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PVA Portal

User Manual

Revision I

Precision Valve & Automation
6 Corporate Drive
Halfmoon, NY 12065

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Table of Contents

1. Introduction

Before operating this system, read the operation and setup manual. This will help the user to become familiar with the product and ensure successful operation.

If any questions or problems arise, contact PVA's Technical Support department.

1.1 PVA Contact Information

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1.2 Document History

Revision	Revision Date	Reason for Changes
REV I	January 2022	Screenshot and General Content Updates
REV H	September 2016	FIS Update
REV G	2016	Part Manager and Quick Fid, Portal Version 1.2.0
REV F	2016	UV Warning Update
REV E	2014	Portal Version 1.1.0
REV D	2013	New Template
REV C	2012	Grammar revised, Portal Version 1.0.7
REV B		Content Update
REV A		Initial Release

Note: All photographs and CAD model representations in this document are a "general representation" of the system and its components. The actual appearance of the system and its components can differ based upon customer specific configuration.

1.3 Safety

Certain warning symbols are affixed to the machine and correspond to notations in this manual. Before operating the system, identify these warning labels and read the notices described below. Not all labels may be used on any specific system.

Always wear approved safety glasses when operating or working near the workcell.

Before operating the system, read and understand the manuals provided with the unit.

Never put hands or tools in areas with this symbol when the machine is in operation. A dangerous condition may exist.

Read and understand the manuals provided with the unit before any repairs or maintenance is done. Only a qualified individual should do service.

Use caution when there are pressurized vessels. Find and repair any leaks immediately. Always wear appropriate safety equipment when working with pressurized vessels or vessels that contain chemicals

Shear hazard from moving parts. Avoid contact.

Do not remove protective guarding.

In situations where inattention could cause either personal injury or damage to equipment, a warning notice is used.

Do not smoke near the machine. Always have a fire extinguisher available for emergency use.

Before performing any repairs or maintenance to the system, turn off power and lock out the power disconnect switch.

Warning notices are used to emphasize that hazardous voltages, current, temperatures, or other conditions that could cause personal injury exist in this equipment or may be associated with its use. Only qualified personnel should enter areas designated with this symbol.

Laser light source present. Do not stare directly into the beam. Do not use in the presence of highly reflective surfaces

Pinch hazard from moving parts. Avoid contact.

Hot surface. Avoid contact.

Warning, Ultraviolet (UV) light hazard. Do not look directly at the UV light source.

This product meets EU standards for health, safety, and environmental protection.

Warning, no open flames.

Electrostatic sensitive device warning. Observe precautions for handling.

1.4 System Description

The manual applies to the following Precision Valve & Automation, Inc. workcells:

PVA350™	PVA6000™
PVA650™	Delta 6
PVA2000™	Delta 8
PVA3000™	Flex Cell

The dispense path and active heads are controlled by a program stored in the motion controller. The motion controller can save up to 30 programs at one time.

The operator controls the workcell with PVA Portal software. This includes machine setup, manual operation, program selection, and automatic operation. Machine status and error messages are shown in the program window and the light tower. The operator(s) must have read this manual or have been trained and understand the operation of the machine.

Any uses that are not approved could result in dangerous conditions that the safety features on the system cannot prevent.

1.5 Personal Protective Equipment

Workcell operation includes air pressure, electrical power, mechanical devices, and the use of hazardous materials. Only qualified personnel can operate and service workcells.

Operators must use eye protection because material contents are under pressure. Always wear gloves when handling materials and solvents. Refer to MSDS sheets on the material that is used for other precautions.

1.6 PVA Portal Computer Requirements

Portal requires an Intel® Core i5 processor or equivalent processor with 4 Gigabytes of RAM, 2 Gigabytes free hard drive space and Windows® 10 LTSB OS (64 bit) or newer. The computer must also have:

- (2) Ethernet adapters
- (1) RS232 serial communications port
- 17" monitor with 1280 x 1024 resolution
- Mouse (USB)
- Keyboard (USB) with a touch pad if used with a PVA monitor mount
- Keyboard extension cable, 6'
- Mouse extension cable, 6'
- Monitor cable, 15' (Display port or DVI)
- Display port or DVI video support (VGA cannot be used)

Note: Portal may not work correctly with systems that do not meet these minimum requirements.

1.6.1 Galil Controller Requirements

Galil controller minimum of DMC-4000 or newer. Due to the custom Galil firmware, controller replacements must be purchased from PVA.

1.6.2 Security Software

Some security software packages and firewalls can interfere with PVA system software. PVA software uses Ethernet ports 23, 60007, and 502 by default. Security software and firewalls must be configured to allow traffic on these ports.

1.7 Operator Skills

The operator must have basic computer skills and be familiar with the Windows® 10 operating system.

2. Installation and Recovery

Before operating a tool, workcell, or program a path, know the tool and workcell components and the steps to program a path. Workcells from PVA will come with the current version of Portal installed. Refer to the installation guide for more information.

Note: Restart the computer after installing Portal or Portal Shell.

2.1 Install Portal Shell or Portal

1. Insert the USB flash drive, or access the electronic file provided by PVA for the workcell.
2. Navigate to the software file named with the correct portal version and build.

Note: The folder will be named according to the Portal version and build.

3. Run 'PVAPortal_Setup.exe' and follow the instructions on the screen.

Note: Install the software in its default directory (c:\Program Files\PVA for 32 bit systems OR c:\Program Files (x86)\PVA for 64 bit systems).

2.2 Backup Portal

To backup Portal, copy and save the entire contents of the 'C:\Program Files\PVAPortal\Config' and 'C:\Program Files\PVAPortal\Lib' directories.

2.3 Restoring Portal

To restore Portal, perform the installation process and then paste the backup 'Lib' and 'Config' folders into the 'C:\Program Files\PVAPortal' directory.

3. System Overview

3.1 Software

The complete Portal software package has several components. Every operator must understand what each piece of software is and its function before operating the workcell.

3.1.1 Portal

Portal is the main user interface that allows the user to interact with the workcell. It sets the mode the workcell is operating in, allows the operator to monitor each system of the workcell, allows the operator to select different PathMaster® routines, and conveys system messages to the user.

3.1.2 PathMaster®

PathMaster® is PVA's Windows®-based programming software. It is used to create, maintain and download project files for the workcell. Refer to the PathMaster® manual for more information.

3.2 Teach Pendant

PVA workcells come with a teach pendant. Each teach pendant has a **Trackball**, **Teach** button, **Purge** button, **Axis** selection button, and **LED** indicators for the selected axes and teach function.

Figure 1: Teach Pendant

The **X**, **Y**, **Z**, and **W LEDs** show the selected axis configuration. The **Teach LED** shows a position was correctly recorded by PathMaster®. The light tower buzzer will “beep” when the **Teach LED** illuminates.

Note: The W-axis trackball control is locked if the Teach Tool is enabled, unless the PathMaster® Tool Offset window is open (Setup-> Machine Parameters-> “Tool Offsets”). This ensures the operator does not accidentally teach a theta position with the teach tool. This function can also be enabled or disabled in Setup mode (for more information refer to Figure 48). When teaching with a device that is not the camera, the theta position will be taught.

If a vision system is being used, the speed of the trackball can be changed by performing the following steps.

1. Push and hold the “**Axis**” button for three seconds.
2. The red teach light will illuminate and the trackball function will move 10x slower.
3. Repeat these steps to change the speed back to normal.

4. Portal Shell Overview

Portal Shell provides the operator with access to general setup of the workcell. It provides an interface to launch any software needed to interact with the workcell.

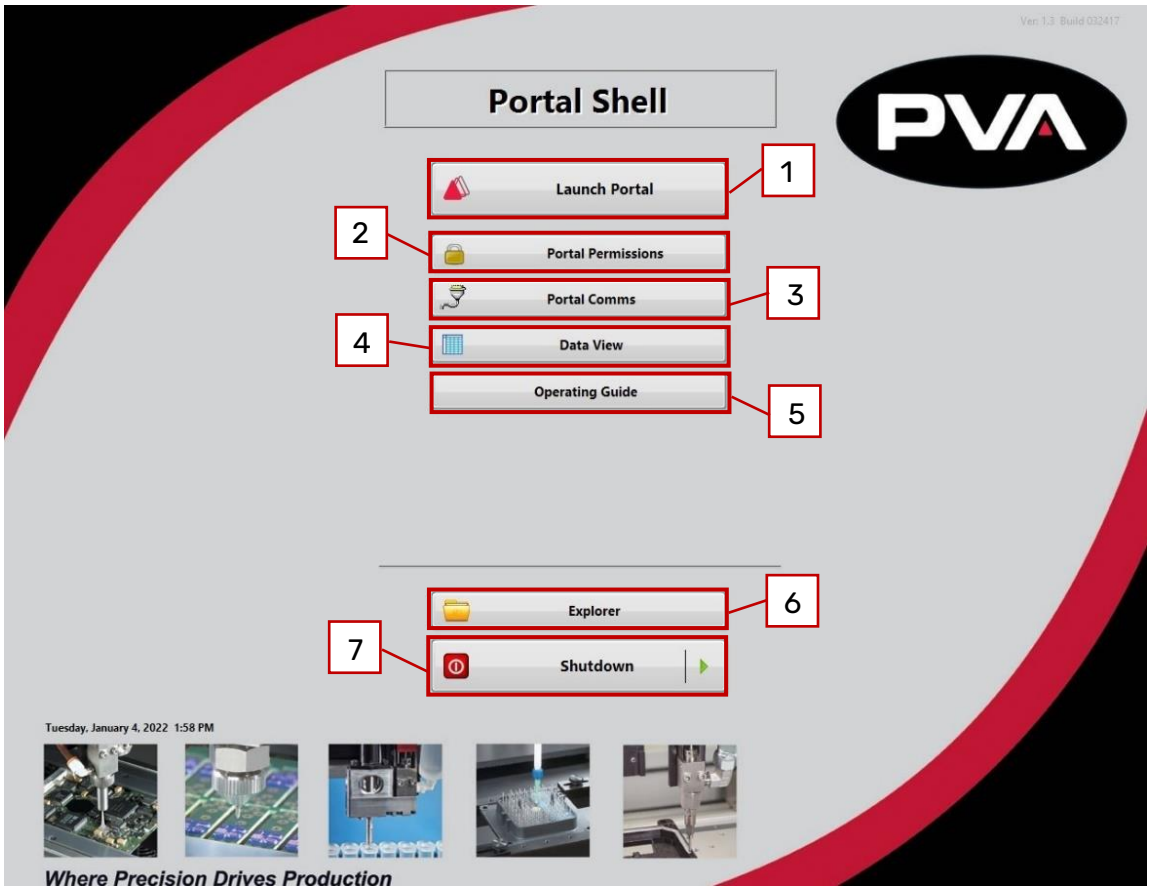

Figure 2: Portal Shell Overview

1. Select **"Launch Portal"** to start the Portal software and operate the workcell through the Portal window. Refer to Section 5 for more information.

2. Select "**Portal Permissions**" to start the Portal Permissions software. This opens the options to adjust user access. Refer to Section 11 for more information.

3. Select "**Portal Comms**" to open the Portal Comms software, allowing the operator to adjust the Galil communication settings. Refer to Section 12 for more information.

4. Selecting "**Data View**" will allow the operator to view any logged data. Refer to Section 13 for more information.

5. Select "**Operating Guide**" to view the PVA Portal User Manual.

6. Selecting "**Explorer**" will open Windows® explorer, allowing the operator to navigate the folders located on the computer.

7. Selecting "**Shutdown**" will shut down the computer.

The number of options available on the Portal Shell depends on the machine configuration. Refer to machine specific manuals for more information.

4.1.1 Portal Shell Keyboard Shortcuts

Note: It is not necessary to exit Portal Shell for normal operation, this is a maintenance feature.

Keys	Action
F1	Keyboard Shortcut Help
Ctrl + Shift + F12	Exit Portal Shell Application
Ctrl + Shift + D	Launch Windows® Desktop
Ctrl + Shift + W	Launch Desktop Then Exit Portal Shell Application

5. Portal Overview

The **Portal** screen has several components. Understanding the sections of the Portal screen will ensure successful navigation of the Portal program.

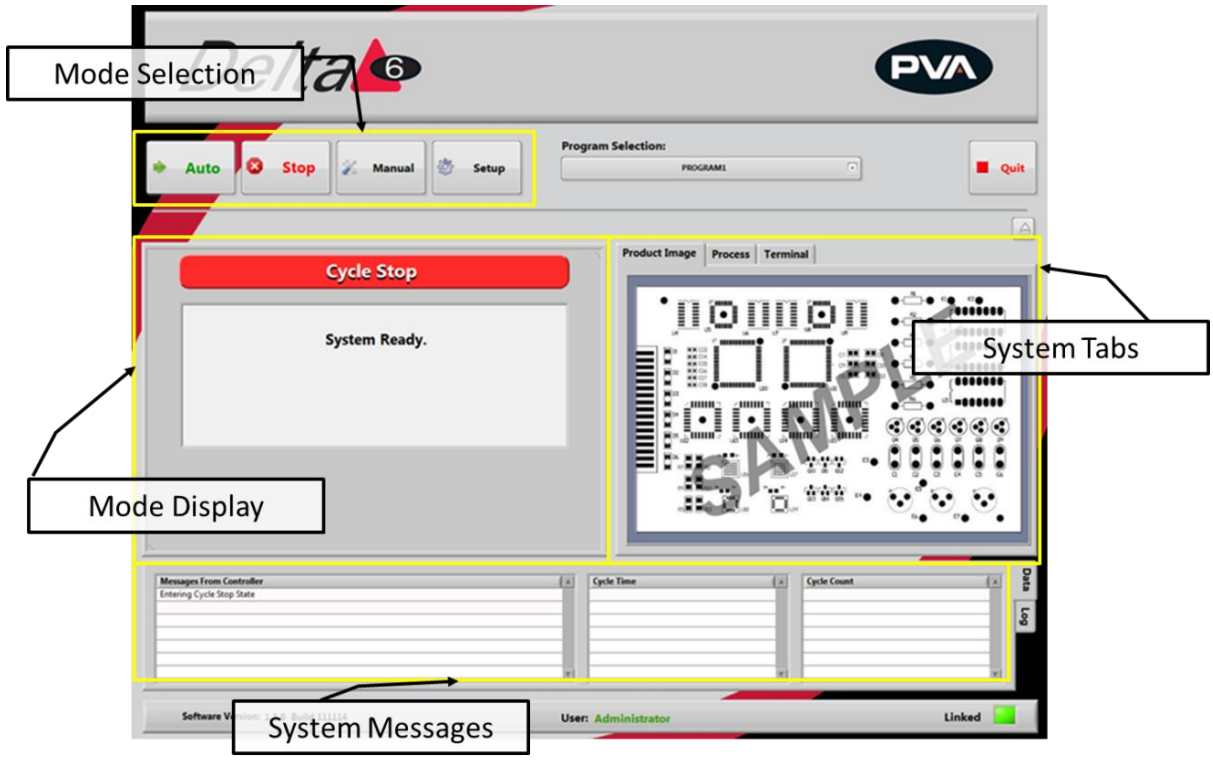

Figure 3: Portal Screen Overview

- Select the desired mode from the mode selection area.

Note: Cycle Stop mode must be selected in order to change to a new mode.

- Upon selecting a mode, the options for that mode will be shown in the mode display section of the screen.

- The **System Tabs** section of the screen remains the same no matter what mode is selected. This section of the screen contains the terminal used to communicate with the controller. The **Terminal** is used as a debug tool.

5.1 Cycle Stop Interface

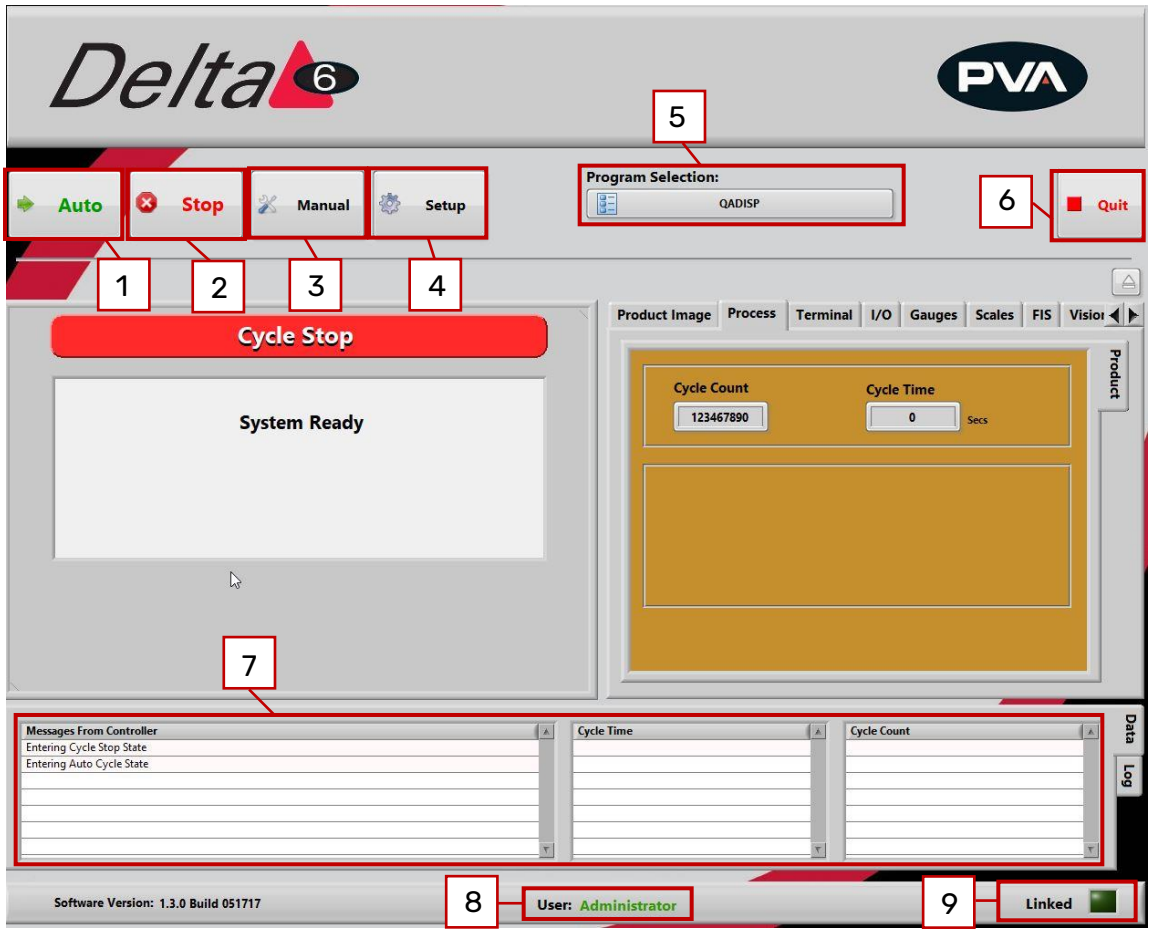

Figure 4: Cycle Stop Interface

After logging in, select "**Continue**". Portal will open in **Cycle Stop** mode, which is the default mode for the workcell. All other modes and options can be accessed from this mode with the buttons shown.

1. Select the "**Auto**" button to operate the machine in **Auto Cycle**. Refer to Section 7 for more information.

2. Select the "**Stop**" button to go to **Cycle Stop** mode from any other mode. Refer to Section 5.1 for more information.

3. Select the "**Manual**" button to operate the machine manually. Refer to Section 6 for more information.

4. Select "**Setup**" to see or change the setup functions of the machine. Refer to Section 8 for more information.

Note: To change from one mode to another, the "Stop" button must be selected. For example, to go from Manual mode to Auto Cycle mode select the "Stop" button and then select the "Auto" button. The Cycle Stop mode must be selected to shut down Portal.

5. Select the desired program to use while in **Auto Mode** from the **Program Selection** dropdown menu. Refer to Section **Error! Reference source not found.** for more information.

6. Select the "**Quit**" button to shut down Portal.

7. All system messages will be shown in the **Messages From Controller** window.

8. To change the **User**, select **Cycle Stop** and select the **User** at the bottom of the window.

Figure 5: User Options

9. The **Linked** display shows the machine status. This indicator will blink while the PC is connected to the workcell, but NOT while the machine is in an error state.

Figure 6: Linked Display

5.2 Program Selection

The active program can be changed at any time with the **Program Selection** drop-down menu. Refer to Sections 14.1 and 14.2 for more information.

6. Manual Mode

The options shown in Portal depend on the workcell configuration. Refer to machine specific manuals and appendices for more information.

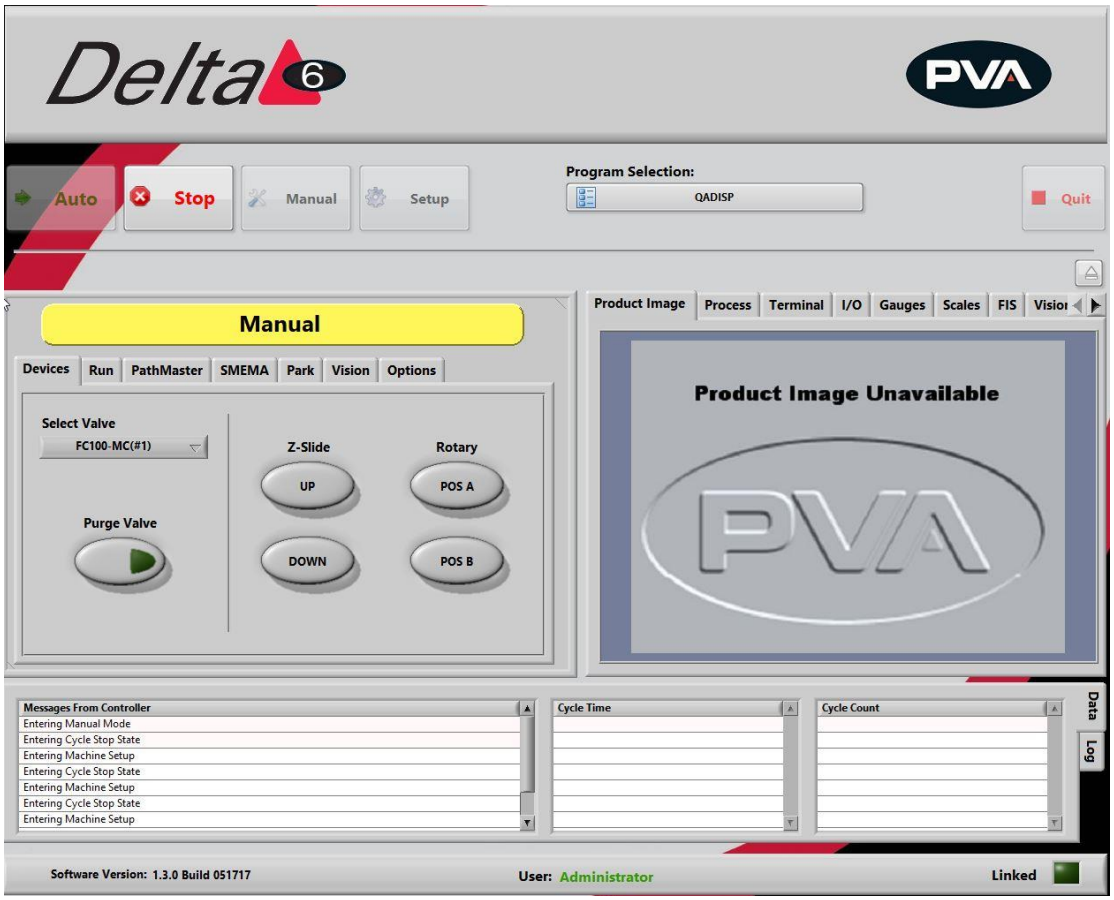

Figure 7: Manual Mode

In **Manual** mode, the operator has manual control of all devices on the workcell. There are tabs in **Manual** mode that are used for different Portal functions. A trackball can be used to move the axes, operate the devices, and teach positions to PathMaster®. Only qualified personnel should operate the machine in **Manual** mode.

