

User
Manual

SmartPAC **PRO**

Wintriss® Press Automation Control
1143100
Rev. E March 2024

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Changes for Revision E of the SmartPAC PRO User Manual (1143100)

This revision of the SmartPAC PRO user manual covers SmartPAC PRO software version 13.08 and higher. The changes include:

- Updated: Installing SmartPAC PRO in a Pendant
- Added: Additional Settings (SFC, optional)
- Added: CAN bus fault message and glossary entry
- Added: Auto Advance column to ProCamPAC Cam Switch setup pages
- Revised: wiring diagrams at end of manual: Figures 1,2
- Added: new wiring diagrams at end of manual: Figures 10, 11, 12

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HOW TO USE THIS MANUAL

This manual shows you how to install, set up, program, operate, and troubleshoot SmartPAC PRO, including the ProCamPAC and DiProPAC options.

Chapter 1 provides an overview of the operation and features of SmartPAC PRO, including the display and user interface.

Chapter 2 shows you how to install SmartPAC PRO, including the optional ProCamPAC and DiProPAC modules.

Chapter 3 shows you how to use SmartPAC PRO in Initialization mode, which is the mode you select to make settings that apply to SmartPAC PRO operation for all tools.

Chapter 4 shows you how to use SmartPAC PRO in Program mode, which is the mode you select to program settings that apply to SmartPAC PRO operation for individual tools.

Chapter 5 shows you how to use SmartPAC PRO in Run mode, which is the mode you select to run the press and make minor adjustments to programmed settings.

Chapter 6 shows you how to use the DiProPAC die protection option in all three operation modes.

Chapter 7 shows you how to use the ProCamPAC programmable cam option in all three operation modes.

Chapter 8 provides explanations of the messages that display on the SmartPAC PRO front panel when a fault condition occurs or a counter preset is reached, and shows you how to correct SmartPAC PRO faults.

Appendix A shows you how to use SmartPAC PRO preventive maintenance.

Appendix B shows you how to update SmartPAC PRO firmware.

Appendix C shows you how to report downtime and scrap to ShopFloorConnect (SFC).

The Glossary provides definitions of some of the terms used in the manual that may be unfamiliar to you.

Setup sheets at the end of the manual provide forms on which you can maintain a record of Initialization and Program settings for your SmartPAC PRO.

Wiring diagrams (Figures 1 through 12) following the Setup sheets provide wiring connections for SmartPAC PRO, DiProPAC, ProCamPAC, and the SmartPAC PRO loopback test.

Important Highlighted Information

Important danger, warning, caution and notice information is highlighted throughout the manual as follows:

DANGER

A DANGER symbol indicates an imminently hazardous situation, which, if not avoided, will result in death or serious injury.

WARNING

A WARNING symbol indicates a potentially hazardous situation, which, if not avoided, could result in death or serious injury.

CAUTION

A CAUTION indicates a potentially hazardous situation, which, if not avoided, may result in property damage.

NOTICE

A NOTICE symbol indicates important information that you should remember, including tips to aid you in performance of your job.

WARRANTY

Wintriss Controls warrants that Wintriss electronic controls are free from defects in material and workmanship under normal use and service for a period of one year (two years for Shadow light curtains) from date of shipment. All software products (SFC), electro-mechanical assemblies, and sensors are warranted to be free from defects in material and workmanship under normal use and service for a period of 90 days from date of shipment. Wintriss's obligations under this warranty are limited to repairing or replacing, at its discretion and at its factory or facility, any products which shall, within the applicable period after shipment, be returned to Wintriss Controls freight prepaid and which are, after examination, disclosed to the satisfaction of Wintriss to be defective. This warranty shall not apply to any equipment which has been subjected to improper installation, misuse, misapplication, negligence, accident, or unauthorized modification. The provisions of this warranty do not extend the original warranty of any product which has either been repaired or replaced by Wintriss Controls. No other warranty is expressed or implied. Wintriss accepts no liability for damages, including any anticipated or lost profits, incidental damages, consequential damages, costs, time charges, or other losses incurred in connection with the purchase, installation, repair or operation of our products, or any part thereof.

Please note:

It is solely the user's responsibility to properly install and maintain Wintriss controls and equipment. Wintriss Controls manufactures its products to meet stringent specifications and cannot assume responsibility for consequences arising from their misuse.

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USER MANUAL
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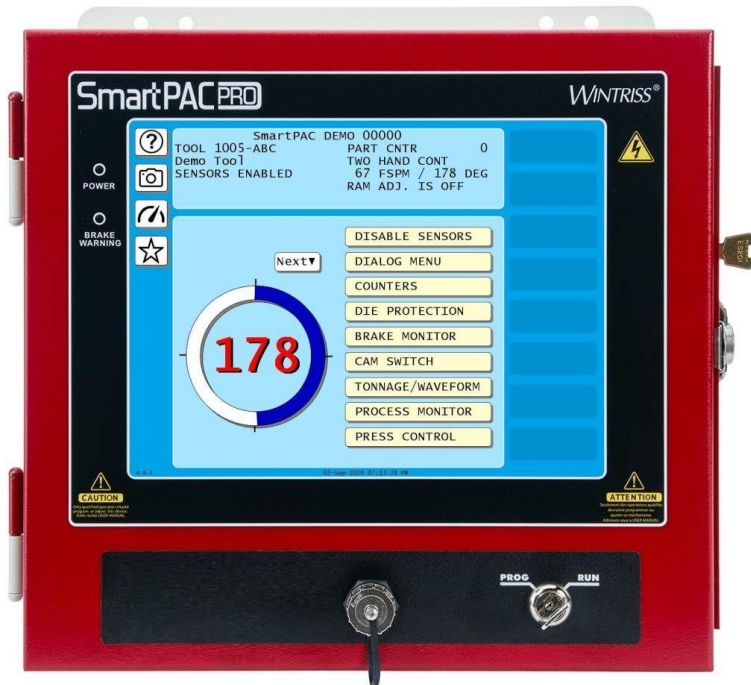


Figure 1-1. SmartPAC PRO Front Panel

SmartPAC PRO is a modular interface for press automation functions including die protection and programmable cam switch. The SmartPAC PRO provides a control-reliable, brake monitor and extensive counter capabilities. SmartPAC PRO monitors and controls a variety of functions for every type of press, and can be connected to your network, enabling press operation to be monitored remotely and messages to be sent to and from the SmartPAC PRO control.

SmartPAC PRO can be configured with the following options:

- Up to 32-sensor die protection system
- Up to 16-channel programmable cam switch
- Up to 32-sensor in-die measurement system
- Solid-state dual-microprocessor-based clutch/brake control
- Two- or four-input load and signature monitoring
- Automated shut-height and counterbalance control
- Automated press speed and lubrication control
- Servofeed interface

In addition, SmartPAC PRO can be integrated into the Wintriss ShopFloorConnect Software (SFC) for data collection, analysis and reporting.

SmartPAC PRO Standard Features

SmartPAC PRO brings a multitude of press automation functions to one central location. Standard features include:

- All settings are made at the operator console, using SmartPAC PRO's touch display
- Tool programs are automatically saved in SmartPAC PRO's memory. To use the same settings when you run the job again, simply re-load your stored tool number. SmartPAC PRO can save settings for thousands of tools.
- SmartPAC PRO's built-in brake monitor checks brake wear by measuring stop time whenever the press stops and displaying that value in milliseconds. SmartPAC PRO also displays the number of degrees that it takes the press to stop.
- Fault messages appear on the SmartPAC PRO display whenever the press malfunctions, counter presets are reached, or stopping/starting times exceed set limits. An error/event log maintains a record of the most recent errors and events.
- SmartPAC PRO is Ethernet-ready, allowing the control to be connected to your network. Network connectivity allows press operations to be viewed remotely via the SmartView utility, enables complete backup of tool and initialization settings and allows sending e-mail messages containing diagnostics and error log information from the SmartPAC PRO.
- SmartPAC PRO upgrades and enhancements can be installed quickly and easily. Upgrades can be either downloaded directly to SmartPAC PRO via the local network or installed via a USB disk.

SmartPAC PRO Options

For additional information on any of these SmartPAC PRO options and capabilities, contact your Wintriss Sales Representative or Wintriss Customer Support.

- Die protection and programmable cam switch options can be added to your SmartPAC PRO. When configured with the DiProPAC option, SmartPAC PRO can monitor up to 32 sensors, to detect malfunctions such as stock buckling, misfeeds, and improper part ejection.
- When the ProCamPAC option is installed, Smart PAC PRO provides cam timing for feed, pilot release, air blow-off, and other press equipment. ProCamPAC also includes global cams for press control functions, an ON WITH DSV cam type, and multiple on/off cycles per cam.
- Info Center, another SmartPAC PRO option, enables setup sheets and other information to be displayed on the SmartPAC PRO screen. This option allows you to store information needed throughout the plant on a central server, where it is available to operators via SmartPAC PRO's Ethernet connectivity.
- Optional external modules such as the WPC 2000 Clutch/Brake Control, AutoSetPAC or WaveFormPAC tonnage monitors, ProPAC In-Die Measurement Systems, and RamPAC Automatic Shut Height and Counterbalance Control can also be added to the SmartPAC PRO.

Resolver-based Operation

For timing, the SmartPAC PRO uses a rugged and reliable resolver driven 1:1 with the press's crankshaft. The resolver constantly reports the crankshaft position to the SmartPAC PRO, enabling it to create timing signals that are accurate to within 2/3 of a degree of rotation.

SmartPAC PRO Settings

You can make the following settings using the screen on the SmartPAC PRO:

- **Assign tool names/numbers.** Settings for each tool are stored by tool number or name, which you assign to identify and access the tool when you want to program or load it.
- **Load settings by tool name/number.** SmartPAC PRO saves all settings in its electronic memory. To use tool settings again, you recall them by selecting the tool name or number from the Tool Manager. SmartPAC PRO retains settings for thousands of tools.
- **Protect settings with lockout and optional password security.** You can lock many of the settings in Run mode, preventing anyone without access to the PROG/RUN keyswitch from altering settings. You can also require that the user enter a password in order to change settings.
- **Set Brake Monitor.** You set the brake monitor stop time limit to provide a warning when the brake needs service. When the stop time limit is exceeded, the brake monitor disables the press, alerting you that your brake requires service. In addition, the Brake Warning LED on the SmartPAC PRO front panel flashes when press stopping time approaches within 10msec of the stop time limit, allowing you to schedule maintenance.
- **Set counters.** SmartPAC PRO's counters keep track of the number of strokes made by the press, the number of good parts produced, the total hits on the die. The good parts counter increments only when the die protection or tonnage monitoring option does not generate a fault. Batch counters can be set to top-stop the press their presets are reached. SmartPAC PRO is able to keep an accurate parts count when multiple parts are produced on each stroke or when multiple strokes are required to produce one part..
- **Review recent errors.** SmartPAC PRO's Error/Event Log feature displays the 200 most recent errors and events that have occurred at the press. Errors (i.e., incidents that cause the press to stop) are shown along with the stroke count and crankshaft angle at which the error occurred. Events, such as tool changes, are displayed with the date, time, and stroke count. The Error Log is accessible from the Main Run Menu.
- **Set timing for sensor inputs (DiProPAC Only).** You can specify how you want installed sensors to monitor press operation. Up to 32 sensors can be used, allowing detection of malfunctions such as stock buckling, misfeeds, and improper part ejection.
- **Set timing for cam channels (ProCamPAC Only).** You can specify the crankshaft angle at which to activate your feed pilot release, assembly operations, air cylinders, transfer devices, lubricators, air blow-off, cut off, loader/unloader controls, and other equipment that requires precise synchronization with the press. You can also assign a name to each cam channel.

DiProPAC Die Protection Module (Optional)

DiProPAC, the SmartPAC PRO die protection option, checks the outputs of sensors monitoring the die and sends a stop signal to the press when it detects a malfunction. Sensors can be mounted on the press or die, and monitor functions such as material feed, part ejection, material buckle, stripper position at BDC, and end of material. Refer to *Chapter 2* for installation instructions and *Chapter 6* for how to use the DiProPAC.

ProCamPAC Programmable Cam Switch (Optional)

DANGER

PROGRAMMABLE CAM SWITCH NOT FOR SAFETY USE

Use SmartPAC PRO's programmable cam switch to control auxiliary functions only. The SmartPAC PRO programmable cam capability should never be used to provide timing signals for any safety use including clutch/brake control or muting of light curtains.

Failure to comply with these instructions will result in death or serious injury.

The optional ProCamPAC module enables you to connect up to eight or sixteen cam channels to your equipment. ProCamPAC consists of a PC board that you install in your SmartPAC PRO and a separate assembly that contains the relays that open and close on signals from SmartPAC PRO. Different types of relays can be used depending upon the voltages of your equipment and your special needs. Refer to *Chapter 2* for installation instructions and *Chapter 7* for how to use ProCamPAC.

