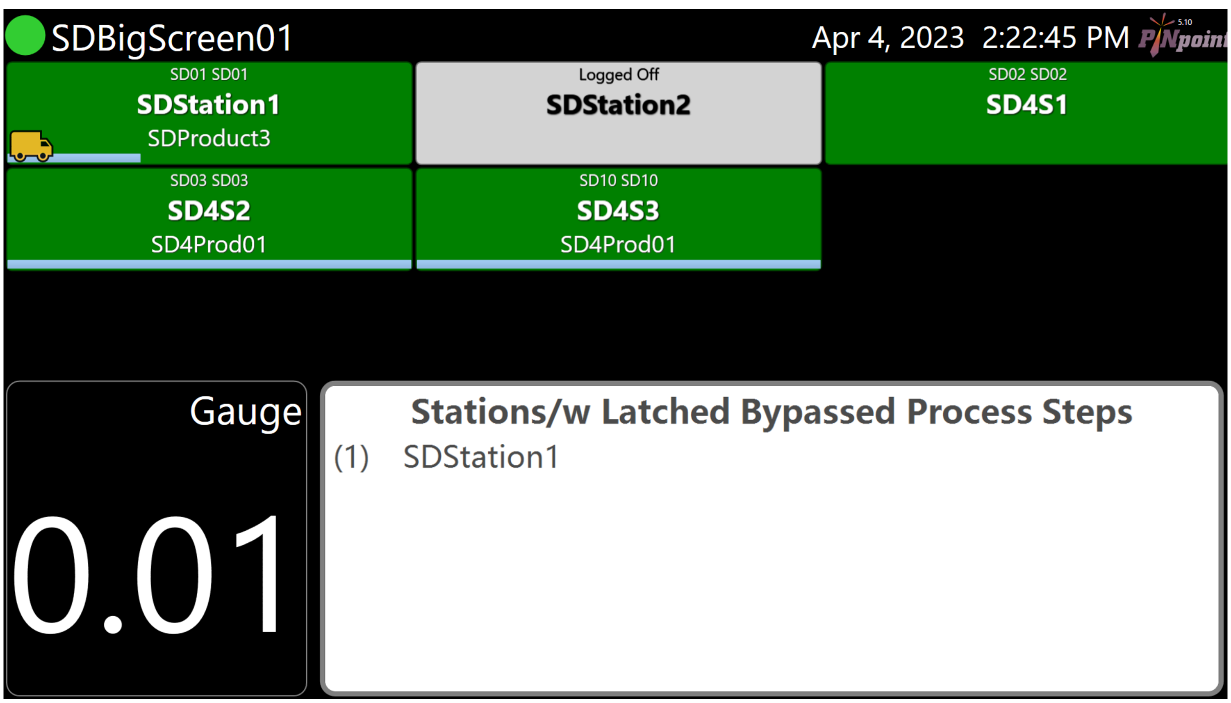



# Set Up a Latch Bypass Report on the Big Screen

The BigScreen can show a list of stations which have steps that are latch bypassed. The report is setup normally with the following link where BigScreenName is the name of the BigScreen in SmartBuild.

```
api/BigScreenExport?rptType=PINpoint.BI.Reports.BigScreen.StationsWithProcessStepLatchB-
ypass&expType=IMAGE&BigScreenName=BigScreenName
```

An Example of the BigScreen Latch Bypass Report



# Set Up an External Destination

The process of setting up an External Destination is dependent upon first establishing a Data Provider and Data Item to channel Event messages to the PLC on the actual physical device, and then creating and configuring the External Destination itself. This is broken down into the following tasks.

- Creating a Data Provider
- Creating a Data Item
- Creating the External Destination (See the SmartBuild Events Section)
- Assigning the Event trigger to the External Destination (See the SmartBuild Events Section)

## Create a Data Provider

To create a Data Provider for a Data Manager, follow these steps.

1. Open SmartBuild.
2. On the **SmartBuild Application**, select **Advanced.** The **Advanced** workspace opens.
3. Right-click the icon of the Data Manager configured to handle Events and hover the mouse pointer over **New** to view the options.
4. Select **OPC Data Provider**. The **OPC Data Provider** dialog is displayed.
5. Type a name for the new OPC Data Provider.
6. Click **Next.** The dialog for configuring the properties of your new component opens.
7. Configure the OPC Data Provider Properties
8. click **Finish.**
9. Click **Save**

## Create a Data Item

Data Items are a dependency of Data Providers.

To create a Data Item, follow these steps.

1. Open SmartBuild.
2. On the **SmartBuild Application**, select **Advanced.** Expand the **Data Managers** hierarchy.
3. Locate the Data Manager configured to handle Events and expand its hierarchy.

4. Right-click the Data Provider and select **New Data Item...**. The Data Item dialog opens.
5. Enter a name for the Data Item and click **Next**.
6. Configure the properties
7. Click **Finish**.
8. Click **Save**

# How To Setup an Image Sensing Device

PINpoint can make use of a variety of image sensing devices. A typical use for an image sensing device is on a Tester Operation. See: "Tester Operation" on page 108

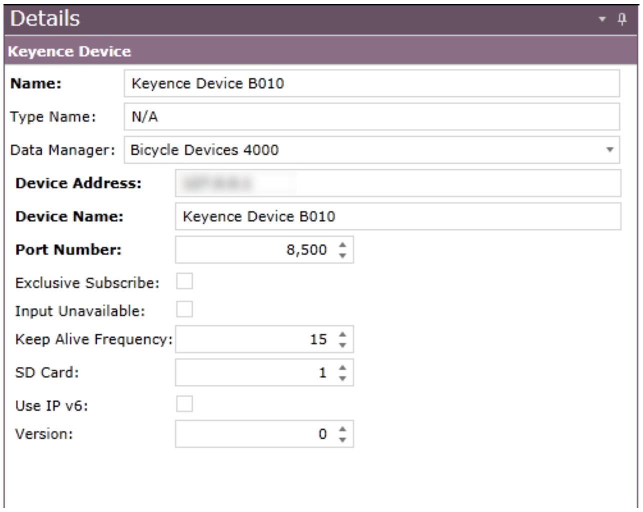
The following applies to a Keyence Input Source, Banner Omni P4, and Cognex Input source.

## How to Setup a Tester Input Source

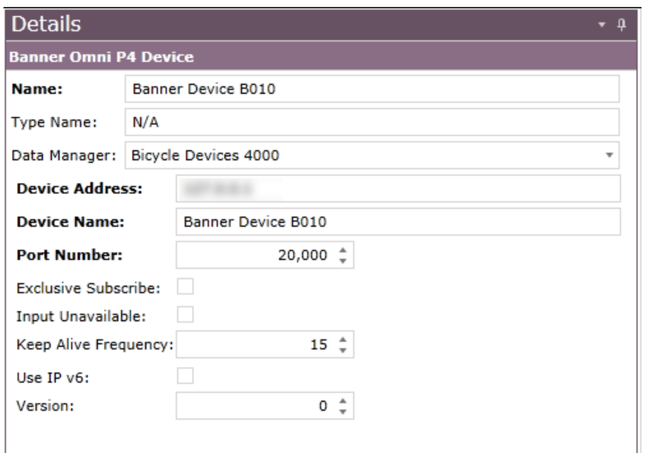
To set up a Tester Input Source for use with PINpoint, follow these steps.

1. On the **SmartBuild Hardware** tab select a station
2. Right-click the Station's **Input/Output Sources** folder and select **New > Tester Input Source >** and then select the input source.
3. Enter a name for the input source and click **OK**. The new input source is displayed in the Input/Output Sources folder of the Station.
4. Configure the properties.
5. Click **Save**

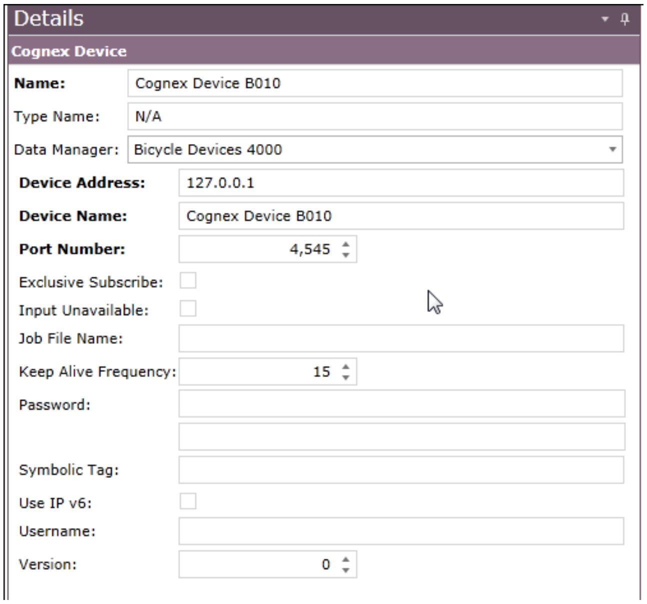
Example Keyence Device parameters




Example Banner Omni P4 Device parameters




Example Cognex Device parameters




## Add an Input Source to a Tester Operation

To add an image device as an Input source to a tester operation:

1. On the **SmartBuild Process** tab select the process.
2. Select the Process Step where the image device will be used.
3. From the **Toolbox**, drag the **Custom** icon down into the **More** tab.
4. Select **Tester Operation.**
5. Enter a name for the Tester Operation and Select **OK.** The Tester Operation is displayed in the More tab.
6. Select the **Add Input Source** icon on the Tester Operation icon. The **Select Input Source** dialog opens.
7. Select the Input Source from the list of **Available Input Sources** and select the **Add** button to move it to the **Current Input Sources** list.
8. Select **OK.**
9. Enter the Tester Operation Properties.
10. Ensure that the **PSet** matches the program in the device.
11. **Save**.

### HIK Robot SC3000

When the device manager uses to the HIK Robot SC3000 camera input source on a tester operation it sends the PSet and the Start command and waits for the Overall Result to be returned.

# Set up Pin Marking

The following section explains how to set up and configure Pin Marking in PINpoint.

## Creating a Serial Marker Input Source

1. On the **SmartBuild Hardware** tab expand the **Input/Output** folder of the station.
2. Right-click the **Input/Output** folder and select **New > SIC Serial Marker Device.**
3. Type a name for the new device and click **OK.**
4. Select the new marker device.
5. In the **Details** pane, select the **Device Manager** to be used with this device from the drop-down list.
6. If necessary, edit the **Device Address** and **Port Number** fields to the values required.

   Make a note of the name, device address, and port number values for later use in configuring the Device Bridge.
7. Click the **Save** button.

The device manager in **SmartBuild > Connections** must be refreshed in order to recognize and communicate with the new device.

## Assigning the Serial Marker Input Source

1. On the **SmartBuild Process** tab Select the **View by Station** tab.
2. Select the Process Step
3. Drag the **Custom Operation** icon down into the work area. The **More** tab becomes active, and the **New Custom Operation** dialog opens.
4. In the **New Custom Operation** dialog, enter a name in the **Name** field.
5. Select **Marker Operation.**
6. Click **OK.** The new Custom Operation is displayed in the **More** tab.

7. Click the tools icon of the new Custom Operation. The **Select Input Sources** dialog opens.
8. In the **Available Input Sources** field, select the SIC Serial Marker Device.
9. Click the **Add** button. The device is transferred to the **Current Input Sources** field.
10. Click **OK**.
11. Click the **Properties: Marker Operation** tab. The **Properties: Marker Operation** pane is displayed.
12. Click **Extended Properties** to view the extended properties.
13. Ensure the **Custom Step Item Path** field contains the string `PinPoint.Library.Operation.PinMarking.dll`.
14. If necessary, edit the following fields:

    **Pattern Name**: File or Pattern to load in the Marker Device

    **Variables**: comma separated list of name-value variables to send to the Marker Device
15. Click **Save**.

## Configuring Device Bridge to Use the Serial Marker Input Source

The Device Bridge is found in the PINpoint installation folder on the computer hosting the Client software, nested in the `PinPoint.Services.DeviceBridge` folder.

To configure the Device Bridge application to work with the SIC Serial Marker Device, follow these steps.

1. Navigate the file system of the computer to which the SIC Serial Marker Device is connected and locate the file `PinPoint.Services.DeviceBridge.exe.config`.
2. Open the file in a text editor.
3. *Edit the parameters in the following lines of code. Do not make changes to "PassThroughDeviceDriver" , PortEOL=0, and "Bidirectional="true".*

```
. . .
      <setting name="Devices" serializeAs="Xml">
        <value>
          <DeviceBridgeConfig>
            <DeviceConfigs>                                                    -
       <!-- Checklist 7.0 -->
              <DeviceConfig Name="NetworkSerial" DeviceType="SerialServerDevice"
DeviceDriver="PassThroughDeviceDriver" Port="7500" ExcludeDelimitersInPayload="true"
InactivityTimeoutPeriod="120" LocalDevicePort="COM8" PortEOL="0" SerialBOL="2" Seri-
alEOL="3" Bidirectional="true">>
                <LocalDeviceSettings>
```

```
. . .
```

4. Save the changes.

# Connect Excel to a Cube

A user with access to a data cube can query the data directly using Business Intelligence (BI) tools such as Excel. This document describes how to access the data cube and create a custom report.

There are three (3) SSAS databases created for a PINpoint installation. There is a Production cube containing production data such as completions, bypasses, defects or cycle times; an Andon cube containing Andon data like events and notifications; and there is a Fastening cube for fastening data.

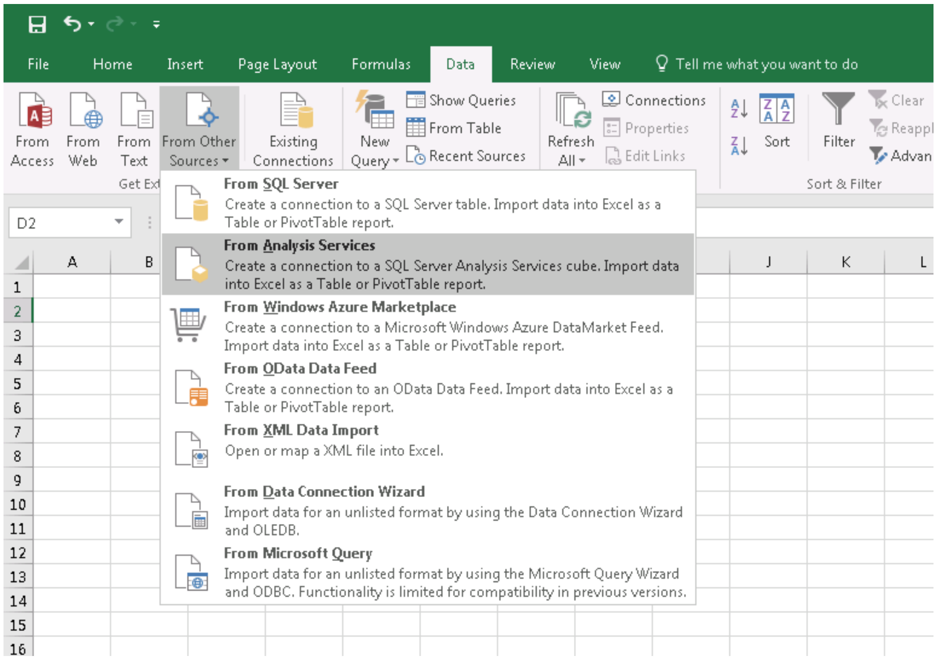
Advanced users may also benefit from using the PowerPivot Excel Add-In. This Add-In allows one to stage the data on a table and make calculations before loading it into an Excel PivotTable. Other SQL Server Analysis Services BI tools such as Tableau may also be used to connect to the PINpoint cube data.

## Connect to a Data Source

The following details outline how to use Excel to access data. (Different versions of Excel and PIN-point may appear different.)

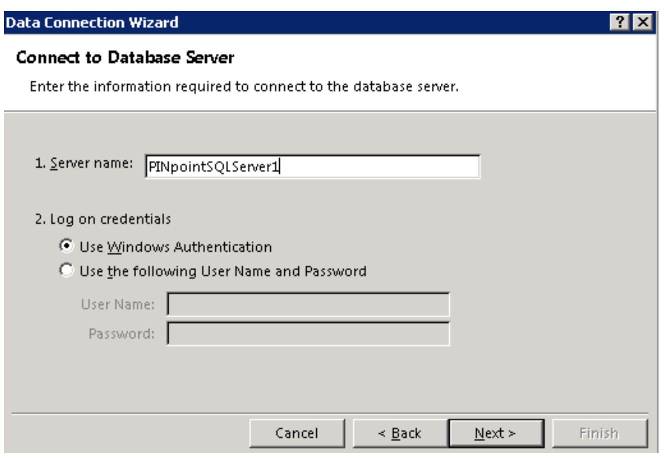
1. Start Excel and begin a new worksheet
2. Click the Data tab on the ribbon then select From Other Sources>>From Analysis Services

   connect to a data source



3. In the Data Connection Wizard type the appropriate Server name where the PINpoint Cube is setup and use windows authentication.

   Data Connection Manager



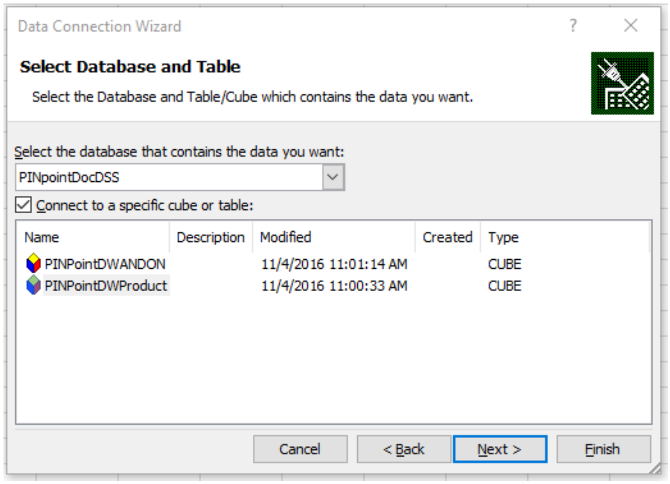
   At this point if the user does not have access to the cube an error will show up.

   For more on granting access to the cube check this information from Microsoft and consult the local IT administrator

4. Ensure the PINpoint database is selected in the drop down and then select the desired PIN-point cube and click next

   Select Database and Table




In this example the Production Cube, **PINPointDWProduct**, is selected.

5. Change the file name and path as desired and click Finish.

6. Select **PivotTable Report** and then choose where to put the data and click OK.

## Creating the Pivot Table

With the PINpoint data cube connection established all the fields are available to create a custom report. In this example the focus is on fastening and torque with the following fields and filters. This can be further altered for specific reports a user may want.

Before beginning it is useful to note how the data cube is designed. On a basic level the database consists of dimensions and measures. Dimensions are the various parameters that apply to the data. And the measures are the actual data values collected (or an aggregated collection of values). For example the Line, Station and Part Number are dimensions whereas the fastening rundown count and serial numbers completed count are measures.

## Initial Setup

1. Click on the pivot table to begin adding fields. (The table may already be selected).

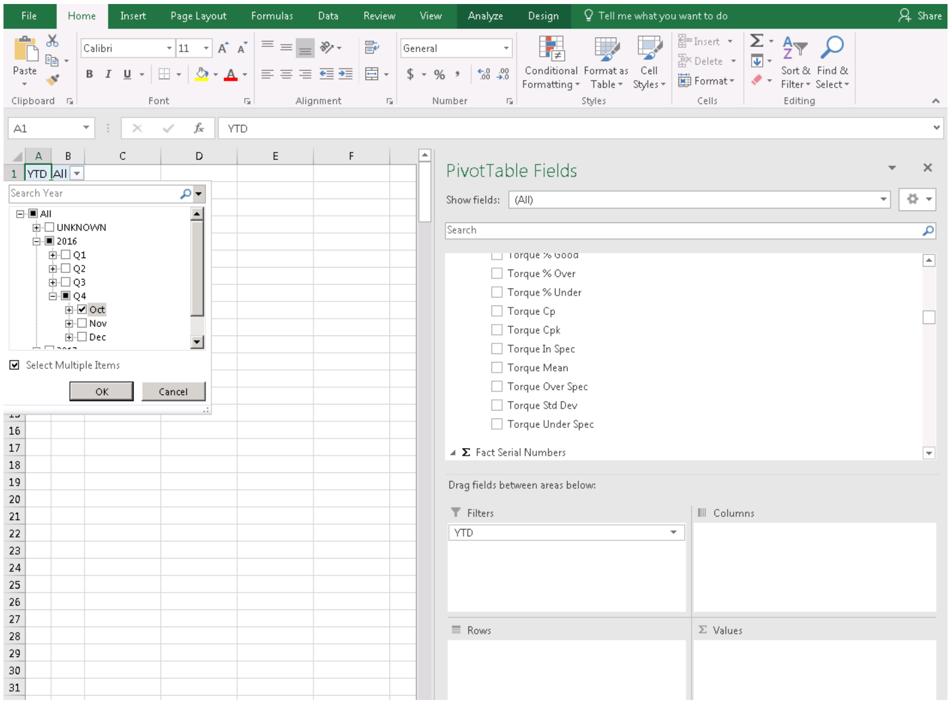
2. From the PivotTable Tools and Options menu, confirm the Field List is set to Show.

3. To improve the performance and pull less data from the database a filter should be added. In this example drag the dimension Data>>YTD in the PivotTable Field List to the Report Filter. Other filters may also be added as desired.

4. Select a smaller time period for the dataset such as 2016>>Q4>>Oct

   Initial Setup




5. From the PivotTable Fields select the following dimensions as rows in the PivotTable.

   5.1. Line>>Line

   5.2. Station>>Station

   5.3. Part>>Part Number

   5.4. Process Step>>Process Step

   5.5. Fastening Operation>>Operation Range

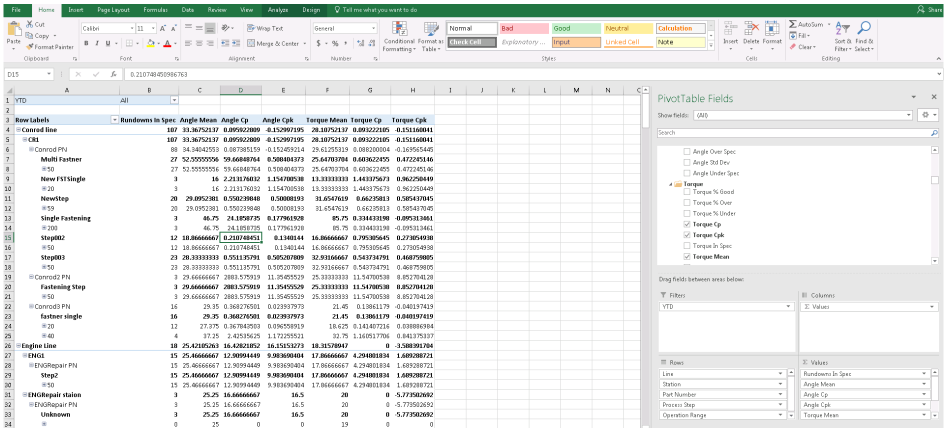
6. Now select the following measures and drag those into the PivotTable Field - Values:

   6.1. Fact Fastening>>Rundowns In Spec

   6.2. Fact Fastening>>Angle>>Mean, Cp, Cpk

   6.3. Fact Fastening>>Torque>>Mean, Cp, Cpk

Example PivotTable View



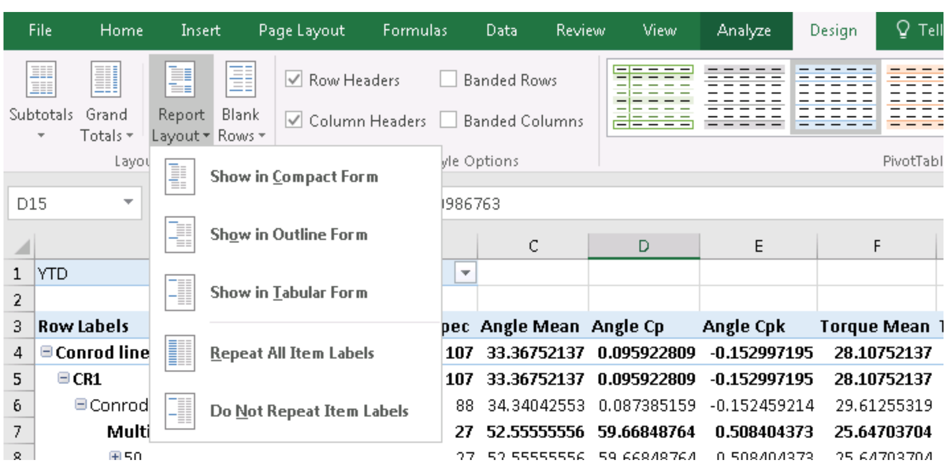
## PivotTable Modifications

Once the PivotTable is created the layout may be changed to a preferred layout. These steps will show how to use some of the design options to alter the table for a different view. Many options are available to change the look and feel of the table.

## Layout

1. Select from the PivotTable Tools Design tab, Report Layout>>Show in Tabular Form

   PivotTable Tools Design Tab




2. Now remove the numerous subtotals by selecting Subtotals>>Do Not Show Subtotals

3. To fill the spaces where no values are shown select PivotTable Tools>>Design>> Report Lay-out>>Repeat All Item Labels

4. Certain columns (e.g. Operation Range) may be collapsed and show the + symbol. Right-click that cell and select Expand Entire Field. After all columns have been expanded to show the – symbol, users may disable the Show +/- Buttons in the PivotTable Options tab Show menu.