Paths can be programmed with the PathMaster® software when in **Manual** mode in Portal. For more information refer to the separate PathMaster® manual.

To leave **Manual** mode and return to **Cycle Stop**, select the "**Stop**" button.

The options that most workcells have are shown in the following sections.

6.1 Device Selection

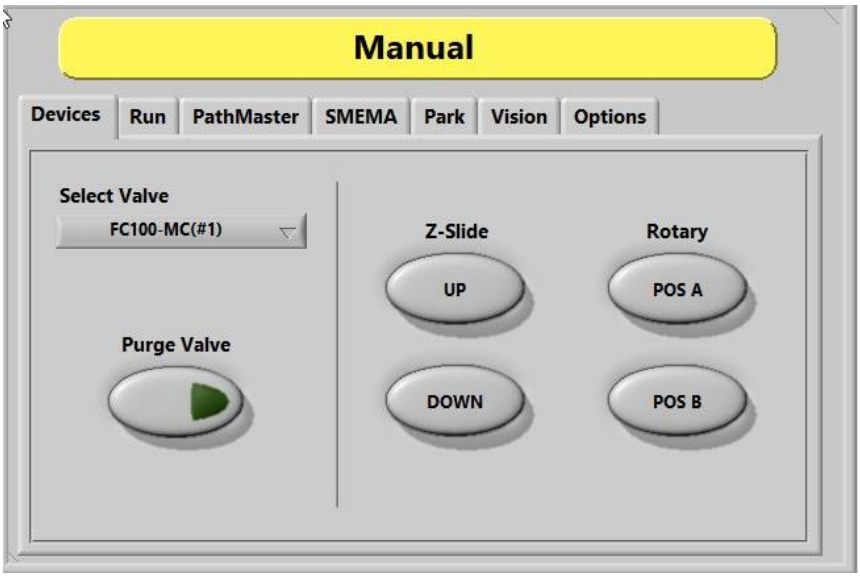

Figure 8: Devices Tab

Workcells with devices have a **Device Selection** mode. Select the active head or valve from the drop-down menu under the "**Devices**" tab. The pneumatic Z-slide(s) and rotary(s), if equipped, can be operated with the applicable buttons.

Note: When programming or operating the workcell, do not use the valve to move components or boards. PVA is not responsible for damages caused from operating the valves incorrectly.

1. Select the "**Devices**" tab.
2. Select a device or valve from the **Select Valve** drop down menu.
3. Select the "**Purge**" button to operate the valve selected. The valve will purge until the "**Purge**" button is released so that it is no longer selected.
4. Select the **Z-Slide** - "**UP**" or "**Down**" buttons to raise or lower the pneumatic Z-slide for the active head.
5. Select the **Rotary** - "**POS A**" or "**POS B**" buttons to put the rotary in the home position (Default, A) or the auxiliary position (B).

6.2 Run Mode

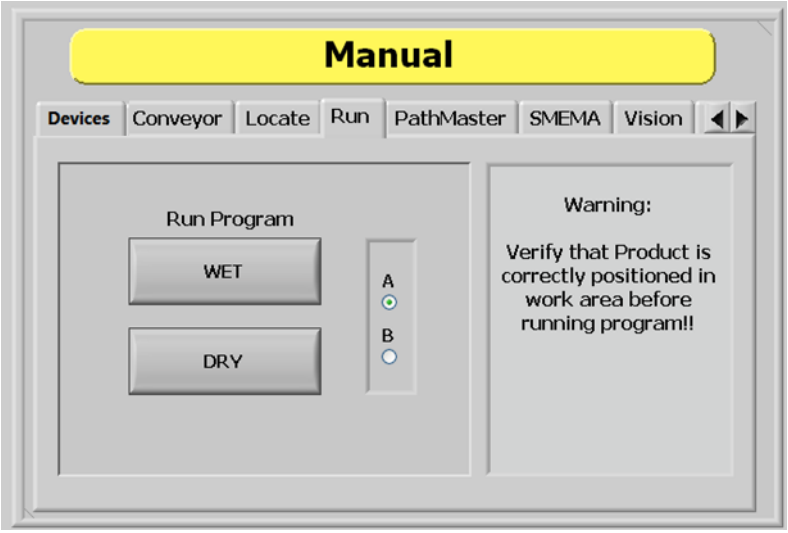

Figure 9: Run Tab

Run mode allows testing of a downloaded path program for a single cycle. The path can be run as "**WET**" or "**DRY**". Ensure that the part is in the correct position inside the workcell before the path is run or the results will not be accurate and could damage the workcell.

1. Select the "**Run**" tab.
2. Select the "**A**" or "**B**" radio button to select which side will run. Select the "**A**" radio button for the left side program select drop down or the "**B**" radio button for right side program select drop down.
3. Select the **Run Program** - **"WET**" button to run the selected program with the valves turned on.
4. Select the **Run Program** - "**DRY**" button to run the selected program with the valves turned off. If this button is selected, the valves will move but they will not dispense.

Note: Confirm the correct program is selected from the Program Selection drop down menu. Ensure the part is correctly installed and all board stops and locators are in the correct position to prevent a crash.

6.3 PathMaster®

The PathMaster tab contains a button that launches the included PathMaster® software.

Figure 10: Launch PathMaster® from Manual Mode

1. Select the **PathMaster** tab.

2. Select the "**Run PathMaster**" button to open the software. The PathMaster® window will open below the Portal screen.

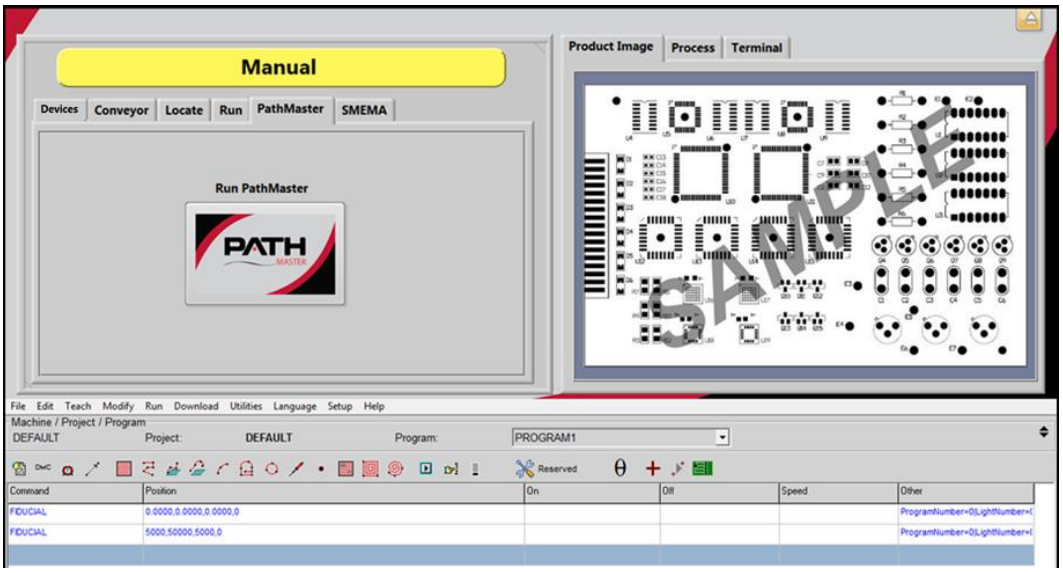

Figure 11: PathMaster® Open in Manual Mode of Portal

6.4 SMEMA Status

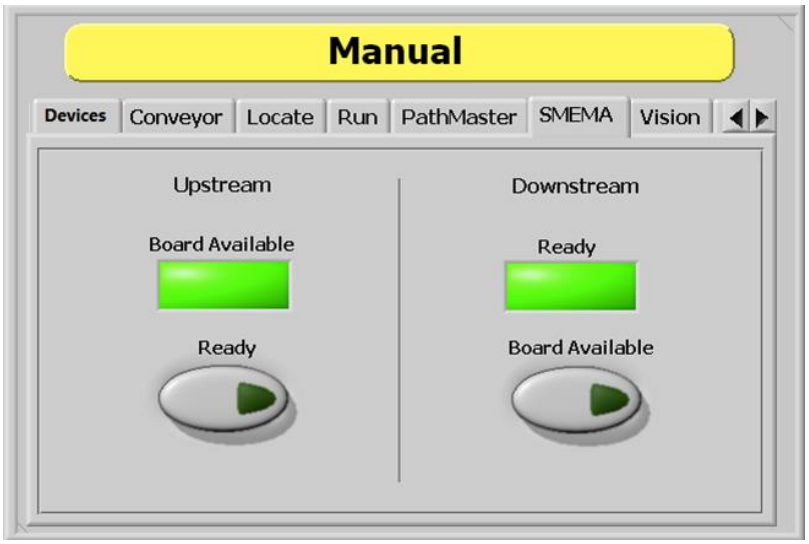

Figure 12: SMEMA Status

When the workcell is put in-line, the SMEMA signals communicate with the upstream and downstream machines. Under the "**SMEMA**" tab, inputs to the workcell can be checked and the **Upstream Ready** and **Downstream Board Available** output signals can be changed.

1. Select the "**SMEMA**" tab.

Note: The Upstream "Board Available" signal turns on when the upstream machine sends a board available signal.

2. Select the **Upstream** - "**Ready**" button to toggle the **Ready** output to the upstream machine on or off. When turned on, the workcell can receive parts.

Note: The Downstream "Ready" signal turns on when the downstream machine sends a ready signal.

3. Select the **Downstream** - "**Board Available**" button to toggle the **Board Available** output to the downstream machine on or off. When turned on, the workcell can send parts.

6.5 Park

The **Manual** mode **Park** tab allows the user to place the gantry/head/valve(s) into a predefined **Park Position**. The positions are taught prior to shipment and can be retaught in **Setup Mode** under the **Positions** tab, if needed. The most common **Park Positions** are **Standby**, **Purge**, and **Solvent**.

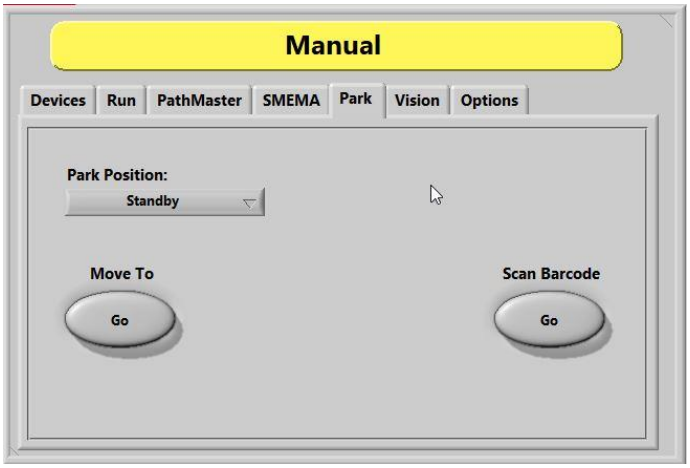

Figure 13: Park Position Options

To place the head into a **Park Position**:

1. Navigate to the **Park Position** drop down list.
2. From the list, select the desired position – **Standby**, **Purge**, or **Solvent**.

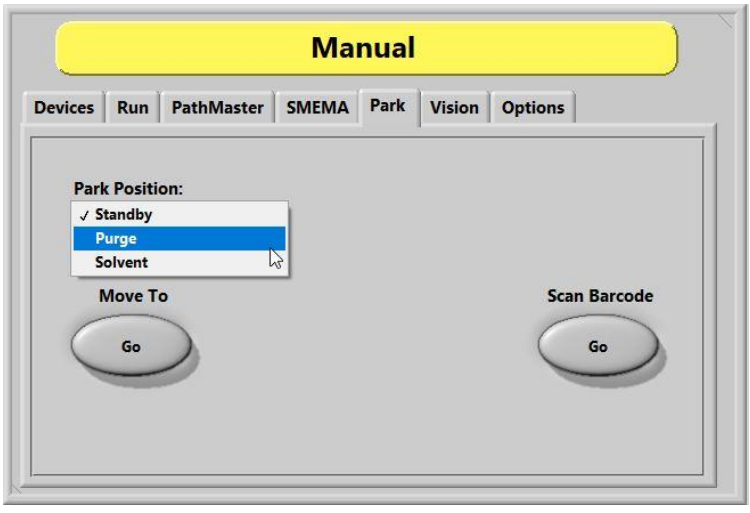

Figure 14: Choosing a Park Position Option

3. Select/press the **Move To –** "**Go**" button.

6.6 Vision

For more information on vision and fiducials, refer to the Vision manual.

6.6.1 Vision Window

Shown below is the standard **Vision Window**. To access the **Vision Window**, select the **Vision** tab from the **System** tab section of the screen.

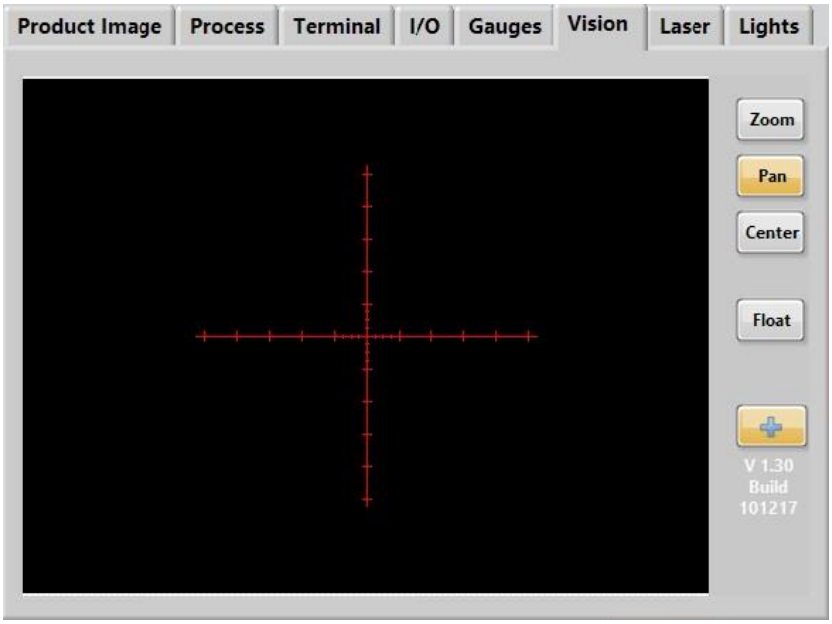

Figure 15: Vision Window

- Select the "**Zoom**" button to zoom in or increase the size of the image on the screen. This option is available for both static and live images.
- Select the "**Pan**" button to move across the zoomed image.
- Select the "**Center**" button to resize the image to its original size and align it with the center of the screen.
- Select the "**+**" (Crosshair) button to toggle the crosshair overlay on and off. This option is available for both static and live images.
- Select the "**Float**" button to open up a floating vision window that stays on top of the Portal window.

6.6.2 Manual Mode Vision Window

The **Vision Window** in **Manual** mode is used to set inspection attributes, create new fiducials from a template, and edit and test inspections.

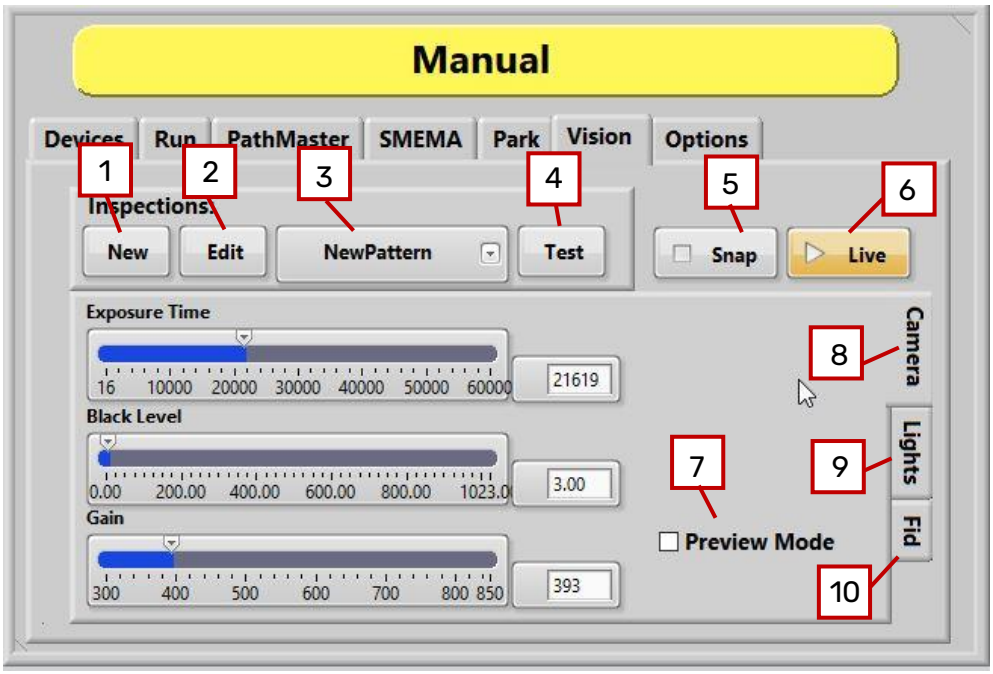

Figure 16: Vision Tab

1. Select the "**New**" button to create a new inspection from a list of templates.
2. Select the "**Edit**" button to take the current image and open NI Vision Builder to edit the steps of the current inspection.
3. Select the **New Pattern** drop down menu to create a new pattern.
4. Select the "**Test**" button to take the current image and run the current inspection.
5. Select the "**Snap**" button to save the current live image.
6. Select the "**Live**" button to toggle the camera live mode on and off.
7. Select the "**Preview Mode**" checkbox to toggle the preview mode on and off.

Figure 17: Preview Mode Toggled On

8. Select the "**Camera**" tab to set the camera attributes related to the current inspection. In this tab, the shutter speed, brightness, and gain can also be adjusted.

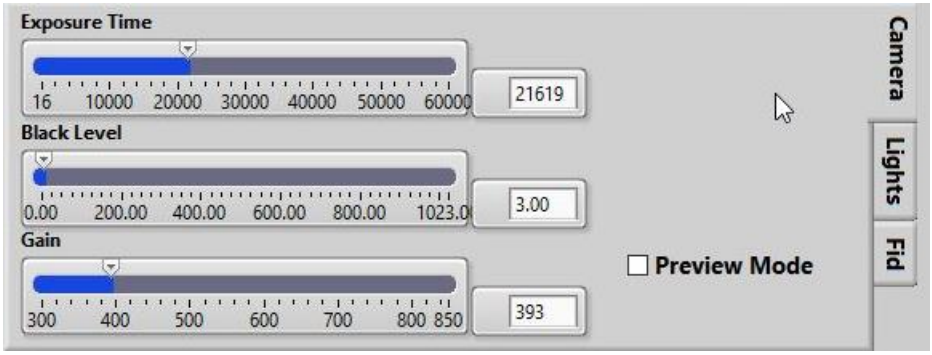

Figure 18: Camera Tab Options

Note: The selected program is updated as soon as image adjustments are changed for shutter speed, brightness, and gain.

9. Select the "**Lights**" tab to toggle the selected light on and off. This is a manual only function that does not change on the automated inspection. Within the **Lights** drop down menu, the FID Light color can be changed to blue, red, green, purple, or white.

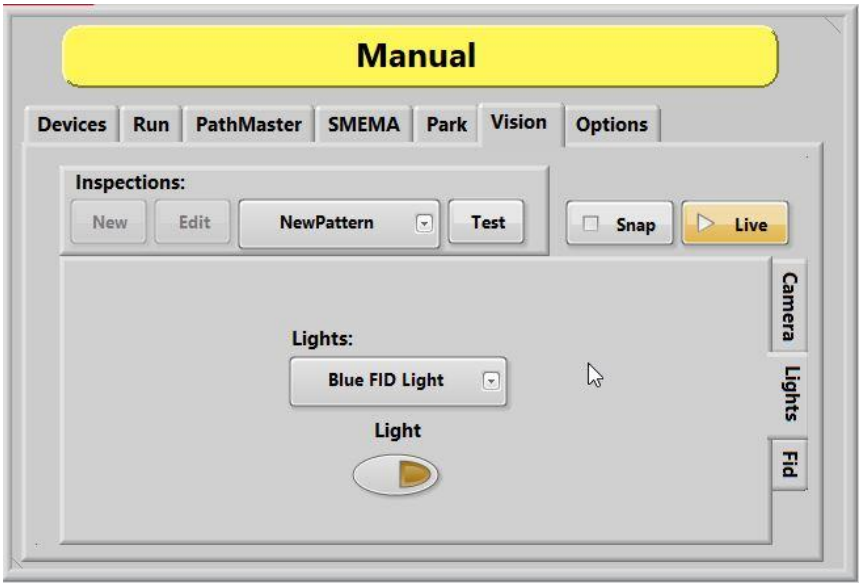

Figure 19: Lights Tab

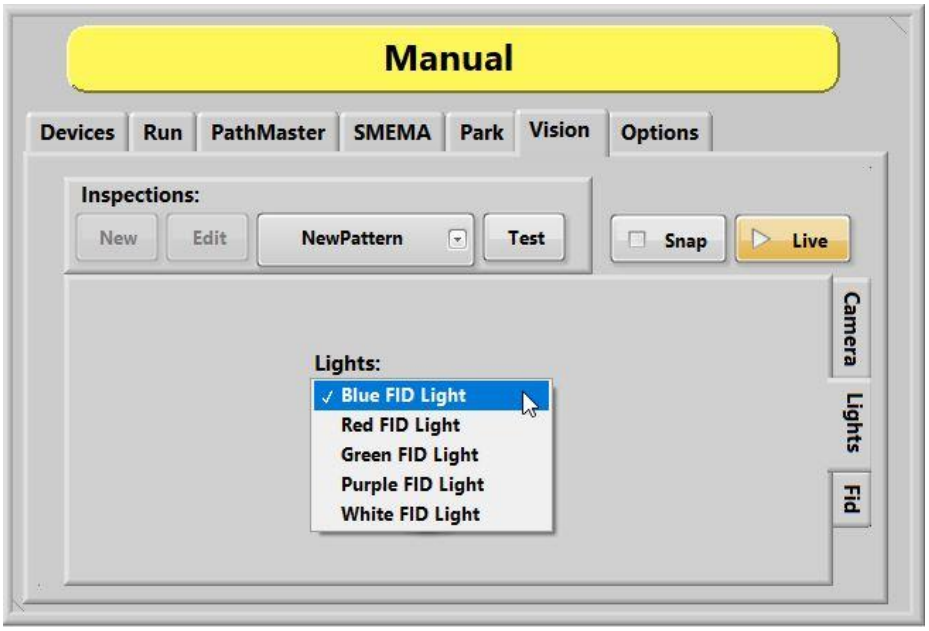

Figure 20: FID Light Options

10. Select the "**Fid Tab**" to set the tolerance for the B fiducial for the current inspection.

Note: An inspection can be used for an A or B fiducial or general inspection type. Fiducial tolerance is the radial tolerance from nominal for a fiducial B type inspection. Refer to the PathMaster® Vision manual for more information.