SmartPAC PRO's Modes of Operation

SmartPAC PRO has three operating modes. The Main, or top, menu for each mode is shown in Figure 1-2.

- **Initialization Mode.** Used to create (mostly) global settings that control operation of SmartPAC PRO when any tool is loaded.
- **Program Mode.** Used to create, modify, and load settings that control SmartPAC PRO operation for specific tools.
- **Run Mode.** Used to operate the press and make adjustments to programmed settings such as sensor and cam timing for the currently running tool.

NOTICE

To exit any mode, be sure you are in the mode's Main menu, shown in Figure 1-2. If you are not in the Main menu, press Reset, Exit, or Back repeatedly until the Main menu appears.

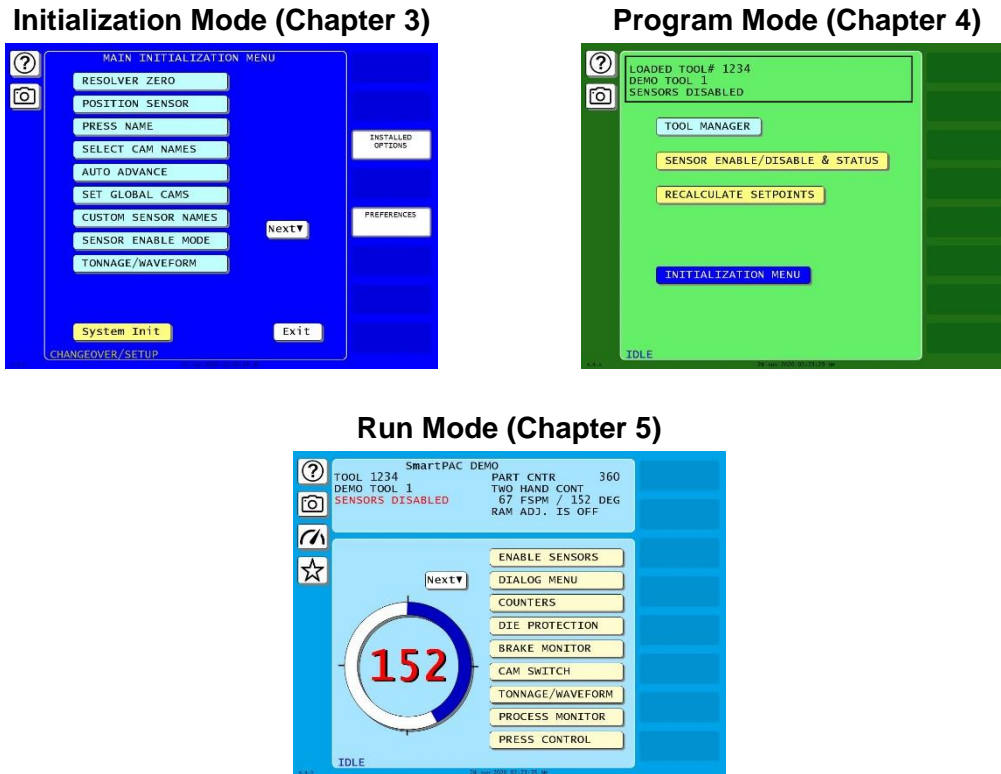


Figure 1-2. “Top” Screen for each of SmartPAC PRO’s 3 Operating Modes

Table 1-1. Initialization, Program and Run Modes: Entry and Exit Procedures

Mode	How to Enter This Mode	How to Exit This Mode
<p>Initialization</p> <p>White text on dark blue display.</p> <p>Make settings that control operation of SmartPAC PRO with all tools.</p> <p>You use Initialization mode extensively when you install a new SmartPAC PRO. You will use this mode only occasionally after you set up SmartPAC PRO and the press is running.</p> <p>See next section and <i>Chapter 3</i>.</p>	<p>Turn the key switch to “PROG” and select “INITIALIZATION MENU” from the Main Programming Menu.</p> <p>We recommend that you password-protect the Initialization menu (see <i>SECURITY ACCESS</i>, page 98)</p>	<p><i>To switch to Program mode:</i></p> <p>Press EXIT.</p> <hr/> <p><i>To switch to Run mode:</i></p> <p>Turn the PROG/RUN keyswitch to RUN.*</p>

Mode	How to Enter This Mode	How to Exit This Mode
<p>Program Black text on green display.</p> <p>Create, modify and load settings for individual tools that control SmartPAC PRO operation when that tool is loaded.</p> <p>See <i>Program Mode</i>, page 33 and <i>Chapter 4</i>.</p>	<p><i>From Run mode:</i></p> <p>Turn the PROG/RUN keyswitch to PROG.*</p> <hr/> <p><i>From Initialization mode:</i></p> <p>Go to the Main Initialization Menu, and Press EXIT.</p> <p>– or –</p> <p>Turn the PROG/RUN keyswitch to RUN and then back to PROG.*</p>	<p><i>To switch to Run mode:</i></p> <p>Turn the PROG/RUN keyswitch to RUN.*</p> <hr/> <p><i>To switch to Initialization mode:</i></p> <p>Select “INITIALIZATION MENU” from the Main Programming Menu</p>
<p>Run Black text on light blue display.</p> <p>Run the press. In this mode you can adjust counters, cams, sensors and other functions while the press is running.</p> <p>See <i>Run Mode</i>, page 33 and <i>Chapter 5</i>.</p>	<p>Turn the PROG/RUN keyswitch to RUN.*</p>	<p><i>To switch to Program mode:</i></p> <p>Turn the PROG/RUN keyswitch to PROG.*</p>
<p>* If you turn the key and nothing happens, press Reset, Exit, or Back repeatedly until SmartPAC PRO changes modes. Before you turn the PROG/RUN keyswitch, make sure SmartPAC PRO is in the Main (or top) menu for the mode it is in. If it is not, press Reset, Exit, or Back repeatedly until the Main menu appears.</p>		

Initialization Mode

Initialization mode allows you make settings that control the operation of SmartPAC PRO with any tool. See *Chapter 3*, page 89, for detailed instructions on how to use SmartPAC PRO in Initialization mode. Settings for individual tools are made in Program mode, *Chapter 4*, page 133.

Initialization mode is used extensively when you install a new SmartPAC PRO, but you will likely use it only occasionally after SmartPAC PRO is set up and the press is running.

Program Mode

Program mode allows you to create, copy, modify, and delete tool settings, as well as enable or disable sensors. See *Chapter 4*, page 133, for detailed instructions on how to use SmartPAC PRO in Program mode.

Run Mode

The SmartPAC PRO is in Run mode for production. The Main Run Menu, (see Figure 1-2) shows the rotation of the crankshaft on a crank angle clock diagram in the lower left corner of the display. When the press is running in Continuous mode, the press speed in strokes per minute is displayed in the center of the clock diagram. When the press is stopped or running in Inch or Single-stroke, the crankshaft angle is displayed inside the clock.

If security access settings in Initialization mode permit, you can make adjustments to programmed settings in Run mode, such as die protection settings, cam timing, etc. See *SECURITY ACCESS*, page 98.

See *Chapter 5*, page 151, for detailed instructions on how to use SmartPAC PRO in Run mode.

SmartPAC PRO User Interface

SmartPAC PRO features a touch screen with on-screen buttons for navigating through its menus and making settings for your tools. In addition, SmartPAC PRO uses an on-screen numeric keypad and an on-screen keyboard for entering alpha-numeric data. These are described below.

NOTICE

You may plug a USB keyboard into the USB port on the front panel of the SmartPAC PRO. When entering alphanumeric data, the SmartPAC PRO will automatically recognize keystrokes from the on-screen keyboard/keypad and the external USB keyboard.

On-Screen Numeric Keypad

Whenever you select a field that requires numbers only, SmartPAC PRO displays an on-screen numeric keypad (see Figure 1-3).

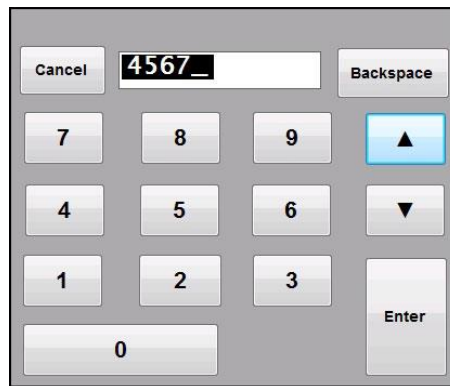


Figure 1-3. Numeric Keypad

The up and down arrows (▲▼) on the keypad increment or decrement the value by 1. Backspace clears the value. Enter accepts the value entered into the field. Cancel closes the numeric keypad without making any changes.

When you use a USB keyboard, the ESC key acts as the Cancel button, while the other keys match their counterparts.

Note that when the on-screen keypad is displayed, the Exit or Back button on the screen is disabled. The keypad value must be entered or cancelled before you can access any other buttons on the screen.

On-Screen Keyboard

Whenever you select a field that requires the input of a combination of letters, numbers, and/or symbols, SmartPAC PRO displays its on-screen keyboard. (see Figure 1-4).

Backspace key clears the value. Cancel closes the numeric keypad without making any changes, and Enter accepts the value entered into the field. Shift capitalizes the next character, CAPS functions like a Caps Lock key.

When a USB keyboard is used, the ESC key acts as the Cancel button, while the other keys match their counterparts.

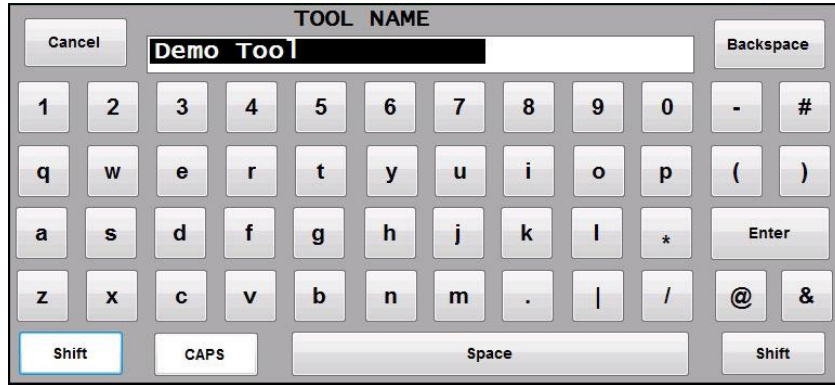










Figure 1-4. SmartPAC PRO On-screen Keyboard

NOTICE

When the on-screen keypad or keyboard is displayed, Exit or Back button on the screen is disabled. The keypad or keyboard value must be entered or cancelled before you can access any other buttons on the screen.

Control and Navigation Buttons

Table 1-2. Control Buttons on SmartPAC PRO

	<p>Help button (on most screens) Press to see instructions for the screen you are viewing.</p>
	<p>Camera button (on most screens) Press to capture an image of the current screen. To view the captured images, press and hold the Camera button for 5 seconds. For details, see <i>Screen Captures</i>, next section.</p>
	<p>Cursor (arrow) and ENTER buttons (some screens for selections and settings) On some screens, use cursor buttons to highlight selections rather than pressing the selection directly. Use the arrow buttons (▲▼◀▶) to move the on-screen navigation highlight, to increment and decrement numeric values, and to set the on and off angles for programmable limit switch outputs and die protection ready signals. Use the ENTER button to select a highlighted item or to register a value entered. It can also toggle values.</p>
	<p>Dashboard button (on Run screen) Press to go to the currently selected dashboard. See <i>Favorite button</i> and <i>Creating and Using Dashboards</i>, page 38.</p>
	<p>Favorite button (on Run screens) Press this button to create a dashboard or select a previously created dashboard. See <i>Dashboard button</i> and <i>Creating and Using Dashboards</i>, page 38.</p>
	<p>Info button (on Dashboard screen) Press to see the SmartPAC PRO information screen which lists the press name, SmartPAC PRO serial number, firmware and hardware versions, options and other information.</p>
	<p>Menu button (on Dashboard and Favorites screens) Press to return to the SmartPAC PRO menus from the Dashboard or Favorites screen.</p>
	<p>Message button (available on Dashboard and Messaging screens) Press to open the Messaging screen to compose and send an e-mail.</p>

Screen Captures

The Camera button (see Table 1-2), when pressed, captures an image of the currently displayed screen.

The image is saved to a USB drive plugged into SmartPAC PRO's USB port or saved internally on the SmartPAC PRO to download or e-mail later. If no USB drive is plugged into the USB port when a screen is captured, SmartPAC PRO stores up to 25 screen captures internally. If more than 25 screens are captured, SmartPAC PRO deletes the oldest file.

SmartPAC PRO stores the captures as JPEG files about 80Kb in size. The file names are unique and are derived from the time and date that the screen was captured.