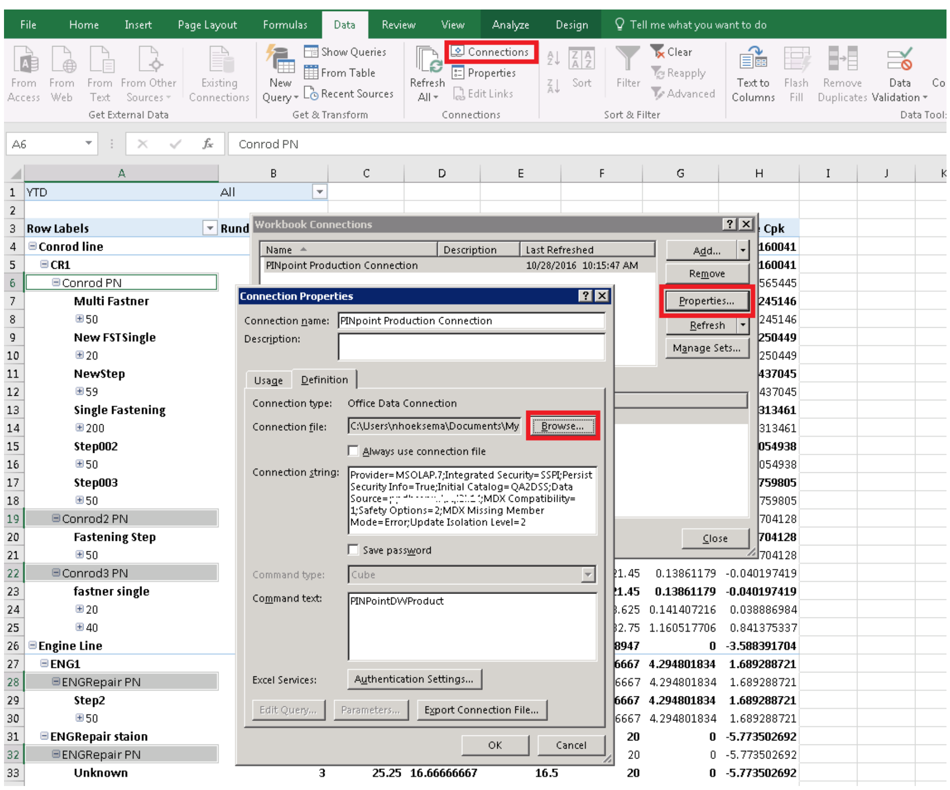
With the Table complete, save the file and it can be reloaded on a different day. A user may easily reopen the document alter the date filter and select Refresh from the PivotTable Options tab and Data menu to get the most recent data.

## Change Data Sources

At times the user may want to share the Excel document or connect to another cube for a different site. PINpoint may provide an Excel file with sample reports pointing to a different cube. This can be done by changing the connections with these steps:

1. From Connections under the Data tab on the ribbon, select Connections.
2. In the Workbook Connections window select the Properties tab
3. Click Browse connection files

   Browse Connection Files



4. A List of saved connection files is displayed. If the file is listed it may be used. If a new file is required select New Source

5. The Data Connection Wizard opens. Select Microsoft SQL Server Analysis Services and click Next

6. Input the appropriate server name that hosts the PINpoint Production Cube and click Next

7. Click Next. The connection's friendly name and odc file name can be modified as desired.

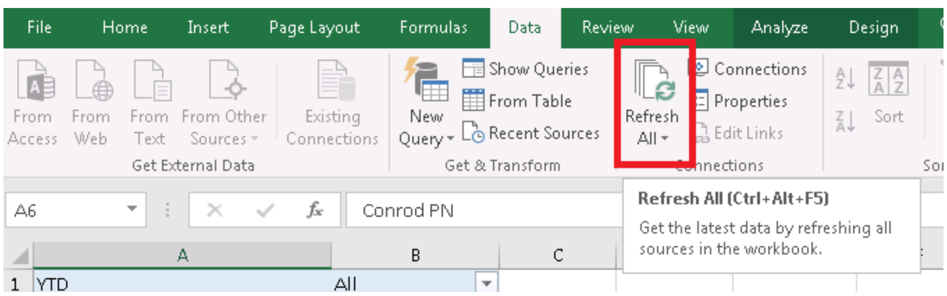
8. Click Finish

   Now the connection has changed.

9. Click OK.

   The data will start to refresh immediately. Refresh the data by clicking the Refresh button at the top under the data tab.

   Refresh Button At Top Under Data Tab




This may also be repeated to connect to multiple databases. When a different data source is required one can select an existing one as in the above steps.

# Change the Language of the Websites or SmartBuild

The PINpoint Websites support Chrome. To view the websites in a specific language change the display language of Chrome.

Change the Language of Chrome

SmartBuild uses the default language of windows to determine what language to display. To view SmartBuild in a specific language change the windows display language.

### Change the language of your Chrome browser

You can set Chrome to show all settings and menus in the language that you want. This option is only available on Windows computers.

**Important:** To add or remove web content languages on your Chromebook, learn how to manage languages.

**On Mac or Linux?** Chrome will automatically display in the default system language for your computer.

1. On your computer, open Chrome.
2. At the top right, click More ⋮ > **Settings**.
3. At the bottom, click **Advanced**.
4. Under 'Languages', click **Language**.
5. Next to the language that you'd like to use, click More ⋮ .
   - If the language isn't listed, add it by clicking **Add languages**.
6. Click **Display Google Chrome in this language**.
   - This option is only available on Windows computers.
7. Restart Chrome to apply the changes.

Change the windows display language

# Manage display language settings in Windows 10

*Windows 10*

The display language you select changes the default language used by Windows features like Settings and File Explorer.

1. Select **Start** > **Settings** > **Time & Language** > **Language**.
2. Choose a language from the Windows display language menu.

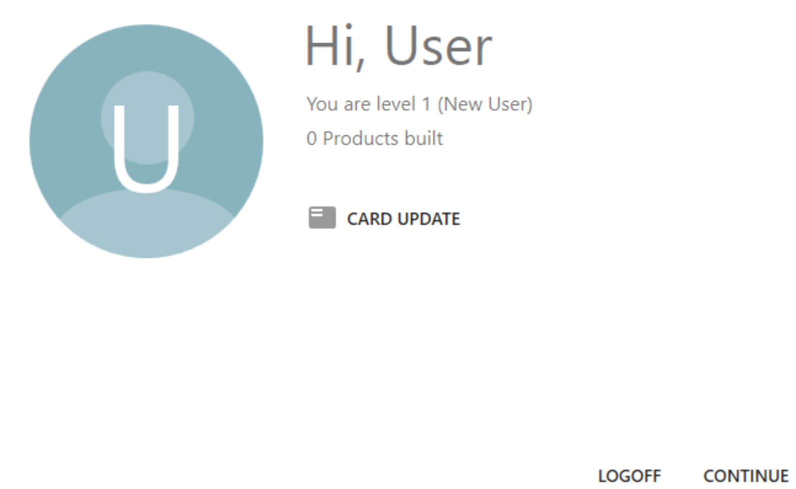
## Update a badge or card from SmartScreen

A badge for a user can be updated on the SmartScreen client or on the Security app. If the station has a badge reader configured then the card update button will be available. The card update button can be accessed by clicking on the user icon or on the welcome screen after a user logs in. An LCA is required to update a badge.

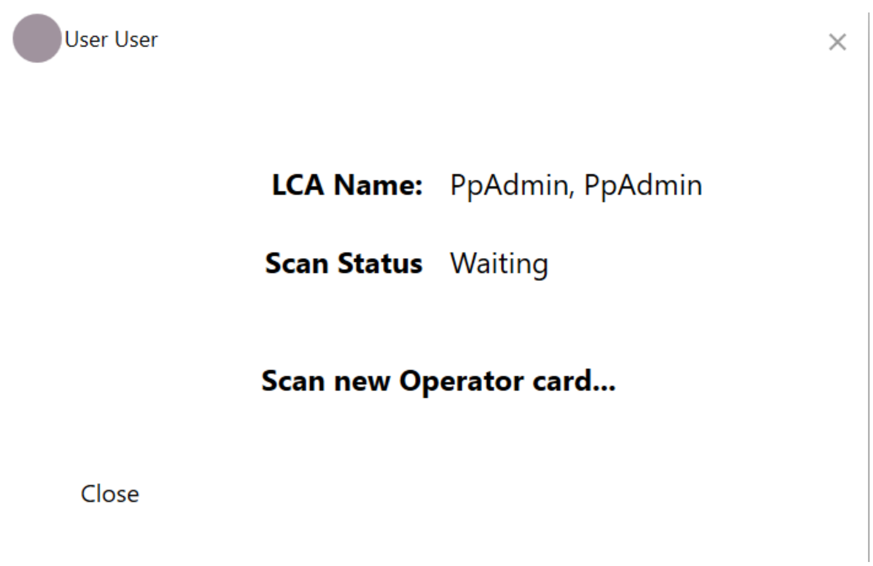
1. First login the user and then choose Card Update.

The Card Update button



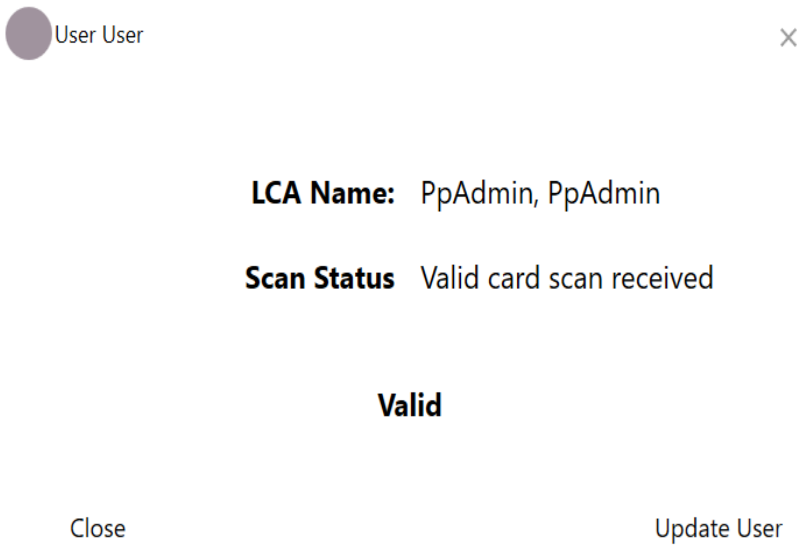

2. Login the LCA
3. Scan the new badge
4. The Card update Window




5. Choose Update User

The Card Update Window After a Valid Scan




# Create an SMTP Server

An SMTP server is used by the event manager to send emails.

To Create an SMTP Server:

1. Open the SmartBuild Advanced tab
2. Right click on the Organization folder
3. Select New -> SMTP Server
4. Enter the Properties

# Play a sound on an invalid Scan

An invalid scan can trigger a sound or stacklight notification. A scan operation has the property **Issue IPV Level 1 Event**. To play a sound from a sound device or trigger a stack light to activate create a notification which is true when an IPV level 1 event occurs at the station. This is used to audibly indicate a failed scan to an operator who cannot see the SmartScreen.

# PINpoint Concepts

## 5 Bucket Model

### Time Categorization in the 5 Bucket Model

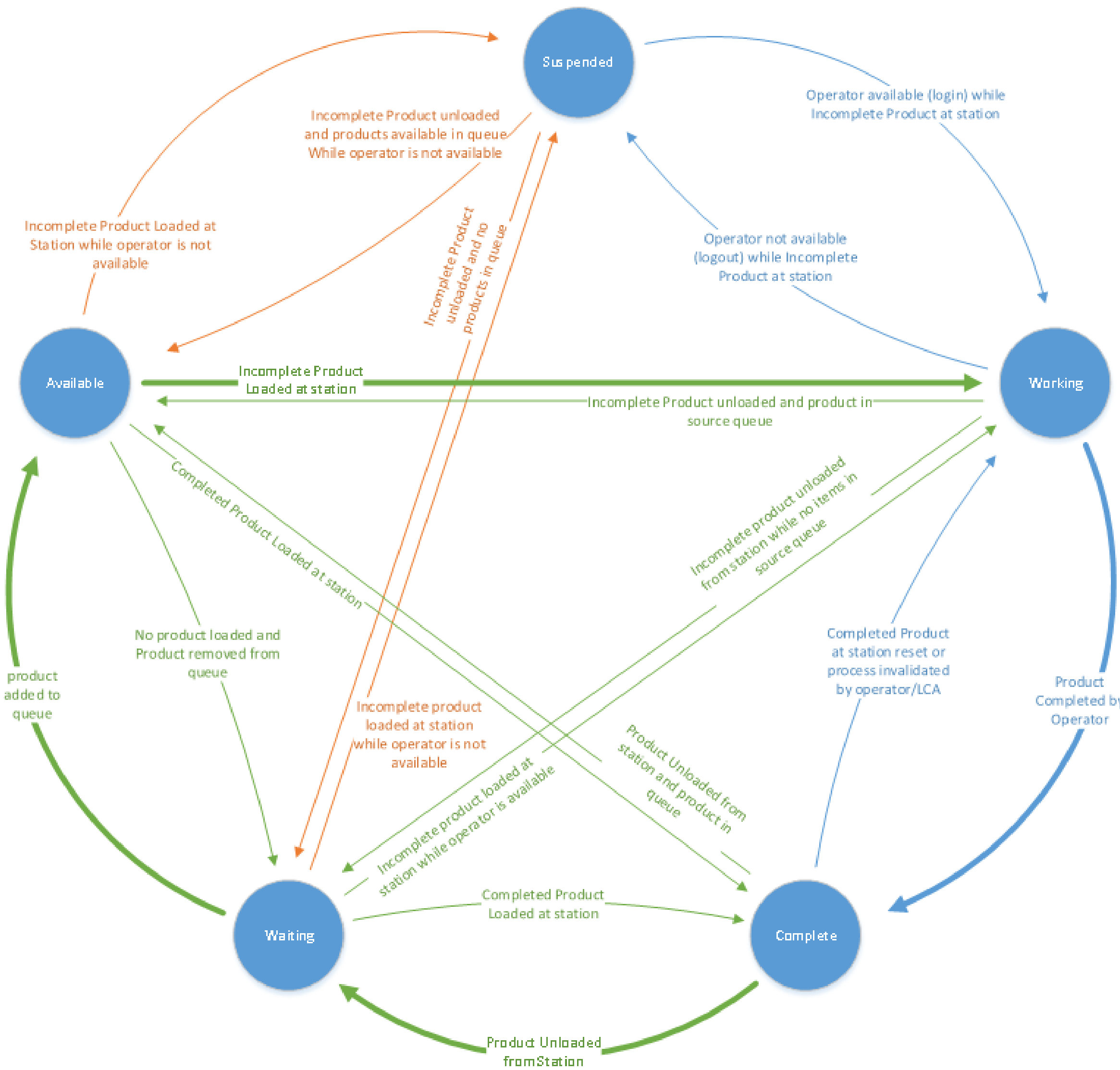
The 5 Bucket Model is the method for which time is categorized. Time spent at a station during shift production time is always categorized into one of the 5 buckets. The normal workflow would see the station transition from Waiting → Available → Working → Complete while the Suspended category is outside of the normal workflow.

The 5 bucket model

| Bucket | Time is Accumulated When |
|---|---|
| Waiting | The station does not have a product loaded and the queue is empty. |
| Available | The station does not have a product loaded and there is a product in the queue. |
| Suspended | The station has a product but the operator is not working on the process steps. The cycle time clock is not ticking. Time can also accumulate if the client is loading a product or if all steps are disabled. |
| Working | There is a product loaded and the operator is working on the process steps. The cycle time clock is ticking. |
| Complete | The product at the station is complete. If an empty item, or an item with a product quality status that of red, is at the station then the station will also be complete. |

The Way A Station Typically Transitions Between States. Products on hold do not count as being in the queue.

Orange – An action which must be done on the Tracking website because there is no operator at the SmartScreen Client
Green – An action which is performed normally on the SmartScreen Client or on the Tracking website
Blue – An action performed on the SmartScreen Client
Thick Lines indicate normal product movement during production



# Product Quality

## Product Quality

The product quality icon summarizes the quality of a product. The product quality icon is a truck which changes colors to signify if there is a quality issue with the product. The actions which set the quality are determined by the settings on the plant in the SmartBuild hardware tab. For more information see: "Line Properties List" on page 422

The Product Quality Icon

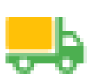
The intended use of this feature is to quickly determine if a product has any quality issues. In a typical setup: Grey products are new. Green indicates there is nothing affecting the quality. Yellow means that something has occurred to the product which will need to be rectified later. Red implies that the product will not be shipped to the customer and is beyond repair. If the quality is red then the operator will not be able to work on the steps.

Defects, Bypassed, incomplete stations, and Rejects, can each be configured to change the product quality to red, yellow or none. When a product is created it has no quality and is grey until it enters production by being loaded at a station or moved on the tracking app. The product quality will change to green when it has entered production. Green and yellow products are always included in performance calculations. Red products are not included in any performance calculations, as Red products will ultimately affect the Performance metric due to the lack of producing a unit when the station should have.

Incomplete stations will affect the product quality. If a product skips a station it will affect product quality. If a route has an OR configuration a station is required to be completed if it has loaded the product. Stations may be excluded from the product quality evaluation by setting the Station property *Include in Route Deviation* false. Excluding a station from the product quality evaluation is intended to allow the use of a repair station in an OR configuration where some but not all steps need to be completed on any products which are loaded at the repair station.

The quality icon will change if the station is on a composite route. The truck will display the product quality at the current station while the cargo will display the product quality from the substations.

The Product Quality Icon When the Station is on a Composite Route. In this Example the Product at the Current Station Has No Quality Issues But There is a Quality Issue on a Substation.



# Performance Calculations

## Performance Calculations

The performance calculations help track the performance of a facility. PINpoint tracks performance on a per product basis which allows PINpoint to provide production metrics at any given point during the production shift. These calculations rely on information entered in the Scheduler app and are used on the SmartBuild Dashboard, Reports, and the SmartScreen client's performance tab.

Calculation Definitions

| Term | Definition |
| --- | --- |
| Overall Equipment Effectiveness (OEE) | $$\mathrm{OEE} = \mathrm{P} \times \mathrm{Q} \times \mathrm{A}$$ OEE is a metric which can be used to track the overall performance of a station and line. |
| Performance (P) | $$P = \frac{\text{Actual (all)}}{\text{Planned}}$$ Performance describes what percentage of planned products the station built. |
| Quality (Q) | $$Q = \frac{\text{Actual (good)}}{\text{Actual (all)}}$$ Quality describes what percentage of products built had a product quality of green. |
| Availability (A) | $$A = \frac{\sum \text{Production Time} - \sum \text{Availability Loss Time}}{\sum \text{Production Time}}$$ Availability describes what percentage of time the station was available to build products. Availability Loss Time must be entered on the dashboard after the shift has ended. If OEE is calculated in real time the availability is 100%. |
| Goal | The amount of products which should be built.<br>The goal for a shift is entered in the Scheduler app. |

| Term | Definition |
| --- | --- |
| Takt | $$\text{Takt} = \frac{\sum \text{Production Time}}{\text{Goal}}$$ The average time it takes between completed units to achieve the goal for a given shift. |
| Planned | $$\text{Planned} = \frac{\sum \text{Elapsed Production Time}}{\text{Takt}}$$ Planned is the amount of products which should have been built at a given time in the shift. |
| Actual (all) | $$\text{Actual (all)} = \sum \text{Green and Yellow products}$$ The sum of all products built at the given time. If a product quality is red it is not counted. A product is counted when it departs a station. |
| Projected | $$\text{Projected} = \text{Actual} + \text{Performance(Line)} \times \text{Best Case}$$ Projected describes the amount of products predicted to be built during the shift based on the performance of the line.<br>If the route is composite then this considers only the specific branch of the route where the station with **contribute to line metrics** is selected. |
| Actual (good) | $$\text{Actual (good)} = \sum \text{Green products}$$ The sum of all products built which have a product quality of green at the given time. A product is counted when it departs a station. |
| Value Add Ratio | $$\text{Value Add Ratio} = \frac{\sum \text{Working Time}}{\sum \text{Elapsed Production Time}}$$ The Value Add ratio is the sum of time spent working over the elapsed production time. This is shown as a percentage and charted against the value add ratio defined in the scheduler app for the shift.<br>The ideal value add ratio is the cycle time percentage. |
| Current Loss | $$\text{Current Loss} = \sum \text{Non Working Time} + \text{Over Cycle Time}$$ The current loss is all the time accrued outside of the working bucket and all of the time spent working if it was over cycle. |

| Term | Definition |
|---|---|
| | This is only calculated for the current product at the station. This is reset every time a new product enters the station. |
| Non-Value Add | $\text{Non-Value Add} = \text{Waiting} + \text{Available} + \text{Suspended} + \text{Complete}$<br>The sum of all time accumulated except working. |
| Best Case | The amount of items which can be built given the state of the route and the cycles remaining. |

## Line Performance Metrics

Performance metrics for the line are calculated using the metrics for each individual station. The product quality for each product at each station, and in each station's queue is considered when summarizing the OEE for the line. Reclassifying Performance Losses to Availability Losses is entered after the shift has ended and is entered for each individual station so it is summarized individually.

| Term | Definition |
|---|---|
| Line OEE | $\text{Line OEE} = \frac{\sum_{\text{All Stations}} \text{Actual}}{\sum_{\text{All Stations}} \text{Planned}} \times \frac{\sum_{\text{All Stations}} \text{Good}}{\sum_{\text{All Stations}} \text{Actual}} \times \frac{\sum_{\text{All Stations}} \text{Production Time} - \sum_{\text{All Stations}} \text{Unplanned downtime}}{\sum_{\text{All Stations}} \text{Production Time}}$ |

## Projected

Projected is the amount of units that PINpoint calculates the production line is likely to produce by the end of the shift. The Projected calculation result is displayed on the Dashboard Plant View and the Dashboard Line View.

The system considers the line's actual performance when calculating Projected.

$$\text{Projected} = \text{Actual} + \text{Performance(Line)} \times \text{Best Case}$$

***Actual*** is the amount of units which have been produced by the station which contributes to line metrics. This is shown on the dashboard.

***Performance(Line)*** is the performance quotient for the line. This is shown in the line OEE calculation.

Line Performance. The Actual amount of green and yellow products released from all stations over the planned amount of units released from all stations at the current point in the shift.

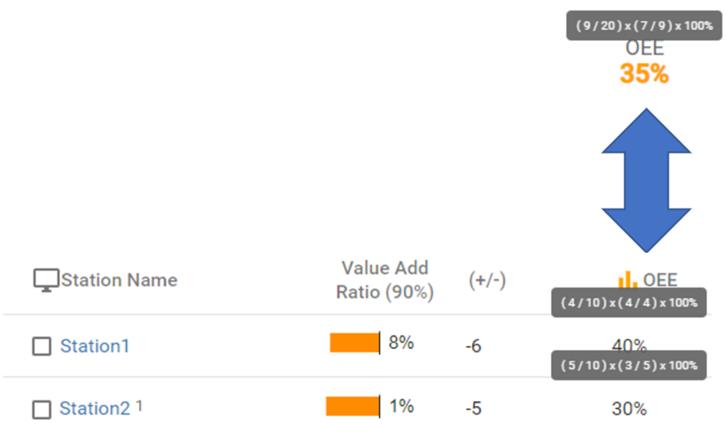
$$\text{Performance (Line)} = \frac{\text{Actual (all)}}{\text{Planned (all)}}$$

Line OEE is displayed on the Dashboard Plant View and the Dashboard Line View. The Dashboard Line View OEE is the total OEE for all stations. The tool tip shown when hovering over the OEE calculation shows the OEE calculation values used for Performance X Quality X Availability.

The Projected calculation will use a value of one for the Performance (Line) when the planned value is zero because the Performance (Line) calculation result is undefined. This is only true during the first takt cycle of a shift.

The Projected calculation will also use a value of one for the Performance (Line) when the Performance (Line) calculation result is zero. This is true when Actual (all) is zero, because no station has built anything.

The Line OEE on the Dashboard Line View and how it relates to the station OEE.



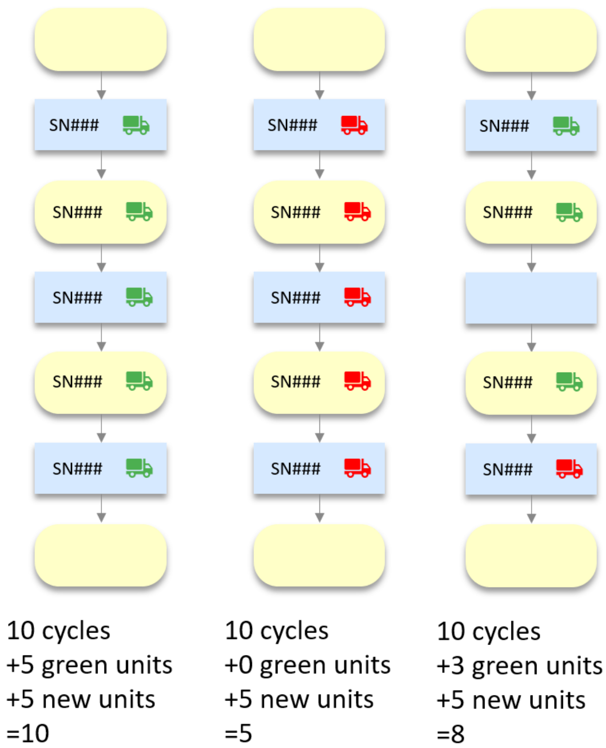

## *Best Case*

Best Case is the sum of green and yellow units which can be built during the remainder of the shift. Best Case is not displayed to the user. A unit is built if a green or yellow unit departs the station which has *Contribute To Production Metrics* set True.

Best Case considers the position of build items on the route and is recalculated whenever any build item on the route moves. Best Case assumes the start queue is filled and that each unit will spend a full takt cycle at each station irrespective of product quality.