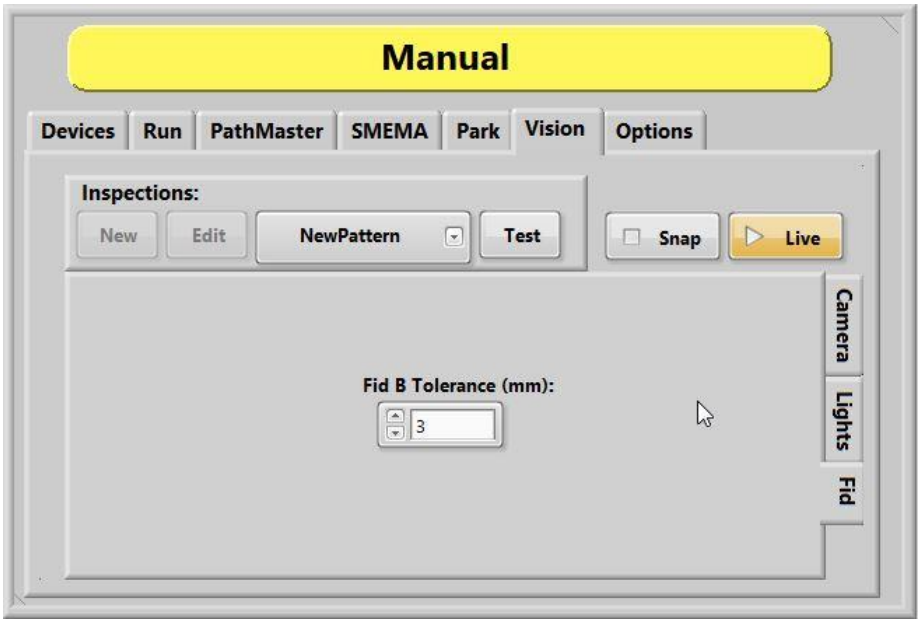

Figure 21: Manual Vision, FID

6.6.3 Quick FID Inspection

Quick Fid Inspection is an optional application in Portal. This option must be enabled to use the following functions. This application provides the use of fiducials without the ability to do inspections.

6.6.3.1 Create a New Inspection

1. Uncheck the "**Preview Mode**" box. Changes to **Inspections** cannot be made in **Preview Mode**. Changes made to the **Camera** attributes in **Preview Mode** do not change the current inspection and are discarded.

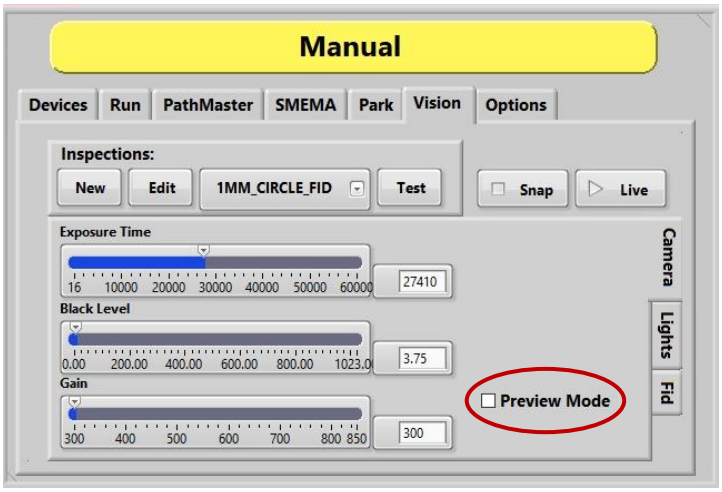

Figure 22: Quick Fids

2. Under **Inspections**, select the "**New**" button.
3. Select the "**Quick Fid**" inspection template from the dropdown menu.
4. Select the "**OK**" button.

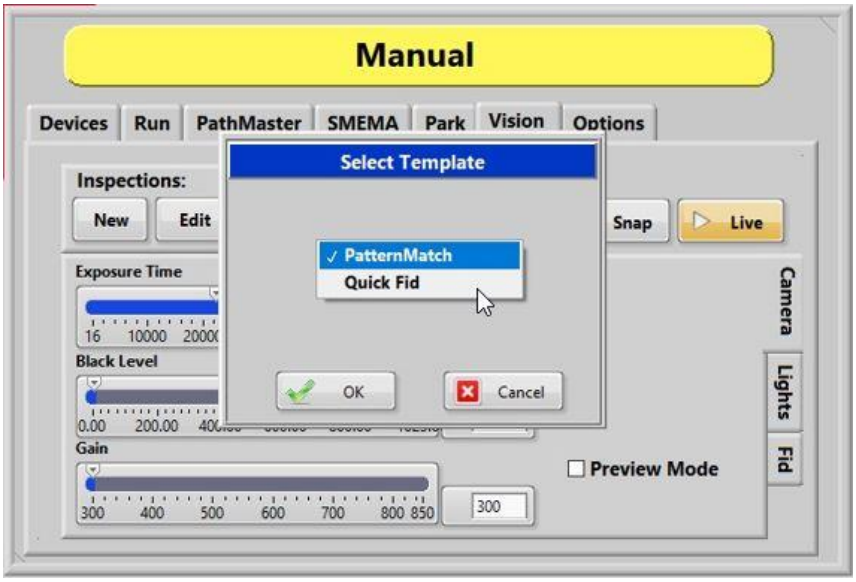

Figure 23: Selecting a Quick Fid Template

5. Give the **Quick Fid** inspection a unique name and then click the "**OK**" button.

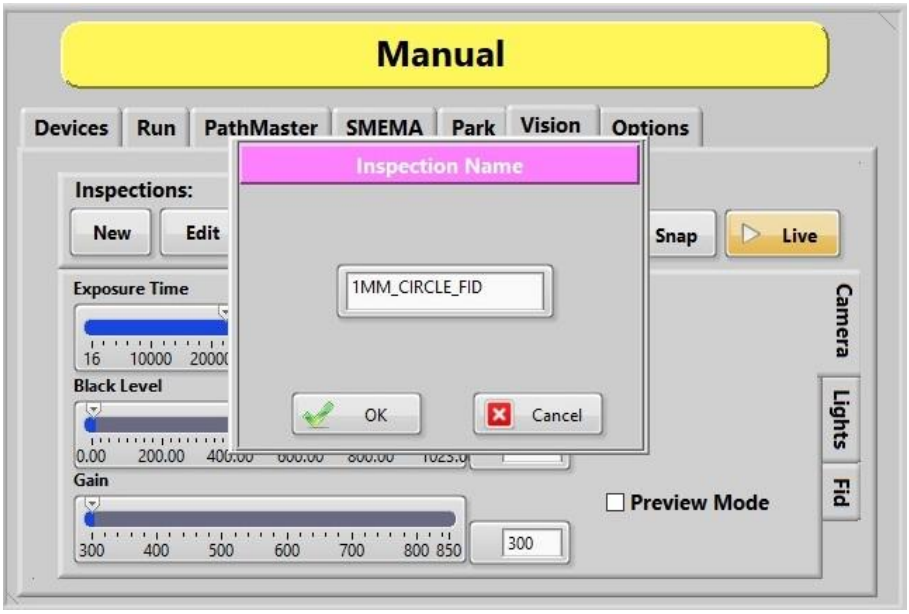

Figure 24: Changing the Inspection Name

6. The new **Quick Fid** inspection has been created.

6.6.3.2 Editing Inspections

1. To edit a **Quick Fid** inspection, click the "**Edit**" button.
2. Select the rectangle tool and draw a rectangle around the fiducial template.
3. Select the "**OK**" button to save the changes.
4. Select the "**Cancel**" button to exit and discard any changes.

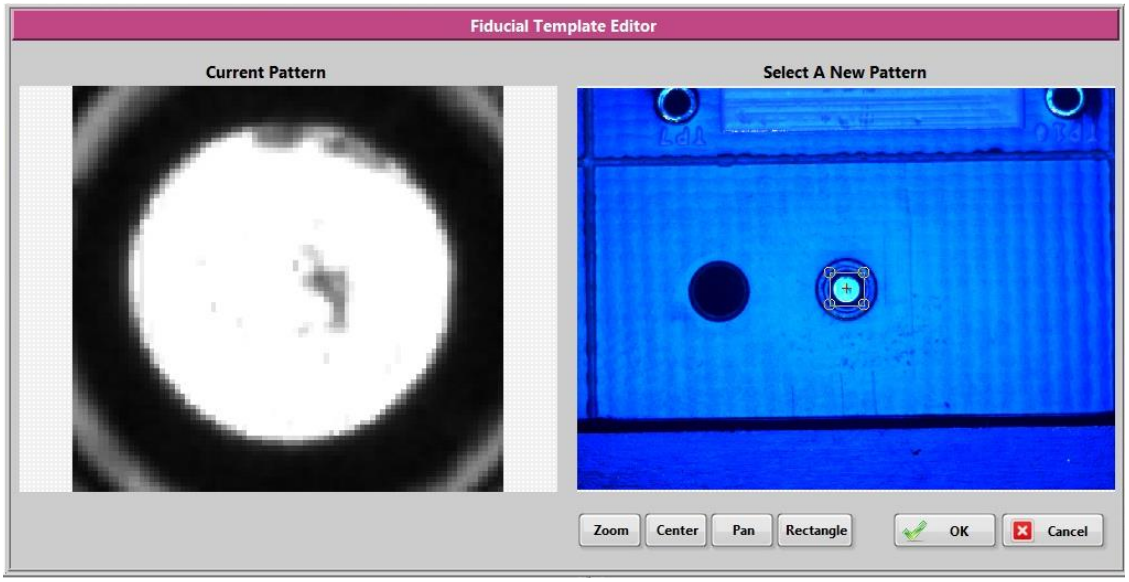

Figure 25: Fiducial Template Editor

6.6.3.3 Preview Mode

In **Preview Mode**, settings adjustments and their effects can be viewed without saving any changes.

1. Ensure the **Preview Mode** box is checked.

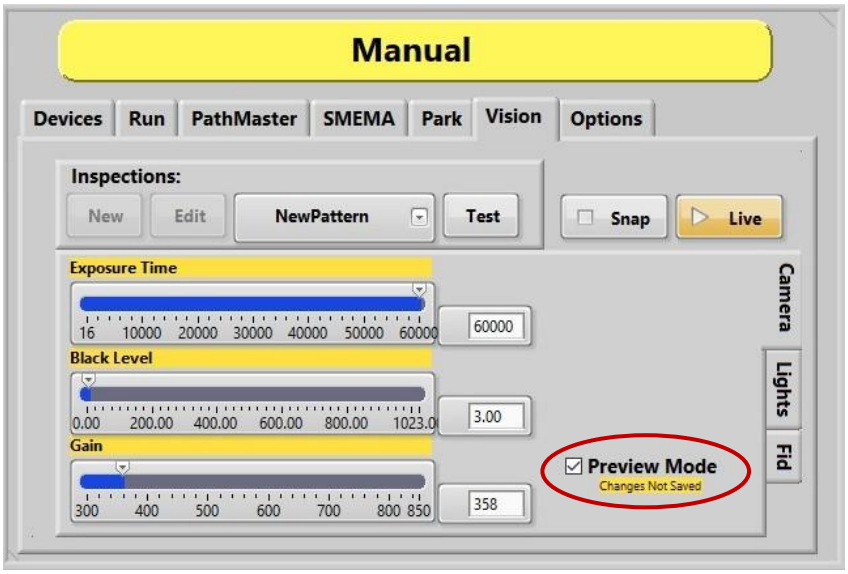

Figure 26: Preview Mode

2. Adjust the **Shutter Speed**, **Brightness**, and **Gains** settings to see how they affect the image on the right.

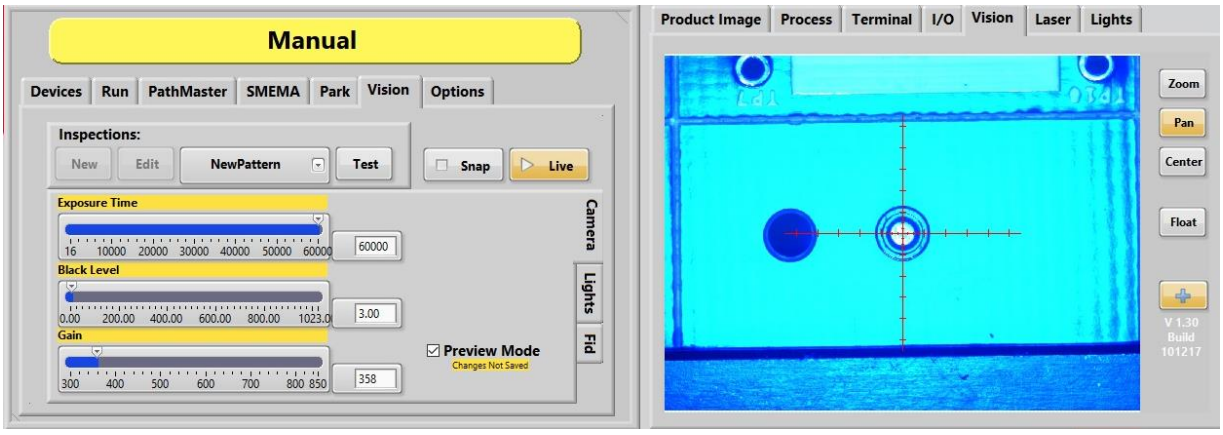

Figure 27: Viewing Setting Adjustments in Preview Mode

6.7 Conveyor Controls

Figure 28: Conveyor Controls

The conveyor and the board stops are controlled in the "**Conv. Controls**" tab found under the "**Options**" tab. These options allow the operator to adjust the position of the boards in the workcell.

Note: Only workcells with conveyors will have this option.

1. Select the "**Options**" tab and then the "**Conv. Controls**" tab.
2. Select the "**Conv. Forward**" button to move the conveyor forward.
3. Select the "**Conv. Reverse**" button to reverse the conveyor direction.

Note: This option is only available on bi-directional systems.

4. Select the "**Board Stop 1**" button to turn the board stops on or off.
5. Select the "**Board Stop 2**" button to turn the board stops on or off. **Board Stop 2** operates the upstream board stops for bi-directional systems. This feature can also be for any additional stops like a buffer, queue zone, or conveyor.
6. Select the "**Locators**" button to move the locators to the up or down position.

Note: This is an optional feature for workcells with pneumatic-powered board locators. Only workcells with board locators will have this option. If this feature is present, the operator can move the board locators to the up and down positions.

6.8 FIS

The PVA integrated **Factory Information System** (**FIS**) is an optional add-on. It is configurable and will interface with the majority of factory information systems. If necessary, its messages can be customized.

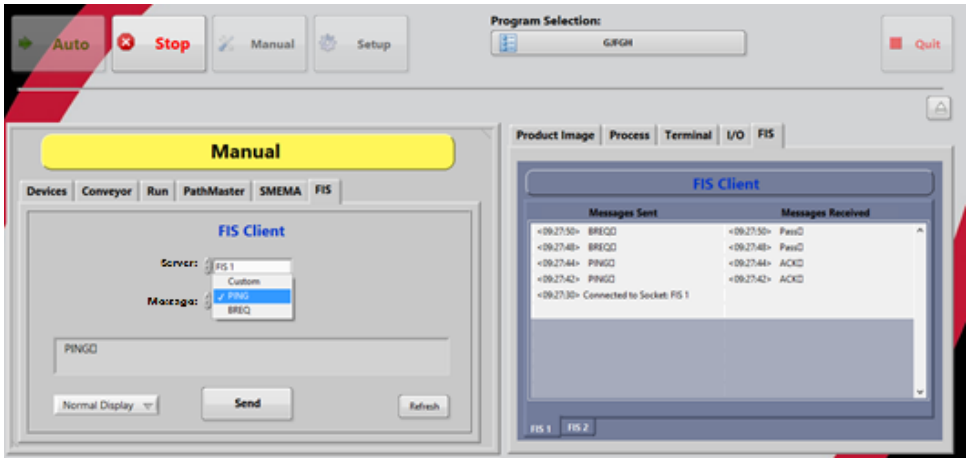

Figure 29: FIS Client Mode and Message Screens

6.8.1 FIS Client Mode Screen

1. The **FIS Client** mode screen can be seen in **Manual** mode when the **FIS** tab is selected.

2. To change the display format, select an option from the **Display** drop down menu (Normal, '\' Code, Hex Code).

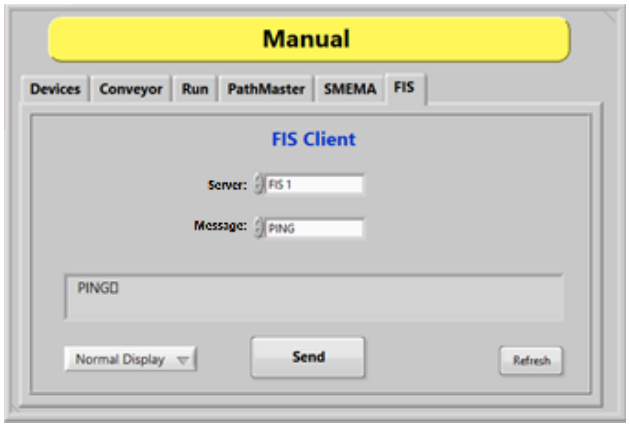

Figure 30: FIS Client Mode Screen

3. Select the **Server** drop down menu to select the server for which to send a message. The server list is specific to each workcell.

4. Select the message to send from the **Message** drop down menu. The message will be shown in the message box.

5. If the **Custom Message** option is selected from the **Message** menu, the message window can be edited. To edit the message window, use the keyboard and type the message exactly as it should be received by the server.

6. Select the "**Clear**" button to clear the custom message. The "**Clear**" button is only available for custom messages.

7. After selecting or typing the message, select the "**Send**" button to send the message.

8. Select the "**Refresh**" button to refresh any dynamic data in the message, such as a Galil variable. The "**Refresh**" button is not shown for custom messages.

6.8.2 FIS Client Message Screen

1. To see the **FIS Client** message screen, select the **FIS** tab from the **Systems** tab.

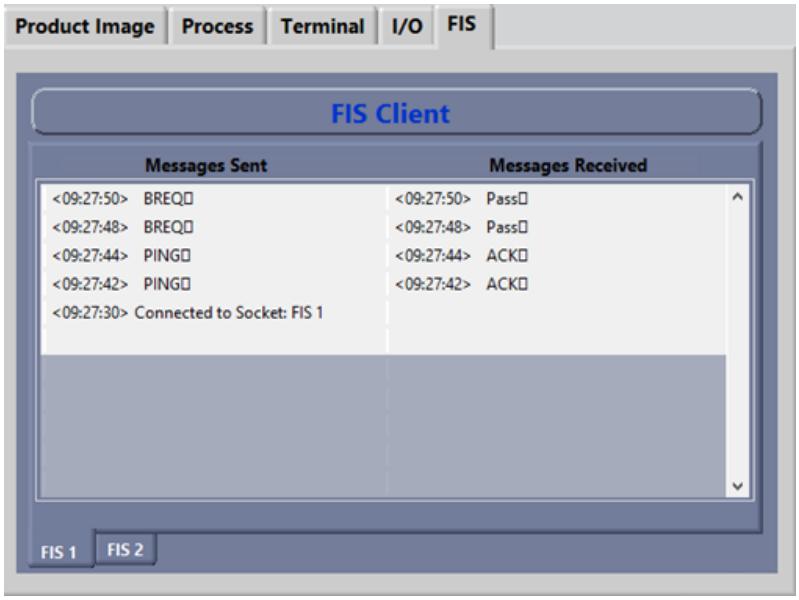

Figure 31: Message Terminal

2. To access the large pop-up display, hold the "**CTRL**" button on the keyboard and double click on the message terminal.

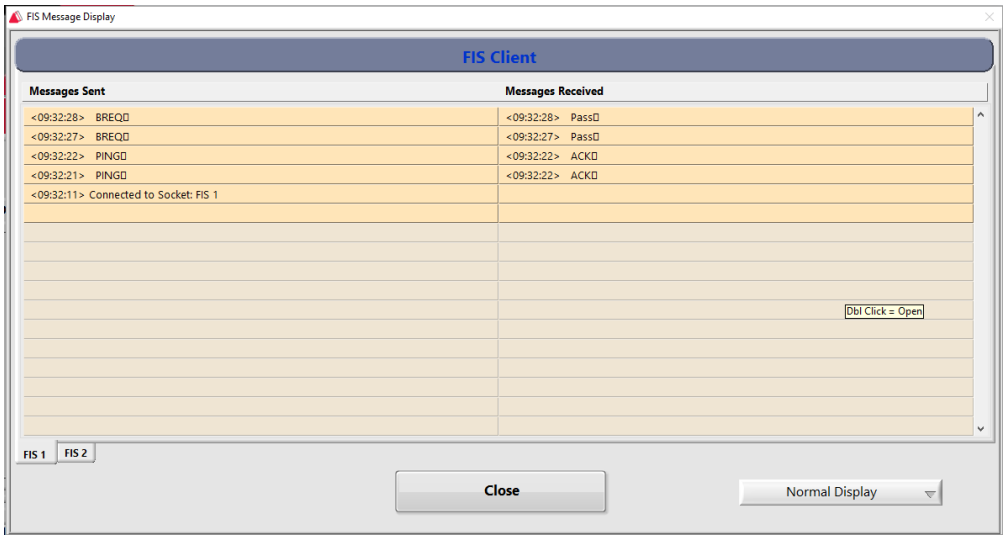

Figure 32: FIS Message Display Window

3. To change the display format, select an option from the **Display** drop down menu (Normal, '\' Code, Hex Code).

4. Select "**FIS 1**" or "**FIS 2**" at the bottom right corner of the window to select the FIS instance (server) that is desired.