Saving Directly to a USB Drive

If there is a USB drive in SmartPAC PRO's USB port, the SmartPAC Pro creates a folder on the drive labelled "CaptureXXXXXXXX," where XXXXXXXX is the SmartPAC PRO's serial number. The screen captures are stored in this folder until the USB Disk is full.

You can retrieve the internally stored screen captures and other diagnostic information from the SmartPAC PRO by plugging a USB drive into the SmartPAC PRO's USB port, going to the Initialization Menu, selecting, DIAGNOSTICS, then SAVE TO USB DISK (see Figure 1-5).

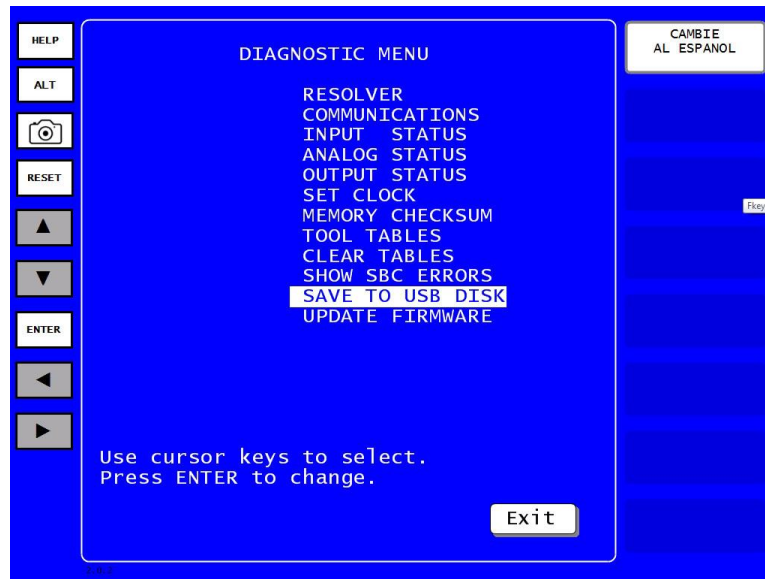


Figure 1-5. Save to USB Disk

The SmartPAC PRO creates a folder on the drive labelled "UploadXXXXXXXX" - with the XXXXXXXX being replaced by the SmartPAC PRO's serial number. The screen captures are saved into this folder.

NOTICE

The SmartPAC PRO also has a built in Image Viewer which allows you to view all the captured images. To launch it, press and hold the Camera icon for 5 seconds.

Exporting Saved Screen Capture Images to a USB Disk

(INITIALIZATION – DIAGNOSTICS – SAVE TO USB DISK)

If you did not have a USB disk plugged in to receive screen captures, they are saved in SmartPAC PRO and you can later export them to a USB drive, as follows.

1. Plug a USB disk into the USB port on the front panel.
2. In Initialization, press DIAGNOSTICS. The Diagnostic Menu appears.
3. Press SAVE TO USB DISK. A message appears while the export happens. When saving is complete, another message appears, Figure 1-6
4. Press OK to return to the Diagnostic Menu.
5. Remove the USB disk.

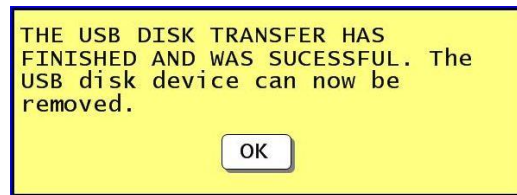


Figure 1-6. USB Transfer Complete

If you attempt to download to USB disk without first plugging one into the USB Port, SmartPAC Pro displays an error (see Figure 1-7).



Figure 1-7. USB Disk Error Message

View Screen Capture Images on SmartPAC PRO

Press and hold down the Camera button for 5 seconds. The Image Viewer window appears, showing one of the stored screen captures with the data and time it was captured. It is marked "Image only." Press the right and left arrow buttons at the bottom of the window to scroll through the saved screen images.

Creating and Using Dashboards



Figure 1-8.
Favorites Button

In Run Mode, to create a dashboard or select a previously created dashboard, press the Favorites button. The Favorites screen appears (Figure 1-9).

- To select an existing dashboard, press the dashboard you want.
- To create a new dashboard, see the instructions in the next section.

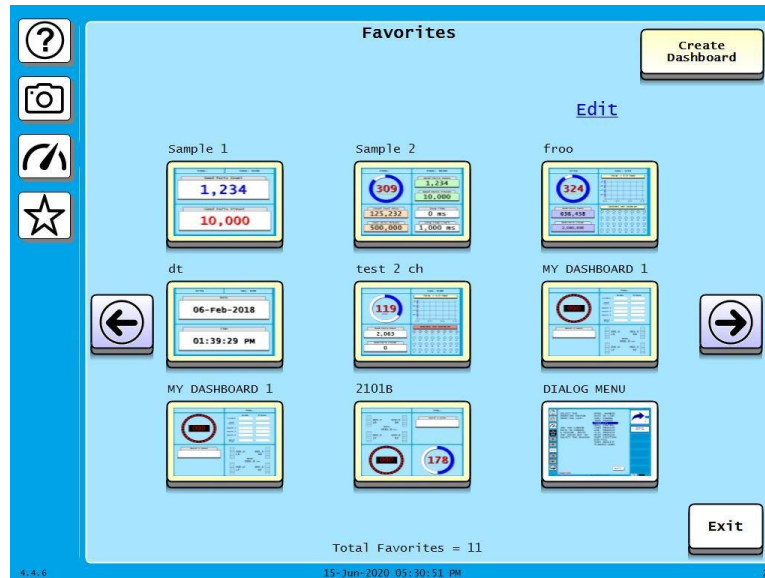


Figure 1-9. Favorites Screen

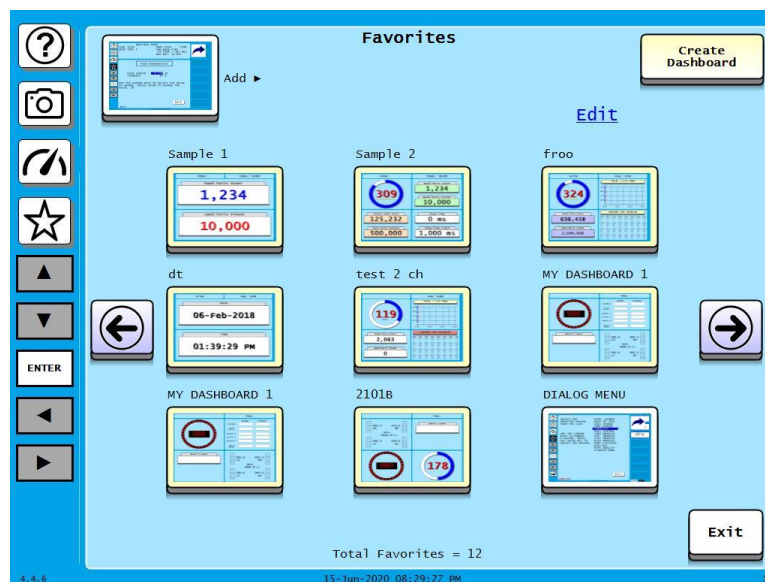


Figure 1-10. Add Screen to Favorites

To remove favorites or dashboard screens:

1. In the Favorites screen press Edit. A red X appears on each favorite or dashboard screen, Figure 1-11.
2. Press the red X to remove each item.
3. When done, press Save. To exit without deleting any screens, press Cancel.



Figure 1-11. Delete Screens from Favorites

Creating a Dashboard

To create a dashboard follow these steps:

1. In Run Mode, press the Favorites (star) button to open the Favorites screen.
2. On the Favorites Screen, press Create Dashboard. The Dashboard Configuration screen appears.

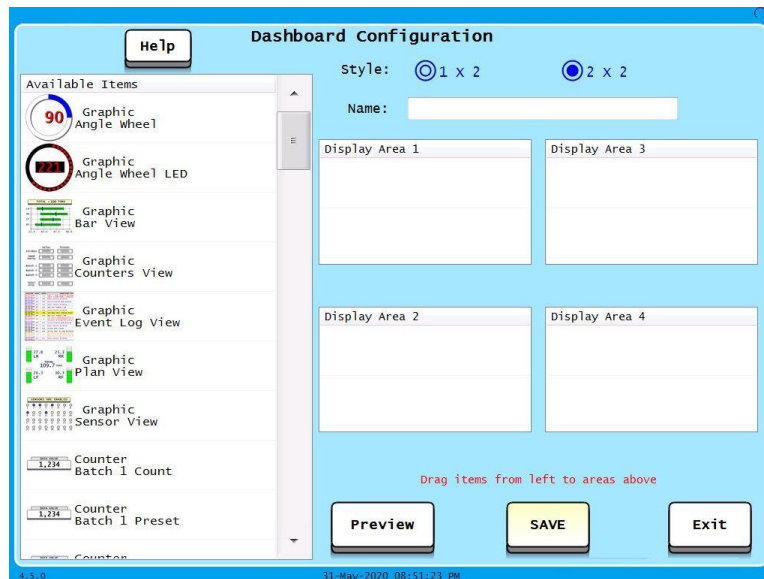


Figure 1-12. Dashboard Configuration Screen

3. Press the button next to 1x2 or 2x2 to select whether to show two or four items on the dashboard. See Figure 1-13 and Figure 1-14.



Figure 1-13. 1 x 2 Dashboard Example

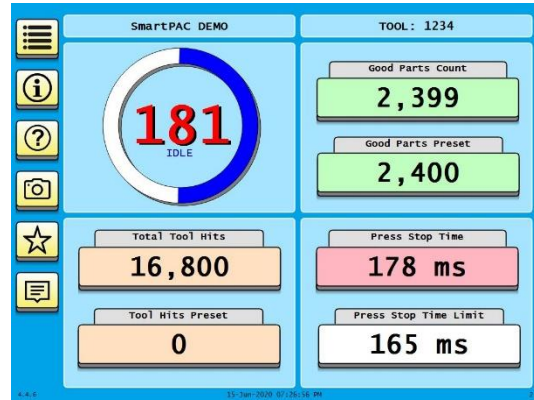


Figure 1-14. 2 x 2 Dashboard Example

4. On the Dashboard Configuration screen, enter a name for the dashboard and populate each display area. Press on the desired item at left and drag it to the appropriate area.

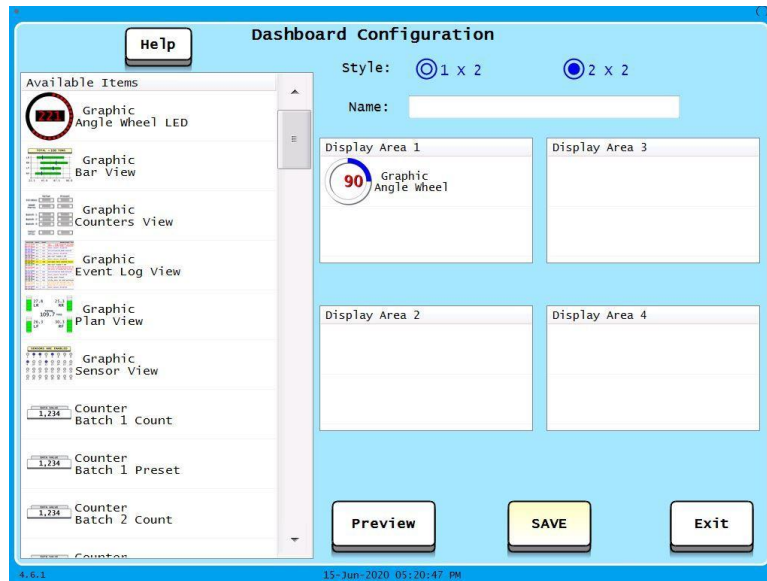


Figure 1-15. Dashboard Configuration Screen, Display Area 1 Filled

5. As you populate the dashboard, press Preview to see a preview of the screen.
6. Press Done to return to the Dashboard Configuration screen. Continue configuring this dashboard, as needed.

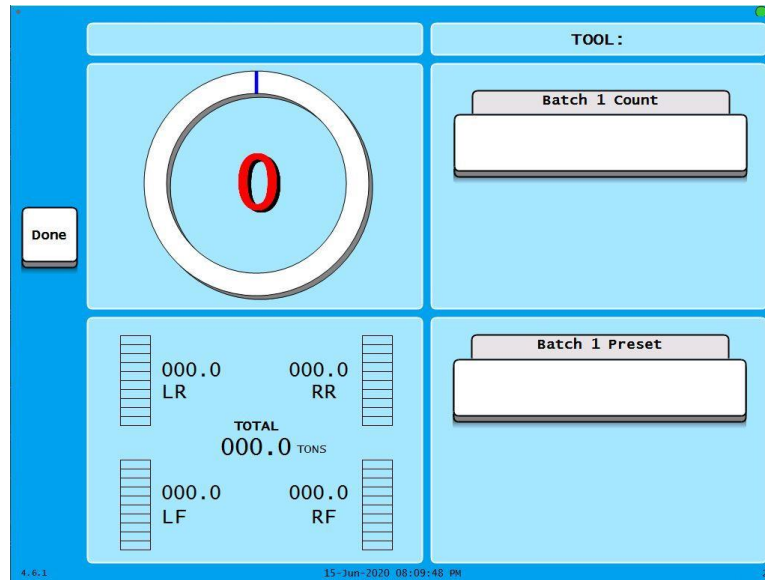


Figure 1-16. Dashboard Configuration Preview

- When you are satisfied with the dashboard, press Save.