Best Case evaluates gaps on the route as lost opportunities to produce one unit and reduces the Projected amount. Stations which are empty are evaluated as gaps.

An example of how Best Case would be calculated based on the route state if there were 10 takt cycles remaining.




# PINpoint and KEPServerEX

Many manufacturing devices are connected to Programmable Logic Controllers (PLC) for automation of machinery on assembly lines. PINpoint can connect to these devices via KEPServerEX, an enterprise grade communications platform for plant control systems. The PINpoint Data Manager, when connected to KEPServerEX will bring an extra layer of process control to your manufacturing needs.

Once connected to KEPServerEX, the PINpoint Data Manager will have access to devices, raise and receive ANDON events, and aid with product tracking and routing. The Data Manager in the SmartBuild Advanced tab contains the connection to KEPServerEX.

Some examples of OPC devices integrated with PINpoint:

- **OPC Fastening**: If fastening is automated at a station, an OPC Fastening device can be defined in PINpoint, and all data collected by the fastener can be relayed to PINpoint. See "OPC Fastening " on page 104.
- **Automated Stations**: an entire station can be configured in KEPServerEX and PINpoint for the purpose of quality control in a part of the assembly line not accessible to the workers. See "Lines and Stations" on page 21.

- **OPC Events**: OPC devices can trigger events in PINpoint via a Generic Event. These events can notify PINpoint BigScreens, stacklights, or other OPC devices.
- **OPC Tracking**: KEPServerEX can be configured to automate the product movement on the assembly line, and PINpoint can initiate and respond to any product movement needs. The correct process and product is brought to the worker, maximizing worker efficiency, quality and speed of assembly.

# PINpoint and PLCs

The automation layer and process control layer of the manufacturing process are controlled by PLCs (Programmable Logic Controllers) and PINpoint software respectively. An OPC Server (OLE for Process Control) is used to bridge these layers and facilitate a bi-directional communication. PINpoint's Data Manager Service is integral to the process control layer and it is responsible for interpreting and evaluating signals between PLCs and PINpoint software. The Data Manager has the capability to support multiple communication channels within the same OPC Server and dedicated channels are used to communicate with devices, raise and receive ANDON events, and conveyor control.

All configuration settings to connect PINpoint software with an OPC Server are found in the SmartBuild Advanced tab in the Data Manager properties or on devices added to the data manager.

Some examples of the bi-directional communication of PINpoint with PLCs:

- **Devices**:
  - Sensors are monitored by the PLC and notify PINpoint software of its state.
  - Fastening controllers are controlled by PLCs and PINpoint software can notify the controllers which Psets are expected and when the tool is enabled / disabled.
- **ANDON Events**:
  - A 'Generic Event' is used in PINpoint software to receive ANDON events raised by the PLCs (e.g., a failed test result).
  - PINpoint will raise ANDON events (e.g., Over cycle events) which can subsequently notify the PLC for appropriate action.
- **Conveyor Control**:
  - PINpoint has a product tracking system designed to keep track of product location and status as well as determining when the conveyor should move. The PLCs controlling the conveyors can notify the Data Manager where pallets are and PINpoint software can assign the corresponding product to the pallet as well as its completion percentage and status (Completed, Bypassed, Rejected). When product is completed at a station, the Data Manager will notify PLCs and the conveyor can be moved forward.

# PINpoint Tracking Concepts

## Tracking Overview

Tracking allows users to plan and execute the production of work orders. The tracking system requires setup in the SmartBuild and on the Configuration Web App. Once it is setup production can be monitored on the Portal's Tracking site.

A list of terms can be found in: "Glossary" on page 508

### Work Orders

In general, Work Orders are created with a list of Work Order Items (Serial Numbers) to be built and a scheduled release date for when they should be built. When the Work Order is released the Work Order Items are populated onto the Route and Build Items are created by the tracking manager to track the production of the Work Order Items.

Build Items are used to uniquely identify an instance of a Work Order Item on the route. The Build Items allow the tracking system to track a specific Work Order Item on multiple segments of a Route. This allows the same Work Order Item to be built at the same time on different parts of the route and then merged together later. Build Items are tracked by the PINpoint system, but they can be tied to a PLC Tracking ID or index value so that a PLC can tell the PINpoint system where the Build Item is.

Work Orders have several states that they go through during production.

1. Not Released: When a Work Order is created it is Not Released. In this state the Work Order can be modified. It must be set to Released to be built.
2. Scheduled: When a Work Order is released but the scheduled date has not yet occurred then the Work Order is Scheduled. When the release date passes the Build Items will be created on the Route.
3. Provisioning: Provisioning is the action of creating the Build Items for each Work Order Item in the Work Order on the Route. This occurs at the release date.
4. Queued: When a Work Order has been provisioned it is released. The Build Items are in the Route's start Queues and the Work Order status is Queued. Start Queues are the first queues on a Route.
5. Started: When any of the Build Items moves beyond the first Queue the Work Order is Started.
6. Completed: When all of the Build Items are in the Route's end Queue the Work Order is Completed.

Each Work Order Item can have its own set of Contextual Data. Contextual Data Items are setup in the Configuration web app and linked to a Part. When a Work Order Item is created the Parts determine which Contextual Data Items will appear and must have the value entered. Contextual Data Items are used when a Work Order Item has additional information which should be communicated to a Station.

Each Work Order Item can have a sub Work Order Items creating a hierarchy of Work Order Items. The hierarchy of Parts is setup on the SmartBuild Bill Of Materials tab. The sub Work Order Items are created based on the Parts selected when a Work Order Item is created. This is used when a single Work Order Item of a certain Part should automatically generate several Work Order Items of another Part.

## Routes

A Route is a diagram of the path a Build Item should take when it moves through the line. The route has Stations and Queues. A Queue can hold many Build Items but a station can only hold one. A route has a list of Parts which determines if a Work Order Item containing those Parts can be built on the route.

## Required Configuration

To track Build Items as they move through the line the following configuration must be completed.

- Stations in the SmartBuild Hardware tab
- Routes in the SmartBuild Build tab
- Processes in the SmartBuild Process Tab
- Serial Number Controllers on the Configuration web app
- Parts on the Configuration web app

See: "Build a Line" on page 330

### *Routes with Multiple Start Stations*

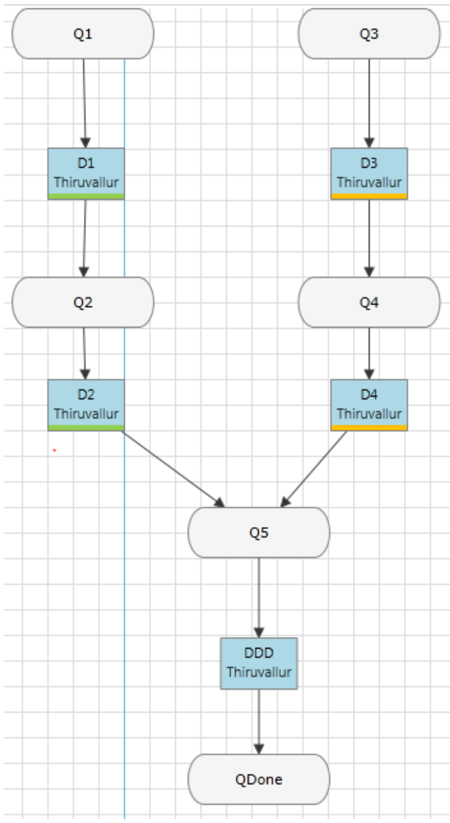
The way a Work Order created at a Client is handled in Tracking for routes that have more than one start Station (that is, Stations configured to be able to start the work on a Product) depends on the nature of the branches the start Stations are on.

#### Separate Feeder Queues

In the example below, Stations D1 and D3 are both configured as start Stations for a Product. These Stations are completely separate and have separate feeder Queues (Q1 and Q3). When a Work Order is created by either start Station in this route, a Work Order with the same serial number appears in the queue of both D1 and D3. The Stations on the separate branches work on this serial number separately from one another. They are independent until they reach Q5.

Route with separate feeder Queues

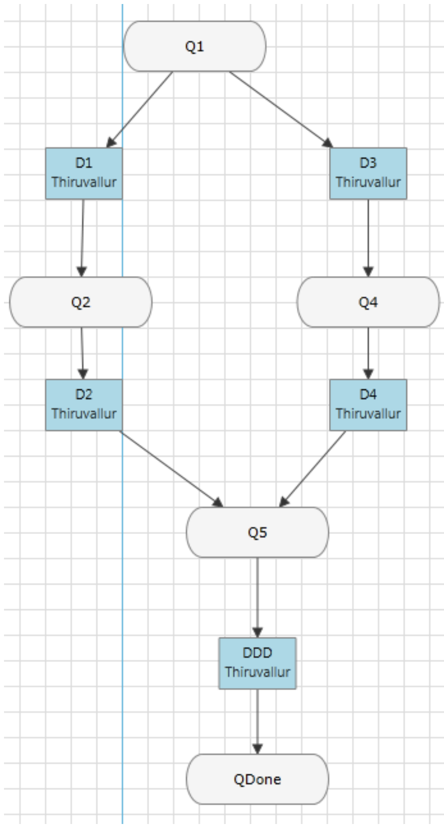



## Common Feeder Queue

In the example below, Stations D1 and D3 are both configured to create work orders. They have a common feeder Queue (Q1), and they build the same part number. When a Work Order for a serial number is created on this route, a Build Item with that serial number will appears in the queue of both D1 and D3.

Since these Stations are drawing from a common queue, whichever Station loads the build item first will take it and move it out of the queue. At this point, the Work Order disappears from the queue of the other start Station. In this scenario, one or the other start Station can work on the Work Order Item, but not both.

Route with common feeder Queue

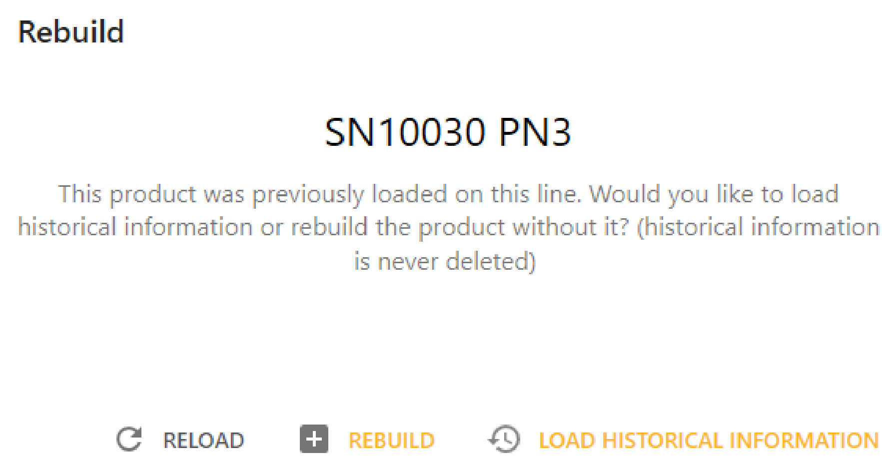



## Rebuild

If the station property Check For Rebuild is set this allows the supervisor to make a decision when a build item returns to a station. A supervisor can choose to either Rebuild the build item as if none of the steps have ever been completed, or to load the historical information which was recorded the last time the build item was at the station. Reload will reload the build item and check if this question was answered on a peer station.

The Rebuild Window




The rebuild window will appear at a station that has **Check for Rebuild** set true if a build item is loaded at the station followed by the station loading another build item, and then the first build item is loaded at that station again.

*For example: If serial number SN01234 is loaded at station 1A, then SN01111 is loaded at station 1A, then SN01234 is loaded again at station 1A, then the rebuild window will appear.*

The rebuild window will not appear if there was a decision made to rebuild or load historical information in the past.

*For example: If serial number SN01234 is loaded at station 1A, and the user selects rebuild, then the user closes the SmartScreen client, then the user opens the SmartScreen client, then the rebuild window will not appear because there was a previous decision.*

The most recent decision to rebuild or load historical information is respected unless the build item has departed and returned to the station again.

*For example: If serial number SN01234 is loaded at station 1A, and the rebuild window appeared and the user selected rebuild, then the user loaded SN01111, then the user loaded SN01234, then the rebuild window would appear again.*

## Peer stations

Check for rebuild must be checked on the peer station if the lead station also has check for rebuild. This ensures that only one decision is made. If the rebuild window appears on the lead station then the peer will display a window stating that it is waiting for a decision from the lead. When the lead decides to rebuild or load historical data the peer station will follow.

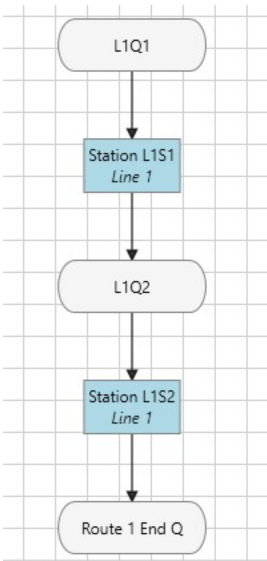
*For Example: If station 1A and station 1B are setup as peers and they both have the rebuild window open when serial number SN01234 is loaded; if the supervisor decides to rebuild or load historical information on station 1A then station 1B can select Reload and serial number SN01234 will be loaded based on the decision made at station 1A.*

## Setting the Completion Action

The Completion Action rule in the Build tab should be set for a station depending on whether the next queue will receive one or more Build Items.

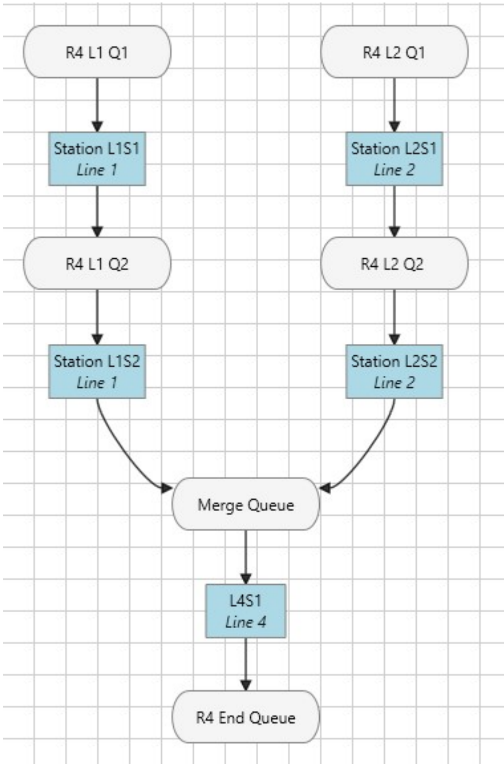
In a linear line, when the same Build Item moves through all queues and stations the **Completion Action** rule should be set to *Send to Next Queue*

A Linear route. Each station should have the Completion Action rule set to *Send to Next Queue*




In a composite route, there may be multiple start stations and merge stations where Build Items are merged together.

Composite route example




The stations L1S2 and L2S2 are prerequisites to the station L4S1. Stations prior to the parent build item do not need to send the build item to the next queue. The L1S2 and L2S2 stations in this example should have the **Completion Action** rule set to *None*.

The parent build item needs to move to the final queue. The L4S1 station should have the **completion action** set to *Send to Next Queue*. An expanded and more complex route follows the same logic.

## Rejecting and Unrejecting Build Items

Work is scheduled for production by generating a Work Order which consist of one or more Work Order Items and each Work Order Item consists of one or more Build Items. It is not uncommon for a Build Item to experience a manufacturing exception severe enough that the Build Item must be rejected preventing the operators from performing any more operations on the Build Item.

### *How to Reject a Build Item*

There are three possible ways that a Build Item can be Rejected.

1. **From the SmartScreen Client** - Log into the Client using LCA credentials and Reject the Build Item at the station.
2. **Individual Build Item from Tracking Web App** - The PINpoint Tracking web app can be used to Reject any Build Item within PINpoint regardless of the Build Item's location on its Route. The

Tracking web app allows both Build Item and Work Order to be rejected. Rejecting a Build Item on the Tracking app is performed using the context menu on the Production View.

3. **Entire Work Order from the Tracking Web App**- The third way in which a Build Item can become rejected is by the system when a Work Order Item is rejected at the Tracking app. When a user rejects a Work Order the system will reject all of the Build Items which make up the WOIs. Rejecting a Work Order Item will also reject all of the Build Items which make up the Work Order Item. A Work Order Item will also be rejected by the system if all of the Build Items which make up the Work Order Item are individually rejected.

## How Reject Reasons Apply

A reason must be provided to reject a Build Item or a Work Order Item regardless of where the action is being executed.

The **Reject Reasons** list is used by default. Reasons can be added in SmartBuild > Advanced > Reasons. Stations can be configured to use a specific reason list in the station config properties.

## Effects of Rejecting a Build Item

A Rejected Build Item can still continue moving along the route to the final queue. The Build Item will continue to be loaded into Client stations. The OPC tags will be set automatically by the DM regardless of any messages received from the SmartScreen Client.

### *Rejected Build Item at the SmartScreen Client*

- Red Status message indicating that it is rejected
- Rejected Status in the work orders tab
- Rejected icon on the steps
- The DM will set the value of all configured PLC tags:
  - The **Station Complete Output Address** OPC tag is set *True*
  - The **Reject Output Address** OPC tag is set *True*

# Tracking Inactivation Routine

Work Orders are not tracked indefinitely. Work Orders will be marked inactive in the database when they are no longer relevant to production. This is done to maintain the performance of the PINpoint system. The PINpoint system has a mechanism to mark work orders as inactive called the Tracking Inactivation Routine. Inactive Work Orders will still appear in reports. Inactive Work Order Items will not appear in tracking by default. Inactive Work Order Items can be found using the search function on the tracking page.

The Tracking Inactivation Routine is part of the PINpoint Maintenance job on the SQL server which runs periodically to find Work Orders which should be marked inactive. The Tracking Inactivation Routine finds Work Orders based on a Work Order Inactivation Long Trigger and a Work Order Inactivation Short Trigger which each mark certain Work Orders as inactive based on their settings. These settings are configured on the Tracking Manager in the SmartBuild Advanced tab.

There is a separate setting called *Days to Retain* for the Short Trigger and for the Long Trigger. The *Days to Retain* setting is used in the Short or Long Trigger to determine a date prior to the current date; Work Orders which have been updated after that date will be not be marked inactive even if they satisfy the other settings to be inactivated. Work Orders are considered to have been updated if a Build Item is moved into a queue or station or if a Work Order Item status was modified. Work Orders will not be marked inactive if they are scheduled for future production.

## The Short Trigger

The Short Trigger is intended to mark Work Orders inactive which have been normally completed and which are not expected to return to anywhere on the route. The Short Trigger will mark an entire Work Order inactive if all of the Work Order Items are valid to mark inactive. A Work Order Item which has all the Build Items in the final queue, and all applicable graveyard locations, and which has not been updated since the last valid date as determined by the value of *Days to Retain* is valid to mark inactive. The Short Trigger can also be configured to exclude Work Orders Items if they have a Build Item which has bypasses, defects, incomplete children, or an incomplete process.

## The Long Trigger

The Long Trigger is intended to mark any Work Order inactive which is older than could possibly be relevant to production. This will also mark Work Orders inactive which have been created but which have never been started. The Long Trigger marks all Work Orders inactive which have not been updated since the last valid date as determined by the value of *Days to Retain*.

# Internet Of Things Concepts

## Overview

The PINpoint system supports Internet of Things (IoT) publishing. The Industrial Internet of Things (IIoT) is a concept which provides message standardization so that different systems in an industrial environment can communicate. The PINpoint system follows the MQTT standard.

The PINpoint system can publish different main topics to an IoT Broker: Tracking Metrics, Client Messaging, Device Telemetry, Production Metrics, Andon Events.

## Configuration

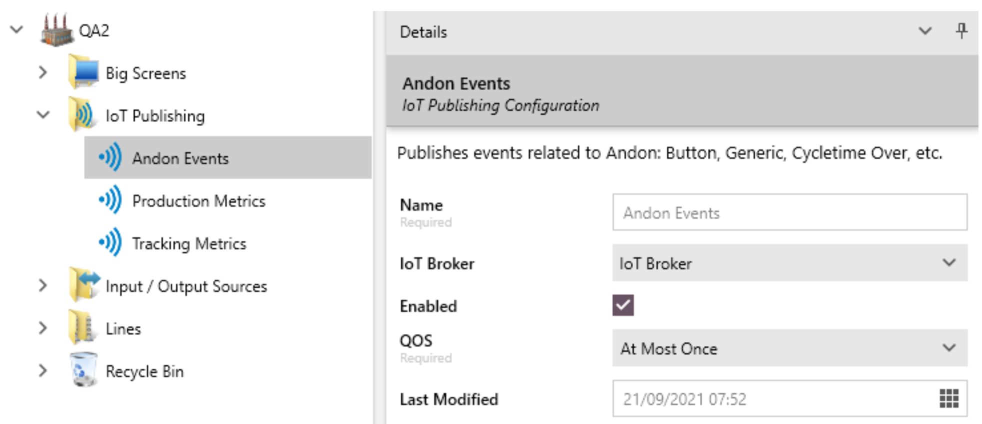
The IoT broker must be configured in the SmartBuild Advanced tab and then linked to the plant in the Hardware Tab. The IoT broker receives topics from publishers and sends requested topics to subscribers. The IoT broker should already be installed. The IoT Broker is not PINpoint software.

1. Add the IoT broker in the Advanced tab. The IoT Brokers folder is a list of brokers which PINpoint can send messages to.

2. Add the Endpoint for the IoT broker in the Advanced tab. This is the connection information for the broker.

3. Configure the IoT publishing configuration of the Plant in the hardware tab. This is the broker which will receive each type of message. For each IoT publishing select the a broker from the list. Production and Tracking metrics will be sent when an event occurs.

   Configure the IoT Events under the plant in the Hardware tab.




4. Each Andon notification must be configured individually in the Events tab. This is configured similar to the other output events.

# IoT Messages

IoT messages are structured with the Data Manager's **Service Instance Name**, then the location they apply to, and then the type of message which they are.

IoT topic format examples

| | |
|---|---|
| **Format** | {ServiceInstanceName}/{LineName}/{StationName}/{Topic}/{Topic} |
| **Production Example** | TrackingManager/Line1/Station1/Production/ShiftEvent |
| **Tracking Example** | TrackingManager/Line1/Station1/Tracking |
| **Andon Example** | EventManager/Line1/Station1/Notification1 |

## *Production IoT Topics*

Production topics are published when the status of the topic changes. Production topics apply to the line and the station.

Production Topics

| Topic Type | Topic | Structure | Details |
|---|---|---|---|
| Production | | | Production information |
| | Line | {LineName}/production | Line production information |
| | BucketState | {LineName}/{StationName}/production/bucketstate | Station bucket state information |
| | Projected | {LineName}/{StationName}/production/projected | Station projected information |
| | QueueCount | {RouteName}/{QueueName}/-production/queueCount | Station queue count information. This will |

| Topic Type | Topic | Structure | Details |
|---|---|---|---|
| | | | only be published if there is also conditional routing configured on the queue. |
| | ShiftEvent | {LineName}/Production/shiftEvent | Line shift information |
| | Station | {LineName}/{StationName} | Station production events |
| | UserLogin | {LineName}/{StationName}/userlogin | Station user login events. |

Each message has a set of properties and values. Not all messages use the same properties. The properties with the work ID in them come from the database. Timestamps may be in local time or in UTC time depending on the property. Many properties use terms from concepts which are defined elsewhere. The properties which can exist are listed in the table below.

Properties and definitions for Production Topics.

| Property | Description |
|---|---|
| Actual | The Actual Count |
| ActualGood | The Good Count |
| Availability | The availability calculated for the station. |
| BuildActual | The Actual Count |
| BuildGood | The Good Count |
| BuildItemId | The build item ID. |
| BuildTarget | The station Target |
| Count | The Count of Build Items which entered the queue for the associated Route. |

| Property | Description |
|---|---|
| CyclesRemaining | The number of takt cycles left before the shift ends. |
| DisplayName | Name of the User logging in or out. |
| IsCurrentOverCycle | If the station and build item is over cycle. |
| IsLogin | If true this is a login. Otherwise the event is a log out. |
| IsMisconfigured | Indicates if the configured contribute to line metrics Station is mis-configured. For Example if there is more than one station per line, or the contribute to line metrics station has multiple paths to the destination, etc. |
| IsPreviousBreak | If the previous state was a break |
| IsPreviousOverCycle | If the previous state was overcycle |
| Projected | The amount of products to be built during the shift. This is based on the amount of<br>products completed and the amount of takt time cycles remaining. See Performance<br>calculations for more information. |
| LineId | The Line ID |
| LineName | The line name |
| LocationStateLogId | The corresponding ID from the LocationStateLogs table (if one exists) |
| LoginType | The type of login/logout.<br><br>Operator = 1,<br>Trainer = 2,<br>LCA = 3,<br>User = 4 |

| Property | Description |
| --- | --- |
| OEE | The OEE |
| Performance | The performance |
| PlantTimestamp | The Plant timestamp |
| Previous | The previous state |
| PreviousDuration | The previous duration |
| Quality | The quality |
| QueueId | The ID of the queue |
| QueueName | The name of the queue |
| RouteName | The name of the route |
| RoutingTemplateId | The ID of the route |
| SerialNo | The Serial number |
| ShiftScheduleId | The ID of the shift schedule |
| State | The state of the event |
| StationId | The ID of the station |
| StationName | The station name |
| TAKTTimeMultiplier | The takt time multiplier |
| TimeDifferential | Time which a Station is ahead or behind the target. If the Station is ahead, meaning it has produced more than the target, then there will be a positive number. If the Station has produced less than the target the number will be negative. |
| Timestamp | The Timestamp in UTC |
| UserId | The ID of the user |

## *Tracking IoT Topics*

Tracking Topics are always published at the station level. A topic is published when a new status occurs.