5. Select the "**Close**" button to close the popup window.

7. Auto Mode

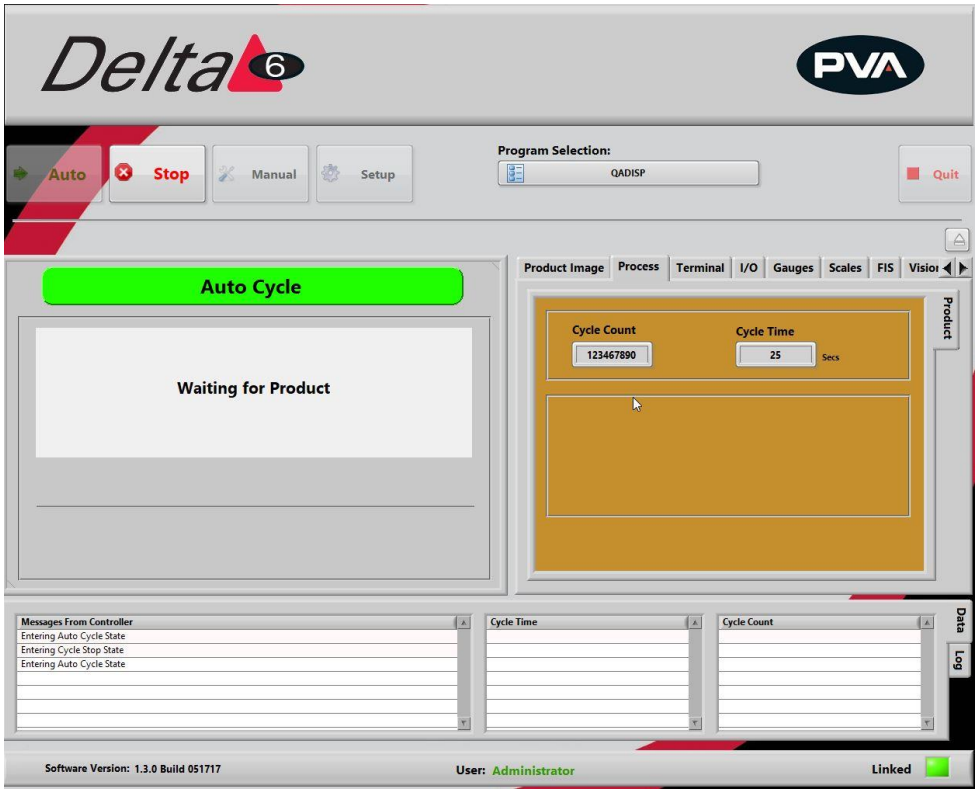

Figure 33: Auto Cycle Mode

In **Auto Mode**, the workcell automatically processes parts as they are available. Some possible workcell setups include conveyor equipped, stand-alone with a door, or stand-alone with a light curtain

For a workcell with a conveyor, the part is put on the conveyor by an operator or through an upstream process. The part is sensed at the entrance of the workcell and is sent to the stop. When the part is against the stop, it is sensed and the PathMaster® program will begin. When the PathMaster® program is finished, the board is sent to the end of the conveyor for the next step. When the part is released or removed, the procedure starts again.

For workcells without a conveyor, all parts must be put in the workcell manually. Optional part-in-place sensors sense when a part is present. If a part is not sensed, a "**Waiting for Product**" message is shown. When the workcell is ready to operate, use the hand switches to produce parts. Remove all finished parts before the next cycle starts.

If the workcell has a light curtain, the light curtain can be used to initiate cycles.

8. Setup Mode

The options shown in Portal depend on the workcell configuration. Refer to machine specific manuals and appendices for more information.

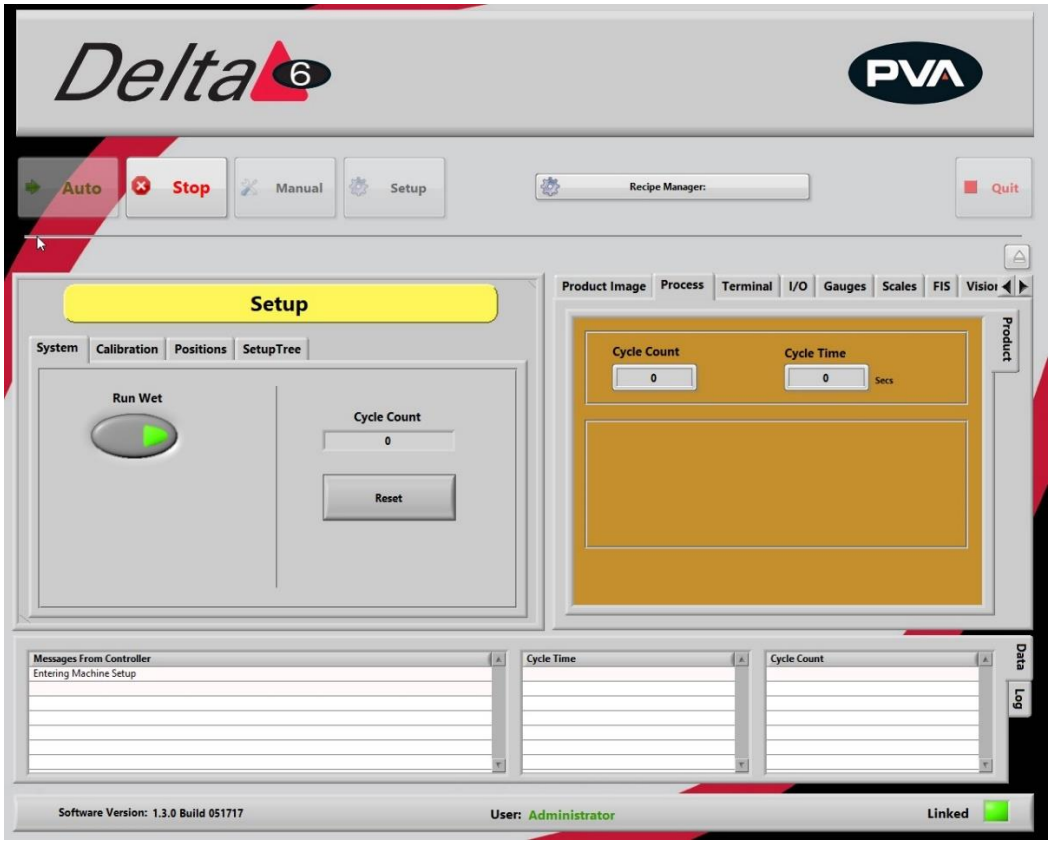

Figure 34: Setup Mode

In **Setup** mode, basic workcell functions can be controlled. **Auto Cycle** parameters and some workcell parameters are set in **Setup** mode.

8.1 System

1. Select the "**System**" tab.

2. Select the "**Run Wet**" button to toggle it on or off. Valve operation is off for **Auto Cycle** when the "**Run Wet**" button is set to off. This does NOT affect the run option in the **Manual** mode. There is a separate option in **Manual** mode to select "**Wet**" or "**Dry**". Refer to Section 6.2 for more information.

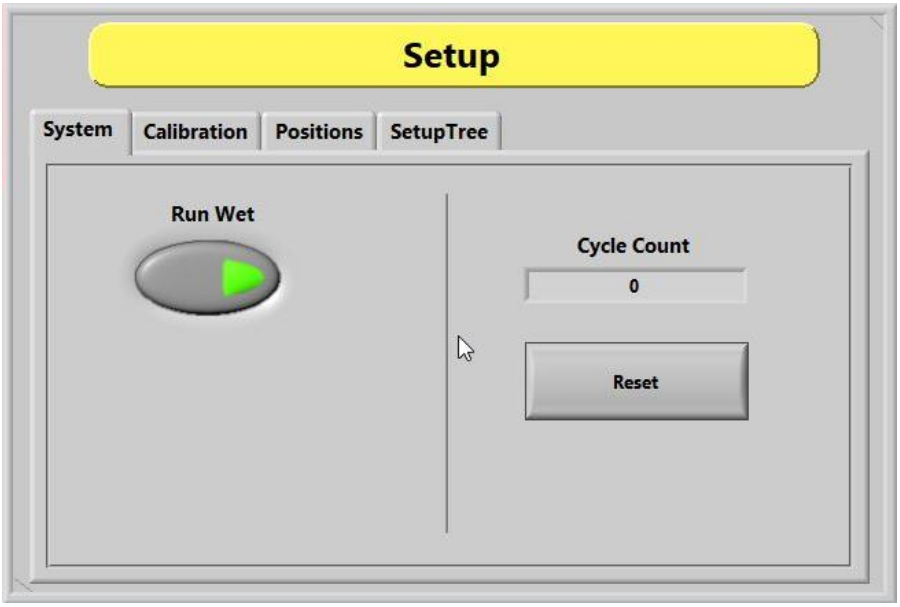

Figure 35: System Tab

3. Select the "**Reset**" button to reset the cycle count to zero.
4. Select the "**Stop**" button to leave **Setup** mode and go to **Cycle Stop** mode.

8.2 Calibration

The workcell has one of three calibration methods: **Standard**, **Operator Defined**, and **Sensor Defined**.

If a **Sensor Defined** or **Operator Defined** method is installed on the workcell, the machine may or may not automatically enter its particular calibration mode when entering **Auto** mode. This will depend on which application the workcell was set up for. Refer to Section 8.2 for more information on different calibration sequences.

8.2.1 Standard Calibration

Standard Calibration is the easiest calibration procedure. Each head on the gantry will have a set reference position. The operator can select the head and move the gantry to its related position. When at the preset point, the operator must physically reposition the dispense needle to confirm that the calibration is correct.

Note: For a calibration plate, each valve tip should align with the crosshair center point. If it does not, physically move the valve until it does. This is only for the mechanical alignment of the head assembly.

1. Select the "**Calibration**" tab in **Setup** mode.
2. Click the "**Select Position**" dropdown menu to change the active valve or tool.
3. Select the **Move to Position -** "**GO**" button to move the selected valve to the related reference position. This procedure is useful when maintenance is performed that might change the alignment of the gantry (e.g., replacing a valve after a head collision).
4. Examine the position of the needle or calibration tip as it relates to the calibration point (e.g., crosshairs).
5. If the needle or calibration tip is not directly above the point, manually bend the needle or adjust the tool position so that the needle or calibration tip is above the calibration point.
6. Select the **Restore Default Position -** "**GO**" button to restore the calibration position back to factory defaults.
7. Select the **Teach Position** – "**GO**" button to reteach the predefined calibration reference position. Use the **Teach Pendant** to move the desired tool to the calibration plate. If installed, press "**PURGE**" to toggle the pneumatic Z-slide up or down. Press "**TEACH**" to save the position.

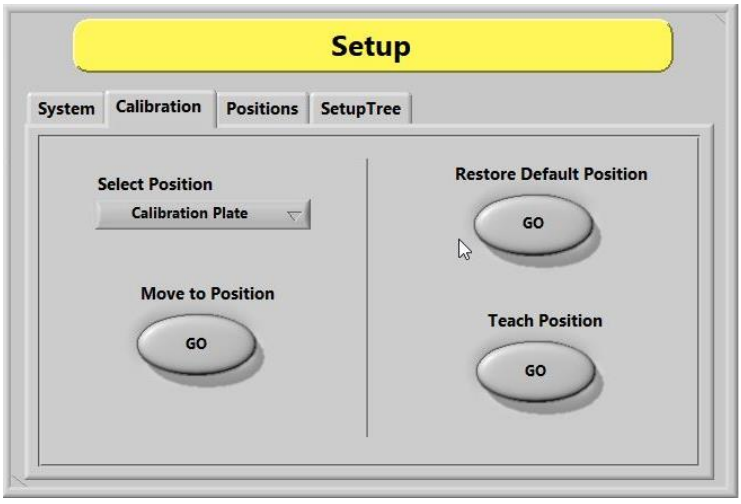

Figure 36: Calibration Tab in Setup Mode

Refer to pump specific manuals for more information.

8.2.2 Sensor Defined Tool Calibration

The sensor defined tool calibration block consists of three sensors with one for each axis (X,Y, and Z).

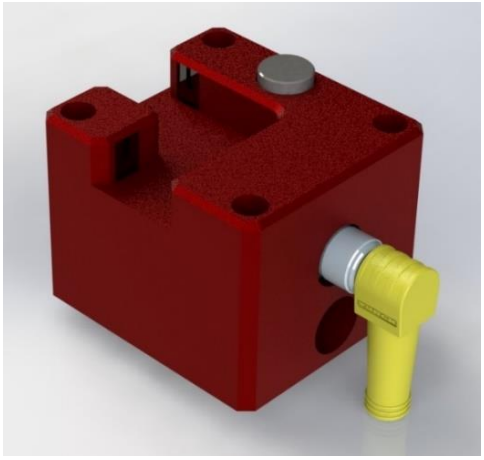

Figure 37: Tool Calibration Sensor Block

Refer to the PathMaster® Manual for more information.

Warning: Do not unplug the cable from the calibration block while the system is powered on, as this could damage the sensors and/or motion controller.

8.3 Positions

To re-teach the **Park/Idle Positions**:

1. Select the appropriate position option (e.g., **Standby**, **Solvent**, **Purge**, or **ALL**).
2. Select the **Teach** – "**Go"** button.
3. While using the **Teach Pendant**/**Trackball**, move the head to the desired position. If pneumatic Z-slides are installed, press and hold the **Purge** button to drop them for teaching the solvent and purge positions.
4. Press the "**Teach**" button when finished to save the new position.
5. To re-home the system, press the **Home System –** "**Go**" button.

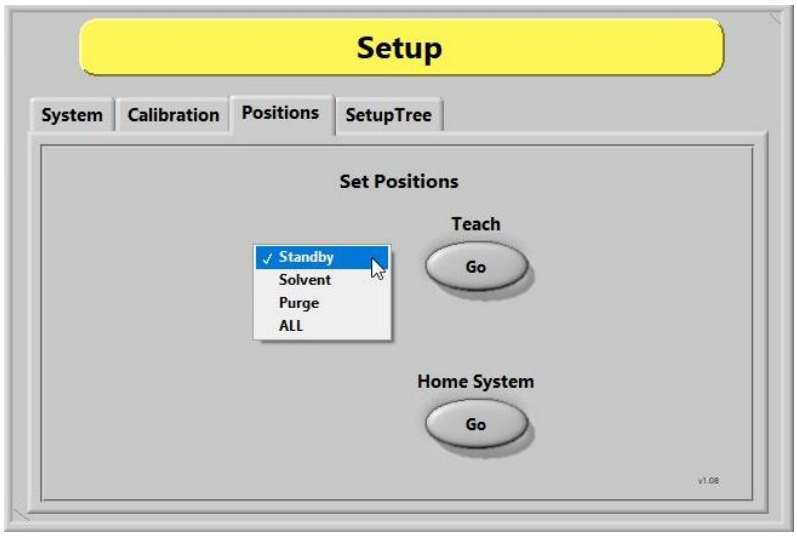

Figure 38: Positions Tab

8.4 SetupTree

The **SetupTree** contains a list of setup options. The tree is split into two main categories: **Global** and **Auto Cycle**.

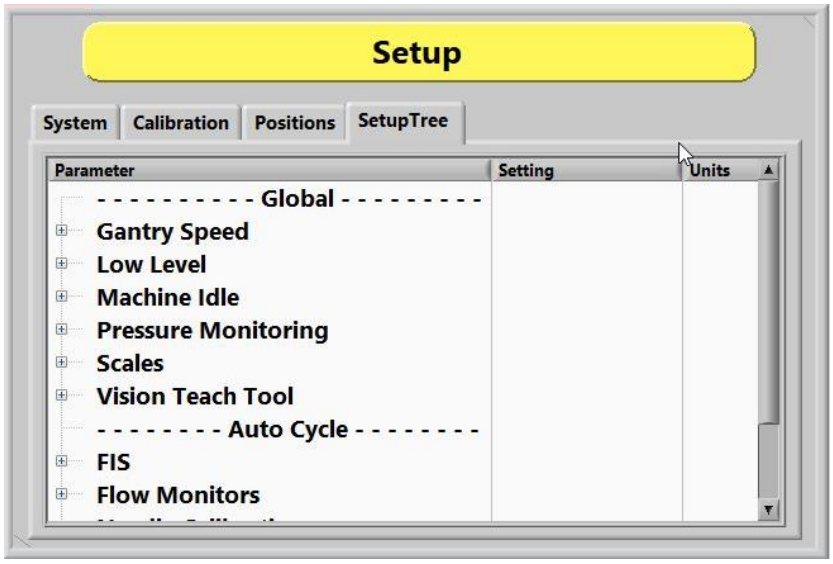

Figure 39: SetupTree Tab

8.4.1 Gantry Speed

The **Gantry Speed** can be setup to run at three different movement speeds:

- **Slow** – the standard gantry speed is reduced by a factor of 2.
- **Standard** – the default/normal operating gantry speed.
- **Fast** – the standard gantry speed is increased by a factor of 1.5.

Note: This setup does not adjust the PathMaster® programs.

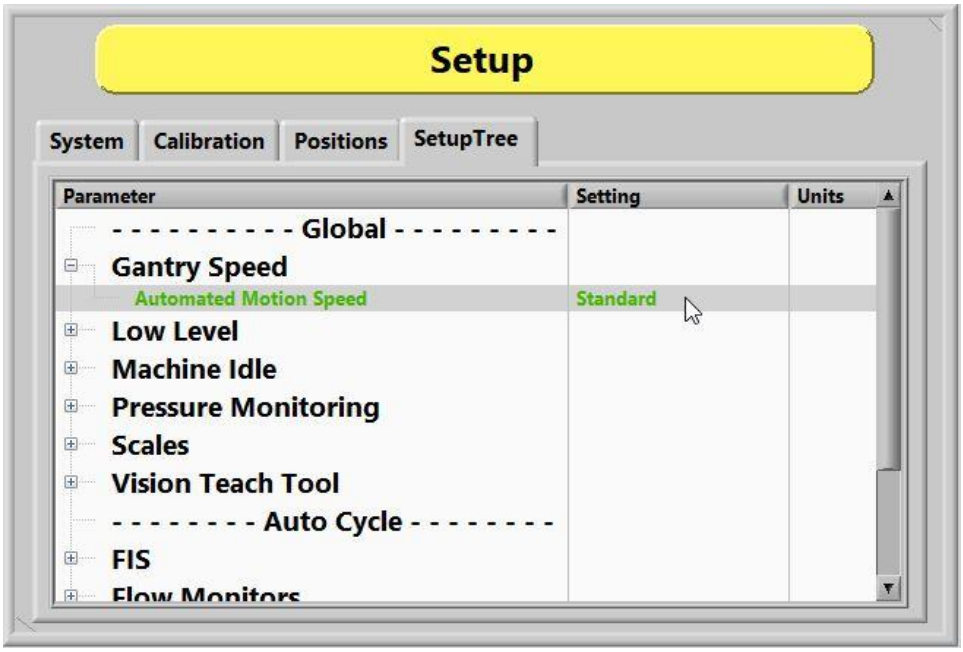

Figure 40: Gantry Speed

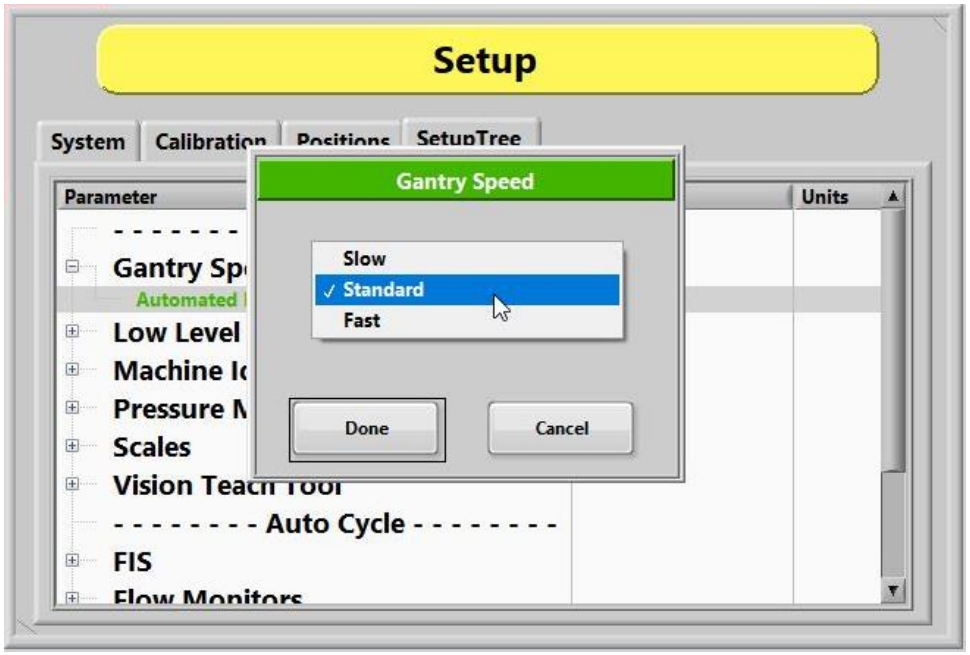

Figure 41: Adjusting Gantry Speed

8.4.2 Low Level

Low Level sensor monitoring can be either enabled or disabled in the **SetupTree** tab.

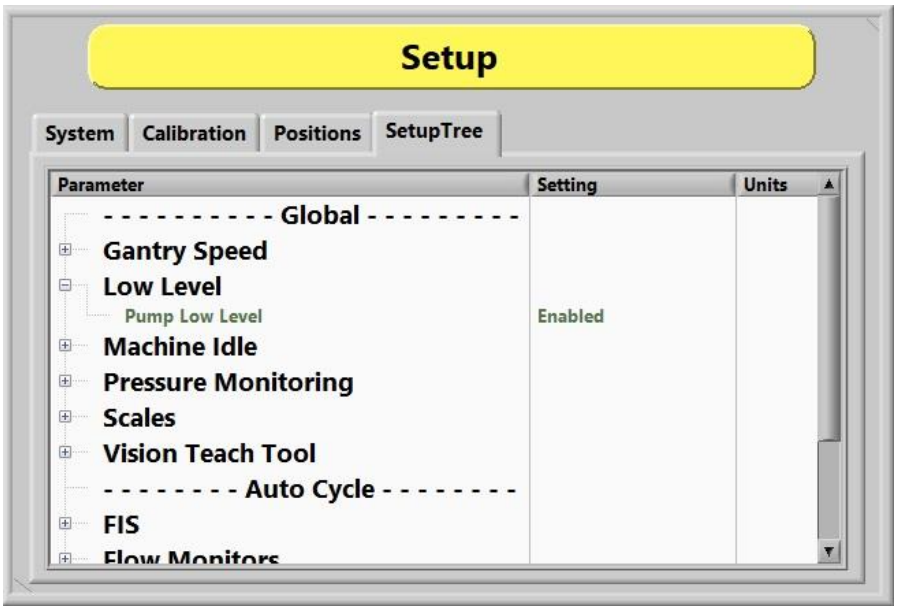

Figure 42: Low Level Sensor Monitoring Enabled

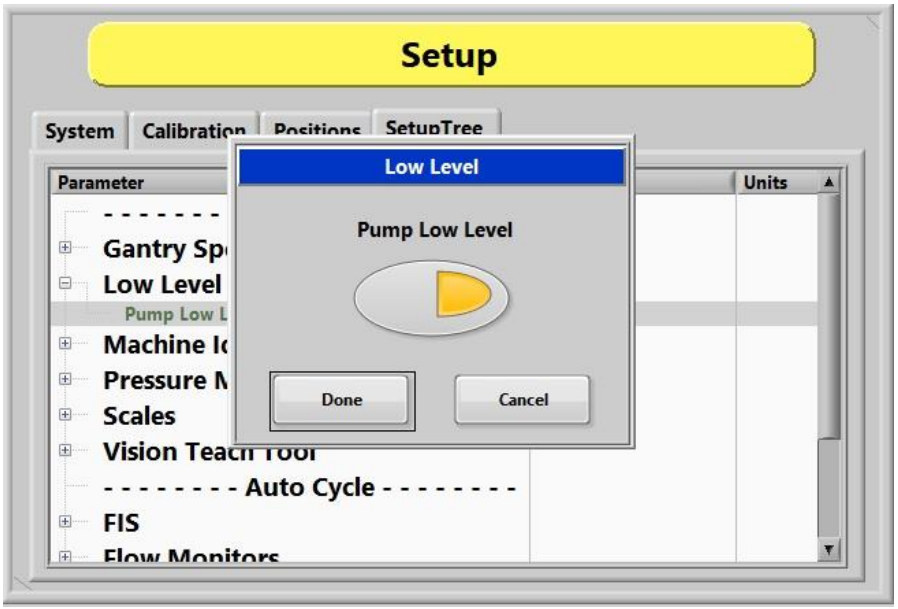

Figure 43: Adjusting Low Level Sensor Monitoring

8.4.3 Machine Idle

Using the **Machine Idle** option, the purge and/or solvent cup features can be adjusted. Auto purge dispenses material from all valves at specific intervals to prevent valves from clogging. The default setting depends on the material used. The workcell only auto purges when in **Auto Cycle** or **Cycle Stop**. The workcell does not auto purge in other modes but will immediately auto purge when returned to the **Cycle Stop** or **Auto Cycle** modes, if necessary.