Showing the Currently Selected Dashboard



Figure 1-17.
Dashboard Button

In any Run screen, press the Dashboard button, Figure 1-17 to display the last dashboard you selected on the Favorites screen.

SmartPAC PRO Specifications

Table 1-3. SmartPAC PRO Specifications

Dimensions	<p>Main enclosure: 14.1 x 13.1 x 5.3 in (358 x 333 x 134 mm), NEMA 12, shock mounted. Weight 19.3 lb</p> <p>Panel mount: 13.7 x 12.8 in (348 x 324 mm)</p> <p>Resolver: 0.75 in (19 mm) keyed shaft; rated shaft loading: 200 lb axial, 200 lb radial</p>
Electrical (System Power)	<p>Input: 115/230 \pm 10% Vac/50/60 Hz 30VA</p> <p>Or 24Vdc \pm 15% 37W</p> <p>When installed, this equipment shall have in close proximity and easily accessible, a switch or circuit breaker marked as the disconnect switch.</p>
Operating Environment	<p>Indoor use only</p> <p>Temperature 32 to 122 °F (0 to 50 °C)</p> <p>Relative humidity: Indoor factory conditions</p> <p>Altitude 6562 ft (2000 m)</p>
Display	<p>12.1 in (307 mm) color active matrix TFT liquid crystal display (LCD), Power LED, Brake Warning LED</p>
Memory	<p>Allows storage of settings for 2000+ tools</p>
Speed	<p>7 -1600 SPM</p>
Accuracy	<p>\pm 2/3 ° (\pm 1.33 ° for high speed version)</p>
Counters	<p>Good parts, strokes, 3 batch with presets (7 digits),</p> <p>Number-of-hits-on-tool counter: counts all hits on tool; resettable to 0 after maintenance</p>
Inputs/Outputs	<p>Inputs for resolver, position sensor (resolver slippage detection), remote reset input, setup mode input</p> <p>Input check circuit: rating 12–250 Vac or Vdc selectable, 15 mA max</p> <p>USB and RJ-45 connectors</p> <p>Outputs for top stop, emergency stop: ratings 0-4A resistive at 120Vac or 30Vdc max; Normally open – held closed. Fault condition or power off opens relay(s)</p>
Communications	<p>Connects via Ethernet to local area network; data viewed via the internet using SmartView remote viewing utility; allows backup of programmed tool settings to a network drive.</p>

SmartPAC PRO Options	
DiProPAC	<p>Provides up to 32 die protection sensor inputs</p> <p>Power for electronic sensors (NPN only): 15 Vdc min., 100 mA total</p> <p>DiPro Sensor Interface, DSI 2*: 5.88 x 5.41 x 3.42 in. (149 x 137 x 87 mm)</p> <p>DiProPAC sensor-disabled output: open collector, 8 mA max.</p>
ProCamPAC	<p>Provides up to 16 programmable cam switch output channels</p> <p>Programmable cam output assembly: NEMA 12, holds up to 8 outputs</p> <p>Enclosure: 9 x 11 x 3.5 (229 x 279 x 89 mm) shock-mounted</p> <p>Relay SPDT 0-3 A resistive @ 240V, 5A @ 30 Vdc</p> <p>DC solid state SPST 2A @ 5-60 Vdc</p> <p>AC solid state SPST 1A @ 70-250 Vac</p>
AutoSetPAC* or WaveFormPAC*	<p>10.25 x 12 x 4 in. (260 x 305 x 102 mm)</p> <p>2 or 4 strain link inputs</p> <p>Ability to store high, low, and repeatability setpoints with tool number</p> <p>Displays, adjusts, recalculates “auto” setpoints and displays actual load</p> <p>Displays and saves load signatures</p> <p>With WaveFormPAC: Up to 4 windows to monitor tonnage at points other than the peak</p>
WPC 2000* (Wintriss Clutch/Brake Control)	<p>16 x 16 x 9 in. (406 x 406 x 228 mm)</p> <p>Ability to set press parameters using a keyboard</p> <p>Easy-to-understand error diagnostic messages on display</p> <p>Stroke selector switch</p>
SFI	ServoFeed Interface integrates servofeed
RamPAC*	<p>10.25 x 12 x 4 in. (260 x 305 x 102 mm)</p> <p>Automatically sets shut height and counterbalance and cushion pressures</p>
ProPAC*	<p>12.3 x 14 x 4.3 in. (312 x 356 x 109 mm)</p> <p>Provides up to 16 analog, NPN or PNP inputs</p> <p>Ability to store high, low, and repeatability setpoints with tool number</p> <p>Display and adjust manual or auto setpoints and display actual values</p> <p>Monitor in-die dimensions and other process parameters</p>
SBR	<p>Provides capability to back up tool settings to a Windows laptop PC</p> <p>Requires purchase of SBR software.</p>
USB Disk Backup	Enables backup of programmed tool settings to USB disk

Info Center	With this option Setup sheets and other press information stored on a central server can be displayed on networked SmartPACs.
High Speed (HSP)	Required for presses with speeds higher than 800 SPM; handles speeds from 14-1600 SPM (see Speed and Accuracy, above)
Bilingual*	(English/Spanish) status/adjust menus
Preventive Maintenance (PM) Monitor	Tracks selected press functions requiring scheduled maintenance and alerts the user when maintenance is due
PLC Interface	Enables SmartPAC PRO to transmit additional tool settings to a Programmable Logic Controller for press automation and auxiliary functions
ShopFloor-Connect Asset Utilization Software (SFC)	Provides capability for production information from SmartPAC PRO to be downloaded to SFC data collection software for generation of OEE (Overall Equipment Effectiveness) and other reports. Requires purchase of SFC software.
3rd Party Comms	This option allows SmartPAC PRO to transmit real-time and status information to external software for reporting and other tasks.

* Consult product user manual. DSI 2: #1121900; AutoSetPAC: #1101600; WaveFormPAC: #1109100; RamPAC: #1115200; ProPAC: #1117500; Bilingual (English/Spanish): #1130600.

Chapter 2 – Installing SmartPAC PRO

⚠ DANGER

ELECTRIC SHOCK OR HAZARDOUS ENERGY

Disconnect main power before installation.

- Remove all power to the press, press control, and other equipment used with the press.
- Follow your company's lockout procedure per OSHA 1910.147 Control of Hazardous Energy (Lockout/ Tagout).
- Ensure that installation is performed by qualified personnel.
- Complete all installation procedures before connecting to the AC power source.

Failure to comply with these instructions will result in death or serious injury.

NOTICE

UPGRADING TO SMARTPAC PRO FROM SMARTPAC 1 OR 2

To upgrade from legacy products to SmartPAC PRO, see *Instruction Sheet - Upgrading SmartPAC 1 or 2 to SmartPAC PRO* on www.wintrissdocs.com.

⚠ DANGER

PROGRAMMABLE CAM SWITCH NOT FOR SAFETY USE

Use SmartPAC PRO's programmable cam switch to control auxiliary functions only. The SmartPAC PRO programmable cam capability should never be used to provide timing signals for any safety use including clutch/brake control or muting of light curtains.

Failure to comply with these instructions will result in death or serious injury.

NOTICE

OPTIONAL MODULES PROCAMPAC AND DIPROPAC INCLUDED IN MANUAL

When you order your SmartPAC PRO, you may include the DiProPAC die protection and/or ProCamPAC programmable cam switch option. This manual includes instructions for installing and using both modules. Remember that they are options and might not be included in your system. See the following chapters for DiProPAC and ProCamPAC:

Chapter 6 – Using DiProPAC Die Protection (Optional), page 167

Chapter 7 – Using ProCamPAC Programmable Cams, page 211

If you ordered SmartPAC PRO with other optional modules such as AutoSetPAC load monitor or ProPAC process monitor, refer to the user manual for that option for complete details on its installation and use.

This chapter describes how to install SmartPAC PRO and some of its options. It is organized in the following sections:

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Before You Start

NOTICE

READ INSTALLATION INSTRUCTIONS BEFORE STARTING INSTALLATION

If you install SmartPAC PRO yourself, read this installation chapter carefully, plan your installation, and figure out what steps you will follow before you start drilling holes, running conduit, or cutting wires.

NOTICE

LEARN TO USE SMARTPAC PRO BEFORE INSTALLING ON A PRESS

If you have not used SmartPAC PRO before, learn how to initialize and program it before installing it on a press. On the bench, connect your unit to a resolver (Table 2-1, page 59) and to AC power (steps 1-3, page 60) so that you can access all the menus and make settings. See Chapter 1 for instructions on using the touch screen and displays, Chapter 3 for using Initialization mode, Chapter 4 for using Program mode, and Chapter 5 for using Run mode.

Installation Guidelines

Observe the following guidelines when installing SmartPAC PRO:

- Separate high- and low-voltage wires

Never run wires for 120V and for lower voltages (e.g., 24V, 60V) inside the same conduit. Run flexible, liquid-tight conduit for high voltage lines (120V power, input check circuit, stop relay circuits) to the upper right-hand corner of the SmartPAC PRO enclosure. Run one or two low voltage conduits for the resolver and communications control wires into the lower left-hand corner of SmartPAC PRO. If you have top-stop and emergency-stop circuits that are 24V or a voltage other than 120V, you must run them separately from the high-voltage wiring.

Never use the SmartPAC PRO power terminals as a junction point to provide power for external devices. In most cases, the AC power supply wires should be connected directly to the press control cabinet. Do not use the ProCam output enclosure as a junction box for the AC control wires. Provide a separate junction box for this purpose.

Communications wiring should be run separately in its own conduit. Communications wiring will be installed if SmartPAC PRO is connected to the WPC 2000 Wintriss Clutch/ Brake Control, ServoFeed Interface (SFI™), AutoSetPAC, SBR, LETS/SFC, or other equipment.

- Provide NEMA 12 conduit and connections

Because SmartPAC PRO is rated NEMA 12 (i.e., protected against dust and oil), you must use conduit of the same rating and make proper connections to ensure that the enclosure is NEMA-12-protected.

- Properly ground SmartPAC PRO

The ground wire from SmartPAC PRO should be connected to the main ground point of the press control system. This ground point may be in the area where the control transformer is grounded. Finding a good place for a ground is sometimes difficult, but the location should be close to where the press receives its ground.

- Correctly terminate all cable shields

Terminate all cable shields to the studs provided in the enclosure or to a good grounding location (see *Terminating Cable Shields*, page 50).

- Install suppressors across inductive loads

All relays, solenoids, or other inductive loads that are controlled by SmartPAC PRO must be suppressed. Suppressors should be installed across the load and as close to the load as possible. See Figure 2-15, page 76. Never install a suppressor across relay contacts. If you do, the suppressor may fail shorted, and the equipment controlled by that relay will remain energized. Additional suppressors (part number 2238801) can be obtained from Wintriss Controls.

NOTICE

REMOTE INSTALLATION OF SMARTPAC PRO DISPLAY

If you install your SmartPAC PRO display separately, in a pendant, for example, see wiring diagrams Figure 7 and Figure 8 for connection details.

Terminating Cable Shields

NOTICE

TERMINATE CABLE SHIELDS CORRECTLY TO MINIMIZE ELECTROMAGNETIC INTERFERENCE (EMI)

Shielded cables are used with the SmartPAC PRO. For effective shielding, terminate the cable shields as near as possible to the terminal block you are wiring to.

NOTICE

TERMINATE BOTH ENDS OF SHIELD

Be sure to terminate cable shields at both ends (for example, at SmartPAC PRO and DSI 2).

For each shielded cable, perform the following steps.

1. Strip the cable jacket back about 3 inches.
2. You can terminate the shield braid or drain wire to either a chassis ground stud or under the screw on a PC board standoff. Find one of these as close as possible to the terminal block you are wiring.
3. Connect the shield drain wire or braid to the chassis ground stud or beneath the screw in the PC board standoff.
4. Connect the insulated wires to their designated positions on the terminal block.

Checking the Press

Before starting the installation, remove the die from the press and run the press in all its operating modes: Inch, Single-stroke, and Continuous. Make sure the press has working top- stop and emergency-stop circuits. Verification that the press operates and stops properly is extremely important because SmartPAC PRO will be connected to the press stop circuits. Do not forget to mark on your electrical prints where you connect SmartPAC PRO. Set the press ram to top dead center (TDC).