Tracking IoT topic message structure

| Topic Type | Topic | Structure | Details |
| --- | --- | --- | --- |
| Tracking | Tracking | {LineName}/{StationName}/Tracking | Sent at the station level when a tracking event occurs. |

Tracking topics have a common set of properties which are listed in the table below.

Tracking IoT message properties

| Property | Description |
| --- | --- |
| MessageType | StatusChanged<br>CompleteBuildJobState<br>PutBuildItemOnHold<br>NotifyShippableStateChange<br>BuildItemLeft<br>ReturnToQueue |
| StationId | The ID of the station |
| BuildItemId | The ID of the BuildItem |
| SerialNo | The Serial Number |
| PartNo | The Part Number of the top level product for the serial number |
| TrackingId | The tracking ID of the build item |
| Status | Pending = -2<br>NotSet = -1<br>ReadyForWork = 0<br>Started = 1 |

| Property | Description |
|---|---|
| | Completed = 2<br>Empty = 5<br>Rejected = 6 |
| ModuleId | The database ID of the top level product |
| ShippableState | NotSet = 0<br>Green = 1<br>Yellow = 2<br>Red = 3 |
| RuleViolations | None = 0<br>HasDefect = 1<br>HasBypass = 2<br>HasRejected = 4<br>HasIncompleteStations = 8<br>This is a bitwise summary. For example: 5 = 0101 = 4+1 = HasRejected + HasDefect |
| IsOnHold | If true then the Build Item is on hold |
| Timestamp | The timestamp |

## Andon IoT Topics

Andon topics are published by the event manager according to the rules in the notifications tab. The list of possible topics is the list of possible events.

Not all events will have all properties. Line level events are not published.

Andon IoT message structure

| Topic Type | Topic | Structure | Details |
|---|---|---|---|
| Andon | *Based on the notification settings* | {LineName}/{StationName}/{NotificationName} | Notification Information. |

## Device Telemetry

Topics for Open Protocol Fastening Input Sources can be published to the IoT endpoint by the Device Manager. Each tool in SmartBuild has a Tool IoT Topic which is a value used to identify the tool in the message structure. Each tool has an IoT Enabled property which must be true to enable IoT messages for that tool to be published.

The properties in the IoT message are static and the values are populated based on the Open Protocol message sent by the tool to the PINpoint Data Manager. The meaning of each property comes from the Open Protocol message standard.

Device Telemetry IoT message structure

| Topic Type | Topic | Structure | Details |
|---|---|---|---|
| Device | | | |
| | Rundown | {Tool_IoT_Topic}/{Rundown} | Rundown Information for:<br>MID0061 |
| | Alarm | {Tool_IoT_Topic}/{Alarm} | Tool Alarm information for:<br>MID0071<br>MID0076 |
| | Relay | {Tool_IoT_Topic}/{Relay} | Tool Relay Information for:<br>MID0217 |

Device Telemetry: Rundown Message Property list

| Properties | Properties | Properties |
|---|---|---|
| Strategy | ParameterSetName | BatchSize |
| StrategyOptions | TorqueValuesUnit | BatchCounter |
| RundownAngleStatus | ResultType | TighteningStatus |

| Properties | Properties | Properties |
|---|---|---|
| CurrentmonitoringStatus | IdentifierResultPart2 | TorqueStatus |
| SelftapStatus | IdentifierResultPart3 | AngleStatus |
| PrevailTorqueMonitoringStatus | IdentifierResultPart4 | TorqueMinLimit |
| Pre-vailTorqueCompensateStatus | CustomerTighteningErrorCode | TorqueMaxLimit |
| TighteningErrorStatus | PrevailTorqueCompensateValue | TorqueFinalTarget |
| CurrentMonitoringMin | TighteningErrorStatus2 | Torque |
| CurrentMonitoringMax | RundownAngleMin | AngleMin |
| CurrentMonitoringValue | RundownAngleMax | AngleMax |
| SelftapMin | RundownAngle | FinalAngleTarget |
| SelftapMax | VinNumber | Angle |
| SelftapTorque | PeakTorque | TimeStamp |
| PrevailTorqueMonitoringMin | FinalAngle | LastPSetChange |
| PrevailTorqueMonitoringMax | Channel | BatchStatus |
| PrevailTorque | Revision | TighteningID |
| JobSequenceNumber | JobID | RundownCount |
| SyncTighteningId | ParameterSet | ToolSerialNumber |

Device Telemetry: Alarm Message Property list

| Properties |
|---|
| AlarmStatus |

| Properties |
| --- |
| ErrorCode |
| ControllerReadyStatus |
| ToolReadyStatus |
| TimeStamp |
| ToolHealth |
| AlarmText |
| DisplayText |

Device Telemetry: Relay Message Property list

| Properties |
| --- |
| RelayNumber |
| RelayFunctionStatus |

## *Client Messaging*

Messages from the SmartBuild Messaging tab are published to the IoT endpoint by the Event Manager.

Client Messaging IoT message structure

| Topic Type | Topic | Structure | Details |
| --- | --- | --- | --- |
| ClientMessage | | {LineName}/{StationName}/ClientMessage | Message information. |

Client Messaging IoT message properties

| Property | Description |
| --- | --- |
| Payload | The message text |
| Priority | The message priority value |
| Duration | The message duration value |
| Repeat | The message repeat value |
| StartDate | The message start date time value |
| AliveUntil | The message alive until date time value |
| From | The message created by value |
| IsAckRequired | The message Acknowledgment Requested value |
| Colour | The message color value |
| ResponseOptions | The message response options |
| Version | The version of the IoT message |
| CoreID | The ID of the message in the PINpoint Database. May not be unique. |
| EndpointID | The PINpoint Database ID of the endpoint. |
| DeviceId | The message target name |
| MessageId | The identifier for the message. This will always be unique. |
| Timestamp | The message Date Created |

# Appendix

## Object Properties

### Acradyne IEC Standard Serial Properties List

| Property | Description |
|---|---|
| Device Address | The IP address of the device. |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| Keep Alive Fre-quency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Name | The Name of the item as it appears in SmartBuild. |
| Port Number | The port the controller will use to communicate with the server. The standard setting is 4545. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Use Tool IO for Reverse Monitoring | Use Tool Trigger I/O to count reverse torques. |

### Aimco UEC-4500 Serial Properties List

| Property | Description |
|---|---|
| Device Address | The IP address of the device. |
| Device Name | A unique identifier / common name for the device, tool, etc. |

| Property | Description |
| --- | --- |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Name | The Name of the item as it appears in SmartBuild. |
| Port Number | The port the controller will use to communicate with the server. The standard setting is 4545. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Use Tool IO for Reverse Monitoring | Use Tool Trigger I/O to count reverse torques. |

## Andon Only Station Properties List

Refer to the table "Station Properties List" on page 479.

## Andon Only Station Config Properties List

Refer to the table "Station Config Properties List" on page 473.

## Automated Station Properties List

Refer to the table "Station Properties List" on page 479.

## Banner Omni P4 Device Properties List

| Property | Description |
| --- | --- |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |

| Property | Description |
| --- | --- |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Name | The Name of the item as it appears in SmartBuild. |
| Port Number | The port the controller will use to communicate with the server. The default setting is 4545. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Use IP v6 | If checked, the device will connect to the specified host using IP v6. |
| Version | The version setting which the device uses to communicate is determined by the device communication protocol. |

## BigScreen Action Properties List

| Property | Description |
| --- | --- |
| Enabled | If checked then the item is functional and will be displayed to the user. |
| Name | The Name of the item as it appears in SmartBuild. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |

## BigScreen Device Properties List

| Property | Description |
| --- | --- |
| Alternate Name | Alternate name to appear on the BigScreen. |
| Background Color | Screen background color in hexadecimal format. |

| Property | Description |
| --- | --- |
| Device Address | The IP address of the device. |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Fixed Row/Column | Determines if the specified value is for a fixed row/column. |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Layout Mode | The available layout options for the BigScreen. This can be previewed by selecting the BigScreen button in the bottom left corner of the Hardware tab. |
| Margin | The margin: left, top, right and bottom in pixels, set in comma-separated values. |
| Port Number | The port the controller will use to communicate with the server. The standard port is 8000. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Station Horizontal Spacing | The horizontal space between the stations when laid out (in pixels). |
| Station Vertical Spacing | The vertical space between the stations when laid out (in pixels). |
| Value | The fixed layout value for the row/column count. |

## Branch Decision Properties List

| Property | Description |
| --- | --- |
| Compare Value | If the value of the source matches the value of this box then the steps of the branch decision will be allowed to be executed. |
| Custom Decision | The assembly which will execute to determine if the branch should be |

| Property | Description |
|---|---|
| | opened. |
| Default Enabled State | If checked then the branch decision will be enabled by default. |
| Source | A link to another operation where this branch will look to determine its state. |
| Name | The Name of the item as it appears in SmartBuild. |

## Broadcast Tester Device

| Property | Description |
|---|---|
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| Name | The Name of the item as it appears in SmartBuild. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Version | The version setting which the device uses to communicate is determined by the device communication protocol. |

## Buffer Station Properties List

Refer to the table "Station Properties List" on page 479.

## Button Properties List

| Property | Description |
|---|---|
| Button Style | This drop-down menu sets the button style as either Off, Flashing, On; or Off, On. |
| Color | The default color for the button. |
| Data Type | This is the .Net data type of the item input. The data type should not normally be changed. |
| Is Interlockable | When enabled, this prevents the station from having a “completed” status while the event is active. |
| Is Pinned | When enabled, this pins the button on the display. |
| Momentary | When enabled, this indicates that the event is momentary rather than persistent. |
| Name | The Name of the item as it appears in SmartBuild. |
| Priority | The event priority. If two events occur then the higher number has priority in the system and once resolved, the lower number one will occur. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Statuses | A comma delimited list of the possible statuses an event can have. This will populate the state tag in an E-mail. The state of the button will be sent to an external destination by default. 0 Off, 1 On, 2 Flashing. |
| **When Flashing** | |
| Caption | Text string displayed on the button when in this state. |
| Color | The color to be displayed by the button when in this state. |
| Image | An image to be displayed on the button. The image must already exist in the SmartScreen Client application folder. This does not use the Image repository. |

| Property | Description |
|---|---|
| Reason | The Reason repository reference which contain reasons the user should select from. This is shown to the user when leaving from this state. |
| User Role | The user role required to transition from this state. |
| **When Solid** | |
| Caption | Text string displayed on the button when in this state. |
| Color | The color to be displayed by the button when in this state. |
| Image | An image to be displayed on the button. The image must already exist in the SmartScreen Client application folder. This does not use the Image repository. |
| Reason | The Reason repository reference which contain reasons the user should select from. This is shown to the user when leaving from this state. |
| User Role | The user role required to transition from this state. |
| **When Off** | |
| Caption | Text string displayed on the button when in this state. |
| Color | The color to be displayed by the button when in this state. |
| Image | An image to be displayed on the button. The image must already exist in the SmartScreen Client application folder. This does not use the Image repository. |
| Reason | The Reason repository reference which contain reasons the user should select from. This is shown to the user when leaving from this state. |
| User Role | The user role required to transition from this state. |

## CheckBox Operation Properties List

| Property | Description |
| --- | --- |
| Custom Formatter | The assembly which will execute when information is entered into the operation. Multiple Assemblies can be entered and they will be called sequentially.<br><br>In the custom formatter assemblies pass the result of one assembly to the next. The result is used by the operation. |
| Custom Validator | The assembly which will execute when information is entered into the operation. Multiple Assemblies can be entered and they will be called sequentially.<br><br>In the custom validator the assembly must return true or false. The assembly will run if the previous one is complete. If all assemblies return true then the operation is true. If any of them return false then the chain stops and the next assembly will not be executed and the operation will return false. |
| Default Value | The value which will populate the scan on step load. The default value can be written to an OPC tag.<br><br>If this is the name of a contextual data item in brackets then the value for that contextual data item will be used. Example [country] would use the value of the country which was stored for that serial number, “Canada”.<br><br>If the default value is a contextual data item and the input source is an OPC tag then the value of the contextual data item will be sent to the OPC tag when the operation is loaded. If the value of the OPC tag changes then the value will be read and stored as the value of the Contextual Data Item. |
| Format Method | A Regular Expression that determines the format of the input. This expression will format the input before the validation method performs its operation. |
| Instruction Text | Optional Input Instruction/Error Message text to display to the operator. |
| Is Read Only | If enabled, the operator cannot change the values of this operation, however an LCA is allowed to override. |
| Label Text | The text that will be displayed to the operator. |

| Property | Description |
|---|---|
| Linked Operation | Allows the user to select another scan (or checkbox) operation associated to this process; the value stored in the selected operation for the same build item will be copied into this operation when the step is activated. |
| Name | The Name of the item as it appears in SmartBuild. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Validation Method | A Regular Expression which validates the Input. If the regular expression returns a positive match to the input the operation will be considered true. |

## Cognex Device Properties List

| Property | Description |
|---|---|
| Device Address | The IP address of the device. |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| Job File Name | Describes what camera job to perform. |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Name | The Name of the item as it appears in SmartBuild. |
| Password | The password for the connection, if required. |
| Port Number | The port the controller will use to communicate with the server. The default setting is 4545. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must |

| Property | Description |
|---|---|
| | refresh SmartBuild before changes are reflected. |
| Symbolic Tag | Used to retrieve the result set. |
| Use IP v6 | If checked, the device will connect to the specified host using IP v6. |
| Username | The user name used to log in. |
| Version | The version setting which the device uses to communicate is determined by the device communication protocol. |

## Contextual Data Item Properties List

| Property | Description |
|---|---|
| Name | The name of the contextual data item. |
| Description | A description of the item. |
| Default Value | This value will populate the contextual data item when creating a work order item. Submitting a value during work order creation will override this value on the work order item. |
| Regular Expression | A regex which must be matched when inputting the value for the contextual data item for a work order item. |
| Required | If checked, this data must be entered when creating a Work Order Item. |
| Display on Client | If checked the contextual data item value will be displayed on the top of the SmartScreen client when a serial number with this item is loaded. If the serial number has multiple contextual data items with Display On Client enabled then the SmartScreen client will periodically rotate the display of each item. |
| Parts | A set of parts which will request a value for this contextual data item when a work order item is created |
| Input Sources | A set of OPC tag Items. When the Station loads a build item the value of |

| Property | Description |
| --- | --- |
| | the contextual data item will be sent to the OPC tag item which is linked to the station and the contextual data item. |

## Custom Assembly Properties List

| Property | Description |
| --- | --- |
| Checksum | An automatically generated checksum for the item. |
| Description | A description of the item. |
| Enabled | If true the custom assembly will be used when it is configured on an operation.<br>If false the operation will behave as if there is no custom assembly configured. |
| File Size | The file size in bytes. |
| Fully Qualified Name | An automatically generated name of the custom assembly item. |
| Last Modified | The date the properties of the item were last modified. |
| Name | The Name of the item as it appears in SmartBuild. |

## Custom Operation Properties List

| Property | Description |
| --- | --- |
| Custom Step Item | The assembly which will execute when information is entered into the operation. Multiple Assemblies can be entered and they will be called sequentially. |
| Format Method | A Regular Expression that determines the format of the input. This expression will format the input before the validation method performs its operation. |

| Property | Description |
| --- | --- |
| Label Text | The text that will be displayed to the operator. |
| Name | The Name of the item as it appears in SmartBuild. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Validation Method | A Regular Expression which validates the Input. If the regular expression returns a positive match to the input the operation will be considered true. |

## Data Item Properties List

| Property | Description |
| --- | --- |
| Mode | Mode for the Data Item Value: 0 = read, 1 = write, 2 = read/write |
| Name | The Name of the item as it appears in SmartBuild. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Value Address | Address for the Data Item Value. |

## Data Manager Properties List

| Property | Description |
| --- | --- |
| Broadcast Endpoint | The Endpoint to call when a build item status change occurs.<br><br>When a build item status change occurs the tracking manager will send a message to the destination (the destination is a combination of the **Broadcast Endpoint** + **Broadcast Web Method**. This is a URL.). The |

| Property | Description |
|---|---|
| | web service which receives the message at the destination is programmed to perform an action. This web service is custom made by PINpoint if required by the facility. |
| Broadcast Web Method | The Web Method to be called for broadcast Build Item changes.<br>See: **Broadcast Endpoint** |
| Client Connect Port | The port used by the client computer to communicate with the server. |
| Client Inactivity Disconnect Period | The number of seconds of inactivity before the data manager will disconnect the client. |
| Days to Retain (Long Trigger) | All inactive Work Orders/Items older than this will be marked inactive. Default value is 30 days. |
| Days to Retain (Short Trigger) | All inactive Work Orders/Items older than this will be marked inactive. Default value is 14 days. |
| Domain | The domain the tool is connected to. |
| Event Client Connection Port | The port used by the server to communicate with the client computer. |
| Exclude Items with Bypasses | The short trigger will inactivate a work order if all work order items are complete. A work order item is normally considered complete if it is in the end queue or outside of the valid date for retention. If this property is true the short trigger will not consider build items with a bypassed process step complete. Those items will be excluded from the tracking inactivation routine. |
| Exclude Items with Defects | The short trigger will inactivate a work order if all work order items are complete. A work order item is normally considered complete if it is in the end queue or outside of the valid date for retention. If this property is true the short trigger will not consider build items with unresolved defects complete. Those items will be excluded from the tracking inactivation routine. |
| Exclude Items with Incomplete Children | The short trigger will inactivate work orders if all work order items are complete. A work order item is normally considered complete if one build item is in the end queue. If this property is true then the short trig- |

| Property | Description |
| --- | --- |
| | ger will not consider a work order item complete unless all build items are in the end queue or any relevant graveyard queues. Those incomplete children of the parent build item will be excluded from the tracking inactivation routine. |
| Heartbeat Out Address | Address for Heartbeat Out. |
| Heartbeat Send Interval | The interval time (in seconds) for when PINpoint will send the heartbeat to the device (minimum 10). |
| Host Address | The IP Address that the Data Manager listens on; for multi-homed servers it is the default NIC if none is specified. |
| Instance ID | The instance number of the data manager running on the server, usually 4040. If setting up a different data manager on the same server the **instance ID**, the **client connection port**, and the **event client connection port** must be changed. |
| Metrics Port | The port used to communicate with the Dashboard app. This is only set on a Tracking Manager. |
| Name | The Name of the item as it appears in SmartBuild. |
| OPC UA Endpoint | This is the endpoint which will be used to connect to the OPC server. Each connection between the Device Manager and the OPC Server must be trusted individually in the OPC Server. |
| Password | The password for the OPC connection, if required. |
| Resend Attempts | The number of times resending should be attempted. |
| Resend Delay | The time in seconds the Data Manager will wait before resending any commands without them getting acknowledged. |
| Server Name | The IP address of the server |
| Service Instance Name | The name of the service running on a server. |

| Property | Description |
|---|---|
| Sort by Provisioning Date | When a work order is provisioned build items are created and placed in each start queue. This setting will place the items in the queue based on the creation date or the provisioning date. This setting only takes effect when the work order is provisioned automatically because the release date has passed<br><br>If this is true then when a work order is provisioned the new build items will be placed in the queue according to the date they were provisioned. This will result in build items being placed at the back of the queue in the order they arrive.<br><br>If this is false then when a work order is provisioned the new build items will be placed in the queue according to the created date of the work order. If work orders are not released in the same order they are created this can result in the queue becoming reordered each time a work order is released<br><br>If a work order is provisioned because a user at a station used the locate function to release it then the build items will be placed in the queue according to the provisioning date.<br><br>The data manager must be restarted for this setting to take effect. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Station Connection Timeout Tolerance | The number of seconds the Data Manager will wait before assuming there is a Station Connection issue. |
| Station Connection Verification Interval | The frequency in seconds at which Station connections are verified, 60 seconds in the minimum. |
| Station Connection Verification Startup Delay | The number of seconds to delay verification of Station Connections after the Data Manager starts. |
| Timeout | Timeout in seconds for the web service call. |
| Tracking Client Connection Port | The port by which the tool communicates with the Tracking Client. If this value is set to any number other than 0, this Data Manager is the Tracking Manager. |
| User | The user name used to log in to the OPC server, if required. This name is determined by the OPC communication protocol. |

## Desoutter CP CVI PC4 Serial Properties List

| Property | Description |
|---|---|
| Device Address | The IP address of the device. |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Name | The Name of the item as it appears in SmartBuild. |
| Port Number | The port the controller will use to communicate with the server. The standard setting is 4545. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Use Tool IO for Reverse Monitoring | Use Tool Trigger I/O to count reverse torque. |

## Email Action Properties List

| Property | Description |
|---|---|
| Body Template | Text and markers (such as #{Station}#, #{Event Name}#, etc.) that form the body of the email. |
| Enabled | If checked then the item is functional and will be displayed to the user. |
| Name | The Name of the item as it appears in SmartBuild. |
| Sort Order | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Subject Template | Text of the subject line of the email. |

## Endpoint Properties

| Property | Description |
| --- | --- |
| Add To Header | This option depends on authentication method.<br><br>If true the API key will be added to the header. If false it will be included in the message. |
| Authentication Method | The Authentication method PINpoint will use when connecting to the Endpoint:<br>No Authentication<br>API Key<br>Bearer Token<br>Basic Authentication<br>OAuth2.0<br>Internal |
| Bearer token | This option depends on authentication method.<br>The value of the bearer token. |
| Client ID | This option depends on authentication method<br>The OAuth 2.0 ClientID |
| Client Secret | This option depends on authentication method<br>The OAuth 2.0 Client Secret. |

| Property | Description |
| --- | --- |
| Default Timeout | The timeout in seconds. If this is not set the default timeout will be 30 seconds. |
| Description | The description |
| Discovery URL | This option depends on authentication method.<br>The OAuth 2.0 Discovery URL. |
| Host Name | The Host Name of the Endpoint |
| Is SSL | If true then SSL will be used. |
| Key | This option depends on authentication method.<br>The name of the API key |
| Name | The name as it appears in SmartBuild |
| Password | This option depends on authentication method<br>The password. |
| Path | The path of the endpoint |
| Port | The port of the endpoint |
| Scope | This option depends on authentication method<br>The OAuth 2.0 Scope |
| Type | The type of endpoint that PINpoint is connecting to:<br>HTTP<br>OPC.TCP<br>TCP<br>WS |
| User Name | This option depends on authentication method.<br>The User Name. |

| Property | Description |
| --- | --- |
| Value | This option depends on authentication method.<br>The value of the API Key. |

## Event Properties List

| Property | Description |
| --- | --- |
| Color | Use this drop-down list to select a color to be associated with the Event. The default is Black. |
| Event Id | This is a unique ID number generated by PINpoint. |
| Event Source | This is a drop-down menu populated with the available Event sources. |
| Is Interlockable | If this option is checked, then the Event needs to be resolved before the user can load a new work order. An icon shows on SmartScreen Button Events to indicate when they are interlocked. |
| Momentary | Check this box if this Event has no state, but simply describes a momentary event which occurs in passing and is over (e.g., a user logging into a station). |
| Name | This is the provided at the time the Event was created. It is possible (though not necessary) to change it using this field. Changing the name here is automatically reflected in the Event in the Buttons and Events folder. |
| Priority | This is the priority of the Event. A numerical value. |
| Statuses | State of the event represented as 0,2,1; or 0,1 (where 0==off, 1=solid, 2=flashing). |

## Fastening Operation Properties List

| Property | Description |
|---|---|
| Alternate Job(s) | A comma delimited list of valid alternate jobs when using an open protocol job input source. |
| AngleLSL | The lower specification limit when monitoring the angle of a fastening operation. If the angle is below this value, the rundown will be NOK. |
| AngleUSL | The upper specification limit when monitoring the angle of a fastening operation. If the angle is above this value, the rundown will be NOK. |
| Disable Tool When Complete | Disables the tool when the rundown count meets the required amount. |
| FreeMode | If selected, Fastening Rundowns are optional. |
| Job | The requested job ID in the controller when using an open protocol job input source. |
| Label | The description of the item as it appears on SmartScreen. |
| Level 1 Tool Lock | If true the tool will be locked by the first NOK rundown and the operator is required to unlock it. This will record a Level 1 Lock Event. |
| Level 2 Lock on Rehit | If true then the when a rundown occurs which has an overall status of NOK and the error message is Rehit a level 2 tool lock will occur. |
| Level 2 Tool Lock | If this amount of NOK rundowns occurs then the tool will be locked and a user with LineControlAccess is required to unlock it. This will record a level 2 lock event. If this value is 0 then the Level 2 lock will never be triggered. |
| Name | The Name of the item as it appears in SmartBuild. |
| OPC Tool Disable | External OPC Tool Disable signal. This is the Device Name of the OPC Generic Tag Item Input Source (see "OPC Tag Item Controller Properties List" on page 437) in SmartBuild. If this tag is set to “True”, the tool will be disabled. The OPC Tag item must be a child of the station. |
| Position PatternName | The name of the pattern used to communicate with third party applications. |

| Property | Description |
|---|---|
| PositionCount | The number of positions there are in the spatial fastening operation. |
| Pset | The parameter set used by the tool controller to run the tool at the current operation. This must be formatted “Pset###” (e.g. PSet002) |
| Repair Job(s) | A comma delimited list of valid repair jobs when using an open protocol job input source. |
| Repair PSet | The parameter set used by the tool controller for the current operation at a repair station. This must be formatted “PSet###”. |
| Repair Reverse PSet | The reverse parameter set used by the tool controller for the current operation at a repair station. This must be formatted “PSet###”. |
| ReversePSet | The parameter set used by the tool controller to run the tool at the current operation. This must be formatted “Pset###” (e.g. PSet002) |
| RundownCount | The number of successful rundowns required to complete the operation. |
| Send Job | This will send the job ID to the open protocol job input source. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Torque Multiplier | Value to multiply the incoming Torque value by. |
| TorqueLSL | The lower specification limit when monitoring the torque of a fastening operation. If the torque is below this value, the rundown will be NOK. |
| TorqueUSL | The upper specification limit when monitoring the torque of a fastening operation. If the torque is above this value, the rundown will be NOK. |
| TraySocket | If a socket tray is used, this 4-digit number is the socket position on the tray. The first 2-digits are the node, followed by a 2-digit position number. For Example: 0105<br><br>If a position is used such as 0105 then only that socket may be selected. All other socket positions on the tray, and all other connected trays must be returned. |

| Property | Description |
|---|---|
| | If the Value is empty or “all” or “ALL” then no socket may be selected. All sockets must be returned to the tray.<br>If the value is not a valid socket position such as “some text” then any socket may be selected.<br>Multiple positions can be called out at the same time and they must all be satisfied before the tool is enabled. Only the first position will blink when using a PINpoint Socket Tray. For Example: 0102,0105<br>If an open protocol socket tray is used the MID will use a different revision based on the 2 digit position number. Positions 01-08 sends MID 254 & 255 using revision 1. Positions 09-99 sends MID 254 & 255 using revision 2. |
| Use Controller Limits Only | If true the limits specified on the fastening operation are not used. The controller limits are used for the rundown grid but only the overall status of the rundown is used to determine if the rundown is OK. The controller limits are also used for statistics on the Fastening Report. |