Note: If the workcell has solvent cups, the solvent cup routine overrides the auto purge settings. The system will only purge, when necessary, with the solvent cup sequence.

1. Select the "**+**" to open the "**Machine Idle**" drop down list.

2. Double left click on the **Idle Action** and select "**None**, **Auto Purge,** or **Move to Solvent**" to set the function. When set to "**None**", the head will move to the taught **Standby Position**. For more information on setting **Idle Positions**, refer to Section 8.3.

3. Set the **Idle Timeout** in minutes of how often the valves will purge or the duration of inactivity during **Auto Cycle** before the heads move to the solvent cups.

4. Set the **Purge Duration** in seconds for the time for which the valves will purge. This applies to both auto purge and solvent options.

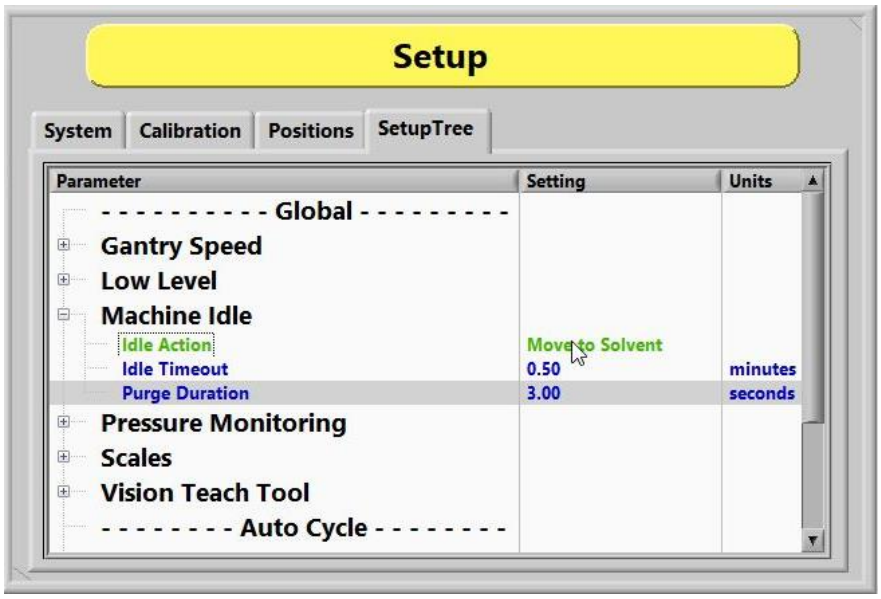

Figure 44: Adjust Machine Idle Options

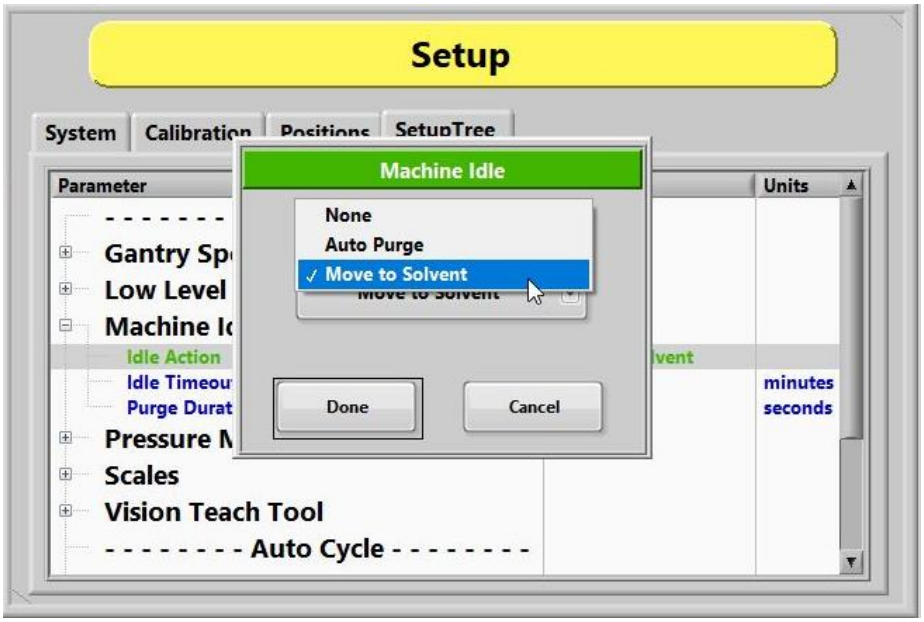

Figure 45: Adjusting Machine Idle Action

8.4.4 Pressure Monitoring

Pressure Monitoring is used to verify the digital gauges installed on the system. When enabled, the monitoring will set an alarm flag and display a message if the pressure is outside the specified ranges for the **Upper** and **Lower Limits**.

The **Upper Limit** and the **Lower Limit** can be adjusted as needed for the process.

Figure 46: Adjust Pressure Monitoring in SetupTree Tab

8.4.5 Scales

Scales are used to verify the digital scales installed on the system. When enabled, the monitoring will set an alarm flag and display a message if the current material tank weight is outside the specified ranges for **Low Threshold** and **Empty Threshold**.

The **Low Threshold** and **Empty Threshold** values can be adjusted as needed for the process. **Low Threshold** will display a warning. **Empty Threshold**, however, will set an alarm and prevent further production.

Note: Always ensure the Low and Empty Threshold values are set so that the material never falls below the tank dip tube.

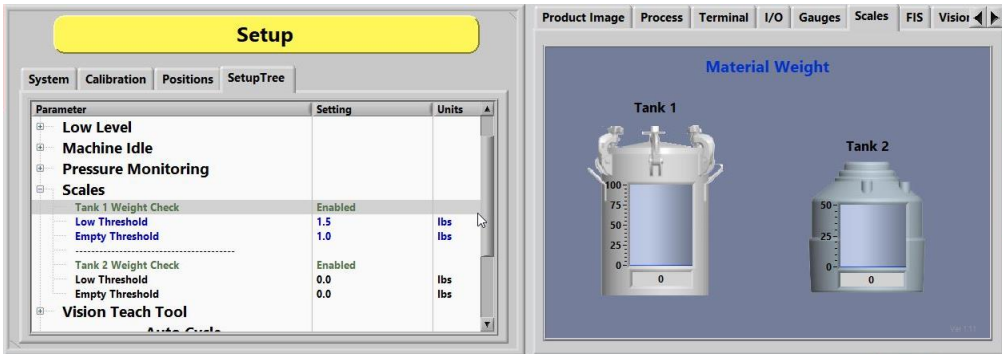

Figure 47: Adjusting the Scales in SetupTree Tab

8.4.6 Vision Teach Tool

The vision functions shown below are set in the **Vision Teach Tool** option under the **SetupTree** tab in **Setup** mode. Each option can be toggled to enable or disable it.

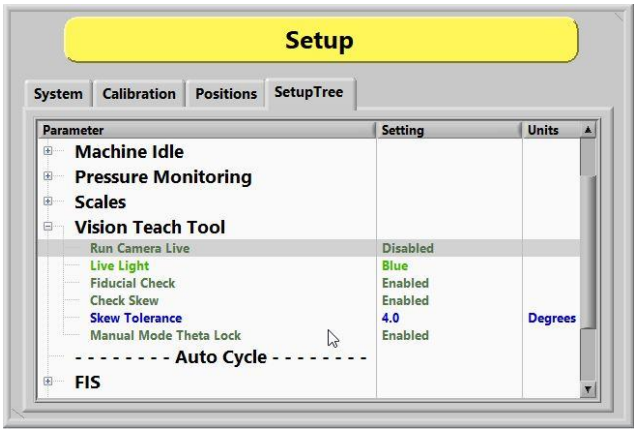

Figure 48: Vision Teach Tool Functions

When enabled, the **Run Camera Live** function will make the camera live unless an inspection is running or if there is a failed inspection. If disabled, the camera will run live only during the inspection and then turn off.

The **Live Light** function allows the live light color to be changed to blue, red, green, purple, or white.

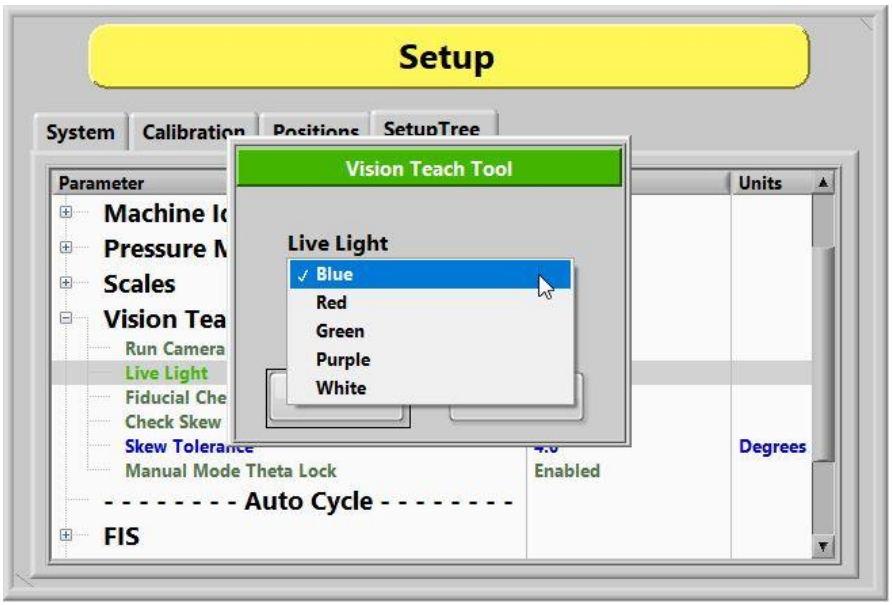

Figure 49: Vision Teach Tool Live Light Options

When the **Fiducial Check** function is enabled, a fiducial check will run in **Auto Cycle**. When the function is disabled, the camera will go to the fiducial coordinate but will not run the inspection.

Note: Any lights related to the inspection will shut off when the camera is not live.

If enabled, the **Check Skew** mode will apply a skew correction to the current program.

The **Skew Tolerance** is the allowable skew correction value in degrees. The range is 0 to 7 degrees of rotation.

The **Manual Mode Theta** function unlocks the theta position (W-axis) to prevent teaching an incorrect theta position.

8.4.7 FIS

In the **FIS** option of the **SetupTree** tab, the FIS Communication can be either enabled or disabled. Refer to Section 6.8 for more information on FIS.

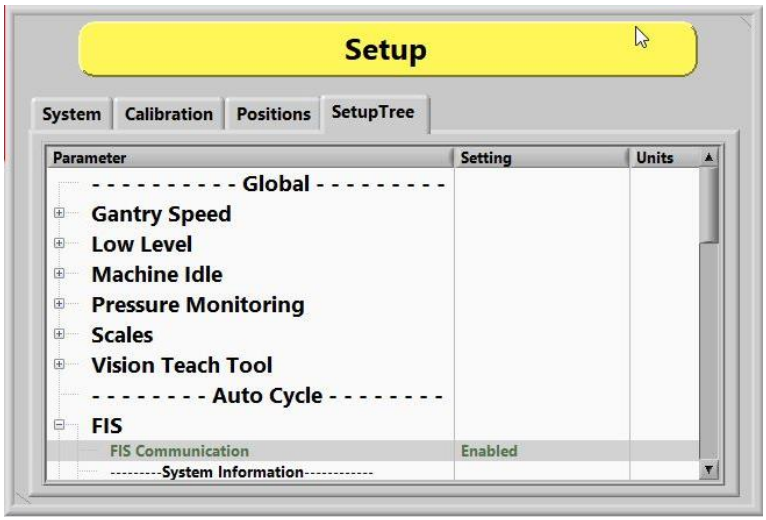

Figure 50: Enable or Disable FIS

8.4.8 Flow Monitors

The **Flow Monitor** will always be in the **SetupTree** with only on/off settings. The **Setpoint** and **Deviation** MUST be set in path programs.

Some workcells have flow monitors, up to four, installed. Workcell flow monitors measure the amount of material that flows through the supply line before it goes to supply the individual valves. Flow monitors are used to show when the actual values are outside of the set values. The operator sets the necessary material volume and a permitted deviation.

8.4.8.1 Priming the Flow Monitor

The flow monitor must be primed before it is used to prevent damage. When priming the flow monitor, the amount of air that goes through the unit during the initial startup is reduced. Perform the following procedure to prime the flow monitor:

1. Fill the pressure vessel with material and close tightly. Refer to the system manual for more information.
2. Set the material pressure regulator to 0 psi.
3. Turn the air inlet and the material outlet valves to the closed position.

4. Disconnect the material line from the inlet port of the flow monitor.
5. Turn the air inlet and the material outlet valves to the open position.
6. Use the material pressure regulator to slowly increase the material pressure until material flows from the disconnected material line.
7. Turn the material outlet valve to the closed position.
8. Reduce the pressure for the pressure vessel and adjust the material pressure regulator to 0 psi. Refer to the fluid system manual for more information.
9. Reconnect the material line to the inlet port of the flow monitor.
10. Perform the manual purge procedure to open the valves. Refer to Section 6.1 for more information.
11. Turn the material outlet valve to the open position.
12. Use the material pressure regulator to slowly increase the material pressure to the operating pressure.
13. Repeat the manual purge procedure for each valve until the material flows without any breaks in the flow.

8.4.8.2 Finding the Correct Material Volume

A complete path program is needed before being able to find the correct material volume. Any change to a program also changes the flow data results.

1. Load a completed path program into memory.
2. In Portal, select **Manual** mode.
3. Put the board in the correct position, as related to the board stops, and run one cycle as "**WET**". For more information on **Manual** mode, refer to Section 6.
4. After the cycle is completed, the dispensed volume is shown in the system messages window.
5. Select the "**Stop**" button to go to **Cycle Stop** mode.
6. Select **Setup** mode and then the "**Flow Monitor**" tab.

7. In the **SetupTree** tab, adjust the setpoint to match the value found.
8. Change the flow set point to the value that was shown on the mode system messages window. This will be a DMC command in the path program; adjust the value of the variable to achieve this.
9. Select the "**Stop**" button to go to **Cycle Stop** mode.
10. Select **Manual** mode.
11. Operate the workcell for additional cycles to ensure that the path program dispenses the same amount of material for each cycle.

8.4.8.3 Set the Material Volume Check

The settings for the material volume check must be programmed into the path program. If no settings are programmed in the path, the machine will use the flow monitor settings of the most recently run program. To set the material volume check parameters, program the following settings into the path program using the two variables **FCx_SET** and **FCx_DEV**:

Note: If either of these variables are set to "0", they will cause errors.

- "x" is the letter of the related flow monitor (A, B, C, or D).
- FCx_SET is the set point for the material flow in cc.
- FCx_DEV is the percent deviation permitted, which can range from 0 to 99.

For example, entering the following line into a path program would put the volume setting for monitor 'A' at 0.5 cc and the allowable deviation at 5%:

- FCA_SET=0.500; FCA_DEV=5

8.4.8.4 Auto Cycle Flow Error

Auto Cycle checks the material flow after every cycle if the error is turned "**ON**" in **Flow Control** mode. If the volume is within the set parameters, no indication is shown. When the volume is outside the set parameters, the flow error screen is shown when the cycle completes, not immediately on error. Before operating the workcell again, remove the part.

Note: Any changes made to settings in the material delivery system (material pressure, stroke adjustment, etc.) will affect the data from the flow monitor. When this happens, it will be necessary to find the correct material volume again.

8.4.8.5 Flow Monitor Calibration

The **Flow Monitor** on the workcell measures the amount of material that moves through the material supply line before it splits to supply individual valves. It does not control the process, but reports deviations from the set values. Both the necessary material volume and the permitted deviation are determined by the operator. The flow monitor calibration should be examined once a month or if changes are made to the fluid delivery system.

The following procedure is to calibrate a single flow monitor, if the specific gravity of the dispensed material is known. This procedure would calibrate the A flow monitor, to calibrate the B, C, and D monitors replace the variable DEZ, with DEW, DEE, and DEF as well as FCA_CAL, with FCB_CAL, FCC_CAL, and FCD_CAL, respectively. Refer to Table 1 for more information on the variables relating to each flow monitor.

1. Login to Portal.
2. Ensure the workcell is in **Manual** mode.
3. Select the **Terminal** tab on the right side of the Portal screen to open the terminal.
4. Type **DEZ=0** (for first flow monitor only) in the top of the terminal screen and select the "**Enter**" button on the keyboard. This resets the flow monitor encoder to zero.
5. Weigh an empty purge cup and record the weight or zero the scale with the empty purge cup on it.
6. Purge a quantity of material into the purge cup.
7. Type **DEZ=?** into the terminal and select the "**Enter**" button on the keyboard. A number will return (e.g., 50 counts per cc dispensed). The factory set value is 1000 count/cc. If zeros or incorrect data are returned, type **MG_DEZ=?**
8. Weigh the dispensed quantity of material in grams. If necessary, subtract the weight of the cup from this value.
9. To find the material volume in cc, use the equation below:

   Grams of material/specific gravity = cc

   e.g.: 0.500 g/0.96 = 0.5208 cc

10. Use this value (in cc) to find the correct number of counts per cc dispensed.

    Counts/cc = counts per cc

    e.g.: 25 counts/0.5208 cc = 48.003 counts per cc

11. Repeat this procedure at least three times then average the results.
12. Open the Main Program in a text editor such as Windows® NotePad.
13. Search for the variable: **FCA_CAL=**. This will be in the section titled**: REM !!!! Machine-Specific Information!!!!**
14. Type in the new value for **FCA_CAL=** (e.g.: FCA_CAL=48.003).
15. Download the modified main program and test changes.

Flow Monitor	Variables	
A	DEZ	FCA_CAL
B	DEW	FCB_CAL
C	DEE	FCC_CAL
D	DEF	FCD_CAL

Table 1: Flow Monitor Variables

8.4.9 Needle Calibration

If the system is equipped with the **Needle Calibration Sensor Block**, refer to Figure 37. **Needle Calibration** can be set to run in **Auto Cycle**. A list of tools will be listed along with the option to enable or disable this function. The check frequency is the number of cycles run per check. The allowable deviation can be set for the X, Y, and Z axis in mm.

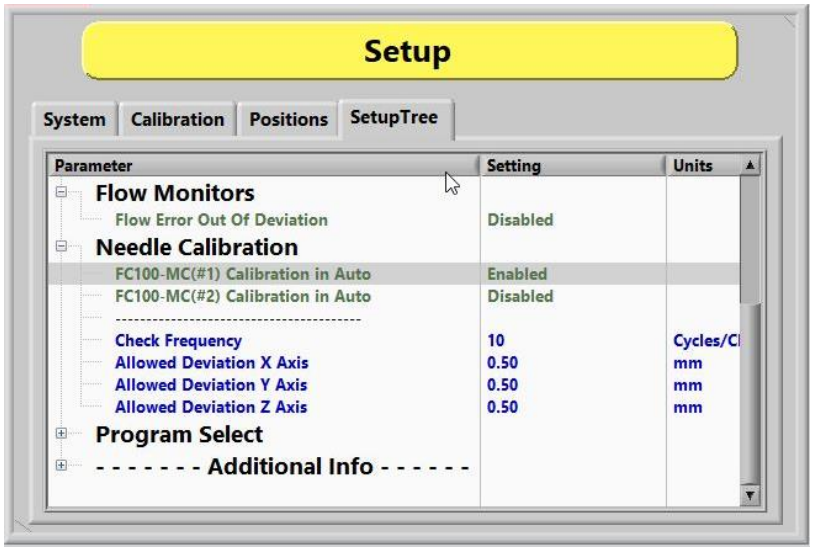

Figure 51: Enable or Disable Tools for Needle Calibration

8.4.10 Program Select

Program Select is an **Auto Cycle** option to enable or disable the **Barcode Scanner**. When enabled, the program will be selected based on the barcode read.

Note: Not all systems will have this option.

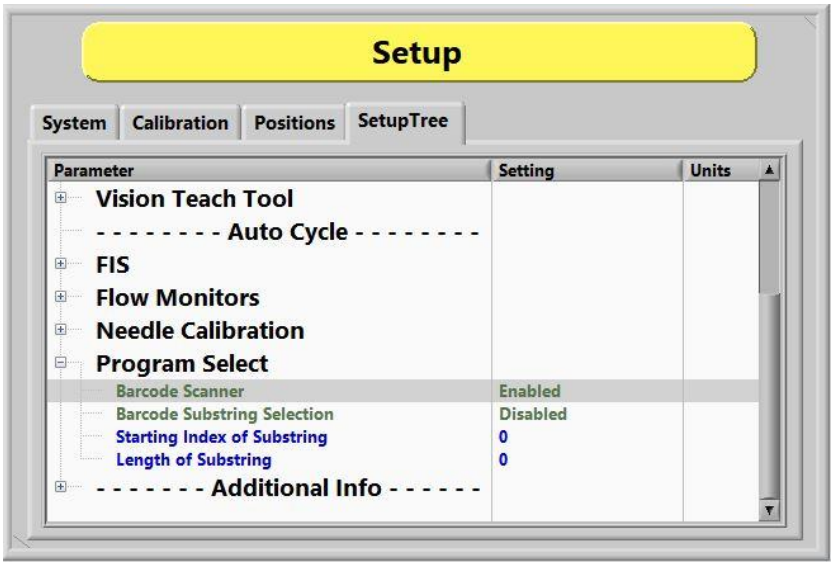

Figure 52: Enable or Disable the Barcode Scanner in Program Select

9. System Tabs

There are three standard **System Tabs**: **Product Image**, **Process**, and **Terminal**. The options that are shown in Portal depend on the workcell configuration. Refer to the machine specific manuals and appendices for more information.

9.1 Product Image

The **Product Image** tab will show an imported image, or the sample image shown below.