NOTICE

MOVE RAM TO TDC BEFORE INSTALLING SMARTPAC PRO

This is an important step because the press must be at top dead center (TDC) when you make final adjustments for the resolver. Be accurate when setting the press to TDC. Set to $0^\circ \pm 2^\circ$. Use a dial indicator on the face of the ram if necessary.

Mounting the SmartPAC PRO Control Enclosure

To mount the SmartPAC PRO enclosure, follow the steps below, referring to Figure 2-1.

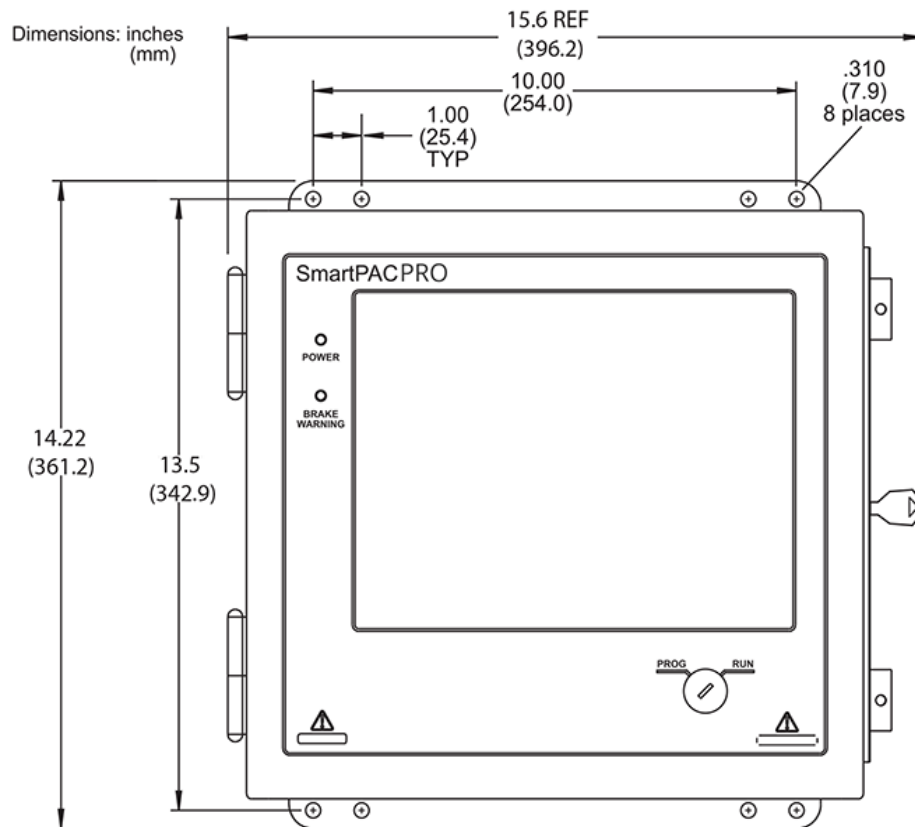


Figure 2-1. SmartPAC PRO Mounting Dimensions

Enclosure mounting – Leave enough room to open the door at least 120°. Leave clearance of approximately 18 inches (46 cm) if you wish to fully open the enclosure's door.

1. Determine a convenient location for the enclosure. Ideally, the enclosure should be mounted where operators and setup personnel can easily see the readouts and reach the display. Make sure that all cables can reach the enclosure. Leave enough room to open the door at least 120°. The enclosure can be mounted on a pedestal, pendant, or the press itself.
2. Drill and tap (if necessary) mounting holes, using a No. 7 drill and 1/4–20 tap, then mount the enclosure, using the enclosed shock mounts. Shock mount studs are 1/4–20.

Installing SmartPAC PRO as a Panel Mount

Follow the steps below to install the panel mount version of the SmartPAC PRO in your enclosure. Be sure to allow at least 6 in. (152 mm) of clearance behind the panel mounting plane to leave enough room for the electronics.

1. Determine a convenient location within your enclosure or console for mounting SmartPAC PRO. Ideally, SmartPAC PRO should be mounted where operators and setup personnel can easily see the readouts and reach the display.
2. Cut out a hole in your enclosure, and drill and tap twelve holes for #10-32 screws, referring to Figure 2-2, page 53, and Figure 2-3, page 54, for mounting and “cutout” dimensions.
3. Prop the panel mount near the cutout location. You can do this by connecting ty wraps from two of the left holes on the panel to the corresponding holes on the enclosure or console, creating hinges.
4. Perform wiring connections as shown in the following sections. Make sure all cables will reach the connectors on the back of the panel mount.
5. When final checkout procedures have been completed (see pages 86 - 87), install the panel mount in your enclosure or console, using twelve #10-32 screws.

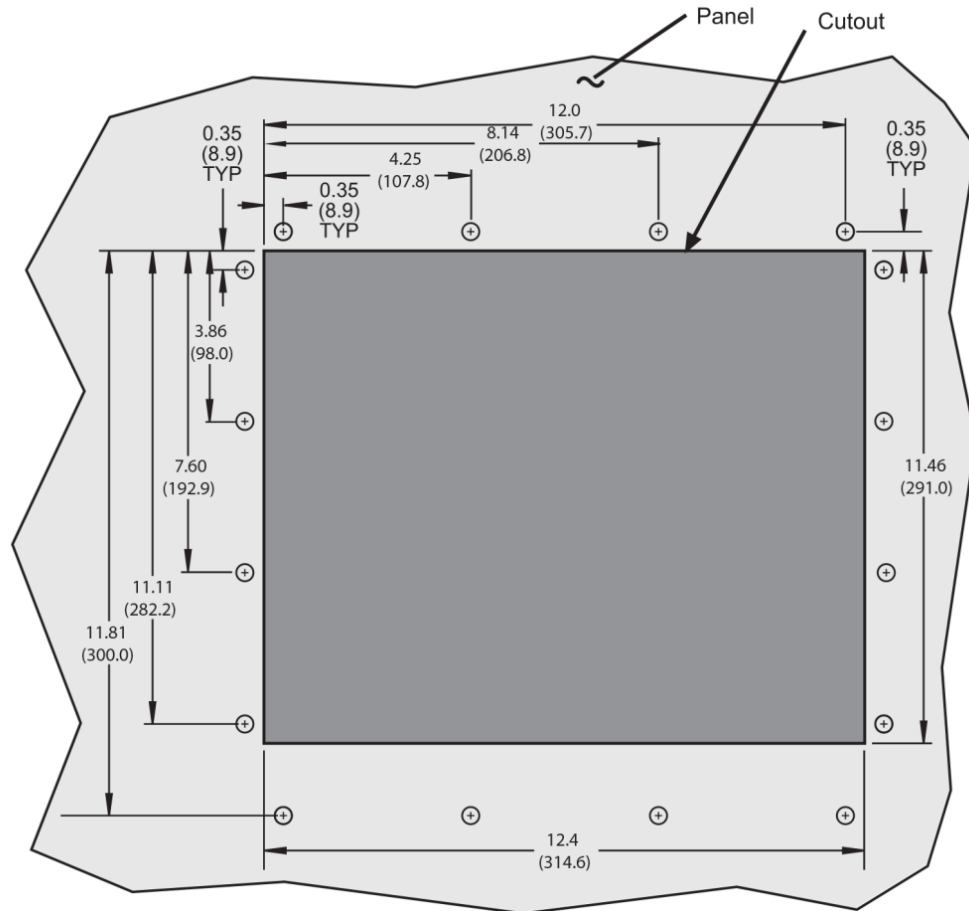


Figure 2-2. SmartPAC PRO Panel Mount Cutout Dimension

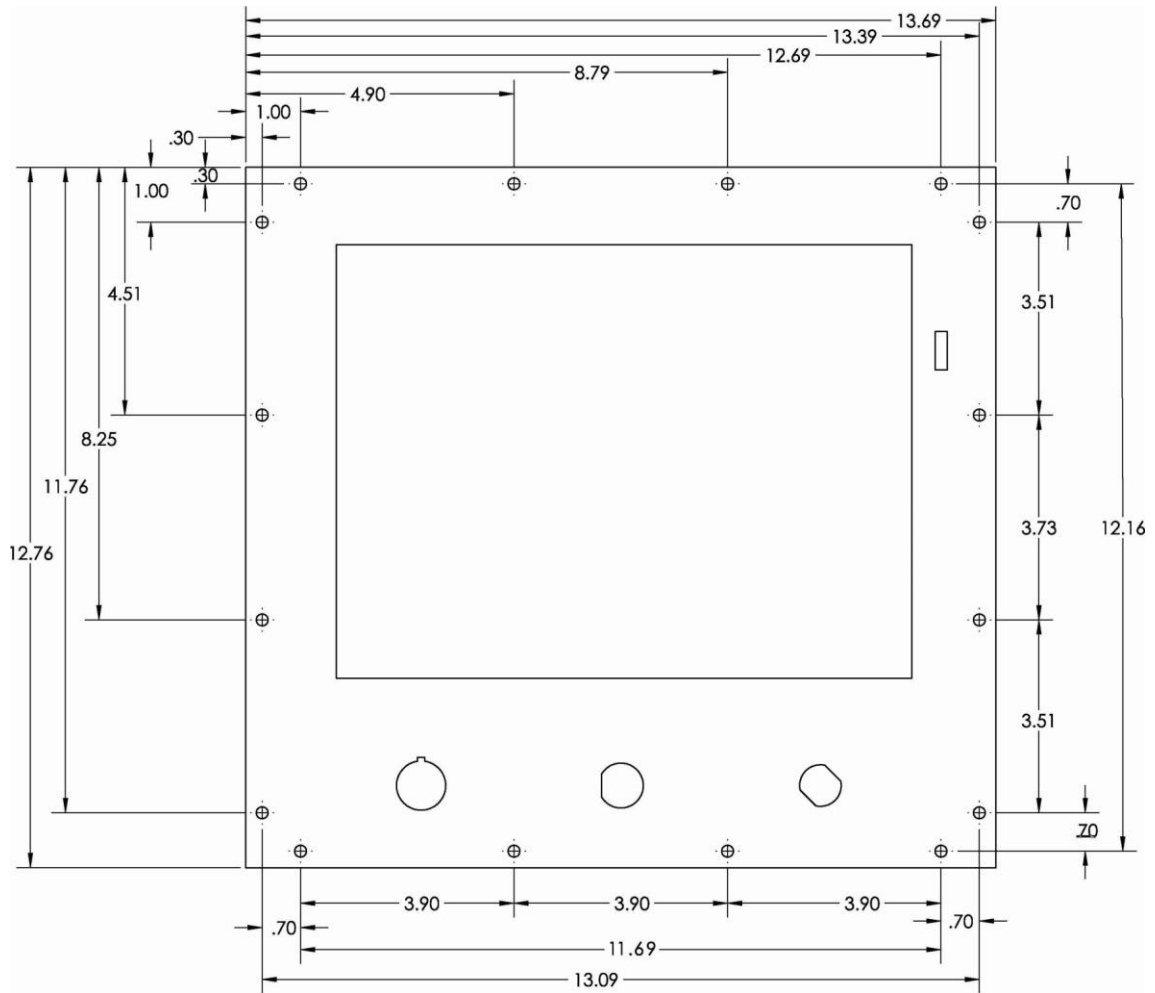


Figure 2-3. SmartPAC PRO Panel Mount Dimensions

Installing SmartPAC PRO in a Pendant

To install the SmartPAC PRO display in a pendant, install the HMI board (display) in the pendant and install the RTS board in the cabinet. Connect with a CAN bus cable, as shown in Figure 2-4. Refer to Figures 10, 11, or 12 at the end of the manual and Table 2-14, page 88.