## Hik Robot SC3000 Properties List

| Property | Description |
|---|---|
| Device Address | The IP address of the device. |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Name | The Name of the item as it appears in SmartBuild. |
| Port Number | The port the controller will use to communicate with the server. The default setting is 4545. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |

| Property | Description |
| --- | --- |
| Use IP v6 | If checked, the device will connect to the specified host using IP v6. |
| Version | The version setting which the device uses to communicate is determined by the device communication protocol. |

## Hosted Tester Device Properties List

| Property | Description |
| --- | --- |
| Device Address | The IP address of the device. |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Name | The Name of the item as it appears in SmartBuild. |
| Port Number | The port the controller will use to communicate with the server. The default setting is 4545. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Use IP v6 | If checked, the device will connect to the specified host using IP v6. |
| Version | The version setting which the device uses to communicate is determined by the device communication protocol. |

## Image Group Properties List

| Property | Description |
| --- | --- |
| Name | The Name |

## Image Properties List

| Property | Description |
|---|---|
| Image | The image must be a either: .BMP, .JPG .PNG.<br>The image will be scaled to 1.5W:1H.<br>For example 1500 pixels wide to 1000 high. |
| Name | The Name |

## Inspection Operations Properties List

| Property | Description |
|---|---|
| Name | The name of the item as it appears in SmartBuild. |
| Label Text | The text that will be displayed to the operator. |
| External Step Operation ID | The external operation ID used by 3rd party applications. |
| Defect Reasons | The list of defect reasons shown to the operator when an inspection fails. |

## IoT Broker Properties List

| Property | Description |
|---|---|
| Clean Session | If true this indicates that the broker should discard all previous state information when a connection is made. |
| Client ID | The name of the publisher. If this is blank the data manager's **Service Instance Name** is used. |
| Keep Alive Frequency | seconds between keep alive messages sent to the IoT broker |

| Property | Description |
|---|---|
| MQTT Version | If 0 (default) then V3. If 1 then V5. |
| Name | The Name of the item as it appears in SmartBuild. |
| Session Expiry Interval | The length of time the IoT broker should store session information if the connection is lost. If 0 then the session ends on disconnection if 4294967295 the session does not expire. |
| SortOrder | the order of this item as it appears in the SmartBuild list. |
| Will Message | The message will be published in the event of an unexpected dis-connection from the IoT broker. |
| Will Topic | The Topic of the message which will be published in the event of an unexpected disconnection from the IoT broker. |

## IoT Publishing Configuration Properties List

| Property | Description |
|---|---|
| Enabled | If true then the device manager will publish IoT events to the selected broker. |
| IoT Broker | The IoT broker this publisher should use. |
| Name | The Name of the item as it appears in SmartBuild. |
| QOS | The quality of service setting as per MQTT standards<br>At Most Once<br>At Least Once<br>Exactly Once |

## IPV Tester Lock Properties List

| Property | Description |
|---|---|
| Consecutive Fault Value | Number of consecutive Faults for a lock to occur. |
| Consecutive High Test Value | Number of consecutive High Test Value for a IPV Level 2 lock to occur. |
| Consecutive Low Test Value | Number of consecutive Low Test Value for a IPV Level 2 lock to occur. |
| Consecutive NOK Test Value | Number of consecutive NOK Tests for a IPV Level 2 lock to occur. |
| Name | The Name of the item as it appears in SmartBuild. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Unlock Roles | Comma delimited role(s) required to unlock IPV Level 2. |
| User Lock | Number of allowed consecutive user Initiated IPV Level 2 lock. |

## Keyence Device Properties List

| Property | Description |
|---|---|
| Device Address | The IP address of the device. |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| Keep Alive Frequency | The rate in seconds that a Keep Alive Message is sent. |
| Name | The Name of the item as it appears in SmartBuild. |
| Port Number | The port the controller will use to communicate with the server. The default setting is 4545. The recommended setting for Keyence is |

| Property | Description |
| --- | --- |
| | 8500. |
| SD card | The SD Card to use. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Use IP v6 | If checked, the device will connect to the specified host using IP v6. |
| Version | The version setting which the device uses to communicate is determined by the device communication protocol. |

## Lightning Pick Light Controller Properties List

| Property | Description |
| --- | --- |
| Device Address | The IP address of the device. |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Name | The Name of the item as it appears in SmartBuild. |
| Port Number | The port the controller will use to communicate with the server. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |

## Line Properties List

| Property | Description |
| --- | --- |
| Cycle Time | The percentage of cycle time target when warning event fires. |

| Property | Description |
|---|---|
| Warning Trigger (%) | |
| External Line ID | Line ID used by 3rd party applications. |
| Line ID | The Database ID of the Line |
| Name | The Name of the item as it appears in SmartBuild. |
| Web Viewer Address | This is the URL for a website which will be displayed on the SmartScreen client when the Web Viewer button is activated. The Web Viewer button on the SmartScreen client is grayed out unless an address is added here and a build item is loaded at the station. The Web Viewer has a button to print the contents by specifying the printer and the print options, and another button to print directly to the default printer on the computer running the SmartScreen Client.<br>The URL specified can have query parameters attached to it which pass along information to allow for dynamic content generation. Information can include, but is not limited to: Serial Number, Part Number, Station Name, User Name. By default no query parameters are attached. Please contact PINpoint for assistance.<br>This is an example of the URL:<br>http://servername/instructions.aspx<br>This is an example of how query parameters would be passed to it:<br>http://servername/instructions.aspx?StationID=100&SerialNumber=SN001 |

## Linear Gauge Properties List

| Property | Description |
|---|---|
| Default Value | The default value of this operation to be displayed after a new build item load. |
| Display Interval | The length of time in seconds the gauge will be displayed for. |
| Gauge Source | A drop-down list of data sources for the Gauge. |

| Property | Description |
| --- | --- |
| Maximum Value | Maximum displayed value of the Gauge. |
| Minimum Value | Minimum displayed value of the Gauge. |
| Name | The Name of the item as it appears in SmartBuild. |
| Regenerate Interval | The length of time in minutes until the data is refreshed. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |

## List Select Input Source Properties List

| Property | Description |
| --- | --- |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Exclusive Subscribe | N/A |
| Name | The Name of the item as it appears in SmartBuild. |
| Reason List | The Reason repository reference which contain reasons the user should select from. |

## Listbox Item Properties List

| Property | Description |
| --- | --- |
| Description Select OFF | Whether to display the prompt when de-selecting item. |
| Description Select ON | Whether to display the prompt when selecting an item. |
| Description Text | The text title to display on description prompt. |

| Property | Description |
|---|---|
| Description Validation Regex | Regex to govern the validity of the text entered. If the Property contains a validating regex statement, the operator must enter a description. |
| Item Desc | Text description of the Listbox Item |
| Name | The Name of the item as it appears in SmartBuild. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |

## Loftware Print Document Properties List

| Property | Description |
|---|---|
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Duplicates | The number of labels per unit quantity. Used when there is an auto-incrementing field on a label that must be constant for X number of labels.<br>Example: A box may require the same label (with same data) be placed on two sides. In this case, there will be 2 duplicates with 1 quantity. |
| Exclusive Subscribe | Unused |
| Name | The name as it appears in SmartBuild. |
| Path | Fully qualified path of the document to be printed.<br>Example: Document.lwl |
| Printer | A drop down list populated with printers that are available on the Loftware Print Server. The Data Manager linked to the Loftware Print Server for this label will query for this list as SmartBuild is loaded. If using **windows printers** the Loftware service must have rights to access these printers. http://help.loftware.com/display/LPSKB/Windows+Printer+Disappear+in+Status+Client |
| Quantity | Number of copies of the document to be printed. |

| Property | Description |
|---|---|
| SortOrder | Unused |
| Tray | Defines which tray to use for paper/label stock. |
| WebService | This is optional. This endpoint is only used when printing something other than the standard parameters. The web-service will be called to collect additional parameters/modify them for the label.<br>Example: http://servername/PinPoint.WebService/api/print |

## Loftware Print Server Properties List

| Property | Description |
|---|---|
| Device Address | The host name or IP address of the server hosting Loftware |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Name | The Name of the item as it appears in SmartBuild. |
| Password | The credentials used to log onto the server. This is not typically used for Loftware. |
| Port Number | Communication port the Loftware Print Server service uses. This will be constant at 2723. |
| SortOrder | Unused |
| User | The user name used when logging into the Loftware Print Server. |
| Web Service Timeout | The amount of time (seconds) to wait for the web-service to retrieve additional/modify parameters. |

## Marker Operation Properties List

| Property | Description |
| --- | --- |
| Custom Step Item Path | The assembly which will execute when information is entered into the operation. |
| Format Method | A Regular Expression that determines the format of the input. This expression will format the input before the validation method performs its operation. |
| Label Text | The text that will be displayed to the operator. |
| Name | The Name of the item as it appears in SmartBuild. |
| Pattern Name | The file or pattern to load into the device. |
| Send Immediately | Sends data upon entry to the process step with marker operation. |
| Sort Order | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Validation Method | A Regular Expression which validates the Input. If the regular expression returns a positive match to the input the operation will be considered true. |
| Variables | A comma separated list of variables listed in name and value pairs. Variables can either be from the list of pre-defined variables or the name value of scan operations on the same step.<br>Examples:<br>▪ var1=PARTNUMBER,var2=SERIALNUMBER<br>▪ var3={ScanOp1},Var4={ScanOP2}<br>▪ var1=Partnumber,var4={ScanOP2}<br>See: "Marker Operation Variables" on page 506 |

## Network Serial Input Source Properties List

| Property | Description |
|---|---|
| Device Address | The IP address of the device. |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Name | The Name of the item as it appears in SmartBuild. |
| Overwrite | If selected, overwrites the existing value upon new received data. |
| Port Number | The port the controller will use to communicate with the server. The default setting is 6010. |
| Send to Multiple | If selected, populate all items with the same source at the same time. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |

## NiceLabel Print Document Properties

| Property | Description |
|---|---|
| Device Name | The name of the Print document. |
| Exclusive Subscribe | Ensures that only one client is subscribed at a time. |
| Identical Label Copies | Specifies the number of label copies to be printed for each unique label. |
| Label Sets | Specifies the number of times the entire label printing process should repeat. |

| Property | Description |
|---|---|
| Name | The name as it appears in SmartBuild. |
| Number of Skipped Labels | Specifies the number of labels that are skipped on the first page of labels. |
| Path | The path of the document on the print server to print.<br>Example:<br>C:\folder\lable.nlbl |
| Printer | The printer to print the label. |
| Quantity | The Quantity of the document to be printed. |
| SortOrder | The sort order as it appears in SmartBuild. |
| Web Service | This is optional. This endpoint is only used when printing something other than the standard parameters. The web-service will be called to collect additional parameters/modify them for the label.<br>Example: http://servername/PinPoint.WebService/api/print |

## NiceLabel Print Server Properties

| Property | Description |
|---|---|
| Device Name | The name. |
| Name | The name as it appears in SmartBuild. |
| Print Server Endpoint | The Endpoint for the print server. |
| Sort Order | The sort order in SmartBuild. |
| Web Service Timeout | The timeout in seconds. |

## Notification Properties List

| Property | Description |
|---|---|
| Delay Notification | The type of delay notification: Time Since First, None. |
| Delay Notification Value | Minutes since the notification occurred. The notification will be sent again if the condition of the notification is still met. |
| Match Method | The list of match methods for a notification item trigger. |
| Match Value | the value which if matched according to the match method will trig-ger a notification |
| Name | The Name of the item as it appears in SmartBuild. |
| Notify When | A list of options which allow the user to select when a recorded event will trigger a notification. |
| Range Lower | The lower limit for the “in-range” list option of a notification item trig-ger |
| Range Upper | The upper limit for the “in-range” list option of a notification item trig-ger |
| Resend Every | The time in minutes after which the notification will be sent again unless it is cleared. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |

## Numerical Gauge Properties List

| Property | Description |
|---|---|
| Default Value | The default value of this operation to be displayed after a new build item load. |
| Display Interval | The length of time in seconds the gauge will be displayed for. |

| Property | Description |
|---|---|
| Gauge Source | A drop-down list of data sources for the Gauge. |
| Maximum Value | Maximum displayed value of the Gauge. |
| Minimum Value | Minimum displayed value of the Gauge. |
| Name | The Name of the item as it appears in SmartBuild. |
| Regenerate Interval | The length of time in minutes until the data is refreshed. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |

## OPC Data Provider Properties List

| Property | Description |
|---|---|
| Heartbeat Out Address | Address for Heartbeat Out. |
| Heartbeat Send Interval | The interval time (in seconds) for when PINpoint will send the heart-beat to the device (minimum 10). |
| Name | The Name of the item as it appears in SmartBuild. |
| OPC UA Endpoint | This is the address which will be used to connect to the OPC server. Each connection between the Device Manager and the OPC Server must be trusted individually in the OPC Server. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |

## OPC Event Source Controller Properties List

| Property | Description |
|---|---|
| Heartbeat Out Address | Address for Heartbeat Out. |
| Heartbeat Send Interval | The interval time (in seconds) for when PINpoint will send the heart-beat to the device (minimum 10). |
| Name | The Name of the item as it appears in SmartBuild. |
| OPC UA Endpoint | This is the address which will be used to connect to the OPC server. Each connection between the Device Manager and the OPC Server must be trusted individually in the OPC Server. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |

## OPC Fastening Input Source Properties List

| Property | Description |
|---|---|
| Data Manager | The data manager the tool is assigned to. This list is populated in the Advanced tab. |
| Device Name | The hostname of the controller. This name will be displayed in the data manager. |
| Disabled | The name of the OPC tag on the OPC server to disable the tool. This is boolean and the PINpoint data manager will write to it to disable the tool. (Mandatory). |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time. |
| Name | The Name of the item as it appears in SmartBuild. |
| OPC UA Endpoint | This is the address which will be used to connect to the OPC server. Each connection between the Device Manager and the OPC Server must be trusted individually in the OPC Server. |

| Property | Description |
|---|---|
| PSet | The name of the Parameter Set OPC tag (integer) for this value on the OPC server. The data manager will write to this address. (mandatory). |
| Reverse Switch | The name of the Reverse Switch OPC tag (Boolean) for this value on the OPC server. The data manager will read this to see if the tool is in reverse. (optional). |
| Rundown Angle | The name of the Rundown Angle OPC tag (integer) for this value on the OPC server. The data manager will read from this. (optional). |
| Rundown New | The name of the New Rundown OPC tag (Boolean) for this value on the OPC server. A new rundown will be recoded whenever this value changes and if the PSET matches. |
| Rundown Overall Status | The name of the Rundown Overall Status OPC tag (Boolean) for this value on the OPC server. The data manager will read this to see whether a rundown was good or bad. |
| Rundown PSet | The name of the Rundown Parameter Set OPC tag (Integer) for this value on the OPC server. The data manager will read this to see if it matches the PSET ordered. |
| Rundown Torque | The name of the Rundown Torque OPC tag (Integer) for this value on the OPC server. The data manager will read this to record the value of the of the rundown. |
| Tightening ID | The name of the Tightening ID OPC tag (String) for this value on the OPC server. The data manager will read this to record the tightening ID of the rundown. This should be unique for each rundown. |
| Trigger | The name of the OPC tag on the OPC server which indicates the trigger has been pulled. This is a boolean input the data manager will read to determine the state of the trigger on the tool.(optional). |

## OPC Generic TagItem Input Source Properties List

| Property | Description |
| --- | --- |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| Item Name | The Item/Tag Name. |
| Name | The Name of the item as it appears in SmartBuild. |
| Read Only | If selected, the item will be read only. |
| Read Value On Step Change | When the step is activated the OPC tag will be read from the OPC Server. This should be set to true if there is a chance that the PLC will write the value before the step is activated. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Write Value On Step Change | Write Value to Server on Step Change. |

## OPC Hybrid Desoutter CP CVI PC4 Serial Properties List

| Property | Description |
| --- | --- |
| Device Address | The IP address of the device. |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Disable Tool On Start | When checked, the tool will be disabled when SmartScreen launches and the tool will only be enabled when the module requires it. |
| Disabled | The name of the OPC tag on the OPC server to disable the tool. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| Name | The Name of the item as it appears in SmartBuild. |

| Property | Description |
| --- | --- |
| OPC UA Endpoint | This is the endpoint which will be used to connect to the OPC server. Each connection between the Device Manager and the OPC Server must be trusted individually in the OPC Server. |
| Port Number | The port the controller will use to communicate with the server. |
| PSet | The parameter set used by the tool controller to run the tool at the current operation. This must be formatted “Pset###” (e.g. PSet002) |
| Resend Delay | The time in seconds the Data Manager will wait before resending any commands without them getting acknowledged. |
| Use Tool IO for Reverse Monitoring | Use Tool Trigger I/O to count reverse torque. |

## OPC Pick Light Controller Properties List

| Property | Description |
| --- | --- |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Domain | The domain the tool is connected to. |
| Name | The Name of the item as it appears in SmartBuild. |
| OPC UA Endpoint | This is the endpoint which will be used to connect to the OPC server. Each connection between the Device Manager and the OPC Server must be trusted individually in the OPC Server. |

## OPC Stack Light Device Properties List

| Property | Description |
| --- | --- |
| Blue | If selected, this light will be available. |

| Property | Description |
|---|---|
| Colors | |
| Data Manager | The Data manager which will control communications to this device. |
| Device Address | The IP address of the device. |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Green | If selected, this light will be available. |
| Heartbeat Out Address | Address for heartbeat out. |
| Heartbeat Send Interval | The interval time (in seconds) for when PINpoint will send the heart-beat to the device (minimum 10). |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| OPC Light Tag | The OPC address to write the light value out. |
| OPC UA Endpoint | This is the address which will be used to connect to the OPC server. Each connection between the Device Manager and the OPC Server must be trusted individually in the OPC Server. |
| Port Number | The port the controller will use to communicate with the server. |
| Red | If selected, this light will be available. |
| White | If selected, this light will be available. |
| Yellow | If selected, this light will be available. |

## OPC Tag Item Input Source Properties List

| Property | Description |
|---|---|
| Device Name | A unique identifier / common name for the device, tool, etc. |

| Property | Description |
|---|---|
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time. |
| Item Name | The Item/Tag Name. |
| Name | The Name of the item as it appears in SmartBuild. |
| Read Only | If selected, the item will be read only. |
| Read Value On Step Change | When the step is activated the OPC tag will be read from the OPC Server. This should be set to true if there is a chance that the PLC will write the value before the step is activated. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Write Value On Step Change | Write Value to Server on Step Change. |

## OPC Tag Item Controller Properties List

| Property | Description |
|---|---|
| Heartbeat Out Address | Address for Heartbeat Out. |
| Heartbeat Send Interval | The interval time (in seconds) for when PINpoint will send the heartbeat to the device (minimum 10). |
| Name | The Name of the item as it appears in SmartBuild. |
| OPC UA Endpoint | This is the endpoint which will be used to connect to the OPC server. Each connection between the Device Manager and the OPC Server must be trusted individually in the OPC Server. |

## OPC Tester Device Properties List

| Property | Description |
| --- | --- |
| Data Manager | The Data manager which will control communications to this device. |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Exclusive Subscribe | If true then this ensures that only one client can be connected to this device at a time. |
| Heartbeat Out Address | Address for Heartbeat Out. |
| Heartbeat Send Interval | The interval time (in seconds) for when PINpoint will send the heart-beat to the device (minimum 10). |
| Name | The Name of the item as it appears in SmartBuild. |
| OPC UA Endpoint | This is the address which will be used to connect to the OPC server. Each connection between the Device Manager and the OPC Server must be trusted individually in the OPC Server. |
| Overall Result Address | The address of the overall result. This is the final result of the test that the PLC sends to PINpoint. This determines if the process step with the test will complete.<br>This is an Integer.<br>0 = Fault<br>1 = Fail<br>2 = Pass<br>3 = Ignore |
| Part Number Address | The address of the part number. The part number as determined by PINpoint and is sent out with the test initialization. This is a string. |
| Pset Address | The address of the Pset. The Pset sent out to the PLC from PINpoint as specified in SmartBuild. This is a String. |
| Request Id Address | The address of the Request Id. This is a unique identifier for the test. PINpoint outputs it with the test initialization and expects it when the results are returned. The PLC will only need to use this if multiple tests are run using the same OPC Tester Device. |

| Property | Description |
|---|---|
| Serial Number Address | The address of the Serial Number. This is the serial number of the build item that is being tested and is sent out with the test initialization. |
| State Address | The address of the State. This value is used to initialize a test from PINpoint. This tells the PLC PINpoint is ready. The PLC sets this back to zero after the test has been completed.<br>Integer<br>0 = Stop test<br>1 = Start test |
| Test Completed Address | PINpoint looks for a rising edge (zero to one) on this bit to indicate the test has been completed. |
| Version | The version. |

## OPC Tester Result Item Properties List

| Property | Description |
|---|---|
| Category Address | The address of the category of the test. This is a string. This is used to group test items together. |
| LSL Address | The address of the lower specifications limit of the test. This is a Double. |
| Name | The Name of the item as it appears in SmartBuild. |
| Name Address | The address of the name given to the test. This is a String. |
| Status Address | The address of the status of the specific test item. This is an integer.<br>0 = Fault<br>1 = Fail<br>2 = Pass<br>3 = Ignore |

| Property | Description |
| --- | --- |
| Unit Address | The address of the units associated with the test value. For example, lb. ft. torque. This is a string. |
| USL Address | The address of the upper specifications limit of the test. This is a double. |
| Value Address | The address of the actual resulting value of the test. This is a Double. |

## OPC Write Operation Properties List

| Property | Description |
| --- | --- |
| Default Value | The value which will populate the scan on step load.<br>If this is the name of a contextual data item in brackets then the value for that contextual data item will be used. Example [country] would use the value of the country which was stored for that serial number, “Canada”.<br>This can be written to an OPC tag. |
| Format Method | A Regular Expression that determines the format of the input. This expression will format the input before the validation method performs its operation. |
| Instruction Text | Optional Input Instruction/Error Message text to display to the operator. |
| Is Read Only | If enabled, the operator cannot change the values of this operation, however an LCA is allowed to override. |
| Label Text | The text that will be displayed to the operator. |
| Linked Operation | A link to another operation where this operation will retrieve its value from. This operation will get the data when the step is activated. |

| Property | Description |
|---|---|
| Name | The Name of the item as it appears in SmartBuild. |
| OPC Write Location | The Name of the OPC Tag Item in SmartBuild that the data manager will write the value to. |
| OPC Write Value | Value to Write to OPC Tag. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Validation Method | A Regular Expression which validates the Input. If the regular expression returns a positive match to the input the operation will be considered true. |

## Open Protocol Fastening Job Input Source Properties List

| Property | Description |
|---|---|
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| Extended Jobs | If checked job IDs from 0-9999 are supported otherwise only 0-99 are supported. |
| FTToolAddress | The IP address of the tool controller |
| Identifiers | This can be used to send information to the tool controller on MID150.<br>• {SerialNumber}<br>• {PartNumber}<br>• {OperatorUserName}<br>• {[ContextualDataItemName]} – This is the name of the contextual data item in the SmartBuild advanced tab. The contextual data item name should only be surrounded with { }.<br>They can be combined, and other text can be added for example: SN |

| Property | Description |
|---|---|
| | {SerialNumber}PN{PartNumber}<br><br>For a list of supported MIDs, see the appendix. |
| Identify by Flashing | If true the LED on the fastening tool will flash when the fastening operation is started. This feature is intended to guide the operator to the correct tool if multiple tools exist in a station. The LED will only stop flashing when the trigger is pressed. |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Name | The Name of the item as it appears in SmartBuild. |
| Port Number | The port the controller will use to communicate with the server. The default setting is 4545. |
| Protocol Standard | The communication protocol standard is defined by the tool settings. This is for informational purposes only. |
| Protocol Version | This is the revision of the open protocol message's sent by the device manager to the tool controller. This is used on all outbound messages except MID0060 (Last Tightening Result Subscribe).<br><br>Some open protocol messages contain different information based on their revision. The revision level will be added to the header of the open protocol message. The contents of the message sent by the device manager may be different on higher revision levels. The largest difference is between revision 1 and revision 2.<br><br>PINpoint supports revision levels 1-6. See the Atlas Copco Open Protocol User Guide for details about each MID. |
| Resend Delay | The time in seconds the Data Manager will wait before resending any commands without them getting acknowledged. |
| Rundown Subscribe Version | This is the revision of the open protocol message MID0060 sent by the device manager to the tool controller.<br><br>When the device manager subscribes to a rundown it sends MID0060 to the tool controller. The revision level sent on MID0060 (Last Tightening Result Subscribe) is the revision level the tool controller should use when sending MID0061 (Last Tightening Result |

| Property | Description |
|---|---|
| | Upload) back to the device manager. The device manager will parse the message based on the revision in MID0061.<br>PINpoint supports revision levels 1-6. See the Atlas Copco Open Protocol User Guide for details about each MID. |
| Tool Number | The 4 digit Tool Number used in the open protocol message when sending MID42 & MID43 on revision 2. This is used to specify the tool to lock, or unlock, to the tool controller. Tool Number 9999 tells the controller to lock or unlock all tools. This should normally be blank unless using a tool controller setup to control multiple tools using revision 2. This field only accepts 4 digits.<br>If the tool number is blank then the message will use revision 1.<br>If the tool number is not blank then the message will use revision 2. |