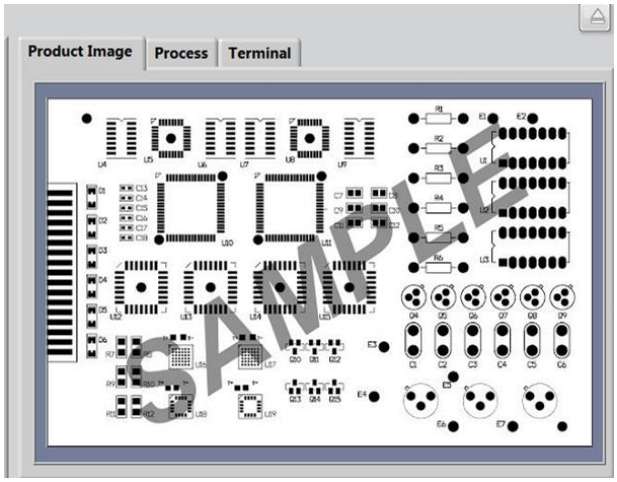

Figure 53: Product Image Tab

If the file name does not match the program name or there are no images associated with a program, the following image will be displayed by default:

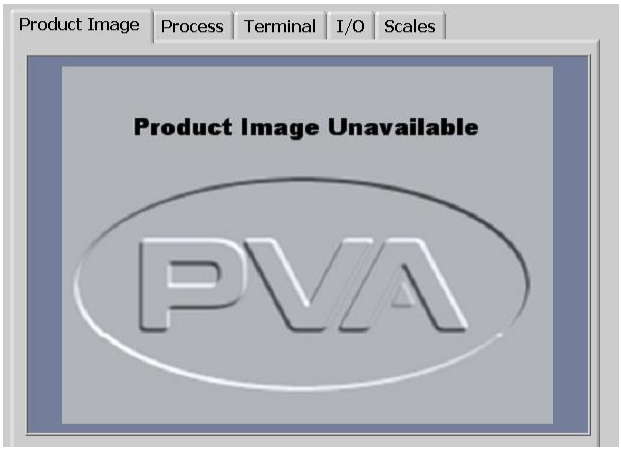

Figure 54: Product Image Unavailable

Note: This is only the case when Part/Recipe Manager is disabled. Refer to Section 14.2 for more information.

9.1.1 Adding Product Images

1. Copy and paste the **Product Image** to the following directory:

   C:\Program Files\PVAPortal\Images

Note: The Product Images must be a JPEG/JPG file.

2. Rename the file to match the PathMaster® Program Name.

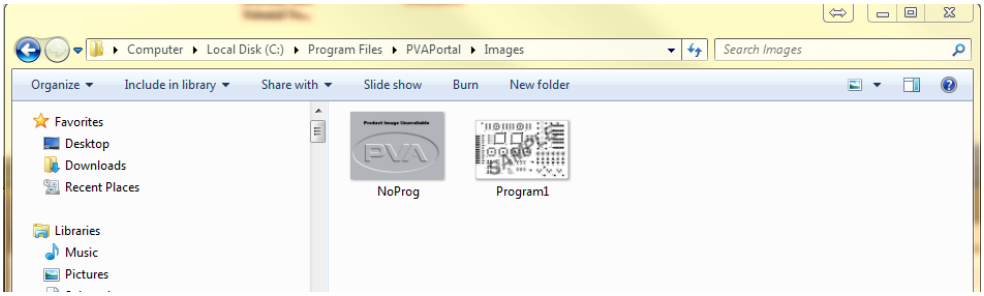

Figure 55: Product Image Directory

9.2 Process

9.2.1 Product

The **Product** tab is on the right-hand side of the **System Tabs** screens within the **Process** tab. This screen shows the **Cycle Count** and **Cycle Time** as well as the **Material Volume** from the previous **Auto Cycle** or **One Shot Run**. The data in this screen is updated after every run.

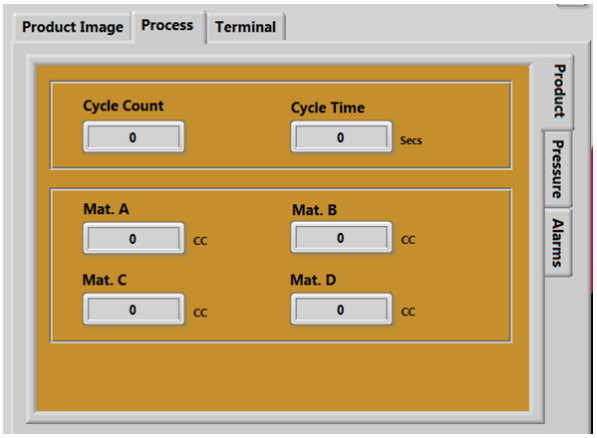

Figure 56: Process Product Tab

9.3 Terminal

The **Terminal** tab is used to communicate with the controller and as a debug tool.

Figure 57: Terminal Tab

9.4 I/O

The **I/O** tab contains the **Galil**, **Remote In**, **Remote Out**, and **B&R Comm** tabs that allow the **Inputs** to be verified and the **Outputs** to be toggled on or off. Refer to the electrical schematics for I/O designation.

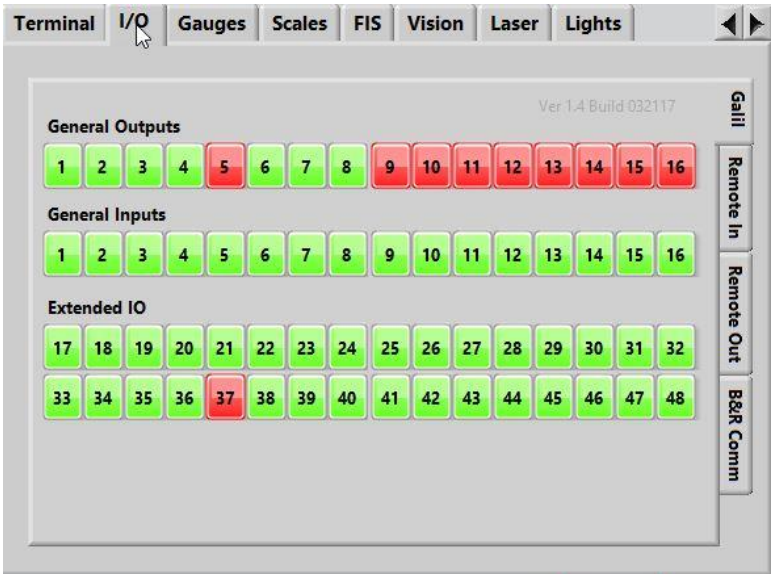

Figure 58: I/O Galil Tab

Figure 59: Remote Inputs Tab

Figure 60: Remote Outputs Tab

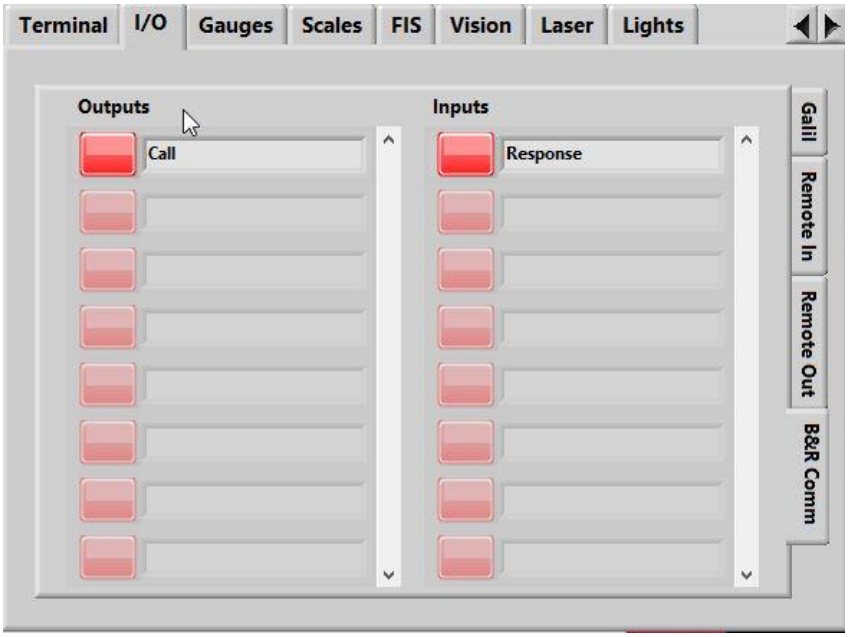

Figure 61: B&R Comm Tab

9.5 Gauges

The **Gauges** tab shows a readout of the digital gauges installed on the machine.

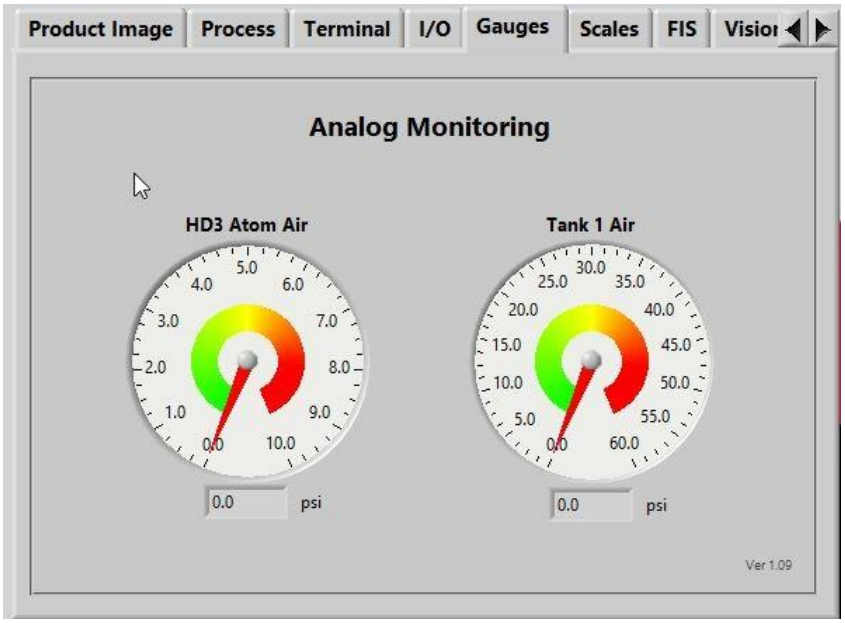

Figure 62: Gauges Tab

If enabled, the **Gauges** are typically monitored in the **SetupTree** tab.

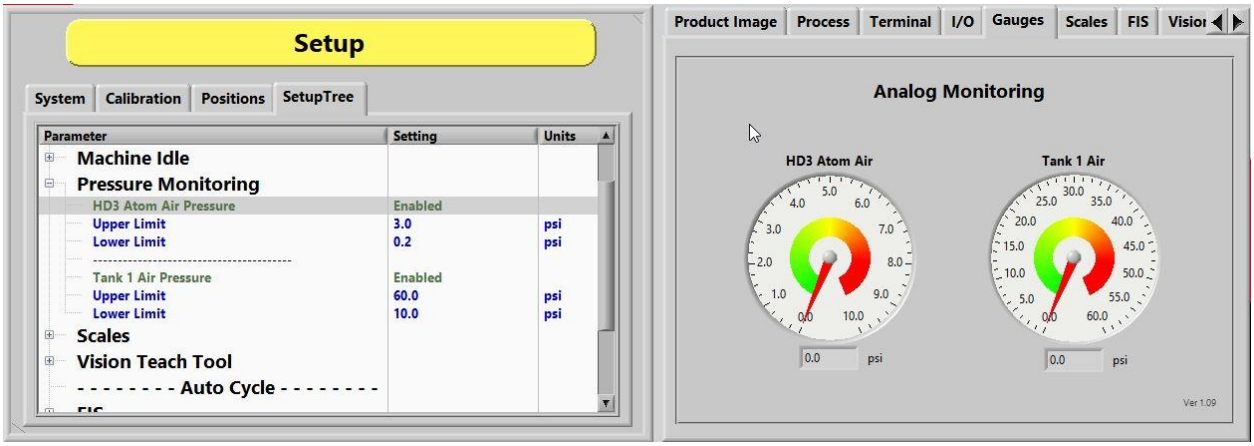

Figure 63: Gauges Tab in the SetupTree

9.6 Scales

The **Scales** tab displays the current weight readout of the digital scale indicators. Refer to Section 15.2 for additional information.

Note: This is not a standard option on all machines.

Figure 64: Scales Tab

If enabled, the **Scales** are typically monitored in the **SetupTree** tab.

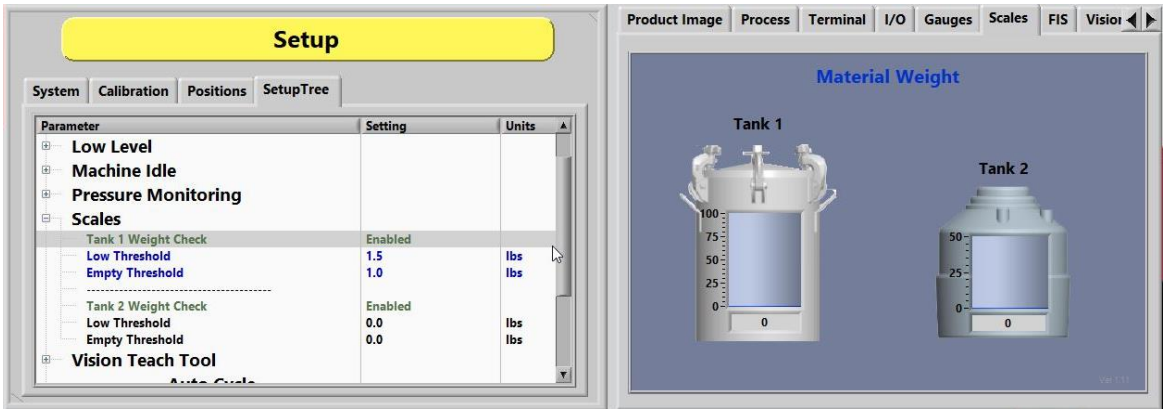

Figure 65: Scales Tab in the SetupTree

9.7 FIS

Refer to Section 6.8.2 for more information on FIS.

Note: This is not a standard option on all machines.

9.8 Laser

The **Laser** tab shows the current readout of the laser height sensor.

Note: This is not a standard option on all machines.

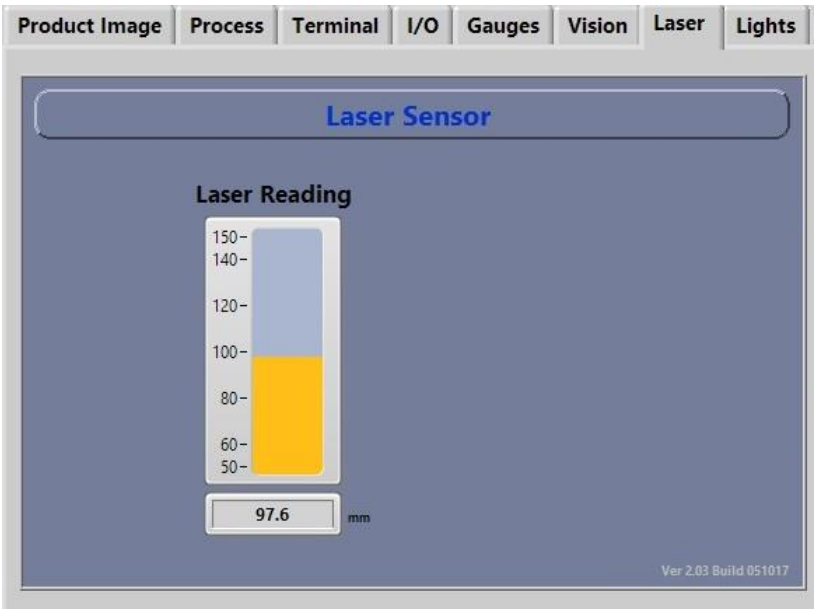

Figure 66: Laser Sensor Screen

Refer to the PathMaster® manual for more information on teaching the laser.

9.9 Lights

The **Lights** tab allows the user to toggle the installed lights on or off.

If the machine is in an error state, the alarm can be silenced by pressing the **Silence Alarm** – "**Go**" button or by pressing the **Teach** button located on the teach pendant.

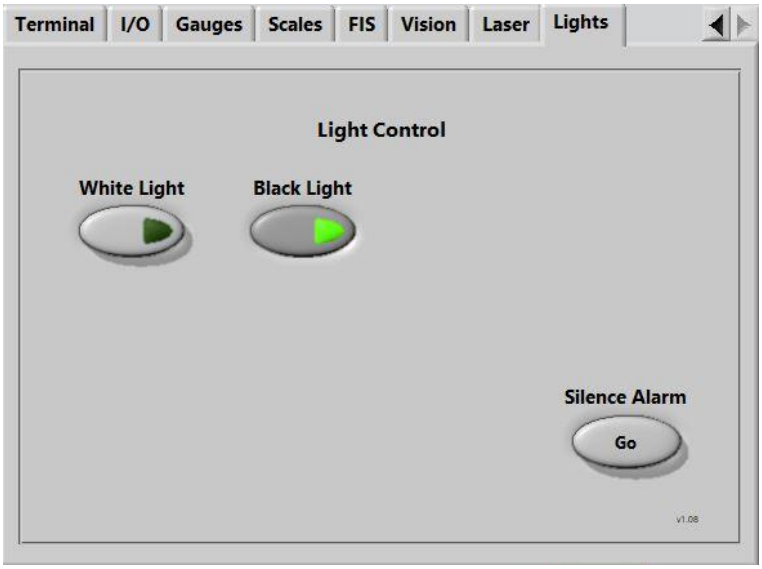

Figure 67: Light Control

10. Operation

Note: Administrator level privileges are needed to setup and correctly configure the workcell. Additionally, Windows® User Account Control must be turned off.

10.1 Startup Procedure

Note: Do not power on the workcell or add material to the pressure vessels until they are properly grounded.

1. Turn the main power switch to the "**ON**" position.

Figure 68: Main Power Switch Example

2. Ensure both the fluid and air pressures are in the correct pressure range.
3. Close all the doors.
4. If applicable, turn the "**DOOR BYPASS**" key switch to the "**OFF**" position.
5. Engage the "**Emergency Stop**" button.
6. Turn the main power switch to the "**ON**" position.

10.1.1 Portal Shell

1. Ensure the computer connected to the workcell is turned on.
2. Portal Shell will open and provide a list of options.
3. Select the "**Launch Portal**" button to open Portal.

Figure 69: Portal Shell

10.1.2 Login to Portal

Login to the PVA Portal Software by selecting the correct user and entering the corresponding password. Push the "**Enter**" button on the keyboard.

Figure 70: User Selection

Note: PVA configures the default password as blank. Refer to Section 11 for more information on Portal Permissions.

10.2 Exhaust Verification

Once the workcell has initialized, it will perform an **Exhaust Verification** test of the exhaust flow rate. If initialization fails, refer to the workcell manual for fault diagnostics. The exhaust flow rate is monitored with the on-board pressure differential switch.

The workcell must exhaust at a rate no less than 300 cubic feet per minute (CFM), otherwise a critical fault will occur and stop the motors. The **Exhaust Verification** test will also help to evacuate any vapors that are in the work area. The time this takes is based on the CFM and the area that must be evacuated. The **Exhaust Input Screen** below will be shown:

Figure 71: Exhaust Input Screen

10.3 Machine Safety Check

Once initialization and exhaust verification are complete, the operator interface displays the message seen in Figure 72.

The **Machine Safety Check** ensures that the workcell safety devices (**Emergency Stop**, **Door Interlocks**, **Light Curtain**, etc.) are operating correctly. During startup, the operator must start the safety check and complete it successfully, or the machine will stop all operations.

1. Select the "**Continue**" button.

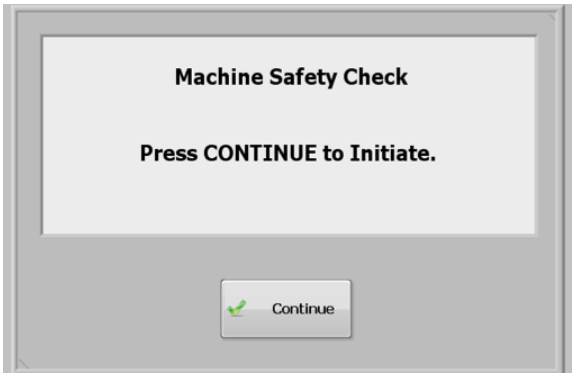

Figure 72: Machine Safety Check

2. Safety devices must be activated and deactivated when shown on the screen. All events in this procedure are timed. If an action is not completed within 8 seconds, an error screen will be shown.

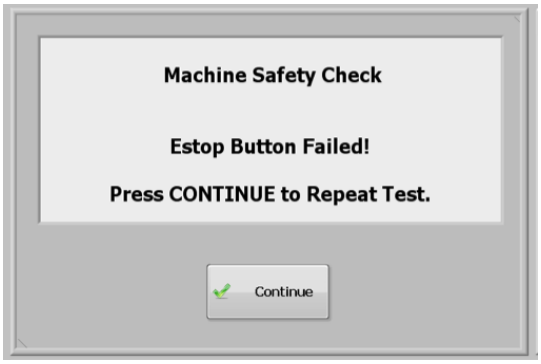

Figure 73: Sample Estop Fail

3. Select the "**Continue**" button to repeat the test.

After the second failure, the workcell stops and must be restarted. Turn the workcell power off and on again. The second failure does not have to be for the same device. For example, an **Emergency Stop** failure followed by a **Door Interlock** failure will stop the workcell.

Note: If the safety check fails, a qualified person must examine the full system before the machine is operated again. Refer to the Troubleshooting Power Check Failures Document for more information.

10.4 Homing the Axes

After the safety check is complete, the screen below is shown:

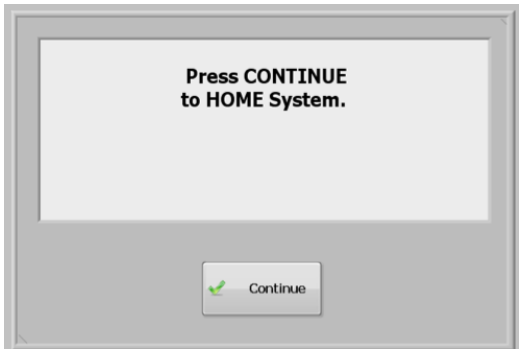

Figure 74: Home the System

1. Select the "**Continue**" button to home the system.
2. The axes will home in the following order: Z, W (if installed), then X & Y simultaneously.

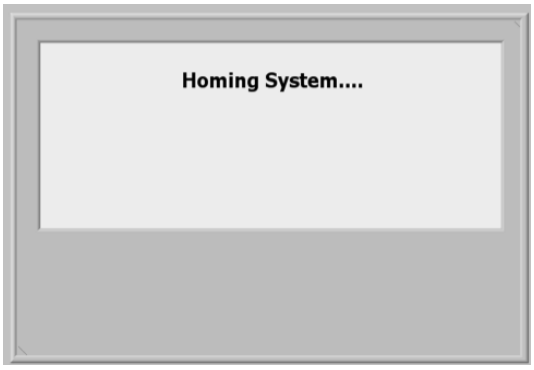

Figure 75: System Homing Screen

10.5 Standby Position

The end effector will move to the **Standby Position** when the homing sequence is complete, all calibration procedures are complete, a part is finished being processed, or if the machine is waiting for parts but it is not necessary to move to solvent or auto purge. The **Standby Position** is a defined location, different from the **Home Position**. Usually, the **Standby Position** is near the board stop to decrease travel during **Auto Cycle**. The workcell always goes back to the **Standby Position** in **Cycle Stop** mode. If the **Standby Position** needs to be changed, refer to Section 8.3 for more information on reteaching the position.

- When Portal opens select the "**Continue**" button to return the heads to the **Standby Position** and to go to **Cycle Stop** mode.

Figure 76: Return Head to the Standby Position

10.6 Shut Down Procedure

If the machine is in cycle, wait for the cycle to finish and then return to **Cycle Stop** mode. The machine must be in **Cycle Stop** mode in order to shut down.

Note: If the system needs to be flushed before it is shutdown, it is necessary to flush the system before shutting down Portal.

1. If the machine is in **Auto Cycle**, wait for the cycle to finish.
2. Select the "**Stop**" button.
3. Close PathMaster®.
4. Select the "**Quit**" button on the Portal interface, on the right side of the window.