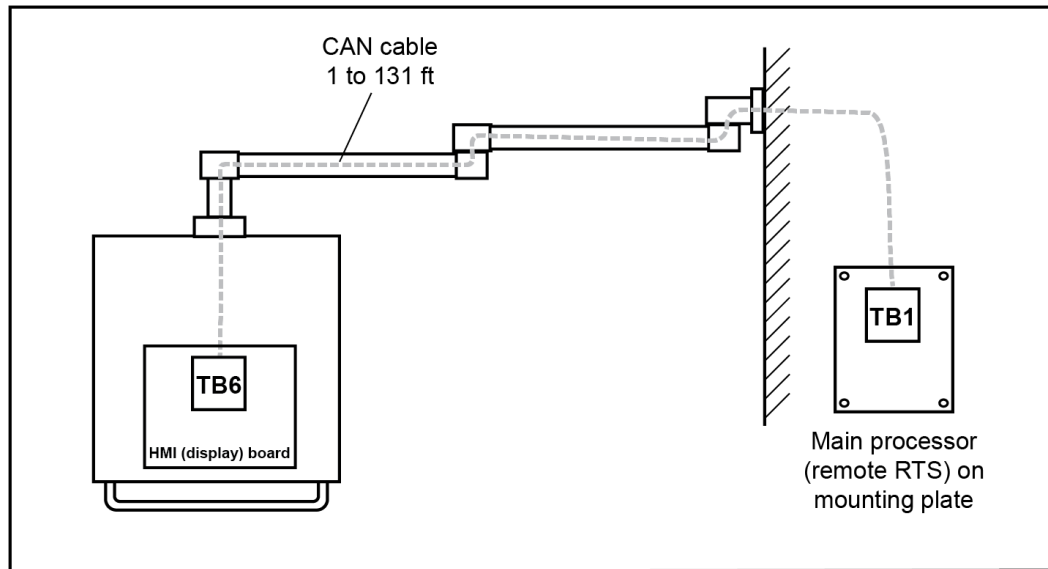


Figure 2-4. Pendant Installation

Installing the Resolver

⚠ DANGER

RESOLVER OUT OF SYNCH WITH CRANKSHAFT

Retain the sprockets on the crankshaft and resolver shaft mechanically so they cannot shift or move out of radial alignment. Be sure that the key on the resolver shaft retains the resolver sprocket. Use a pin or other method to fix the location of the sprocket on the crankshaft.

Failure to comply with these instructions will result in death or serious injury.

The resolver (see Figure 2-5 for dimensions) provides SmartPAC PRO with the exact position of the crankshaft at every angle throughout the stroke (see *Resolver-based Operation*, page 30). To deliver this precision, the resolver must be driven smoothly at a 1:1 ratio with the crankshaft.

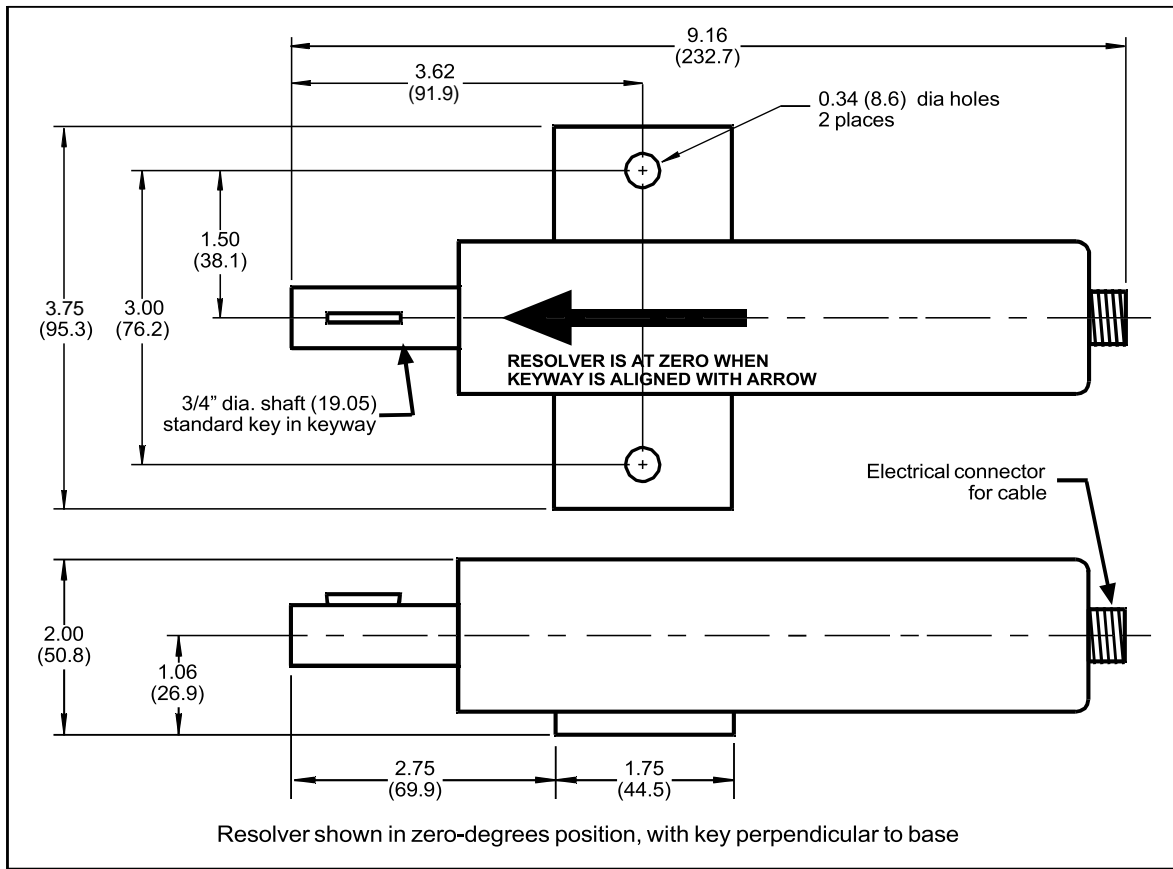


Figure 2-5. Resolver Dimensions

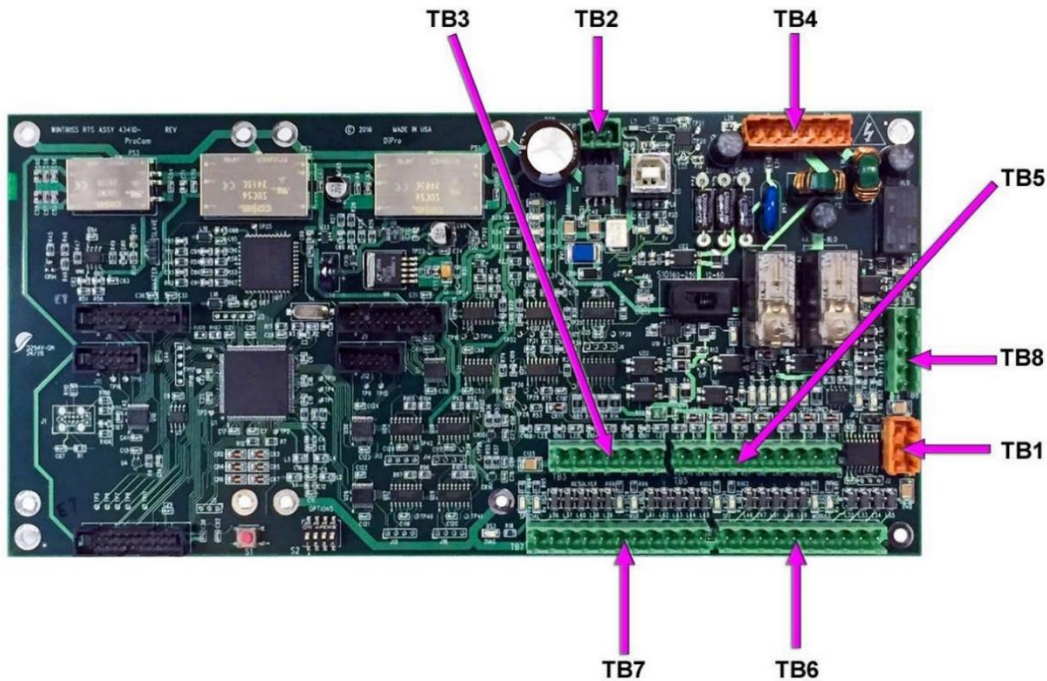


Figure 2-6. Location of Terminal Blocks TB1 through TB8

CAUTION**DAMAGE TO RESOLVER**

Be sure that the sprocket or gear driving the resolver chain or timing belt is mounted so that it is centered on the crankshaft. If the gear or sprocket is mounted off-center, the resulting loads on the resolver shaft may cause the resolver to fail.

Failure to comply with these instructions could result in property damage.

Wintriss Controls Group stocks a spring-loaded base (part# 4194300) with a hole pattern that matches the hole pattern on the resolver.

The resolver can turn in a clockwise or counterclockwise direction. You can change the direction of rotation by swapping the black and yellow wires on the resolver connector (see Table 2-1, page 59).

When designing the drive for the resolver, make sure that the drive allows for adjustment of the resolver to its zero position at top dead center. All sprockets must be keyed or pinned. The resolver shaft has a standard key.

Design a method of driving the resolver directly from the crankshaft, using a chain or timing belt (not a V belt) and sprockets. Use either an idler sprocket or spring-loaded resolver base to compensate for slack or stretch.

Observe these additional precautions when designing the resolver drive:

- Do not use a long, sloppy chain. The distance between the center of the resolver shaft and the center of the crankshaft should be no more than 3 feet (1 m).
- Do not use gears, right-angle joints, or shafts with universal joints because these will develop too much backlash or too much play.
- Do not try direct-coupling to the crank because this requires extreme precision. If the resolver is only slightly off-center, the resolver bearing will be subjected to side loads well beyond its rated capacity and will ultimately fail.
- Do not use flexible couplings, which can be inaccurate, or V belts, which may slip and cause inaccuracy.
- Do not use a flexible shaft like a speedometer cable. Because the shaft twists on start-up, the resolver will lag the crank. When the crank stops, the resolver will turn past the true stopping point and snap backward.

Mounting the Resolver

Once you have thought out your design and gathered the parts, mount the resolver as described below. Don't worry about which direction the resolver turns at this point. You will adjust for the direction of rotation later when you wire the resolver.

1. Mount the resolver by bolting it to the press or other platform.
2. Install your drive mechanism.
3. Make sure the press is within $\pm 5^\circ$ of Top Dead Center (TDC).
4. Before attaching the chain or other drive mechanism, rotate the resolver shaft so that the keyway

is aligned with the arrow on the housing. See Figure 2-5.

5. Keeping the resolver's keyway aligned with the arrow (within $\pm 5^\circ$), attach the chain or drive mechanism.

Wiring the Resolver

Wire the resolver as follows, referring to Table 2-1, page 59.

1. Find the resolver cable if it is not connected to the resolver. Plug the end with the connector into the resolver. It only goes one way. Twist the locknut so the connection is tight.
2. Run the resolver cable through 1/2 in. conduit from the resolver to the bottom left knockout of the SmartPAC PRO enclosure.

NOTICE

RUN POSITION SENSOR WIRES WITH RESOLVER WIRES, IF CONVENIENT

If you are installing the position sensor, you can run the position sensor cable through the same conduit as the resolver wires. Since you cannot install the position sensor until the resolver is electronically set to 0° , you will have to leave installation of the position sensor until later (see *Installing the Position Sensor (Optional)*, page 82). Refer to Figure 2-23, page 85, for a typical position sensor mounting location. The position sensor is usually placed near the resolver.

3. Find the resolver connector TB-3 on the SmartPAC PRO board (see Figure 2-6, page 56).
4. Measure and cut the resolver wires so they comfortably reach SMARTPAC PRO. (If you run the position sensor cable through the same conduit, do not cut these wires until the position sensor is installed).
5. Viewing the resolver from the shaft end, determine which direction the shaft will turn – clockwise or counterclockwise – when the press runs.
6. Unplug the L-shaped connector from TB3.

NOTICE

WIRE AND PLUG IN CONNECTOR CORRECTLY

The connector can plug into the receptacle on the PC board in only one direction. Before wiring the connector, mark its left and right ends when it is plugged in to make sure you wire the correct pin numbers.

7. Connect the wires to TB3 as shown in Table 2-1. Make sure you connect the black and yellow wires correctly, based upon the way your resolver will rotate – clockwise or counterclockwise – as you face the resolver shaft.
8. Double-check connections when you are finished wiring.
9. Plug the L-shaped connector firmly into its receptacle on the SmartPAC PRO board. It can plug in only one way.

Table 2-1. Resolver Wiring

Pin # on TB3	Resolver Cable Wire Color	
	CW Rotation	CCW Rotation
212 (GND)	No connection	
213 (S1)	Black	Yellow
214 (S2)	Green	
215 (R1)	Red	
216 (S3)	Yellow	Black
217 (R2)	Orange	
218 (S4)	Brown	

Terminate the cable shield to the ground stud nearest the cable entry.

Connecting Power Wiring – AC Powered Units

WARNING

ELECTRIC SHOCK HAZARD

- Do not connect the AC power source until you are done with all other installation procedures.
- Turn off and disconnect power from the machinery SmartPAC PRO is connected to before making any wiring connections. This includes power to the machine control and motor.

Failure to comply with these instructions could result in death or serious injury.

Run the AC power wires through a “high-voltage” conduit (see *Installation Guidelines*, page 49) along with the wiring for emergency-stop, top-stop, and input check circuits. No. 16 wire (No. 14, if local codes require it) with a minimum 75° C temperature rating is recommended for these circuits. Bring the conduit into the top right knockout of the SmartPAC PRO enclosure. Then, to wire the AC input terminal block, follow these steps:

1. Find the AC terminal block at the top right corner of the back wall of the enclosure (see Figure 2-7).

For a panel mount unit, the terminal block is mounted to the back of the faceplate near the top right corner of the SmartPAC PRO PC board.