## Open Protocol Fastening Tool Always On Input Sources Properties List

| Property | Description |
|---|---|
| Alarm Notification | If checked then the alarms which the controller outputs will be monitored and displayed |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Disable Tool On Start | When checked, the tool will be disabled when SmartScreen launches and the tool will only be enabled when the module requires it. |
| Enable Relay Communication | If true the direction switch of the tool will be monitored. If the tool is in reverse the tool will be disabled. This requires the property On Subscribe Relays to be set. |
| Exclusive PSet Control | If checked, SmartScreen will override all other pset choice selections made by the controller and will select the pset desired. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| FTToolAddress | The IP address of the tool controller |

| Property | Description |
|---|---|
| Identifiers | This can be used to send information to the tool controller on MID150.<br>■ {SerialNumber}<br>■ {PartNumber}<br>■ {OperatorUserName}<br>■ {ContextualDataItemName} – This is the name of the contextual data item in the SmartBuild advanced tab. The contextual data item name should only be surrounded with { }.<br>They can be combined, and other text can be added for example: SN {SerialNumber}PN{PartNumber}CD{DataItem1}<br>For a list of supported MIDs, see the appendix. |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Multi-spindle | When selected, SmartBuild will interpret the data as coming from a multi-spindle device. |
| Name | The Name of the item as it appears in SmartBuild. |
| On Subscribe Relays | If the tool should be disabled when it is in reverse then this relay should read: DirectionalControlSwitchCounterClockwise. If the positional tool controller software requires knowledge of the trigger this should read: Trigger. |
| Port Number | The port the controller will use to communicate with the server. The default setting is 4545. |
| Protocol Standard | The communication protocol standard is defined by the tool settings. This is for informational purposes only. |
| Protocol Version | This is the revision of the open protocol message’s sent by the device manager to the tool controller. This is used on all outbound messages except MID0060 (Last Tightening Result Subscribe).<br>Some open protocol messages contain different information based on their revision. The revision level will be added to the header of the open protocol message. The contents of the message sent by |

| Property | Description |
| --- | --- |
| | the device manager may be different on higher revision levels. The largest difference is between revision 1 and revision 2.<br>PINpoint supports revision levels 1-6. See the Atlas Copco Open Protocol User Guide for details about each MID. |
| Resend Delay | The time in seconds the Data Manager will wait before resending any commands without them getting acknowledged. |
| Rundown Subscribe Version | This is the revision of the open protocol message MID0060 sent by the device manager to the tool controller.<br>When the device manager subscribes to a rundown it sends MID0060 to the tool controller. The revision level sent on MID0060 (Last Tightening Result Subscribe) is the revision level the tool controller should use when sending MID0061 (Last Tightening Result Upload) back to the device manager. The device manager will parse the message based on the revision in MID0061.<br>PINpoint supports revision levels 1-6. See the Atlas Copco Open Protocol User Guide for details about each MID. |
| Socket Tray Enabled | When checked, an Atlas-Copco socket tray is in use. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Tool Number | The 4 digit Tool Number used in the open protocol message when sending MID42 & MID43 on revision 2. This is used to specify the tool to lock, or unlock, to the tool controller. Tool Number 9999 tells the controller to lock or unlock all tools. This should normally be blank unless using a tool controller setup to control multiple tools using revision 2. This field only accepts 4 digits.<br>If the tool number is blank then the message will use revision 1.<br>If the tool number is not blank then the message will use revision 2. |
| Use Tool IO for Reverse Monitoring | Use Tool Trigger I/O to count reverse torque. |

## Open Protocol Fastening Tool Input Source Properties List

| Property | Description |
|---|---|
| Alarm Notification | If checked then the alarms which the controller outputs will be monitored and displayed |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Disable Tool On Start | When checked, the tool will be disabled when SmartScreen launches and the tool will only be enabled when the module requires it. |
| Enable Relay Communication | If true the direction switch of the tool will be monitored. If the tool is in reverse the tool will be disabled. This requires the property On Subscribe Relays to be set. |
| Exclusive PSet Control | If checked, SmartScreen will override all other pset choice selections made by the controller and will select the pset desired. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| FTToolAddress | The IP address of the tool controller |
| Identifiers | This can be used to send information to the tool controller on MID150.<br>• {SerialNumber}<br>• {PartNumber}<br>• {OperatorUserName}<br>• {[ContextualDataItemName]} – This is the name of the contextual data item in the SmartBuild advanced tab. The contextual data item name should only be surrounded with { }.<br>They can be combined, and other text can be added for example: SN {SerialNumber}PN{PartNumber}<br>For a list of supported MIDs, see the appendix. |
| Identify by Flashing | If true the LED on the fastening tool will flash when the fastening operation is started. This feature is intended to guide the operator to the correct tool if multiple tools exist in a station. The LED will only stop flashing when the trigger is pressed. |

| Property | Description |
| --- | --- |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Multi-spindle | If true the tool must send multi-spindle messages to PINpoint. The number of spindles is read from the open protocol messages and does not need to be set in SmartBuild. |
| Name | The Name of the item as it appears in SmartBuild. |
| On Subscribe Relays | If the tool should be disabled when it is in reverse then this relay should read: DirectionalControlSwitchCounterClockwise. If the positional tool controller software requires knowledge of the trigger this should read: Trigger. |
| Port Number | The port the controller will use to communicate with the server. The default setting is 4545. |
| Protocol Standard | The communication protocol standard is defined by the tool settings. This is for informational purposes only. |
| Protocol Version | This is the revision of the open protocol message's sent by the device manager to the tool controller. This is used on all outbound messages except MID0060 (Last Tightening Result Subscribe).<br><br>Some open protocol messages contain different information based on their revision. The revision level will be added to the header of the open protocol message. The contents of the message sent by the device manager may be different on higher revision levels. The largest difference is between revision 1 and revision 2.<br><br>PINpoint supports revision levels 1-6. See the Atlas Copco Open Protocol User Guide for details about each MID. |
| Resend Delay | The time in seconds the Data Manager will wait before resending any commands without them getting acknowledged. |
| Rundown Subscribe Version | This is the revision of the open protocol message MID0060 sent by the device manager to the tool controller.<br><br>When the device manager subscribes to a rundown it sends MID0060 to the tool controller. The revision level sent on MID0060 (Last Tightening Result Subscribe) is the revision level the tool con- |

| Property | Description |
|---|---|
| | troller should use when sending MID0061 (Last Tightening Result Upload) back to the device manager. The device manager will parse the message based on the revision in MID0061.<br><br>PINpoint supports revision levels 1-6. See the Atlas Copco Open Protocol User Guide for details about each MID. |
| Socket Tray Enabled | When checked, an Atlas-Copco socket tray is in use. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Tool Number | The 4 digit Tool Number used in the open protocol message when sending MID42 & MID43 on revision 2. This is used to specify the tool to lock, or unlock, to the tool controller. Tool Number 9999 tells the controller to lock or unlock all tools. This should normally be blank unless using a tool controller setup to control multiple tools using revision 2. This field only accepts 4 digits.<br><br>If the tool number is blank then the message will use revision 1.<br><br>If the tool number is not blank then the message will use revision 2. |
| Use Tool IO for Reverse Monitoring | Use Tool Trigger I/O to count reverse torque. |

## Open Protocol MT Focus 6000

| Property | Description |
|---|---|
| Alarm Notification | If checked then the alarms which the controller outputs will be monitored and displayed |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Disable Tool On Start | When checked, the tool will be disabled when SmartScreen launches and the tool will only be enabled when the module requires it. |
| Enable Relay Com- | If true the direction switch of the tool will be monitored. If the tool is |

| Property | Description |
|---|---|
| munication | in reverse it will be disabled. |
| Exclusive PSet Control | If checked, SmartScreen will override all other pset choice selections made by the controller and will select the pset desired. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| Extended Jobs | If Checked jobs from 1-9999 are supported otherwise only 1-99 are. This modifies the open protocol revision which is used from revision 1 (which only supports 99 jobs) to revision 2. |
| FTToolAddress | The IP address of the tool controller |
| Identifiers | This can be used to send information to the tool controller on MID150.<br>- {SerialNumber}<br>- {PartNumber}<br>- {OperatorUserName}<br>- {[ContextualDataItemName]} – This is the name of the contextual data item in the SmartBuild advanced tab. The contextual data item name should only be surrounded with { }.<br>They can be combined, and other text can be added for example: SN {SerialNumber}PN{PartNumber}<br>For a list of supported MIDs, see the appendix. |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Multi-spindle | N/A |
| Name | The Name of the item as it appears in SmartBuild. |
| On Subscribe Relays | If the tool should be disabled when it is in reverse then this relay should read: DirectionalControlSwitchCounterClockwise |
| Port Number | The port the controller will use to communicate with the server. The default setting is 4545. |

| Property | Description |
| --- | --- |
| Protocol Standard | The communication protocol standard is defined by the tool settings. This is for informational purposes only. |
| Protocol Version | N/A. Note: The Micro Torque 6000 follows a unique Open Protocol Standard. |
| Resend Delay | The time in seconds the Data Manager will wait before resending any commands without them getting acknowledged. |
| Rundown Subscribe Version | N/A |
| Socket Tray Enabled | When checked, an Atlas-Copco socket tray is in use. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Use Tool IO for Reverse Monitoring | Use Tool Trigger I/O to count reverse torque. |

## Part Properties List

| Property | Description |
| --- | --- |
| Part Number | The unique identifier for the Part. Leading and Trailing spaces are removed. |
| Description | The description of the item. |
| External ID | An alternate identifier for the Part |
| Serial Barcode Prefix | The serial barcode prefix is matched when creating a work order from the SmartScreen client if the station property **Match Part Barcode Prefix** is true. See: "Creating Work Orders from the Client" on page 319 |
| Serial Number Group | Text which can be used as a token by the serial number controller in the **Serial Number Format.** See: "Serial Number Controller" on page 14 |

| Property | Description |
|---|---|
| Contextual Data Item IDs | A set of contextual data items which will appear when creating a work order. |

## Pick Light Input Source Properties List

| Property | Description |
|---|---|
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| Light Location | The ID that identifies the location of the Pick Light. |
| Name | The Name of the item as it appears in SmartBuild. |
| Sensor Location | The ID that identifies the location of the sensor. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |

## Pick Light Operation Properties List

| Property | Description |
|---|---|
| Color | The color of the process light on this Pick Step, if supported. |
| Count | This integer value is the number of items from the bin that must be removed by the operator for the Step. If the value is greater than 1, the Multiple Selections check box should be enabled. |
| De-energize After Step | If selected, this will cause the Pick Light to be de-energized after the |

| Property | Description |
| --- | --- |
| | Step it is on is complete. |
| Default Value | Unused |
| Description | The description of the Pick Light (location, purpose, etc.). |
| Energize on Load | If true the Pick Light will be active as soon as the process loads. If false, the Pick Light will become active only at the time of the required Process Step. |
| Format Method | A Regular Expression that determines the format of the input. This expression will format the input before the validation method performs its operation. |
| Instruction Text | Unused |
| Multiple Selections | Multiple trips of the sensor must occur to complete the requirement. This should be enabled if the Count attribute is set to any value greater than 1. |
| Name | The Name of the item as it appears in SmartBuild. |
| Not Interlocked | If checked, the operator is not required to complete the tripping of the sensor to proceed to the next Step. |
| Part Number | Text identifying the item the operator should get. This is displayed on the Pick Light tab. |
| Solid After Selection | The light will flash when required and be solid after a selection is made.<br>If true, the Pick Light will flash to indicate the item is now required, and will become solid when the operator meets the pick count value. The light will turn off on build item unload.<br>If false, the Pick Light will come on solid to indicate the item is now required, and will turn off when the operator meets the pick count value. |
| Validation Method | A Regular Expression which validates the Input. If the regular expression returns a positive match to the input the operation will be considered true. |

## PINpoint Pick Light Controller Properties List

| Property | Description |
|---|---|
| Device Address | The IP address of the device. |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Name | The Name of the item as it appears in SmartBuild. |
| Node | Number to identify the controller as a node. |
| Port Number | The port the controller will use to communicate with the server. The standard setting is 5059. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Version | The version setting which the device uses to communicate is determined by the device communication protocol. |

## Plant Properties List

| Property | Description |
|---|---|
| Auto Generate Work Order Numbers | Whether to auto generate Work Order numbers when creating a new Work Order. |
| Auto Promotion/Demotion | If true then the station settings *Day Count for Power User Demotion, Product Count for Power User Demotion, Product Count for Power User Promotion* will change a user's level when they login at the SmartScreen client. |
| Days Not Worked For Demotion | A user will be demoted from Power User to Decertified User if they have not logged into a station in this many days. The user level is changed during login. This changes the user's level per station. |

| Property | Description |
| --- | --- |
| Event DataManager | The data manager which will be used for events communication. |
| Has Bypass | If the product has a bypass the product quality will be changed to the colour selected: Yellow, Red. |
| Has Defects | If the product has a defect the product quality will be changed to the colour selected: Yellow, Red. |
| Has Incomplete Stations | If the product has an incomplete station product quality will be changed to the colour selected: Yellow, Red. |
| Has Rejected | If the product is rejected the product quality will be changed to the colour selected: Yellow, Red. |
| Ignore Unknown Child Part Numbers | This determines whether or not PINpoint returns an error if a part number in a work order is not configured in SmartBuild. If true then an error will not be returned and the part numbers will be ignored. If false then an error will be returned stating that the part number is unknown and should be configured in SmartBuild.<br><br>This applies when a work order is submitted using the API or the Import Work Order feature. |
| Max Completed Work Order Days | Only bring back X days worth of completed work orders.. |
| Maximum Queued Items To Retrieve | Only bring back X number of build items in each of the queues for the monitor page. Aids in responsiveness. |
| Minimum SmartScreen Client Version | Checks a connected SmartScreen Client's version value against the entered value. E.g., SmartScreen Client version 5.6.875.1 connects to a system with this value set to 5.6.900.1: the 5.6 meets requirements, but the Client version 875 value is less than the recommended value of 900; i.e., it is an older version of the Client software. In this event, a warning that a newer version of the Client exists is shown to the Client's Operator. Note that this is only a warning, and does not prevent the Client from connecting to and working with the system. |
| Name | The Name of the item as it appears in SmartBuild. |

| Property | Description |
|---|---|
| Reset All Operations Includes Setting Fastening Count to 0 | If a step is reset then the rundown count on the fastening operation will be reset to 0.<br>This will send a signal to positional tools to restart the rundown process. |
| Serial Number Unique Per Serial Number Controller | **If True:** Serial numbers can be reused but only if they are submitted to routes using different serial number controllers.<br>For example: A work order item with serial number SN001 can be on route 1 and a work order item with serial number SN001 can be submitted to route 2 at as long as Route 1 and Route 2 use a different Serial Number Controller.<br>**If False:** Serial numbers must be unique.<br>For example: A work order item with serial number SN001 is on route 1 so another work order item with serial number SN001 cannot be submitted.<br>Note: If a serial number is rejected then a duplicate check is not performed and the serial number can be used again. |
| Tracking DataManager | The data manager which will be used for tracking communication. |

## Positional Fastening Tool Input Source Properties List

| Property | Description |
|---|---|
| Alarm Notification | If checked then the alarms which the controller outputs will be monitored and displayed |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Disable Tool On Start | When checked, the tool will be disabled when SmartScreen launches and the tool will only be enabled when the module requires it. |
| Enable Relay Communication | If true the direction switch of the tool will be monitored. If the tool is in reverse the tool will be disabled. This requires the property On Subscribe Relays to be set. |

| Property | Description |
|---|---|
| Exclusive PSet Control | If checked, SmartScreen will override all other pset choice selections made by the controller and will select the pset desired. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| FTToolAddress | The IP address of the tool controller |
| Identifiers | This can be used to send information to the tool controller on MID150.<br>▪ {SerialNumber}<br>▪ {PartNumber}<br>▪ {OperatorUserName}<br>▪ {[ContextualDataItemName]} – This is the name of the contextual data item in the SmartBuild advanced tab. The contextual data item name should only be surrounded with { }.<br>They can be combined, and other text can be added for example: SN {SerialNumber}PN{PartNumber}<br>For a list of supported MIDs, see the appendix. |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Multi-spindle | When selected, SmartBuild will interpret the data as coming from a multi-spindle device. |
| Name | The Name of the item as it appears in SmartBuild. |
| On Subscribe Relays | If the tool should be disabled when it is in reverse then this relay should read: DirectionalControlSwitchCounterClockwise. If the positional tool controller software requires knowledge of the trigger this should read: Trigger. |
| Port Number | The port the controller will use to communicate with the server. The default setting is 4545. |
| Position Controller Address | The IP address and port of the controller. |

| Property | Description |
| --- | --- |
| Position Controller Assembly | The custom assembly which will execute and determine when to allow the tool to be run based on the tool's position. This should be PINpoint.Library.AdapticsClientWrap.dll |
| Position Display Assembly | The custom assembly which will run and display the information about the positional fastening operation to the operator. This should be PINpoint.Library.AdapticsClientWrap.dll |
| Protocol Standard | The communication protocol standard is defined by the tool settings. This is for informational purposes only. |
| Protocol Version | This is the revision of the open protocol message's sent by the device manager to the tool controller. This is used on all outbound messages except MID0060 (Last Tightening Result Subscribe).<br><br>Some open protocol messages contain different information based on their revision. The revision level will be added to the header of the open protocol message. The contents of the message sent by the device manager may be different on higher revision levels. The largest difference is between revision 1 and revision 2.<br><br>PINpoint supports revision levels 1-6. See the Atlas Copco Open Protocol User Guide for details about each MID. |
| Resend Delay | The time in seconds the Data Manager will wait before resending any commands without them getting acknowledged. |
| Rundown Subscribe Version | This is the revision of the open protocol message MID0060 sent by the device manager to the tool controller.<br><br>When the device manager subscribes to a rundown it sends MID0060 to the tool controller. The revision level sent on MID0060 (Last Tightening Result Subscribe) is the revision level the tool controller should use when sending MID0061 (Last Tightening Result Upload) back to the device manager. The device manager will parse the message based on the revision in MID0061.<br><br>PINpoint supports revision levels 1-6. See the Atlas Copco Open Protocol User Guide for details about each MID. |
| Socket Tray Enabled | When checked, an Atlas-Copco socket tray is in use. |

| Property | Description |
|---|---|
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Use Tool IO for Reverse Monitoring | Use Tool Trigger I/O to count reverse torque. |

## Print Operation Properties List

| Property | Description |
|---|---|
| Format Method | Unused |
| Label Text | The name of the label displayed to the operator. |
| LCA Reprint Only | If true then an LCA is required to reprint documents. If false then any operator may reprint documents. |
| Name | The name as it appears in SmartBuild. |
| Print On Complete | If true then the print operation will automatically print when all other items are complete. |
| Sort Order | Unused |
| Validation Method | Unused |

## Process Step Properties List

| Property | Description |
|---|---|
| Always Active | Activate this step when a new build item is loaded using the first available operator and remain active until manual intervention. |
| Cycle Time Target | The cycle time target as show on SmartScreen. |

| Property | Description |
|---|---|
| External Process ID | Process ID used by 3rd party applications. |
| Is Auto Next Step | If true then when this step is complete the next step will be loaded. |
| Last Modified | The timestamp of when this step was last modified |
| Name | The Name of the item as it appears in SmartBuild. |
| Repair Step | When checked, this process step will only be displayed at repair stations. |
| Revision | The name of the revision assigned to this step. |
| Status | The status of the step according to the revision. If the status is Active the step will appear. If the status is Inactive the step will not appear. |
| Step Description | The text displayed on the process step. |
| Time to Autocomplete | The time in seconds at which point the step will automatically complete. Applicable to steps with Documents only. 0 is disabled. |

## Process Properties List

| Property | Description |
|---|---|
| Description | A string describing the object. |
| Is Sequential | When checked, the process steps must be completed sequentially. |
| Process ID | The Database ID of the Process. |
| Process Name | The Name of the item as it appears in SmartBuild. |
| Parts | A list of Parts. The parts in the parts list are used to determine if the process will be selected. The process will be selected if the work order item has a part which is also in the process's parts list. |

## Quadrant Gauge Properties List

| Property | Description |
|---|---|
| Default Value | The default value when loaded. |
| Display Interval | The length of time in seconds the gauge will be displayed for. |
| Gauge Source | A drop-down list of data sources for the Gauge. |
| Maximum Value | Maximum displayed value of the Gauge. |
| Minimum Value | Minimum displayed value of the Gauge. |
| Name | The Name of the item as it appears in SmartBuild. |
| Regenerate Interval | The length of time in minutes until the data is refreshed. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |

## Radial Gauge Properties List

| Property | Description |
|---|---|
| Default Value | The default value when loaded. |
| Display Interval | The length of time in seconds the gauge will be displayed for. |
| Gauge Source | A drop-down list of data sources for the Gauge. |
| Maximum Value | Maximum displayed value of the Gauge. |
| Minimum Value | Minimum displayed value of the Gauge. |
| Name | The Name of the item as it appears in SmartBuild. |
| Regenerate Interval | The length of time in minutes until the data is refreshed. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |

## Reason Group Properties List

| Property | Description |
| --- | --- |
| Name | The Name |

## Reason Properties List

| Property | Description |
| --- | --- |
| Instruction Text | Text which is shown to the operator above the description field |
| Name | The Name |
| Validation RegEx | The regex which the text must match before the reason description can be submitted. If this is blank then any text is acceptable. |

## Repair Station Properties List

Refer to the table "Station Properties List" on page 479.