5. A screen confirming the user wants to shutdown will be shown; select the "**Yes**" button to confirm shutdown.

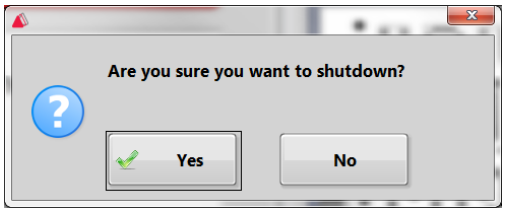

Figure 77: Portal Shutdown Question

6. A screen will show that Portal is shutting down.

Figure 78: Portal Shutdown Screen

7. When Portal is closed, the Portal Shell window will be shown. Select the "**Shutdown**" button to shut down the attached PC. To restart or log off, select the green arrow on the "**Shutdown**" button and select "**Restart**" or "**Log Off**".

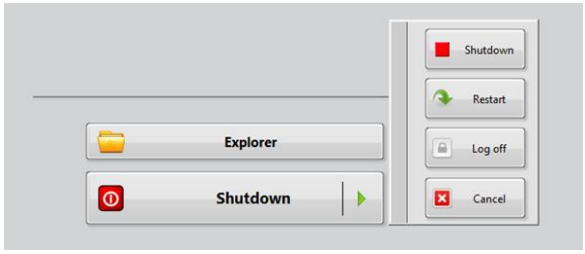

Figure 79: Portal Shutdown Options

8. For a list of ways to exit the Portal Shell screen without turning off the computer, press the "**F1**" button on the keyboard. A window with shortcuts to exit the Portal Shell will be shown. Refer to Section 4.1.1 for more information on Portal keyboard shortcuts.

Note: Ensure that the PC has been correctly shutdown BEFORE stopping power to the workcell. Refer to the Workcell Installation Guidelines and Troubleshooting Maintenance manual for additional information on how to shut down the workcell.

11. Portal Permissions

Each user must have a username and password. To see any changes that have been made, log out and log back in. To add a user or make changes to the password or user permissions perform the following steps:

1. Select the "**Portal Permissions**" button from the Portal Shell screen.

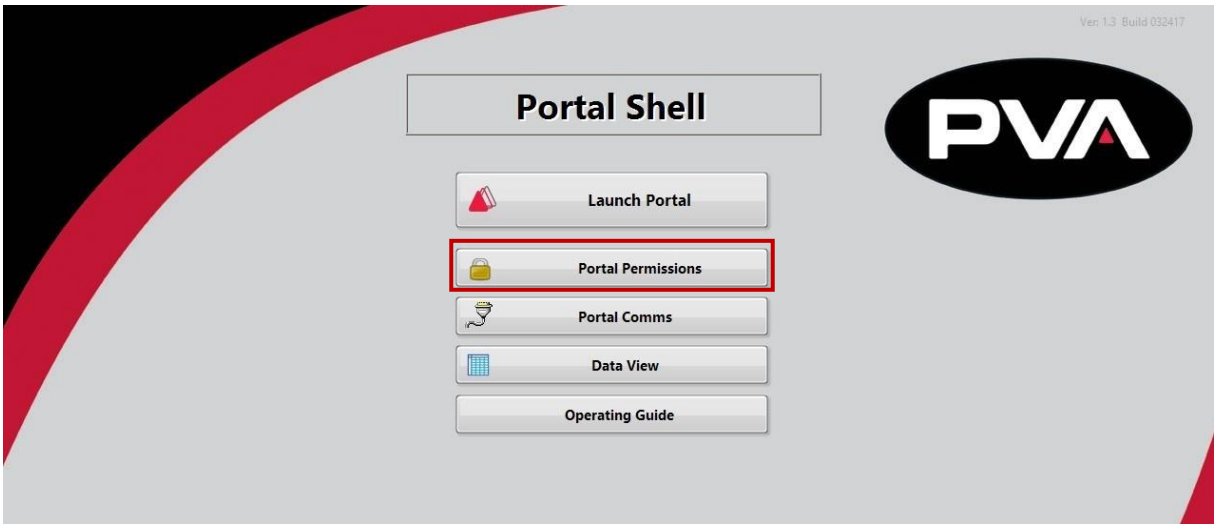

Figure 80: Portal Permissions

2. The administrator must login.

Figure 81: Portal Administrator Login Screen

3. When the administrator is logged in, the operator has access to Portal user accounts and can select the permissions for each user.

Figure 82: Portal User Accounts Screen

11.1 To Add a User Account

1. Select the "**Add User**" button.

Figure 83: Select "Add User"

2. Under **User Login**, type the Username, Password, and re-enter the Password.

3. Select the correct **Permissions** for each user by clicking on the related permissions boxes. When selected, the permission boxes will be bright green.

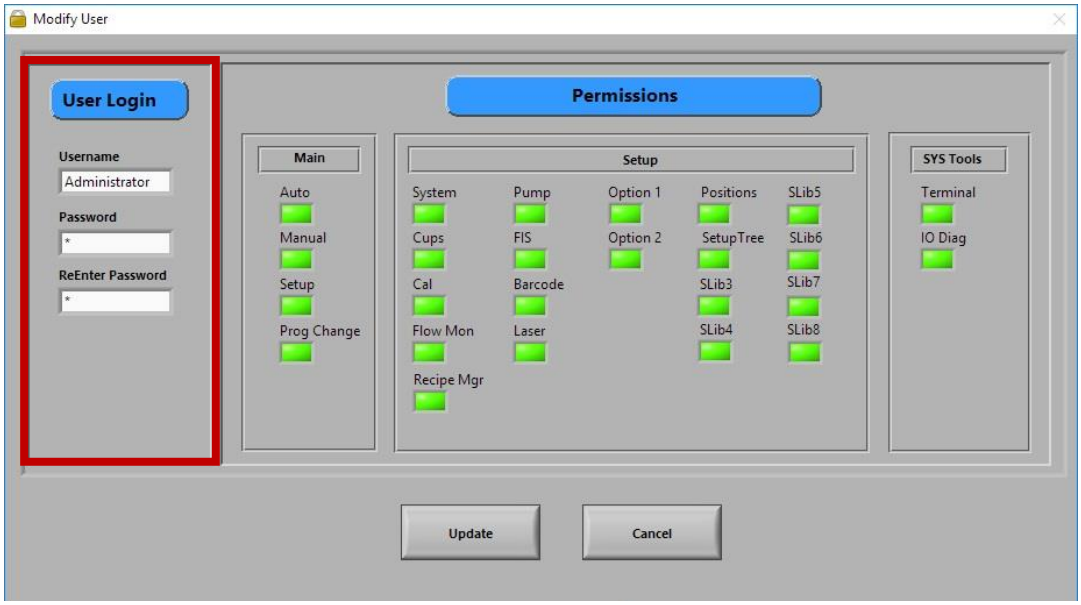

Figure 84: Enter the User Login

4. Select the "**Add User**" button.

5. Repeat steps 1-4 as many times as necessary to set up all the required accounts.

6. Select the "**Exit**" button to save and close Portal user accounts.

11.2 To Modify User Accounts

1. Select the username that needs to be modified.
2. Select the "**Modify User**" button.

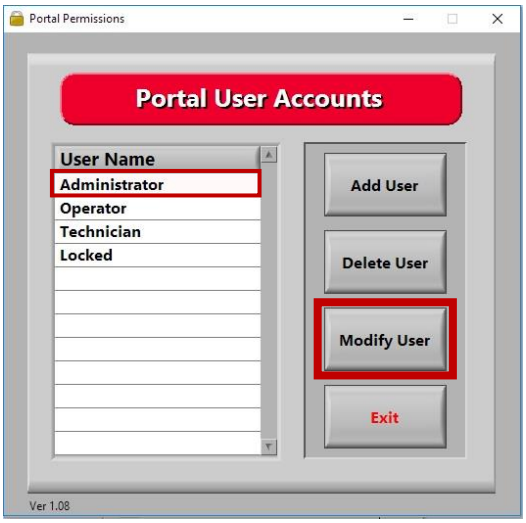

Figure 85: Select "Modify User"

3. Change the user settings, select new permissions, or change the user password.

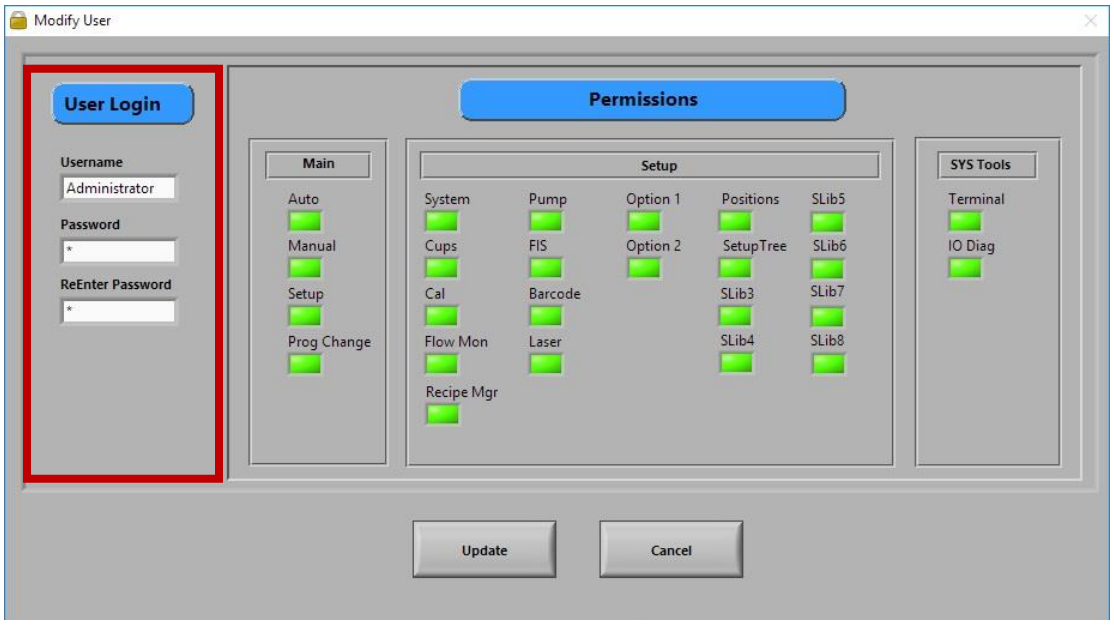

Figure 86: Changing User Settings

4. Select the "**Update**" button to save any changes.

12. Portal Communications

Portal Communications contains the parameters for communicating between Portal and the Galil. There are two virtual communications established with the controller: the **Primary Connection** and the **Unsolicited Connection**.

Note: Changing the IP Address, Port, or Handle will cause communication issues unless main program modifications are done correctly. Contact PVA before changing any default values.

12.1 Communication

The **Communication** tab contains the **IP Address** and the **Timeout**.

1. To change the **IP Address**, type the new value in the box.
2. To change the **Timeout** value, type a new value in the box or use the arrows to increase or decrease the value.

Figure 87: Communication Tab

3. Select the "**Save and Exit**" button to save the updated values.

Note: Selecting the "Defaults" button at any time will return the Communication settings to the default factory settings.

12.2 Primary Connection

The **Primary Connection** tab has the settings for the primary communication between the Galil and Portal.

1. The **Primary Handle** and **Type** must be different from the settings for the **Unsolicited Connection**.
2. Select the arrow next to the setting to select a setting from the drop-down menu.
3. Select the "**Save and Exit**" button to save the updated values.

Figure 88: Primary Connection Tab

Note: Selecting the "Defaults" button at any time will return the Primary Connection settings to the default factory settings.

12.3 Unsolicited Connection

The **Unsolicited Connection** tab has the settings for the system messages communication between the Galil and Portal.

1. The **Unsolicited Handle** and **Type** must be different from the settings for the **Primary Connection**.
2. Select the arrow next to the setting to select a setting from the drop-down menu.
3. Select the "**Save and Exit**" button to save the updated values.

Figure 89: Unsolicited Connection Tab

Note: Selecting the "Defaults" button at any time will return the Unsolicited Connection settings to the default factory settings.

13. DataView

The Portal **DataView** application can run as a standalone application or as an embedded version within PVA Portal. The window for the standalone version can be resized, maximized, or minimized. The embedded version is in the **Log** tab on the main Portal screen and has a fixed dimension that is sized accordingly. Additional configuration of each version of the **DataView** app is handled in the Portal Sysconfig.ini file. Refer to the ini configuration parameters listed below for more information.

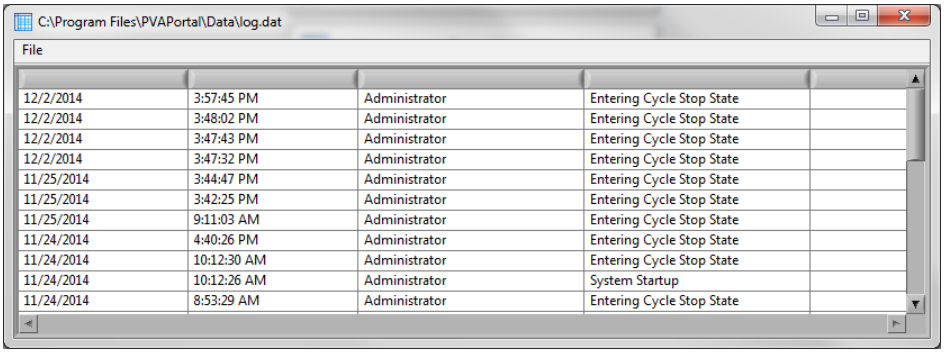

Figure 90: Log File

13.1 Startup Log File

PVA Portal can write data to any of 10 different log files. However, **DataView** can only display the content of one log file at a time. On startup, the default log file is loaded into **DataView**.

The default log is configured by setting the 'InitialLogFile' key in the [DataView] section of the configuration files.

To load a log file other than the initial log file:

1. When **DataView** is running in the standalone version, select ***File*** -> ***Open File*** on the menu bar.

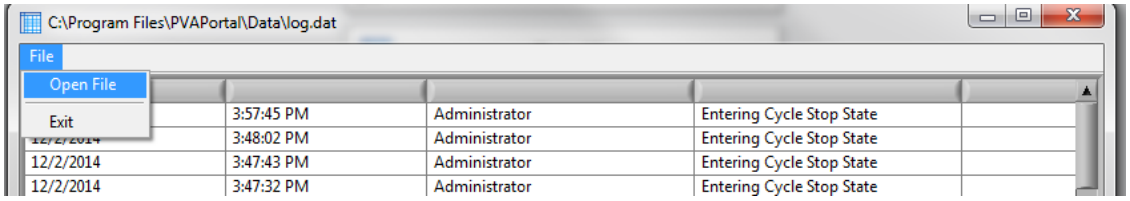

Figure 91: Open File from Standalone DataView

2. Select a log file to view. Click the "**OK**" button to load the file.

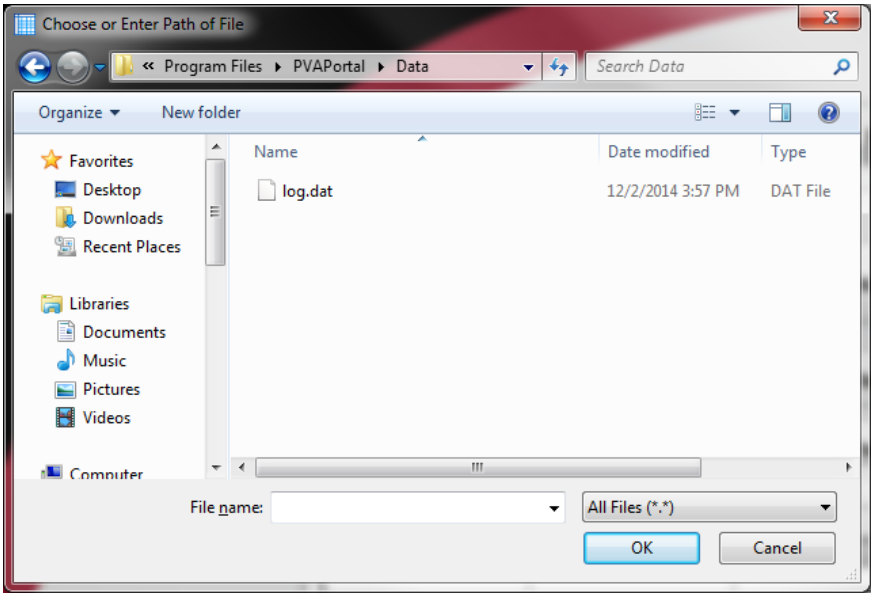

Figure 92: Log File Selection

3. While in the embedded **DataView** version, press and hold the '**CTRL'** key while '**double clicking'** the data grid to select a log file to view. The standalone version can be launched from within Portal by pressing and holding the '**ALT'** key while 'double clicking' the data grid.

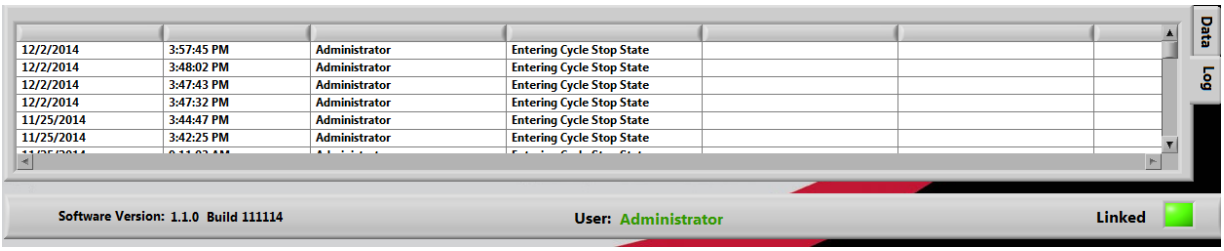

Figure 93: Embedded DataView

14. Part Manager

Part Manager is an embedded library used to manage **Portal Part Selection** and **Part Recipes**. **Part Recipes** can be configured in the **Recipe Manager** window. The **Recipe Manager** window is accessible from the **Portal Part Selection** field when in the workcell is in **Setup** mode. The structure of a recipe can be defined from the 'PartDataType.cfg' file.

In **Setup** mode, there is a **Recipe Manager** drop down menu. In every other mode, the drop-down menu will say **Program Selection**.

Figure 94: Recipe Manager and Program Selection Menus

14.1 Part Selection Console

1. To see the **Part Selection Console**, select the drop-down menu and select a part.

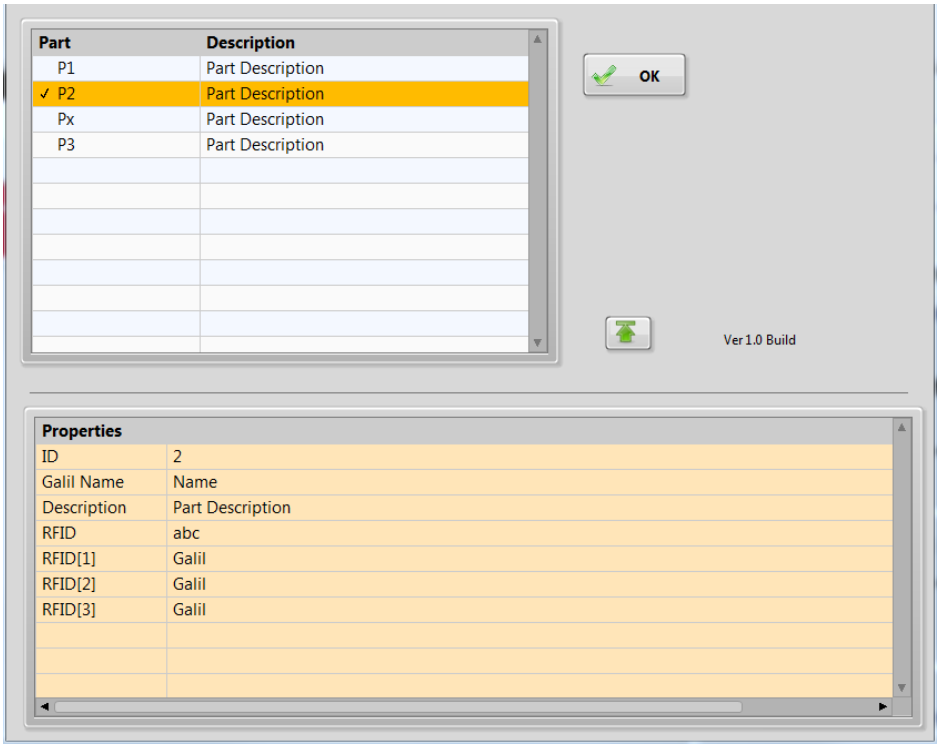

Figure 95: Part Selection Console

2. Select the column header to sort the part view.

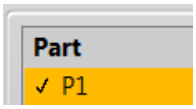

Figure 96: Column Header

3. Select the "**OK**" button to accept the selected highlighted part.

Figure 97: "OK" Button

4. Use the arrow buttons to expand or collapse the window to view or hide current part properties.

Figure 98: Arrow Buttons to Expand or Collapse the Window

14.2 Recipe Manager

1. In **Setup** mode, select "**Recipe Manager**" to go to the **Recipe Manager**.

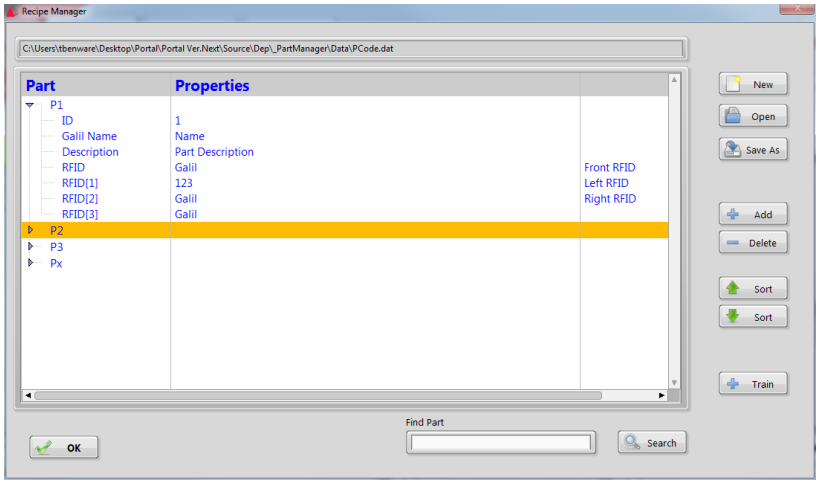

Figure 99: Recipe Manager Window

2. Select the "**New**" button to create a new Dataset file.
3. Select the "**Open**" button to open an existing Dataset file.
4. Select the "**Save As**" button to save the current Dataset file as a new Dataset file.
5. Select the "**Add**" button to add a new part to the current data set. Ensure the new part name is unique.

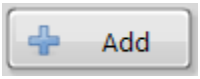

Figure 100: Add Button

6. Select the "**Delete**" button to delete the selected part record.

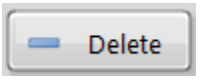

Figure 101: Delete Button

7. The part record can be viewed in ascending or descending order. To view the part record in ascending order, select the "**Sort**" button with the up arrow. To view the part record in descending order, select the "**Sort**" button with the down arrow.