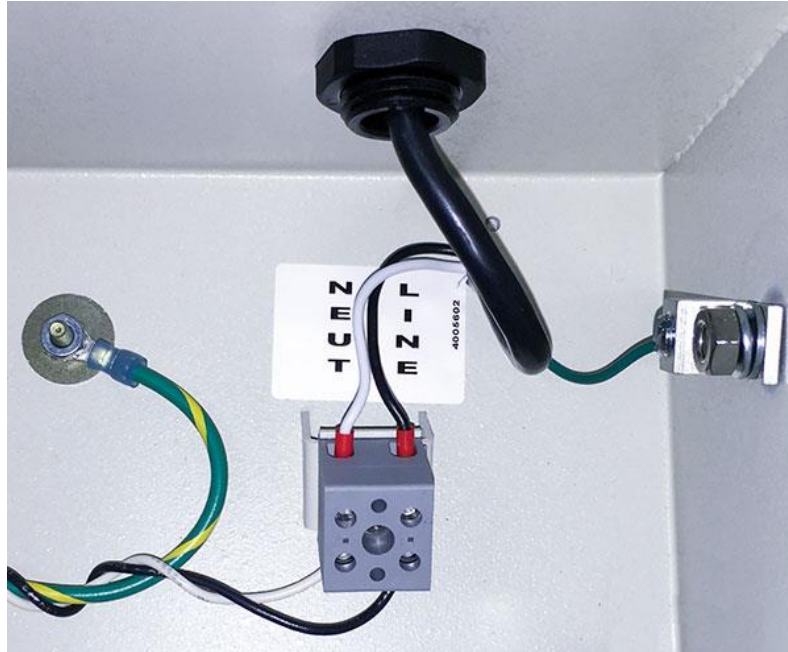


Figure 2-7. Wiring AC to Terminal Block, Inside Enclosure, Top Right

2. Determine how you will bring wiring from your 115 Vac power source (or 230V source, if applicable) to the unit. These wires should be connected directly to the press control transformer at the press control. For 115 Vac, you need three wires: high (black), neutral (white) and ground (green). For 230 Vac, wires are black and red with green or green/ yellow for ground.
3. Connect the AC input wires and ground wire as shown in Figure 2-7 and Figure 4 at the back of the manual. Make your ground connection as follows:
 - **SmartPAC PRO Enclosure:** Connect your ground (green or green/yellow) wire to the set screw terminal on the inside of the enclosure. To connect to the set screw terminal, strip the ground wire about 1/4 in. (6.4 mm) from end, loosen the screw on the terminal, slide the wire in the hole, and tighten the screw to secure the wire in place.
 - **SmartPAC PRO Panel Mount:** Connect the ground wire to the ground stud on the face plate below the AC input terminal block.
4. Connect AC wires to the power source only after all installation procedures have been completed and you are ready to perform final checkout tests (see page 86).

⚠ WARNING

ELECTRIC SHOCK HAZARD

Do not connect the AC power source until you are done with all other installation procedures.

Failure to comply with these instructions could result in death or serious injury.

Connecting Power Wiring – 24 VDC Powered Units

Run a +24V and return wire from a 24VDC, 2A power supply into the conduit on the top of the enclosure on the right side. Connect the +24V wire to TB2 Pin 257, and the return wire to TB2 pin 258.

⚠ WARNING

ELECTRIC SHOCK HAZARD

Do not connect the DC power supply to an AC power source until you are done with all other installation procedures.

Failure to comply with these instructions could result in death or serious injury.

Connecting Stop Circuits and Input Check Circuit

You need four wires to connect SmartPAC PRO to your press control stop circuits, two for the emergency-stop circuit and two for the top-stop circuit. You can wire these circuits at your press control. Refer to your press control manual or other electrical prints.

You need two wires to connect to the input check circuit. These wires are connected in parallel with one of the coils on the Dual Safety Valve that controls the clutch/brake. When the clutch is engaged, 12–250 VAC or VDC (50-60 Hz) must be present across terminals A and B, as shown in Figure 2-8. The connection can be made inside the press control where the circuits to the valve relays are connected. Refer to your press control manual and electrical prints. It does not matter which wire goes to terminal A and which to terminal B.

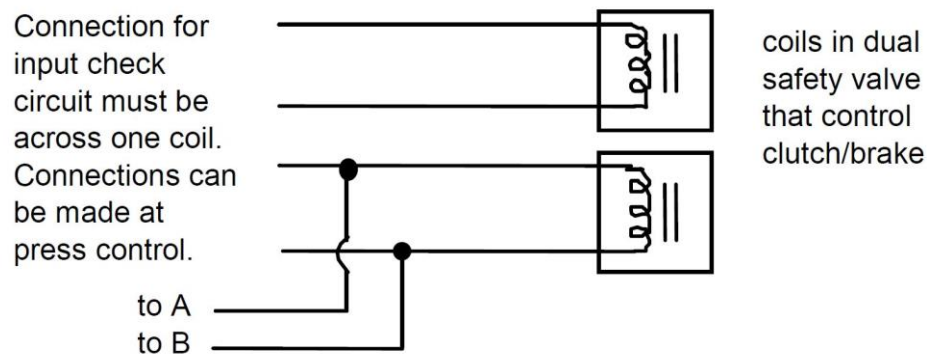


Figure 2-8. Schematic of Input Check Circuit for 10-130 Vac or Vdc

Making Wiring Connections

To make wiring connections from SmartPAC PRO to your press control emergency-stop, top-stop, and input check circuits, do the following:

1. Run the stop circuit and input check circuit wires to SmartPAC PRO through flexible liquid-tight conduit to the enclosure. Because SmartPAC PRO is rated NEMA 12 (protected against dust and oil), you must use conduit of the same rating and make proper connections to ensure that the

enclosure is NEMA-12-protected.

2. Locate connector TB4 on the SmartPAC PRO board (see Figure 2-11, page 65) and unplug it from its socket. Connect the wires for the stop and input check circuits to TB4 pin locations, as shown in Table 2-2 and wiring diagram Figure 4 at the end of the manual.

Table 2-2. Stop and Input Check Circuit Wiring Connections: TB4

Circuit	SmartPAC PRO TB 4 Pin Locations
Input check A	205
Input check B	206
E-stop	207
E-stop	208
Top-stop	209
Top-stop	210

3. Plug the connector back into its socket. Double-check connections to make sure that you did not wire the connector backward.
4. Connect top-stop, E-stop, and input check circuit wires at the press control or other box into which you are tying them.

NOTICE

Be sure to number all wires in a way consistent with your press's electrical prints.

5. Make all the necessary conduit connections to ensure NEMA 12 protection.

Setting the Input Check Voltage Switch

To set voltage for the input check circuit, do the following:

1. Find the input check voltage switch, S101, on the SmartPAC PRO board. It is located on the right side of the board just to the left of the E-stop relays.
2. Place S101 in the Left or Right position, depending on the coil voltage of the dual safety valve.

For a coil voltage of 60-250V, place the switch in the Left position (this is the factory setting).
For 12-60V coil voltage, set the switch to the Right setting (Figure 2-9).

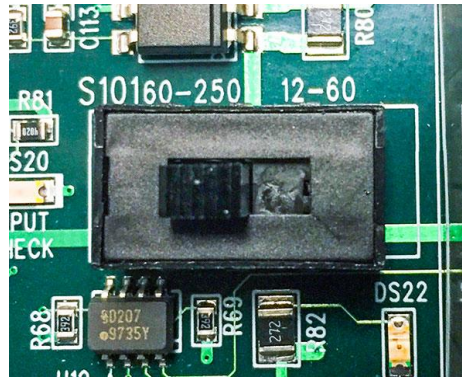
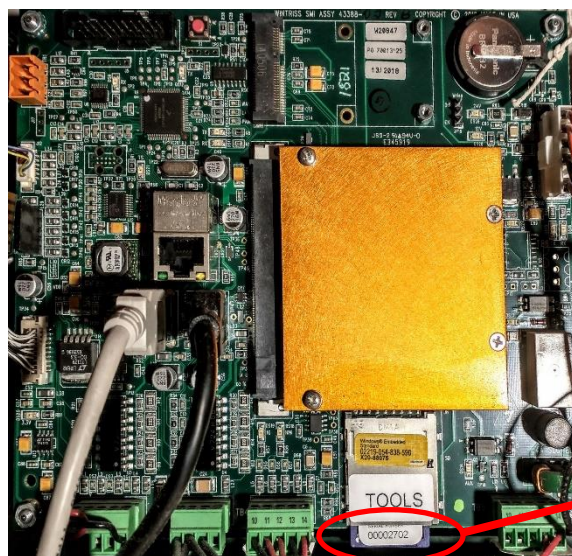


Figure 2-9. Input Check Voltage Switch (S101) in the Factory Default (60-250V) Position



Serial number
on SD card

Figure 2-10. Location of Serial Number on SD Card (HMI Board)

NOTICE

HOW THE INPUT CHECK CIRCUIT DETECTS RESOLVER CHAIN BREAKAGE

When the press control energizes the dual safety valve relay to start the press, voltage is induced across the input check circuit. If SmartPAC PRO gets no signal from the resolver within the specified start time limit (resolver not turning), SmartPAC PRO opens the emergency-stop circuit and a “loss of rotation” fault message is displayed on the screen. The fault indicates that the resolver belt or chain is broken or so loose that the resolver shaft cannot move. Other possible reasons for the fault are low air pressure to the clutch or a bad clutch.

Adding or Upgrading DiProPAC or ProCamPAC Option

WARNING

ELECTRIC SHOCK HAZARD

Turn off and disconnect power from SmartPAC PRO and from the machinery it is connected to before making any wiring connections. This includes power to the machine control and motor. Do not connect the AC power source until you are done with all other installation procedures.

Failure to comply with these instructions could result in death or serious injury.

CAUTION

DAMAGE TO BOARD FROM STATIC DISCHARGE

Ground yourself before touching circuit boards or chips by touching a large metal object such as the press. Static electricity can destroy electronic components.

Failure to comply with these instructions could result in property damage.

NOTICE

INSTALL DIPROPAC AND/OR PROCAMPAC BOARD IN CORRECT LOCATIONS

Install these boards in the locations shown in Figure 2-11, below. If you install a board in the wrong location, SmartPAC PRO will not recognize that the option is installed.

Eight-, 16-, and 32-channel configurations of the same option are interchangeable. When a board is installed in the correct location, SmartPAC PRO recognizes whether it is an 8-, 16-, or 32-channel version of DiProPAC or an 8- or 16-channel version of ProCamPAC.

NOTICE

For information about using the DiProPAC or ProCamPAC options, see:

- *Chapter 6 – Using DiProPAC Die Protection (Optional)*, page 167
- *Chapter 7 – Using ProCamPAC Programmable Cams*, page 211

The following instructions describe how to add die protection capabilities to a basic SmartPAC PRO. If you ordered either of these options with your new SmartPAC PRO, the boards will have been installed at the factory, and you can skip to the wiring sections for these modules. DiProPAC is available as an 8-sensor, 16-sensor, or 32-sensor board. You can obtain the ProCamPAC board in 8-cam or 16-cam versions.

Wiring instructions for the DiProPAC board are provided below. Wiring for the ProCamPAC board is documented starting on page 70.