## Report Properties List

| Property | Description |
| --- | --- |
| Display Interval | The length of time in seconds the gauge will be displayed for. |
| Regen-erate Inter-val | The length of time in minutes until the data is refreshed. |
| Report Endpoint | The endpoint for the report. |
| Report Name | The Name of the item as it appears in SmartBuild. |

| Property | Description |
|---|---|
| Report Path | This should be similar to this:<br>api/BigScreenEx-<br>port.as-<br>px?rptType=PINpoint.Reports.ANDON.GPAReport&expType=IMAGE&Id=25037<br><br>The ID=25037 is a variable. The value can be replaced with the value of the line ID or the station ID. If the line ID is used then the station on the line with the station property contribute to production metrics set true will be used. If the station ID of a specific station is entered, then it will be used even if it does not have contribute to production metrics set true. |
| Report Type | The Type of information that will be retrieved: SSRS Report, .TIFF , .PNG |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |

## Route Properties List

| Property | Description |
|---|---|
| Name | The name of the item |
| Description | The description of the item |
| Default | If true this is the default route for the plant. Work Orders submitted without a route will use this route. Only one route can be default. |
| Serial Number Controller | The serial number controller which is used to generate serial numbers for work order items submitted to the route. All routes use a serial number controller. If a serial number controller is not set then the default serial number controller for the plant will be used. |

## Scan Operation Properties

| Property | Description |
|---|---|
| Custom Formatters | The assembly which will execute when information is entered into the operation. Multiple Assemblies can be entered and they will be called sequentially.<br>In the custom formatter assemblies pass the result of one assembly to the next. The result is used by the operation. |
| Custom Validators | The assembly which will execute when information is entered into the operation. Multiple Assemblies can be entered and they will be called sequentially.<br>In the custom validator the assembly must return true or false. The assembly will run if the previous one is complete. If all assemblies return true then the operation is true. If any of them return false then the chain stops and the next assembly will not be executed and the operation will return false. |
| Default Value | The value which will populate the scan on step load. The default value can be written to an OPC tag.<br>If this is the name of a contextual data item in brackets then the value for that contextual data item will be used. Example [country] would use the value of the country which was stored for that serial number, “Canada”.<br>If the default value is a contextual data item and the input source is an OPC tag then the value of the contextual data item will be sent to the OPC tag when the operation is loaded. If the value of the OPC tag changes then the value will be read and stored as the value of the Contextual Data Item. |
| External Step Operation ID | An external identifier for the operation referenced by 3rd party systems |
| Format Method | A Regular Expression that determines the format of the input. This expression will format the input before the validation method performs its operation. |
| Formula | A math formula which defines this value. For Example: A+B/#C |
| Gauge LSL | Lower limit to compare the value to. |

| Property | Description |
| --- | --- |
| Gauge USL | Upper limit to compare the value to. |
| Instruction Text | Optional Input Instruction/Error Message text to display to the operator. |
| Is Read Only | If enabled, the operator cannot change the values of this operation, however an LCA is allowed to log in and modify the value.<br>If the scan operation has **Is Read Only** set True data can be scanned in using a Serial Barcode Scanner or a Keyboard Wedge Scanner. |
| Issue IPV Level 1 | If true then when the scan is evaluated as invalid an IPV level 1 event will be generated. This is used to trigger a notification such as a stack light or sound output when there is an invalid scan. |
| Label Text | The text that will be displayed to the operator. |
| Linked Operation | Allows the user to select another scan (or checkbox) operation associated to this process; the value stored in the selected operation for the same build item will be copied into this operation when the step is activated. |
| Name | The Name of the item as it appears in SmartBuild. |
| Show Large Validation Popup | This determines the settings for the validation popup which can appear when a scan is completed. The options are:<br>- PopupEnabled - Enables the popup<br>- TimeToFade - The time in milliseconds the popup will appear for<br>- MessageFontSize - the size of the text in the message<br>Example: popupEnable=true;TimeToFade=1000;MessageFontSize=32 |
| Sort Order | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Validation Method | A Regular Expression which validates the Input. If the regular expression returns a positive match to the input the operation will be considered true. |
| Variable Name | The variable name of this value to be used in formulas. Note that global variables can be defined across steps by using #VariableName. |

## Serial Number Controller Properties List

| Property | Description |
|---|---|
| Is Plant Default | If true then this serial number controller is used to generate the serial number for a new work order item when the route does not have a serial number controller. If this is true then routes do not need to be linked. Only one serial number controller can be the plant default. Selecting this will assign this serial number controller and unassign the current one. |
| Name | The name of the item |
| Description | The description of the item |
| Serial Number Format | The format the serial number will take when it is generated by the serial number controller. Trailing spaces are removed. See: "Serial Number Controller" on page 14 |
| Serial Number Regex | A regex which must be satisfied before saving the work order when the serial number is entered or generated. |
| Routes | A list of routes which will use this serial number controller. |

## Sentinel C28 Tester Device Properties List

| Property | Description |
|---|---|
| Daily Calibration Required | If enabled, this requires the device to be calibrated daily. |
| Device Address | The IP address of the device. |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Name | The Name of the item as it appears in SmartBuild. |

| Property | Description |
| --- | --- |
| Port Number | The port the controller will use to communicate with the server. The standard telnet setting is 23. |
| Serial Device | When selected, SmartBuild will treat this device as a serial device. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Unit Station | Tester Unit/Station number. |
| Version | The version setting which the device uses to communicate is determined by the device communication protocol. |

## Serial Barcode Scanner Input Source Properties List

| Property | Description |
| --- | --- |
| Baud Rate | The baud setting for the barcode scanner. This is determined by the barcode scanner communication protocols when the barcode scanner was set up. |
| Data Bits | This is the number of bits in a character for RS-232 communications. This value comes from the serial device properties. |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| Handshake | Handshake string. |
| Name | The Name of the item as it appears in SmartBuild. |
| Overwrite | If selected, overwrites the existing value upon new received data. |
| Parity | The parity setting for the barcode scanner. This is determined by the barcode scanner communication protocols when the barcode scanner was set up. |

| Property | Description |
|---|---|
| Port Name | The communication port setting for the barcode scanner. This is determined by the barcode scanner communication protocols when the barcode scanner was set up. |
| ReadTimeout | Time in ms to timeout read operations. |
| RTS Enabled | Send RTS to Device upon initialization. |
| Send to Multiple | If selected, populate all items with the same source at the same time. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Stop Bits | The stop bits setting is dictated by the serial device communication protocol. |

## Serial Number Controller Properties List

| Property | Description |
|---|---|
| Is Plant Default | |
| Name | |
| Description | |
| Serial Number Format | |
| Serial Number Regex | |
| Routes | |

## SIC Serial Marker Device Properties List

| Property | Description |
| --- | --- |
| Device Address | The IP address of the device. |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Name | The Name of the item as it appears in SmartBuild. |
| Port Number | The port the controller will use to communicate with the server. The standard setting is 7500. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |

## SMTP server Properties List

| Property | Description of the Item |
| --- | --- |
| Description | The Description. |
| From Email Address | The email address from which the email is sent. |
| Name | The Name of the item as it appears in SmartBuild. |
| SMTP Port | The port the Smtp server uses. |
| SMTP server | The Smtp server which will send the email. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |

## Socket Tray Properties List

| Property | Description |
|---|---|
| Device Address | The IP address of the device. |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Name | The Name of the item as it appears in SmartBuild. |
| Node | Number to identify the tray as a node. |
| Port Number | The port the socket tray will use to receive messages from the data manager. |
| Version | The version setting which the device uses to communicate is determined by the device communication protocol. |

## Sound Action Properties List

| Property | Description |
|---|---|
| Duration | The duration (in seconds) the sound will play for when an event is triggered. |
| Enabled | If checked then the item is functional and will be displayed to the user. |
| Name | The Name of the item as it appears in SmartBuild. |
| Number of Repeats | The amount of times the sound will repeat when an event is triggered. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |

| Property | Description |
|---|---|
| Sound File | Sound File in the system to be used. |
| Sound Url | URL of the sound to be used. |
| Time Between Repeat | Time in seconds between the end of the sound playing and when it will repeat. |
| Tone | The tone the sound device will output. |
| Volume | The volume of the event sound. |

## Sound Device Properties List

| Property | Description |
|---|---|
| Device Address | The IP address of the device. |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Name | The Name of the item as it appears in SmartBuild. |
| Port Number | The port the controller will use to communicate with the server. The port number is different for each sound device which will play sounds. 7300 will play a sound on a computer. 7010 will play sounds on a stack light. This is configurable in the PINpoint Device Bridge configuration. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |

## Stack Light Action Properties List

| Property | Description |
|---|---|
| Enabled | If checked then the item is functional and will be displayed to the user. |
| Name | The Name of the item as it appears in SmartBuild. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |

## Stack Light Device Properties List

| Property | Description |
|---|---|
| Blue | If selected, this light will be available. |
| Colors | |
| Device Address | The IP address of the device. |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Green | If selected, this light will be available. |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Name | The Name of the item as it appears in SmartBuild. |
| Port Number | The port the controller will use to communicate with the server. The Standard port is 7000. This is configurable on the PINpoint device bridge software. |
| Red | If selected, this light will be available. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |

| Property | Description |
|---|---|
| Sound | If selected, the device will play the sound configured for events. |
| White | If selected, this light will be available. |
| Yellow | If selected, this light will be available. |

## Stanley Wireless Wrench CA Series Properties List

| Property | Description |
|---|---|
| Device Address | The IP address of the device. |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Name | The Name of the item as it appears in SmartBuild. |
| Port Number | The port the controller will use to communicate with the server. The standard setting is 4545. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Use Tool IO for Reverse Monitoring | Use Tool Trigger I/O to count reverse torque. |

## Station Config Properties List

| Property | Definition |
|---|---|
| Allow Duplicate User Login | Allow an operator to remain logged in at this station after they log in at another station. |
| Allow Operator To Control Product Movement | If true then it allows an operator to use the following buttons on SmartScreen which usually require an LCA: Return to source queue, Place on Hold, Release to destination. |
| Allow Operator To Load Out Of Sequence | When enabled, the operator is allowed load any Serial Number in their queue rather than only the next one (provided the serial number in station is complete, or there is no serial number loaded in station). |
| Allow Operator To Locate | When enabled, the operator is allowed to locate and load any Serial Number within their route, but not within their queue (provided the serial number in station is complete, or there is no serial number loaded in station).<br><br>This will not allow operators to load items within their queue unless **Allow Operator to Load Out Of Sequence** is also true. |
| Auto Generate Serial Number | If true the operator will be provided a serial number automatically when creating a new work order. |
| Auto Next Step To Incomplete | Automatically proceed to the next incomplete process step after completing a step. |
| Barcode Scanner Com Port | The com port configuration for a Barcode Scanner (COM1,9600,None,8,1) |
| Count CycleTime On All Steps | If true then when more than one step is active time will be recorded on all steps. The sum of the time recorded for all steps can be more than the sum of the cycle time recorded for the station because more than one step can be active at the same time.<br><br>If false then only the process step that is active will accumulate cycle time. The sum of the cycle time recorded should match the working time recorded at the station. |

| Property | Definition |
|---|---|
| Count Zero Tor-queAngle As RMV | If true then when a rundown with 0 torque and 0 angle is received the Fastening Operation will count it as a removal. |
| Enable Andon | If selected, Andon is enabled. |
| Enable Certifications | If selected, Certifications are enabled. |
| Enable Keyboard Wedge | If True the SmartScreen client will listen to keyboard strokes and use them as an input method. This should be enabled when using a barcode scanner which cannot be setup to use a virtual com port. When the barcode scanner submits data it will be read into the active scan operation, splash screen, or login window.<br><br>A keyboard wedge scanner will enter information into scan operations which are read only but it will not overwrite the data currently in the scan operation.<br><br>Enabling this allows keyboard wedge scanners to be used to scan a badge and login an operator. Users can login by scanning their badge on the splash screen. All other logins, such as LCA, team lead, or trainer, must login by clicking on the badge icon in the login window and then scanning their badge. |
| Enable Qualifications | If selected, Operator Qualification checks are enabled. |
| Enable Steps on Product Load | If selected, the steps will be enabled when the build item is loaded. This should normally be true.<br><br>If false this will disable all the steps when a build item arrives at a station and the operator will not be able to work until they are enabled. This should only be used when another system is controlling the movement of build items and the decision to enable and disable processes on a PINpoint SmartScreen Client. |
| Focus Fastening Tab On Rundown | If selected, the focus will be on the fastening tab when a rundown occurs. |
| Force Culture | Force Culture. Specify Region code. |

| Property | Definition |
|---|---|
| Force UI Culture | Force User Interface Culture. Specify Region code. |
| Inactivity Timeout | The amount of time (in seconds) before all operators logged in to SmartScreen become inactive. This only affects operators when the SmartScreen client is setup to use Multiple Operators. The active operator is the one using the SmartScreen client when there are multiple operators. |
| Key | The computer name which is running the SmartScreen client. The full computer name should not be used. |
| LCA Logoff Count Down Time | If an LCA logoff is triggered this is the amount of time (in seconds) to show a warning on the SmartScreen client that the LCA is being logged off. When the timer expires the LCA is logged off. |
| Load By Scanning Only | When enabled, the operator must load a Serial Number using a barcode scanner only. Typing in a Serial Number is only permitted if an LCA logs in. |
| Lock Process When Complete | When all the steps on the SmartScreen client have been completed the process steps will be locked with a pop up message and a user with Line Control Access will be required to unlock the station so the next Build Item can be Loaded. |
| Logoff Count Down Time | If an operator logoff is triggered this is the amount of time (in seconds) to show a warning on the SmartScreen client that the operator is being logged off. When the timer expires the operator is logged off. |
| Match Part Barcode Prefix | If true the first scan into the work orders window will select a part if there is a part with a serial barcode prefix which matches the scanned data.<br><br>If false operators can use a second scan and match the part number using the Part Number Regex. |
| Maximum Number of Operators | The maximum amount of operators which can be logged in at the same time. This feature is only available to customers who have purchased a Multiple Operator SmartScreen license. |
| Minimum Number of | The amount of operators which must be logged into the station |

| Property | Definition |
| --- | --- |
| Operators | before steps can be assigned. This feature is only available to customers who have purchased a Multiple Operator SmartScreen license. |
| Over Cycle Categorization Required | If true then the operator will be required to enter a reason when the cycle time of the station exceeds the cycle time of the scheduler tab. |
| Over Cycle Categorization Trigger (%) | The percentage of the cycle time after which the over cycle event will be triggered |
| Popup Settings For Fastening | This determines the settings for the popup which can appear when a rundown is received. This popup displays the status of the rundown so the operator can read it at a distance. The options are:<br>▪ PopupEnabled - Enables the popup<br>▪ TimeToFade - The time in milliseconds the popup will appear for<br>▪ MessageFontSize - The size of the text in the message<br>Example: popupEnable=true;TimeToFade=1000;MessageFontSize=32 |
| Popup Settings For Repair | This property is only valid for repair stations. If a build item enters a Repair Station and a step is not complete then this determines the settings for the popup which can appear stating "Attention Required". The options are:<br>▪ PopupEnabled - Enables the popup<br>▪ TimeToFade - The time in milliseconds the popup will appear for<br>▪ MessageFontSize - The size of the text in the message<br>Example: popupEnable=true;TimeToFade=1000;MessageFontSize=32 |
| Part Number Regex | If a regex is present, and the operator must use a second scan to select the part number (based on **Scan to select Part In List)**, then the work orders window will use the results of the regex function to select a Part from the part numbers in the list. |
| Reason List For Acknow- | The Reason repository reference which contain reasons the user |

| Property | Definition |
|---|---|
| ledge | should select from. |
| Reason List For Bypass | The Reason repository reference which contain reasons the user should select from. |
| Reason List For Defects | The Reason repository reference which contain reasons the user should select from. |
| Reason List For Down-time | The Reason repository reference which contain reasons the user should select from. This is used when reclassifying time for this sta-tion on the dashboard web app. |
| Reason List For IPV Locks | The Reason repository reference which contain reasons the user should select from. |
| Reason List For Main-tenance Overrides | The Reason repository reference which contain reasons the user should select from. |
| Reason List For Reject | The Reason repository reference which contain reasons the user should select from. |
| Reason List For Reset | The Reason repository reference which contain reasons the user should select from. |
| Reason List For Tool Unlock | The Reason repository reference which contain reasons the user should select from. |
| Reason List For Unre-ject | The Reason repository reference which contain reasons the user should select from. |
| Scan To Select Part In List | If true this allows the operator to scan a barcode to select the part when creating a work order at the SmartScreen Client. This occurs after the scan to enter the serial number. |
| Security Card Reader COM Port | Default Security Card Reader com port number (COM1,9600,None,8,1)<br>If this is specified, and only local logins are in use, then the login operator window will default to the card tab. |
| Security Card Reader | Used when operators are attempting to login at the station using a |

| Property | Definition |
|---|---|
| Login Regex | scanner (not a card reader). This is required to differentiate between a user login barcode and a scan item barcode.<br>If this is specified, and only local logins are in use, then the login operator window will default to the card tab. |
| Serial Number Locate Format | When data is entered into the locate field this format is used to match the data against the list of serial numbers. This supports SQL wildcards .<br>For example: “%_{serial}_”.<br>{serial} is the information which has passed the text input regex, if there is one. This is being checked against all serial numbers. The wildcards should be used to locate a serial number in PINpoint from a partial text scan at the station. |
| Serial Regex | If present, performs a regex match for Serial Number on the scanned data. |
| Show Work Orders Window on Complete | Automatically show the Work Orders window when the Station is complete. |
| Show Work Orders Window on Initial Login | Automatically show the Work Orders window after the initial operator login. |
| Sort Order | The order of which the item will be displayed in SmartBuild. The order in SmartBuild is the same as the order on the BigScreen. This also applies to the repair station. |
| Startup Tests Enabled | If selected, startup tests are enabled. |
| Station Config Name | The Name as it appears in smartbuild |
| Tab Order | The order in which to display the tabs on the screen, in format [Tabname]=[ordernumber];[Tabname]=[order number]. |
| Team Lead Required To Build | If true then a user with the team lead role will be required to login before other users are allowed to login and complete process steps. |
| Text Input Regex | The regex which will be applied to any text scanned into the Work Orders window. |

| Property | Definition |
|---|---|
| User Level Promotion Button Enabled | Show the manual user level promotion button. |
| Work Order Creation Limit | The maximum number of build items that may reside in a Station's Queue during work order creation using the work orders window. If this limit is reached, no more work orders may be submitted. |
| Work Orders Window Assembly (DLL) | The custom assembly which will be loaded instead of the default Work Orders window. |

## Station Properties List

| Property | Description |
|---|---|
| Assembly Order | This is a Process to Station property. It only appears in the Process Tab when a station is selected.<br>If a build item is loaded at this station and it has multiple processes which are loaded then this value is used to determine which order the steps from each process should be displayed. For example: Process A is 10, Process B is 20, Process C is 30. The steps will appear in the order ABC. Changes here can be visualized on the plan. |
| Auto Log Off LCA | Automatically logs off the LCA when the station is complete. This does not trigger the countdown timer, the LCA is logged off immediately. |
| Check for Rebuild | If a serial number returns to a station after another serial number has been there then the Rebuild window will appear so a user with Line Control Access can decide whether to load historical step data or not.<br>Check for rebuild must be checked on the peer station if the lead station also has check for rebuild.<br>For more information, see Rebuild |
| Contribute to Line Production Metrics | Check this value if this station should drive the production performance metrics for the entire line. |

| Property | Description |
|---|---|
| Cycle Time Target | This is a Process to Station property. It only appears in the Process Tab when a station is selected.<br>If a value is entered then this value is used instead of the cycle time target derived on the Scheduler app. If a build item has more than one process associated to it then the cycle time will be summed. |
| Cycle Time Warning Trigger (%) | The percentage of cycle time target when warning event fires. If non-zero this overrides the Line level value. |
| Day Count for Power User Demotion | A user will be demoted from Power User to Standard User this many days after their user level was last changed. The user level is changed during login. This changes the user's level per station. This requires that the plant setting *Auto Promotion/Demotion* is set true. |
| Disable Is Sequential | If checked then the “Is sequential” property of any process loaded on this station will not be enforced. If it is not enforced then the operator can activate any step at any time. |
| Exclude from Production Metrics | When true the station will not publish metrics and data from this station will not be included in line level metrics calculations. When this value is modified the dashboard app must be refreshed to update the calculations but no other components need to be restarted. |
| External Operation ID | This is a Process to Station property. It only appears in the Process Tab when a station is selected.<br>This is used when a 3rd party application calls PINpoint to create work orders at a station. The 3rd party application should match this ID. |
| External Station Identifier | Station Identifier used by 3rd party applications. |
| Include In Route Deviation | If true the station will be included in the route deviation calculation for product quality. This is used to check whether or not the product went to the repair station. This setting is only applicable to repair stations. |

| Property | Description |
| --- | --- |
| Is Data Ready Input Address | PINpoint will respond to the rising edge (from 0 to 1) of this tag and read the following OPC tags: 'Part Number Input Address', 'Serial Number Input Address', 'Tracking ID Input Address', 'Rejected Input Address', 'Station Complete Input Address', 'Release Complete Input Address', 'Product Present Input Address'. Output tags are updated appropriately. |
| Look Ahead Mode | If True, the station will automatically load the next build item available in the queue when the current build item is completed and has departed the station.<br>If False, the new build item will not be automatically loaded until the station is commanded to load using a load sequence trigger. |
| Name | The Name of the item as it appears in SmartBuild. |
| Pallet Empty Output Address | Address for Pallet Empty Output. |
| Part Number Output Address | Part Number loaded at the station in PINpoint. |
| Percent Complete Out | The percentage of: The process steps completed divided by the total process steps for the build item at this station. |
| Product Count for Power User Demotion | A user will be demoted from Power User to Standard User this many serial numbers after their user level was last changed. The user level is changed during login. This changes the user's level per station. This requires that the plant setting *Auto Promotion/Demotion* is set true. |
| Product Count for Power User Promotion | A user will be promoted from Standard User to Power User this many Serial numbers after their user level was last changed. The user level is changed during login. This changes the user's level per station. This requires that the plant setting *Auto Promotion/Demotion* is set true. |
| Product Present Input Address | The address of the tag which indicates a product is present in the station. A value of 1 will indicates a product is present at the station. |

| Property | Description |
|---|---|
| Product Quality Output Address | When the processes for a build item are loaded the Product Quality will be written to this as an integer. 1=green, 2=yellow, 3=red. This is the product quality for the current build item only. This is not the product quality for any child build items. |
| Rejected Input Address | The OPC address the PLC may use to indicate an item is rejected. This is Boolean. If true then the item is rejected. |
| Rejected Output Address | Set to 1 when the build item is defined as rejected by PINpoint. |
| Rejected Reason Input Address | The OPC address the PLC may use to indicate the reason why the item was rejected. This is a string. The reason must match a reason found in the SmartBuild advanced tab. This is not case sensitive. |
| Serial Number Input Address | The OPC address the PLC may use for the Serial Number which should be loaded if the station rule *Pallet Present & Serial Number* is set. |
| Serial Number Output Address | The output of the Serial Number loaded at the station in PINpoint. |
| Station Complete Output Address | Set to 1 when PINpoint considers the current build item to be completed at the station.<br>The state of this tag should be one of many factors evaluated by the PLC to determine whether or not a pallet can move (or the line can index). The PLC should consider the state of tools and operators at the station before determining that it is safe to move a pallet. |
| Station ID | This is the database ID of the station. |
| Station Unload Timer | When the SmartScreen client is complete this is the value in seconds which will be used on a timer which counts down and then unloads the SmartScreen client by sending the build item to the destination.<br>Selecting anything on the SmartScreen client will cancel the timer. This functions on repair stations but not automated stations or peer stations. Reloading the station will restart the timer. If the station is interlocked then the SmartScreen client will not |

| Property | Description |
| --- | --- |
| | begin the unload timer until after the station interlock is removed. |
| Synchronizing Index Input Address | The address of the synchronizing index. When this integer value changes the build items on the route will increment. |
| Takt Time Multiplier | The takt time will be multiplied by this value. This is typically used when the station is in an OR configuration. If a station has a takt time multiplier set it will be reflected on the dashboard. |
| Tracking ID Input Address | The address for the tracking ID supplied by the PLC. |
| Tracking ID Output Address | The Pallet ID of the product at the current station as determined by PINpoint. |
| Trainer Concept Enabled | If this is true then the station will require a trainer to login with users who require one. |

## Synchronizing Index Properties List

| Property | Description |
| --- | --- |
| Auto Index | Stations will index at the same time automatically when every Station sharing that tag is complete. Normally, a signal from a PLC is used to index synchronized Stations. Using Auto Indexing means that stations that do not use a PLC can be coordinated to work in the same way. |
| Auto Load | Auto Load only affects the first station in the cluster.<br>If true then the next build item in queue will be loaded when the cluster indexes. if the station is pending a build item and one becomes available it will be loaded.<br>If false a build item will not be loaded when the cluster indexes. If the station is pending a build item and one becomes available it will not be loaded. |
| Color | The color of the index so it can be viewed on the build tab and tracking app. |

| Property | Description |
|---|---|
| Destination Capacity | The maximum number of Build Items the outbound Queue can contain. It should be set to match reality when possible so that a line does not move build items into a physical location which is full. Automatic Indexing cannot occur unless there is space in the Queue. If the limit is 0, the Tracking Data Manager will only allow an index of the cluster if the cluster's outbound queue is empty and any station which draws from the cluster's outbound queue can accept Build Items. The Destination Capacity does not consider build items which are on hold. If there is no need for a limit for the outbound Queue, leave this number at the default "Not Set", which means there is no limit. |
| Name | The name as it appears in SmartBuild |

## Tester Device Properties List

| Property | Description |
|---|---|
| Device Address | The IP address of the device. |
| Device Name | A unique identifier / common name for the device, tool, etc. |
| Exclusive Subscribe | Ensures that only one client is subscribed to a device at a time, |
| Keep Alive Frequency | This is the frequency in seconds that a keep alive message will be sent to the controller. |
| Name | The Name of the item as it appears in SmartBuild. |
| Port Number | The port the controller will use to communicate with the server. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Use IP v6 | If checked, the device will connect to the specified host using IP v6. |
| Version | The version setting which the device uses to communicate is determined by the device communication protocol. |

## Tester Operation Properties List

| Property | Description |
|---|---|
| Allow Calibration | Show Calibrate button on Tester control. Calibration does not function with OPC tester devices. |
| Allow Start | Show Start button on Tester control. |
| Always Start | If true the test will always be started when the build item is loaded. This will start the test when the station is reloaded or when a build item arrives even if the test, the step, or the station, has already been completed.<br>This should not be used with Auto-Start because Auto-Start is intended to start the test automatically when the step is activated and only functions the first time the build item arrives.<br>This does not need to used with the step property Always Active because the step will be made active by this property. |
| Auto Start | Automatically starts the test when the step is activated if there are no existing test results. |
| Custom Step Item | The assembly which will execute when information is entered into the operation. |
| Default Value | The value which will populate the scan on step load.<br>If this is the name of a contextual data item in brackets then the value for that contextual data item will be used. Example [country] would use the value of the country which was stored for that serial number, “Canada”.<br>This can be written to an OPC tag. |
| Force Calibrate Before Test | Forces a calibration prior to commencing a test. |
| Format Method | A Regular Expression that determines the format of the input. This expression will format the input before the validation method performs its operation. |
| Instruction Text | Optional Input Instruction/Error Message text to display to the operator. |

| Property | Description |
|---|---|
| Is Read Only | If enabled, the operator cannot change the values of this operation, however an LCA is allowed to override. |
| Label Text | The text that will be displayed to the operator. |
| Linked Operation | A link to another operation where this operation will retrieve its value from. This operation will get the data when the step is activated. |
| Lock State Tag Device Name | The device name for the tag that is used to write the lock state. This is only used when using a CX38 tester and the Custom Step Item path is PinPoint.Library.Operation.TesterCX38.dll |
| Name | The Name of the item as it appears in SmartBuild. |
| Pset | Parameter Set to be used for this operation. |
| PSet Tag Device Name | The device name for the tag that is used to write the PSet value. This is only used when using a CX38 tester and the Custom Step Item path is PinPoint.Library.Operation.TesterCX38.dll |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |
| Status Callback Tag Device Name | The device name for the tag that is used to read the current status (invalid Pset, device lock, etc...). This is only used when using a CX38 tester and the Custom Step Item assembly is PinPoint.Library.Operation.TesterCX38.dll |
| Validation Method | A Regular Expression which validates the Input. If the regular expression returns a positive match to the input the operation will be considered true. |