Figure 102: Sort Ascending or Descending Buttons

8. Select the "**Train**" button to add a new part record based on a trained part code.

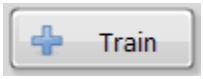

Figure 103: Train Button

9. Select the "**Search**" button to search for a part by name in the current dataset. The search is case sensitive.

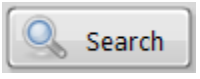

Figure 104: Search Button

14.2.1 To Edit Part Name or Part ID

To edit a **Part Name** or **Part ID**, hold the "**CTRL**" key down and double click the necessary field. This action prevents accidental edits to these fields.

14.2.2 To Edit a Property Field

1. To edit a property field, click on the part name to expand the property list.
2. Double click on the property that is to be edited. The edit property window shown will depend on the data type of the selected property.

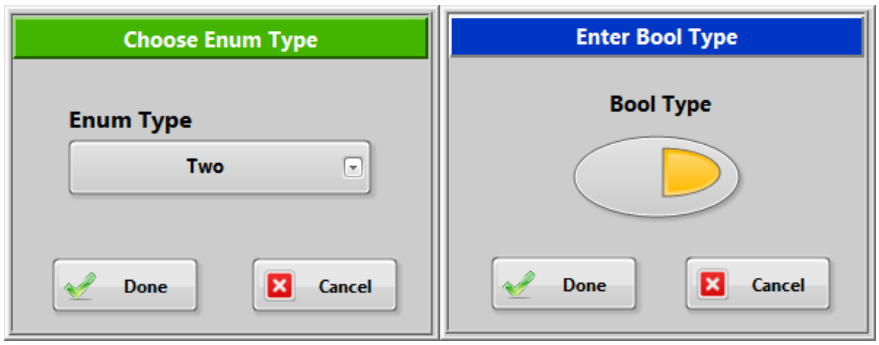

Figure 105: Choose Enum and Enter Bool Type Windows

3. The edit field may have limits on what can be entered. For example, a property of type 'String' may be restricted to a length of 12 characters and some characters may not be allowed. A property of type 'Num' may only allow numbers in the range of 1 - 30 to be entered.

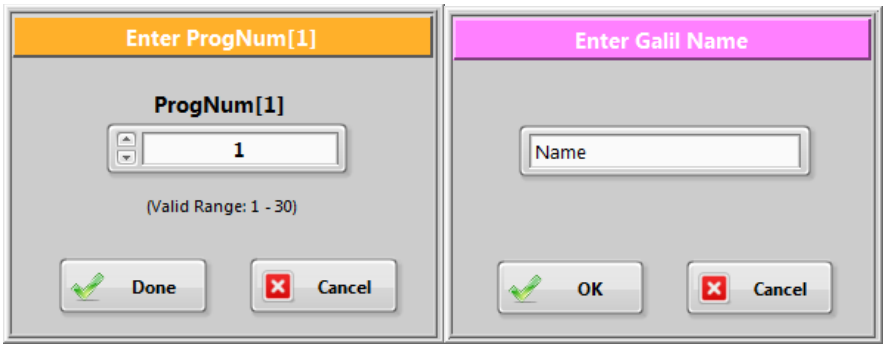

Figure 106: Enter ProgNum and Enter Galil Name Windows

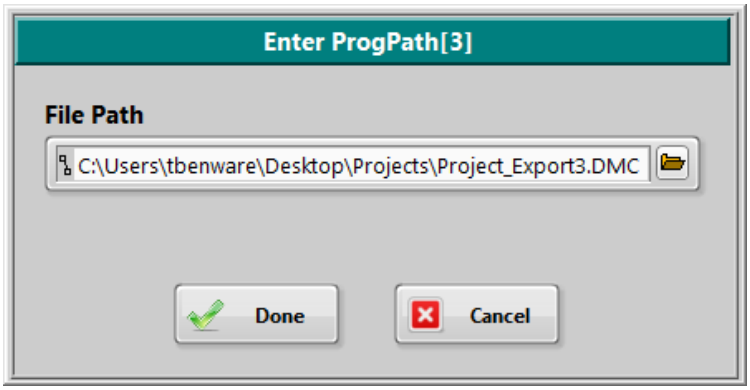

Figure 107: Path Program File Location

14.3 How to Train a New Part

PartCodes must be trained in order to create a new part record. A **PartCode** could be a barcode, RFID tag, etc. **PartCodes** must be unique to the dataset. If the trained **PartCode** is found in the dataset, the **Train** window will close and the part matching the **PartCode** will be selected.

1. Select the "**Train**" button from the **Recipe Manager** window.

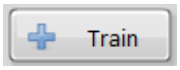

Figure 108: Train Button

2. The **Train** window will open. Select the "**Train Part**" button.

Figure 109: Train Part Button

3. The **Train** window will display a prompt to put the **PartCode** under the reader.

Figure 110: PartCode Prompt

4. After the **PartCode** is read, the value is shown in the **PartCode** field.

5. Enter a unique part name in the **Part Name** field.

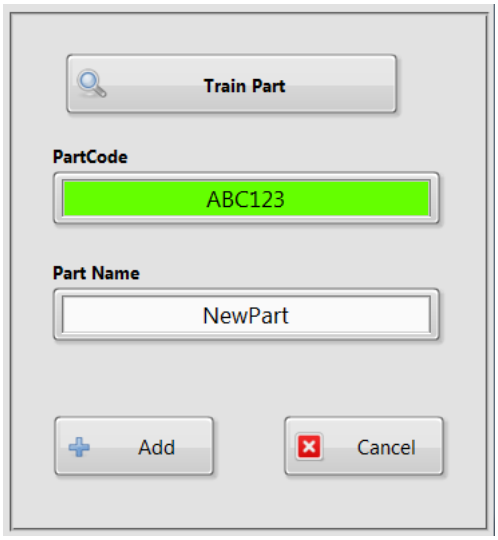

Figure 111: Train Part Window

6. Click the "**Add**" button to add the new part to the dataset or click the "**Train Part**" button to train the **PartCode**.

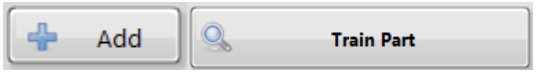

Figure 112: Add and Train Part Buttons

Note: If an error needs to be corrected in the PartCode scanned, or if the PartCode scan was incomplete, select the "Train Part" button.

14.3.1 Train Part Faults

There are two types of faults that can occur when training a part:

1. **Train Part Timeout**: A timeout fault that occurs when the user clicked the "**Train Part**" button to request a **PartCode**, but the system did not respond within the 10 second timeout period.

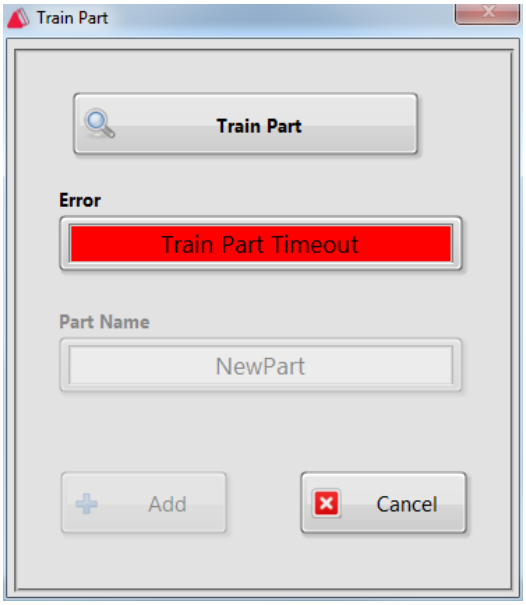

Figure 113: Train Part Timeout Error

2. **Train Part Failed**: This fault occurs when the system returns a **Negative Acknowledge** (**NAK**) when asked to read the **PartCode**. This means that the device could not successfully read the **PartCode**.

15. Faulty Recovery

15.1 Recovering From Emergency Stop and Other Machine Errors

If the **Emergency Stop** button is engaged or the machine encounters a system error, perform the following procedure to return the machine back to normal operation.

Note: If the Emergency Stop was engaged because of system failure, DO NOT disengage the Emergency Stop button. Shut the system down and have qualified personnel repair the machine. Do not operate the workcell again until the cause of the failure has been repaired.

1. Open the front doors and remove all parts/PCBs from the work area.
2. Close the doors and disengage the "**Emergency Stop**" button if it was not engaged because of a system failure.
3. Press the "**Continue**" button to return the head to the **Standby Position**. The screen will return to the **Cycle Stop** mode.

Note: All functions are stopped until the "Emergency Stop" button is disengaged.

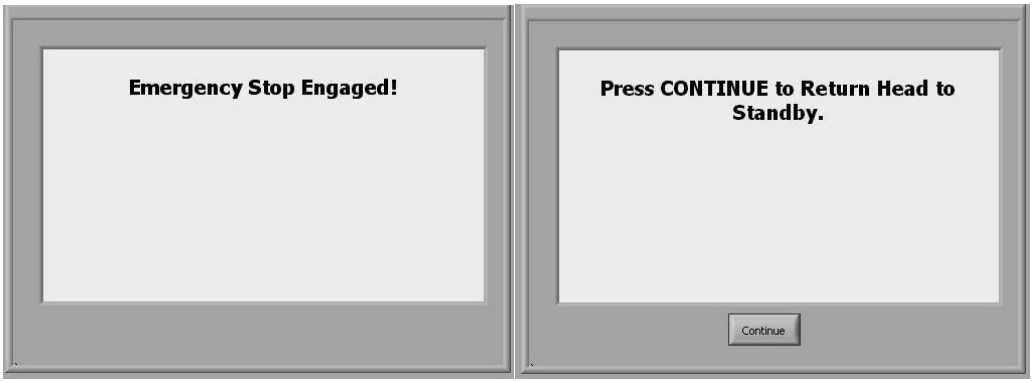

Figure 114: Emergency Stop Screens

4. Correct the fault that caused the operator to engage the "**Emergency Stop**" button.
5. Open the access door.
6. Remove all parts from the work area. Find any parts that can still be used and put them in the input queue.
7. Close the access door.

8. Perform the **Startup Procedure**. Refer to Section 10.1 for more information.

If a door is open while the **Door Bypass** switch is in the **OFF** position, or the workcell is in any machine state besides the **Manual** or **Calibration** modes, it will cause a door error. Recovery from a door error is similar to the recovery from an **Emergency Stop**.

Other workcell errors can occur, such as:

- Low air pressure
- Low material flow
- Insufficient exhaust air flow

These errors must first be corrected, and then the **Startup Procedure** can be performed to continue. Refer to the section that relates to the error. Refer to Section 10.1 for more information on the Startup Procedure.

Below are examples of the other possible error screens:

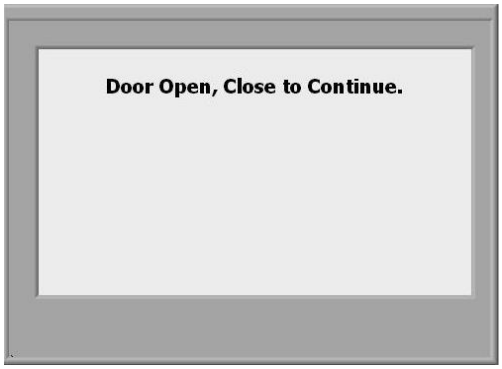

Figure 115: Door Open Error

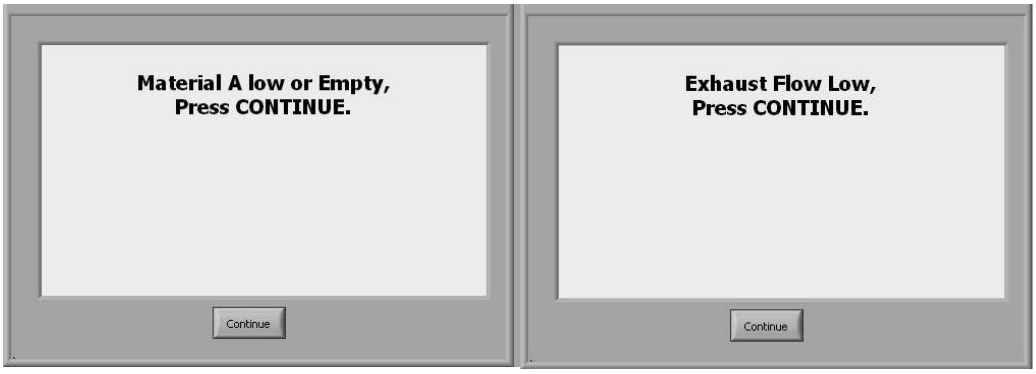

Figure 116: Low Material Level and Low Exhaust Flow

15.2 Low Material Level

There are three common ways to monitor the material level:

- **Scales** are the most common and flexible option to monitor the material level. They have two settings: one for a low material level and one for an empty level. When the low material level is reached, the operator will be shown a message, but the workcell will continue to operate. When the empty level is reached, the workcell will stop operating. To view the amount of a material in a tank, select the **Scales** tab on the right side of the Portal screen. This option can be viewed in any mode. Refer to Section 9.6 for more information on Scales.

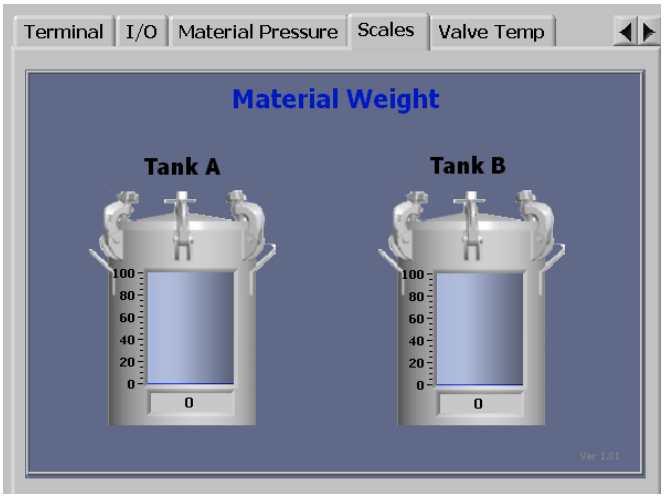

Figure 117: Material Level in Scales Tab

- **Floats** are an additional way to monitor the material level. However, this option will only notify the operator when the material is low.

- **Proximity Sensors** are used for cartridges or syringes. The proximity sensor is activated when the ram moves to the low material position.

The workcell only measures the material level(s) when in **Auto Cycle** or **Manual** "**One Shot Wet**" mode. If there is a material level error, the machine can operate in all modes, except for **Auto Cycle** or **Manual** "**One Shot Wet**" mode, until the material level is raised above the low level.

Note: A low material level will not stop a cycle. The cycle will complete the path program and then stop machine operation.

15.3 Resetting the Exhaust Fan Overload Relay

Machines with exhaust fans may have errors if the overload relays trip. Perform the following steps to return to normal operation:

1. Set the main power switch to the "**OFF**" position.
2. Open the electrical enclosure and examine the overload relay for a tripped flag.
3. Confirm that the current set point is set correctly on the overload relay. Examine the rating on the exhaust fan housing for current draw.
4. If necessary, push the "**Reset**" button to reset the relay.
5. Restart the machine.
6. If the problem persists, refer to the Workcell Installation Guidelines Troubleshooting Maintenance Manual or contact PVA Customer Service for more information.

15.4 Pneumatic Error Recovery Procedure

The system's pneumatics are checked for errors every time they operate. The pneumatics must be in their home position before the axes can home or move to the standby position. If a pneumatic fails, an error will be shown.

Figure 118: Pneumatic Error Example

1. Find the cause of the problem.
2. Correct the problem.

3. Select the "**Continue**" button.

4. Refer to the Pneumatic Actuator Failure section in the Workcell Installation Guidelines Troubleshooting Maintenance Manual for more information.

15.5 Run-Time Error Recovery Procedure

Run-time errors are generated during the operation of a program. This type of failure should not occur during normal operation. The error type and program line number will be displayed in the system messages window.

1. Find and record the error type, program line number, and any additional information shown in the system messages window and contact PVA Technical Support.

2. Select the "**Continue**" button.

Figure 119: Command Error Example

3. Perform the **Startup/Recovery Procedure**. Refer to Section 15.1 for more information.

4. Download the updated program and run it to confirm if the error was corrected.

Note: For more information on error codes, refer to the Troubleshooting guide. For more information on programming paths, refer to the PathMaster® manual.

15.6 Position Error Recovery Procedure

A position error occurs when the difference between the commanded position and the current position is more than the maximum allowable error limit for an axis.

An error limit will happen if the dispense/spray head hits a hard stop in **Manual** mode, if the speed or acceleration is set too high, or if the axes drives are not powered. Ensure the "**Emergency Stop**" button is not engaged. The motor stop codes are shown in the system messages window.

Note: Refer to Section 15.8 for more information on stop codes.

Figure 120: Position Error

To correct the position error, perform the following steps:

1. Engage the "**Emergency Stop**" button.
2. Open the access door.
3. Move the dispense head to the center of the work area. Engage the brake on the Z-axis. Turn the Z-axis motor coupling by hand to move the dispense head, as necessary.
4. Close the access door.
5. Disengage the "**Emergency Stop"** button.
6. Select the "**Continue**" button to clear the error.
7. Perform the **Startup Procedure**. Refer to Section 10.1 for more information.

15.7 Limit Error Recovery Procedure

The machine encounters a limit error when the gantry exceeds the software or hardware limits. The stop codes are shown in the system messages window.

Figure 121: Limit Error

1. Engage the "**Emergency Stop**" button.
2. Open the access door.
3. Move the dispense head to the center of the work area. Engage the brake on the Z-axis. Turn the motor coupling by hand to move the dispense head, as necessary.
4. Close the access door.
5. Disengage the "**Emergency Stop"** button.
6. Select the "**Continue**" button to clear the error.
7. Perform the **Startup Procedure**. Refer to Section 10.1 for more information.

15.8 Stop Codes

For position and limit errors, the error screen shows stop codes for all the motors. This shows which axis (or axes) caused the machine to fault.

Code	Meaning
0	Motors are running, independent mode.
1	Motors stopped at commanded independent position.
2	Decelerating or stopped by FWD limit switch or software.
3	Decelerating or stopped by REV limit switch or software.
4	Decelerating or stopped by Stop Command (ST).
6	Stopped by Abort input.
7	Stopped by Abort command (AB).
8	Decelerating or stopped by Off-on-Error (OE1).
9	Stopped after Finding Edge (FE).
10	Stopped after Homing (HM).
50	Contour running.
51	Contour Stop.
99	MC timeout.
100	Motors are running, vector sequence.
101	Motors stopped at command vector.

Table 2: Stop Code Definitions

15.9 Request the Motion Controller Version

Perform the procedure below to request the motion controller firmware version. Refer to the PathMaster® Manual for more information.

1. Select the **Terminal** tab on the right side of the Portal window.
2. In the terminal window type "**^R^V**".

Figure 122: Portal Terminal Window

3. Press the "**Enter**" button.
4. The motion controller model and firmware version are shown in the terminal window.

16. Notes

17. Warranty

PVA Warranty Policy

PVA warrants the enclosed product against defects in material or workmanship on all components for one year from the date of shipment.

The warranty does not extend to components damaged due to misuse, negligence, or installation and operation that are not in accordance with the recommended factory instructions. Unauthorized repair or modification of the enclosed product, and/or the use of spare parts not directly obtained from PVA (or from factory authorized dealers) will void all warranties.

All PVA warranties extend only to the original purchaser. Third party warranty claims will not be honored at any time.

Prior to returning a product for a warranty claim, a return authorization must be obtained from PVA's Technical Support department. Authorization will be issued either via the telephone, facsimile, or in writing upon request.

To qualify as a valid warranty claim, the defective product must be returned to the factory during the warranty period. Upon return, PVA will repair (or replace) all components found to be defective in material or workmanship.

(Retain this for your records)

Product Information:

PRODUCT: _____

SERIAL NUMBER: _____

DATE OF PURCHASE: _____

18. Table of Figures

19. Table of Tables

20. Appendix A – Definitions

Auto Cycle: Machine state where cycles are running.

Auto Purge: A machine function that automatically purges material after a predefined period of time or during solvent cups procedures.

Calibration Position: The location in the workspace where the X, Y, Z and W locations for the needle(s) is normalized.

Cycle Stop: Machine state where no action is occurring, and the machine is at the standby position.

Depress: Push and hold for the duration of the operation.

Dispense/Spray Path: A continuous motion profile. The valve is on (dispense/spray) during the entire motion profile. This is also known as a **Path** or **Motion Sequence**.

DMC: Language used to program the motion controller in the workcell.

End Effector: The dispense/spray head assembly. The end effector is moved by the axes.

Head: Dispensing/spraying valve.

Home Position: The (0, 0, 0, 0) location of the workspace. This position is determined by the location of the home sensors. It is NOT the same as the **Standby Position**.

Jog: Moving any combination of axes continuously at a set rate of speed until commanded to stop.

Light Tower: The light tower consists of three stacked lights: red, amber, and green (top to bottom, respectively). It is used to indicate the status of the machine.

Main Program File: A text file containing the code that runs the workcell during normal operations.

Motion Sequence: A continuous motion profile. The valve is on (dispense/spray) during the entire motion profile. This is also known as a **Dispense/Spray Path** or **Path**.

Path: A continuous motion profile. The valve is on (dispense/spray) during the entire motion profile. This is also known as a **Dispense/Spray Path** or **Motion Sequence**.

PathMaster®: Windows®-based programming software. This software is used to create, maintain, and download program files for the workcell.

Push: Push and release.

Program: A collection, or series, of motion sequences.

Project: A file containing the code for one or more programs (typically 30 programs).

Purge Position: The location in the workspace where the head moves to perform all auto purge operations.

PVA: Precision Valve & Automation, Inc.

Solvent Cups: Reservoirs containing a compatible solvent used to maintain the dispense/spray valves when the workcell is not processing product.

Solvent Position: The location in the workspace where the head moves to rest in a solvent solution to maintain the dispense/spray valves when the workcell is not processing product.

Standby Position: The rest position for the end effector. The machine moves here after homing and after each cycle. This position is usually located near the start point for the program(s). It is NOT the same as the **Home Position**.

Terminal: A program used as a communication link between the motion controller and the operator.

Teach: A process by which the workcell registers its current gantry location with PathMaster® to create a motion sequence.

Workcell: A model PVA250™, PVA250E™, PVA350™, PVA550™, PVA650™, PVA650-FT™, PVA750™, PVA1000™, PVA2000™, PVA2000C™, PVA3000™, Delta 6, Delta 8, or Flex Cell automated system.

21. Appendix B – Serial Communication

21.1 Serial Communication

The workcell can communicate with a computer using the EIA RS-232C standard. This is used for debug purposes. The computer is the **Data Terminal Equipment** (**DTE**) **Device**, and the motion controller is the **Data Communications Equipment** (**DCE**) **Device**. The table below gives a brief overview of the connections required to communicate between the **DTE** and **DCE** devices.

Note: The computer must be at the same ground potential as the workcell. Damage to the workcell or computer may result if the ground potentials are different. If provided, use the workcell service outlet for computer power.

21.2 9 Pin Serial Connector

Error! Reference source not found. describes the pin configuration for standard serial ports found on most portable computers.

Pin	Description
1	Carrier Detect (CD)
2	Received Data (RD)
3	Transmitted Data (TD)
4	Data Terminal Ready (DTR)
5	Signal Ground
6	Data Set Ready (DSR)
7	Request to Send (RTS)
8	Clear to Send (CTS)
9	Ring Indicator (RI)

Table 3: DTE 9 Pin Serial Connector