## Text Message Action Properties List

| Property | Description |
|---|---|
| Body Template | Text and markers (such as #{Station}#, #{Event Name}#, etc.) that form the body of the email. |

| Property | Description |
|---|---|
| Email Suffix | The telecommunication company's email suffix (e.g., @tele-com.com) |
| Enabled | If checked then the item is functional and will be displayed to the user. |
| Name | The Name of the item as it appears in SmartBuild. |
| SortOrder | The order of item in PINpoint. If this value is changed, the user must refresh SmartBuild before changes are reflected. |

## Trigger Operation Properties List

| Property | Description |
|---|---|
| Custom Trigger Action | The assembly which will execute when information is entered into the operation. |
| Duration | Duration of the momentary signal in ms. |
| Instruction Text | Optional Input Instruction/Error Message text to display to the operator. |
| Label Text | The text that will be displayed to the operator. |
| Linked Operation | A link to another operation where this operation will retrieve its value from. This operation will get the data when the step is activated. |
| Name | The Name of the item as it appears in SmartBuild. |
| Normal State | The default state of the trigger button when it is not pressed. |
| Pressed State | The pressed state of the trigger button. |

## Verification Operation Properties List

| Property | Description |
|---|---|
| Name | The name of the item as it appears in SmartBuild. |
| Label Text | The text that will be displayed to the operator. |
| Defect Reasons | The list of defect reasons shown to the operator when a verification fails. |
| Defect Images | The image(s) displayed to the operator to complete the verification. |

## WebApi Endpoint Properties List

| Property | Description |
|---|---|
| Name | The name as it appears in SmartBuild |
| WebApi Method | A method on the endpoint. The message will be sent to this URL. The web service which receives the message decides how to act on the information. This web service is typically 3rd party software. Information about the format of the message is in the PINpoint API documentation.<br>Example:<br>/method |
| WebApi Url | The Endpoint |

## Work Order Operation Properties List

| Property | Description |
|---|---|
| Format Method | Not Used |
| Label Text | The label of the operation as it appears in SmartBuild |

| Property | Description |
|---|---|
| Name | The name of the operation as it appears in SmartBuild |
| Part / Route | The Part and route combination which should be created is selected here. This is a search field. |
| Quantity | The amount of work order items to be created when this operation is loaded. If this is greater than 1 the serial number must be auto generated. |
| Release To Production | If true the work order will be released to production immediately. |
| Serial Number | This is the Serial number which will be used for the work order item. It can utilize text, variables, or contextual data.<br>**Contextual Data** can be used to generate the serial number by using square brackets. For Example: [City] would generate the serial number: “Toronto”. The contextual data value will only appear if the contextual data item is called on the step; the contextual data item must be set as the default value of a scan operation on the same step. contextual data cannot be combined with text or variables.<br>**Variables** can be used to generate the serial number by using a hash tag. For Example: #Size would generate the serial number “50”. If the variable cannot be found then the serial number will be automatically generated. #length#width is not valid because variables cannot be combined in a string. Math functions are not possible.<br>If this property is blank the serial number controller will generate the serial number. |
| Sort Order | Not Used |

# SmartScreen Web App Document Properties

## Certification Properties

| Property | Description |
|---|---|
| Certification Type | The options are **Safety** and **Operator**. The type of the Certification |

| Property | Description |
| --- | --- |
| | and the Certification Response Group must match or they cannot be used together. |
| Created | Use the calendar icon to enter the creation date, this can be considered the start date when the Certification will begin being enforced. Alternatively, type the date in MM/DD/YYYY format. |
| Description | Enter a description for the Certification explaining its purpose. |
| Enabled | If this check box is filled, the Certification is enabled and applies. If this check box is unfilled, the Certification does not apply but remains available in the system. |
| End Date | Use the calendar icon to enter the end date, after which the Certification will no longer apply. Alternatively, type the date in MM/DD/YYYY format.<br>If blank the Certification will never expire. |
| Name | Enter a name for the Certification. |
| Plant | Select the entire Plant, or expand the Plant to select the particular Line or Station the Certification should apply to. |

## Maintenance Properties

| Property | Description |
| --- | --- |
| Allow Snooze | If true a button to snooze the Maintenance Document will appear when the Maintenance Document is displayed. Snoozed Maintenance Documents appear again when the next build item arrives at the station or when the operator logs into the station again. There is no limit to how many times an operator can snooze an Maintenance Document. |
| Description | A description of the task the operator must perform. |
| Enabled | If true the maintenance document can be active and appear if other |

| Property | Description |
|---|---|
| | criteria is also met. If false the maintenance document is disabled and cannot become active. |
| End Date | The date after which the Maintenance Document will no longer be active.<br>Leaving this field blank indicates that the Maintenance Document will be active indefinitely. |
| Name | The name of the Document. |
| Repeat Day | If the **Repeat Every** selection is week then this allows the user to select which days of the week this Maintenance document should occur on. |
| Repeat every | This is the frequency of when the Maintenance document should repeat.<br>The options for when the Maintenance documents will be shown to the operators again are: Shift, Day, Week, Month, Year.<br>Depending on the selection the **Repeat Day** and **Repeat Time** properties will become visible |
| Repeat Time | If the **Repeat Every** selection is day or week then this allows the user to select the time when the Maintenance document should occur. The Maintenance Document will appear when the next build item arrives at the station after this time. |
| Show to all operators | If true then the Maintenance Document will be displayed to all operators who log in to the station each time the Maintenance Document repeats. For example: if a document is scheduled weekly then all users who login to that station must complete the document each week. |
| Start Date | The date on which the Maintenance Document can be displayed. |

## Message Video Properties

| Property | Description |
|---|---|
| Acknowledge By Date | This is the date after which the operator must acknowledge the document to continue building at the station. Prior to this date, the operator may choose to view it, but is not required to view it or provide a response. |
| Acknowledge Repeat Count | The number of times an operator must view and acknowledge the document. |
| Description | The description of the document. |
| Document Name | The name of the document. |
| Enable On Serial No. | If a serial number is entered then the document will automatically enable when this serial number is loaded at the target station. |
| Enabled | If true then the document can be displayed if it matches the other criteria. If false the document will not be displayed. This must be set manually. |
| End Date | The date after which the document will stop being displayed.<br>Leaving this field blank indicates that the Document will never expire. |
| File | The document which will be displayed.<br>Video files have a size limit of 25MB and must be one of the following types: .MP4, .AVI, .WMV, .MPG |
| Location/Process Tab | The target of a document can be determined by selecting the locations or the Processes from the lists in the tabs. The location can either be a single Station or an entire Line. A document may be assigned to one or many Processes and the operator will only be prompted with the document when that Process is loaded at the station. |
| Start Date | The date on which the document will start to be displayed according to its schedule. |
| URL | The URL to an external item which will be displayed. Acknowledgments and level demotions only apply when the document is ini- |

| Property | Description |
|---|---|
| | tially created. Documents that change at the URL source will not re-notify operators or affect operator levels.<br>For more information see: *"External Documents" on page 82* |
| View Every Time | If true, the operator will be required to view the document every time they login, regardless of how many times the operator has already viewed or acknowledged the document. |

## Qualification Properties

| Property | Description |
|---|---|
| Annual Requalify Date | The date on which operators must requalify. This is only relevant if the selected **Requalify Period Type** is “**Fixed Annual Date**”. |
| Description | The description of the Qualification. |
| Enabled | If true, the Qualification is enabled and can be active if the other criteria is also met. If false the Qualification is not enabled and cannot be active. |
| End Date | The date after which the Qualification can no longer be active.<br>If this is blank the Qualification can remain active indefinitely. |
| Expiry Warning Period | The number of days before the qualification expiry date that operators whose qualifications are nearing expiry will be warned. |
| Grace Period | The grace period is the time that an unqualified operator will still be allowed to continue using the station. If there is a **Grace Period Start** other than “None”, this is the length of the grace period in days. |
| Grace Period Start | The grace period is the time that an unqualified operator will still be allowed to continue using the station. This selection defines when the grace period will start. Select one of the following types of grace periods:<br>**Next Log in attempt**: the grace period will begin after the next login.<br>**None**: no grace period and operators who are not qualified cannot |

| Property | Description |
|---|---|
| | login.<br>**Qualification create**: the grace period will begin at the creation date. |
| Locations | The set of stations where operators must be qualified in order to login. |
| Name | The name of the Qualification |
| Operators | The list of operators. Operators who are qualified have the check box true. To requalify an operator click the requalify icon next to the check box. |
| Requalify Period | The amount of days after an operator acknowledges a qualification that an operator must be requalified. This is only available if the selected **Requalify Period Type** is "**Days After Acknowledgment**". |
| Requalify Period Type | If operators are required to re-qualify periodically. This determines when they need to requalify<br>**Days after acknowledgment**: once the operator makes the acknowledgment of the requalification, then they requalify within the number of days designated in **Requalify Period** (see below in this table).<br>**Fixed annual re-qualify date**: the operator must requalify every year on the date designated in **Annual Requalify Date.**<br>**No re-qualification: operators are not required to requalify.** |
| Start Date | The date when the Qualification can become active. |

## Work Instruction & Quality Alert Properties

| Property | Description |
|---|---|
| Acknowledge By Date | This is the date after which the operator must acknowledge the document to continue building at the station. Prior to this date, the operator may choose to view it, but is not required to view it or provide a response. |
| Acknowledge Repeat | The number of times an operator must view and acknowledge the |

| Property | Description |
|---|---|
| Count | document. |
| Demote Operators to Level 2 | If true, the user will be demoted to Level 2 after viewing the document.<br><br>Selecting this check box will require the trainer to login. If multiple stations are selected for this document, production may be affected as the trainer can only be logged into one station at a time. |
| Description | The description of the document. |
| Document Name | The name of the document. |
| Enable On Serial No. | If a serial number is entered then the document will automatically enable when this serial number is loaded at the target station. |
| Enabled | If true then the document can be displayed if it matches the other criteria. If false the document will not be displayed. This must be set manually. |
| End Date | The date after which the document will stop being displayed.<br><br>Leaving this field blank indicates that the Document will never expire. |
| File | The document which will be displayed.<br><br>PDF files are limited to a size of 25 MB.<br><br>Video files have a size limit of 25MB and must be one of the following types: .MP4, .AVI, .WMV, .MPG |
| Location/Process Tab | The target of a document can be determined by selecting the locations or the Processes from the lists in the tabs. The location can either be a single Station or an entire Line. A document may be assigned to one or many Processes and the operator will only be prompted with the document when that Process is loaded at the station.<br><br>A Process cannot be selected on it’s own. The Process must be select, and enabled, and the station must be selected to ensure the work instruction appears when a serial number arrives at the station. |

| Property | Description |
|---|---|
| | If a Process is selected then View Every Login should be false or the document will not be shown to a user when a serial number with this Process is loaded because the user will have seen the document already when they logged in. |
| Question | The question which will be displayed while the document is shown. |
| Required Response | The required response to the question. the question will appear until the operator selects the correct response. |
| Response Options | The possible responses to the question. |
| Start Date | The date on which the document will start to be displayed according to its schedule. |
| URL | The URL to an external item which will be displayed. Acknowledgments and level demotions only apply when the document is initially created. Documents that change at the URL source will not re-notify operators or affect operator levels.<br>For more information see: *"External Documents" on page 82* |
| View Every Login | If true, the operator will be required to view the document every time they login, regardless of how many times the operator has already viewed or acknowledged the document. |

# OPC Information

## OPCUA Namespace

OPCUA expects tags to be in a namespace. All tags are identified in PINpoint with the Tag Name, however the tag name is automatically prepended with **ns=2;s=** when used in a message to the OPCUA server. For example tag name **Tag1** changes to **ns=2;s=Tag1** .

Some OPCUA servers put tags in a different namespace. If a Tag Name in PINpoint starts with text like **ns=#;s=** then PINpoint will use the namespace specified. For example tag name **ns=3;s=Tag2** will not be modified when used in a message to the OPCUA server.

# Open Protocol Information

## Supported Open Protocol Tightening Errors

The following tightening errors are supported by PINpoint.

Tightening Errors Supported by PINpoint

| Error |
| --- |
| RundownAngleMinShutOff |
| TorqueMaxShutOff |
| AngleMaxShutOff |
| SelftapTorqueMaxShutOff |
| SelftapTorqueMinShutOff |
| PrevailTorqueMaxShutOff |
| PrevailTorqueMinShutOff |
| PrevailTorqueCompensateOverflow |
| CurrentMonitoringMaxShutOff |
| PostViewTorqueMinTorqueShutOff |
| PostViewTorqueMaxTorqueShutOff |
| PostViewTorqueAngleTooSmall |
| TriggerLost |
| TorqueLessThanTarget |
| ToolHot |
| MultistageAbort |

| Error |
|---|
| Rehit |
| DSMeasureFailed |
| CurrentLimitReached |
| EndTimeOutShutoff |
| RemoveFastenerLimitExceeded |
| DisableDrive |
| TransducerLost |
| TransducerShorted |
| TransducerCorrupt |
| SyncTimeout |
| DynamicCurrentMonitoringMin |
| DynamicCurrentMonitoringMax |
| AngleMaxMonitor |
| YieldNutOff |
| YieldTooFewSample |
| DriveDeactivated |
| ToolStall |
| DriveHot |
| GradientMonitoringHigh |
| GradientMonitoringLow |

| Error |
| --- |
| ReactionBarFailed |

## Supported Open Protocol MIDs

The data manager will only support certain open protocol messages. This is a list of all the supported MIDs which can be either sent or received by the Data Manager.

MID Messages Supported by PINpoint

| MID | Description |
| --- | --- |
| MID0001 | Communication start |
| MID0002 | Comm start acknowledge |
| MID0003 | Communication Stop |
| MID0004 | Command error |
| MID0005 | Command accepted |
| MID0008 | Application Data Message Subscribe. MT 6000 Tool Only. |
| MID0009 | Application Data Message Unsubscribe. MT 6000 Tool Only. |
| MID0014 | PSet selected Subscribe |
| MID0015 | PSet selected |
| MID0016 | PSet selected acknowledge |
| MID0017 | PSet selected unsubscribe |
| MID0018 | Select PSet |
| MID0030 | Job ID Upload Request |
| MID0031 | Job ID Upload Reply |

| MID | Description |
|---|---|
| MID0034 | Job Info Subscribe |
| MID0035 | Job Info |
| MID0036 | Job Info Acknowledge |
| MID0037 | Job Info Unsubscribe |
| MID0038 | Select Job |
| MID0039 | Job Restart |
| MID0042 | Disable tool |
| MID0043 | Enable tool |
| MID0060 | Last tightening result data subscribe |
| MID0061 | Last tightening result data |
| MID0062 | Last tightening result data ack |
| MID0063 | Last tightening result data unsubscribe |
| MID0070 | Alarm subscribe |
| MID0071 | Alarm |
| MID0072 | Alarm acknowledge |
| MID0073 | Alarm Unsubscribe |
| MID0074 | Alarm acknowledged on controller |
| MID0075 | Alarm acknowledged on controller ack |
| MID0076 | Alarm status |
| MID0077 | Alarm status ack |

| MID | Description |
| --- | --- |
| MID0100 | Multi spindle result subscribe |
| MID0101 | Multi spindle result |
| MID0102 | Multi spindle result ack |
| MID0103 | Multi spindle result unsubscribe |
| MID0113 | Identify the tool by Flashing. |
| MID0150 | sends an identifier to the controller to mark the next rundown that will occur |
| MID0216 | Relay function subscribe |
| MID0217 | Relay function |
| MID0218 | ack |
| MID0219 | unsubscribe |
| MID0220 | Digital input function subscribe |
| MID0221 | Digital input function |
| MID0222 | ack |
| MID0223 | unsubscribe |
| MID0224 | Set Digital Input Function. MT 6000 Tool Only. |
| MID0225 | Reset Digital Input Function. MT 6000 Tool Only. |
| MID0250 | Selector socket info subscribe |
| MID0251 | Selector socket info |
| MID0252 | Selector socket info ack |

| MID | Description |
|---|---|
| MID0253 | Selector socket info unsubscribe |
| MID0254 | Selector socket green lights. Revision 1 and 2. |
| MID0255 | Selector socket red lights. Revision 1 and 2. |
| MID1201 | Operation Result Overall Data. MT 6000 Tool Only. |
| MID1202 | Operation Result Overall Data. MT 6000 Tool Only. |
| MID9999 | Keep alive |

# Regular Expressions

Regular Expressions (a.k.a. regex) are used in scan operations to format and validate the data entered by a Serial barcode scanner or another device. This is intended to be a guide to using regular expressions with the pinpoint software. For an explanation of what regular expressions are and common arguments see the following links:

- An explanation of regular expressions: https://www.regular-expressions.info/quickstart.html

In the case of a scan operation the format method returns the first match from the input string and this match is then compared using the validation method. If the validation method finds a match then it is considered true. If both fields are left blank then whatever is input will simply be stored.

## Testing

Regular expressions should be tested on an Online resource such as https://regexr.com or https://regex101.com. When testing using an Online resource test with the PCRE version of regex to ensure that the regex being tested will behave correctly in the PINpoint system.

When testing check that the regex does not have any hidden characters. Hidden characters will show up when the regex is pasted into an Online resource. Hidden characters will not appear in PINpoint but they will be processed as if they are valid characters in the regular expression by the SmartScreen Client.

# Format Method

The format method field is intended to format the string from the input device and returns the first match found. This is optional.

This matches a string of characters without special characters.

[a-z,A-Z,0-9,\-,_]{1,}

## Comma Separated Values

This regular expression can be used where X is the amount of Values before the value desired and Y is the amount of values after. The last character in the string should not be ","

(?<=((.*)(\,)){X})(.*)(?=((\,)(.*)){Y})

Broken down it reads as follows: Find a string of characters that ends in a comma X amount of times and then continue to match a string of characters until a comma with a string of characters after it is found Y amount of times. It is basically a find after function joined with a find until function.

`(?<=((.*)(\,)){X})(.*)` Find "characters" until "," X amount of times then match "characters"

`(.*)(?=((\,)(.*)){Y})` Match "characters" until "," is found followed by "characters" Y amount of times.

### Examples

To match the 2nd value of the string:

Value 1,Value 2,Value 3,Value 4,Value 5

Expression:

(?<=((.*)(\,)){1})(.*)(?=((\,)(.*)){3})

Matches: Value 2

To match the 1st value of the string:

Value 1,Value 2,Value 3,Value 4,Value 5

Expression:

(?<=((.*)(\,)){0})(.*)(?=((\,)(.*)){4})

Matches: Value 1 (the last value can be found by swapping the numbers 0 and 4)

### Variations

If characters are separated by a tab or other character replace the "\," with that character. The expression below checks for a list separated by tabs.

(?<=((.*)(\t)){3})(.*)(?=((\t)(.*)){2})

### *Character Positions*

To match specific positions in a string use the same method as the Comma Separated Values but the total length of the string must be known and entered.

This regular expression can be used where X is the amount of characters before the string we want, Y is the length of the string we want, and Z is the length of characters after the string we want:

(?<=(.){X})(.){Y}(?=((.){Z}))

To match a specific location of the string:

1a2b3c4d5e6f7g8h9i0j

Expression:

(?<=(.){2})(.){3}(?=((.){15}))

Matches: 2b3

## Validation Methods

To check that an input string in a scan operation is correct users can write a regular expression into the Validation Method field. If a match is found it will be treated as true within smartbuild. If this field is blank then the data will simply be stored.

### *Text Validation*

To validate a simple string of text or numbers to ensure it matches a format some examples are listed below:

To validate a specific part number scan (34-1234)

34-1234

To validate one of the 2 specific part numbers "dog" or "elephant". The bar (|) means or

dog|elephant

To validate only three numeric digits are entered. Change the 3 in the express to match the length

^[0-9]{3}$

To validate only four alphanumeric characters.

^[0-9a-zA-Z]{4}$

To validate only five alphanumeric characters with a optional dash.

^[0-9a-zA-Z\-]{5}$

To validate at least two (or more) alphanumeric characters are entered.

^[0-9a-zA-Z]{2,}$

To validate any part number which is entered e.g. 23-2345 or 123-1234.

^[0-9a-zA-Z]{2,3}\-[0-9a-zA-Z]{4}$

### *Value Validation*

To validate a numerical value to ensure that it is within limits the range of numbers for each digit must be separate. each digit required a new or statement to validate it and this must also be mirrored after the decimal if one exists.

#### Ranges

To validate a number 0-9:

^([0-9])$

To validate a number 0-99 excluding 00:

^([0-9]|[1-9][0-9])$

To validate a number 0-999 excluding 00,000:

^([0-9]|[1-9][0-9]|[1-9][0-9][0-9])$

#### Decimals

To validate a number 0.00-99.99 excluding 00.00 but including 0.00:

^([0-9]|[1-9][0-9])\.([0-9]|[0-9][0-9])$

# Query Parameters

Query parameters can be sent by some operations. The query parameters are inserted into the text string and they are replaced by their values.

For example if the string is:

https://server/api/Location={StationName}&Serialnumber={SerialNumber}

Then the query parameters will be replaced when the string is used.

https://server/api/Location=Station1&Serialnumber=ABC123

Query Parameters List

| MID | Meaning |
|---|---|
| {SerialNumber} | The serial number currently loaded |
| {PartNumber} | The part number of the top level product of the serial number cur- |

| MID | Meaning |
|---|---|
| | rently loaded |
| {ChildPartNumber} | The part number of the child product of the serial number currently loaded |
| {StationName} | The station name |
| {LineName} | The line name |
| {OperatorUserName} | The user name of the operator |
| {*ContextualDataName*} | The contextual data name can be entered. This will use the value of the contextual data item. |

# Marker Operation Variables

The Marker Operation supports the following list of variables.

Marker Operation Variables List

| Keyword | Description |
|---|---|
| SERIALNUMBER | The current serial number at the station |
| PARTNUMBER | The current part number at the station |
| STATIONNAME | The name of the station |
| STATION ID | The internal station ID |
| LINEID | The internal Line ID |
| USERNAME | The current active user at the station |
| OPERATOR | The full name of the current active user at the station |
| OPERATORLASTNAME | The last name of the current active user at the station |

| Keyword | Description |
| --- | --- |
| OPERATORFIRSTNAME | The first name of the current active user at the station |
| DATETIME | The full current date and time |
| DATE | The current date |
| TIME | The current time |
| LCID | The language ID of the station |
| SUPERVISORLOGGEDIN | If a supervisor is logged in this will send true |
| SUPERVISOR | The full name of the current LCA |
| SUPERVISORLASTNAME | The last name of the current LCA |
| SUPERVISORFIRSTNAME | The first name of the current LCA |
| SUPERVISORUSERNAME | The username of the current LCA |

# Glossary

| Term | Description |
|---|---|
| Bill Of Materials | This is a feature which links Parts in a parent child relationship so that a user can create a Work Order Item by selecting one Parts and have the necessary amount of Sub Work Order Items automatically generated based on the requirements. |
| Build Item | An instance of a Work Order Item on a Route. A Build Item moves through a route. Each Build Item is unique. Build items are created on the route when a work order is provisioned based on the structure of the route. Build Items can have other build items related to them as children. |
| Contextual Data Item | An additional piece of information assigned to a Work Order Item. Contextual Data Items are related to Parts. When a Work Order Item is submitted the list of Parts determines which contextual data items in repository will be added to the Work Order Item. |
| Feature | When a Work Order Item has multiple Parts assigned to it the first part is the top level part and each additional Part is called a Feature. |
| Operation | A type of task the operator must perform such as Fastening or Scanning. Operations are added to steps in SmartBuild. |
| Part | An item which can be ordered for production on a route. Parts are linked to routes. Parts are linked to contextual data items. |
| Process | A collection of steps at stations. A Process has a Part list which determines if it is selected for a Work Order Item. When a build item is loaded at a station the Parts which are part of the work order item are used to determine which processes to load based on which processes have those parts in their parts list. |
| Product | The term Product refers to the physical workpiece, sometimes on a pallet, which moves around the assembly line. The detailed description of how that workpiece is being tracked by the system is more accurately described by other terms based on how the system is configured. For example if the **Product Present** OPC tag for a station becomes true it can indicate that a *build item* assigned to a *tracking ID* is physically present at the station. |
| Product Quality | The Product Quality summarizes the quality of the product. |

| Term | Description |
|---|---|
| | See: "Product Quality" on page 369 |
| Queue | A virtual list of Build Items. A Station must have an inbound Queue and an outbound Queue. |
| Route | A diagram of Stations and Queues which describes how Work Order Items should be built at Stations. A Route has Parts linked to it. A Route has a Serial Number Controller assigned to it. |
| Serial Number | A unique string used to identify a Work Order Item. |
| Serial Number Controller | An item used to determine the Serial Number for Work Order Items submitted to a route where the Serial Number is not submitted and must be generated by PINpoint system. |
| Station | A location where steps are performed to produce a Work Order Item. |
| Step / Process Step | A set of operations which must be performed. |
| Sub Work Order Item | A Work Order Item which is listed in under another Work Order Item. These are created in the work order when the Bill Of Materials feature is used. |
| Top Level Part | The first Part on a Work Order Item is called the Top Level Part. When the Work Order Item is listed the Serial Number and the Top Level Part will usually by shown. |
| Tracking ID | A value the PLC assigns to a carrier or pallet which physically moves the workpiece around the production line. The PLC tells the tracking manager where the tracking ID is and then the tracking manager commands SmartScreen to load the build item associated to that tracking ID. |
| Work Order | A list of Work Order Items which should be built and the date they should be released. A Work Order is identified by the Work Order Number. A Work Order has an overall status which indicates what stage of production it is in. |
| Work Order Item | An item which should be built on a Route and a list of Parts. A Work Order Item is identified by the Serial Number. A Work Order Item can have a list of contextual data items and values. A Work Order Item can have Sub Work Order Items associated to it. |