To install a new DiProPAC or ProCamPAC board, do the following:

3. On the SmartPAC PRO board, locate the connector in which the new board should be installed (see Figure 2-11).

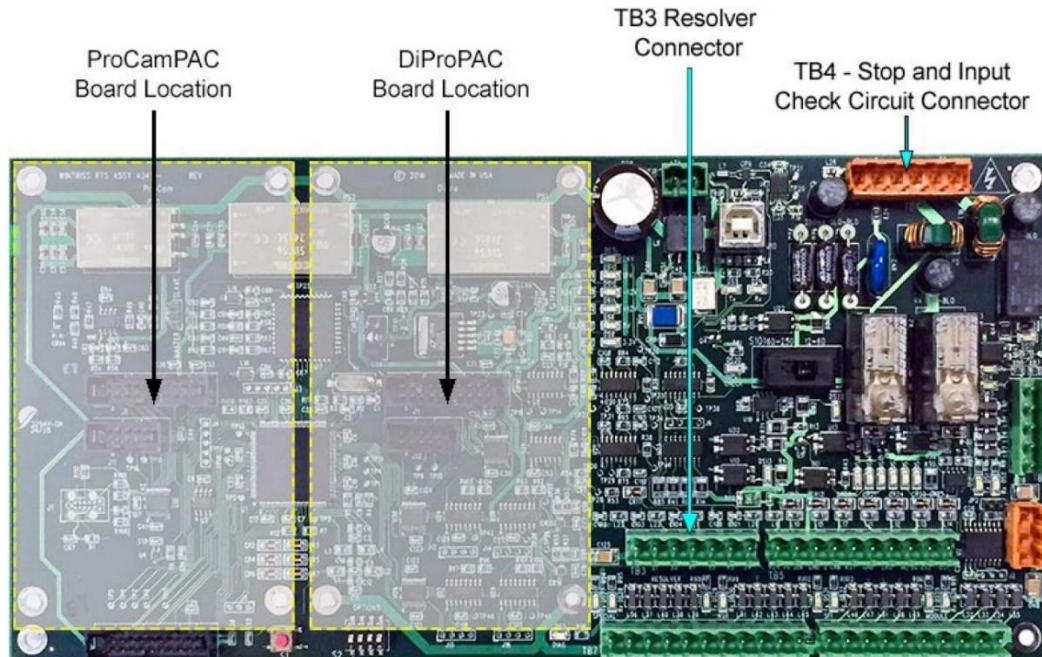


Figure 2-11. SmartPAC PRO Main (RTS) Board Showing Location of Option Module Boards, and TB3 and TB4

CAUTION

DAMAGE TO BOARD FROM STATIC DISCHARGE

Ground yourself before touching circuit boards or chips by touching a large metal object such as the press. Static electricity can destroy electronic components.

Failure to comply with these instructions could result in property damage.

4. Making sure that you are grounded, install the new board by plugging it into the appropriate connector. Connectors are keyed, so you can plug in the boards in only one direction.
5. When the board is properly seated, screw it down to the four standoffs, using the screws that came with the kit.
6. Remove the connector(s) from the board, one connector for an 8-sensor or 8-cam unit, two connectors for a 16-sensor or 16-cam unit, four connectors for a 32-sensor unit. Terminal block assignments for these different boards are as follows. See Figure 2-12.
 - DiProPAC 8: Sensors 1-8 to TB554
 - DiProPAC 16: Sensors 1-8 to TB554, sensors 9-16 to TB554
 - DiProPAC 32: Sensors 1-8 to TB554, sensors 9-16 to TB554, sensors 17-24 to TB555, and sensors 25-32 to TB555
7. Wire the connector(s) to the appropriate component(s). Wire the connector(s) to the DiPro Sensor Interface, following the instructions in *Connecting DiPro Sensor Interface to SmartPAC PRO*, page 66.
8. Plug the connector(s) back into their sockets on the board.

9. Verify that you have installed the board(s) properly by performing the procedure in *Zeroing the Resolver*, page 79. You need to complete this procedure before you can use SmartPAC PRO.

Connecting DiPro Sensor Interface to SmartPAC PRO

NOTICE

For information about using the DiProPAC, see *Chapter 6 – Using DiProPAC Die Protection (Optional)*, page 167

To connect your DiPro die protection sensors through the DiPro Sensor Interface (DSI) 2, refer to

- Table 2-3 to wire sensors 1-8
- Table 2-4 to wire sensors 9-16
- Table 2-5 to wire sensors 17-24
- Table 2-6 to wire sensors 25-32.

Refer to wiring diagrams at the end of the manual (Figure 1 for sensors 1-16, Figure 2 for sensors 17-32). Refer to the DSI 2 manual for more information.

Terminate cable shields as close as possible to the terminal blocks, either beneath a screw on a standoff or to a ground stud, as described in *Terminating Cable Shields*, page 50.

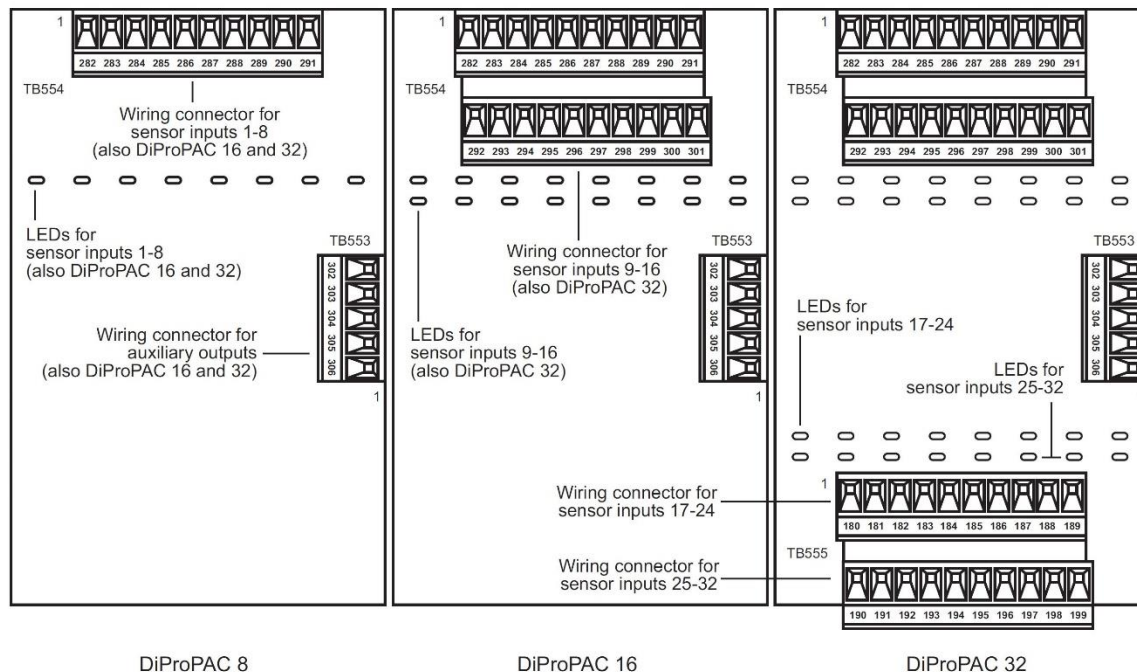


Figure 2-12. DiProPAC Boards (8-, 16-, and 32-Sensor): Location of Components

Table 2-3. DiPro Sensor Interface (DSI) 2 to SmartPAC PRO Wiring, Sensors 1-8

Wire color*	1st DSI 2 (TB2)		DiProPAC (TB554)	
	Pin #	Pin Designation	Pin #	Pin Designation
Brown	1	SENSOR 1	282	SENSOR 1
Red	2	SENSOR 2	283	SENSOR 2
Orange	3	SENSOR 3	284	SENSOR 3
Yellow	4	SENSOR 4	285	SENSOR 4
Green	5	SENSOR 5	286	SENSOR 5
Blue	6	SENSOR 6	287	SENSOR 6
Violet	7	SENSOR 7	288	SENSOR 7
Gray	8	SENSOR 8	289	SENSOR 8
		No connection	290	Sensor power
Black	9	GND	291	GND
	10	GND		No connection
	11	+5 VDC		No connection
Shield	Terminate drain wire to ground stud		Terminate drain wire to ground stud	

* Your colors may be different

Table 2-4. DiPro Sensor Interface (DSI) 2 to SmartPAC PRO Wiring, Sensors 9-16

Wire color*	2nd DSI 2 (TB2)		DiProPAC (TB554)	
	Pin #	Pin Designation	Pin #	Pin Designation
Brown	1	SENSOR 1	292	SENSOR 9
Red	2	SENSOR 2	293	SENSOR 10
Orange	3	SENSOR 3	294	SENSOR 11
Yellow	4	SENSOR 4	295	SENSOR 12
Green	5	SENSOR 5	296	SENSOR 13
Blue	6	SENSOR 6	297	SENSOR 14
Violet	7	SENSOR 7	298	SENSOR 15
Gray	8	SENSOR 8	299	SENSOR 16
		No connection	300	Sensor power
Black	9	GND	301	GND
	10	GND		No connection
	11	+5 VDC		No connection
Shield	Terminate drain wire to ground stud		Terminate drain wire to ground stud	

* Your colors may be different.

Table 2-5. DiPro Sensor Interface (DSI) 2 to SmartPAC PRO Wiring, Sensors 17-24

Wire color*	3rd DSI 2 (TB2)		DiProPAC (TB555)	
	Pin #	Pin Designation	Pin #	Pin Designation
Brown	1	SENSOR 1	180	SENSOR 17
Red	2	SENSOR 2	181	SENSOR 18
Orange	3	SENSOR 3	182	SENSOR 19
Yellow	4	SENSOR 4	183	SENSOR 20
Green	5	SENSOR 5	184	SENSOR 21
Blue	6	SENSOR 6	185	SENSOR 22
Violet	7	SENSOR 7	186	SENSOR 23
Gray	8	SENSOR 8	187	SENSOR 24
		No connection	188	Sensor power
Black	9	GND	189	GND
	10	GND		No connection
	11	+5 VDC		No connection
Shield	Terminate drain wire to ground stud		Terminate drain wire to ground stud	

* Your colors may be different

Table 2-6. DiPro Sensor Interface (DSI) 2 to SmartPAC PRO Wiring, Sensors 25-32

Wire color*	4th DSI 2 (TB2)		DiProPAC (TB555)	
	Pin #	Pin Designation	Pin #	Pin Designation
Brown	1	SENSOR 1	190	SENSOR 25
Red	2	SENSOR 2	191	SENSOR 26
Orange	3	SENSOR 3	192	SENSOR 27
Yellow	4	SENSOR 4	193	SENSOR 28
Green	5	SENSOR 5	194	SENSOR 29
Blue	6	SENSOR 6	195	SENSOR 30
Violet	7	SENSOR 7	196	SENSOR 31
Gray	8	SENSOR 8	197	SENSOR 32
		No connection	198	Sensor power
Black	9	GND	199	GND
	10	GND		No connection
	11	+5 VDC		No connection
Shield	Terminate drain wire to ground stud		Terminate drain wire to ground stud	

* Your colors may be different.

NOTICE

If there are extra wires in the cable, cut them off close to the end of the cable jacket.

Connecting ProCamPAC Programmable Cam Channels

DANGER

PROGRAMMABLE CAM SWITCH NOT FOR SAFETY USE

Use SmartPAC PRO's programmable cam switch to control auxiliary functions only. The SmartPAC PRO programmable cam capability should never be used to provide timing signals for any safety use including clutch/brake control or muting of light curtains.

Failure to comply with these instructions will result in death or serious injury.

CAUTION

BOARD DAMAGE OR SHORT CIRCUIT WHEN MOUNTED WITHOUT ENCLOSURE

- Mount the cam output assembly in a clean area where it will be safe from damage.
- Provide at least 0.5 in. (12.7 mm) clearance between the back of the Cam Outputs board and any metal surface.

Failure to comply with these instructions could result in property damage.

If you purchased the ProCamPAC option with SmartPAC PRO, you receive a separate output assembly for wiring up to sixteen cam channels to your equipment. The assembly contains the relays

that open and close at the angles you set in SmartPAC PRO, turning your equipment on and off. Different types of relays can be used, depending on the voltages of your equipment and any special requirements.

To mount the ProCamPAC Output Assembly and wire it to the ProCamPAC board inside the SmartPAC PRO control, follow the instructions below. These instructions may be used with either the 8- or 16-channel ProCamPAC board. Refer to Table 2-7 and Table 2-8 for wiring connections. A wiring diagram is provided in Figure 3 at the end of the manual.

1. Select a convenient location for running conduit from the ProCamPAC Output Assembly to the equipment that it will control.
2. Mount the output enclosure, using the mounting holes on the flanges as shown in Figure 2-14.
3. Select the relays to be used with each channel. Relays should already be plugged into the Cam Outputs board (see Figure 2-14), each relay labelled with its type (i.e., standard or solid state).

Standard relays can be plugged only into the slots labeled K301 through K305, K307, K309, and K311, which are channels 1-8. Optional solid state relays can be plugged only into slots labeled K306, K308, K310, and K312, which are channels 5-8.

Locate the 12-conductor cable(s) for wiring the ProCamPAC board solid state relay into channel 5 (location K306), you cannot plug a standard relay into location K305. See Figure 2-14.

Example

Say you wish to use three standard relays and one solid state relay. You would install the three standard relays in channels 1 through 3, and the solid state relay in channel 5, skipping the channel 4 output for all wiring and programming.

4. To remove a relay, pull the plastic retention clip away from the relay and pull the relay straight out of its socket. When re-inserting the relay, make sure that the pins line up with the socket holes, then press in firmly.
5. Locate the 12-conductor cable(s) for wiring the ProCamPAC board (see Figure 2-14 for layouts of 8- and 16-channel boards) to terminal block TB301 inside the ProCamPAC Output enclosure. If you are wiring an 8-channel ProCamPAC, one cable is supplied (for channels 1-8). If you are wiring a 16-channel board, two cables are supplied, one for channels 1 through 8, the other for channels 9 through 16.

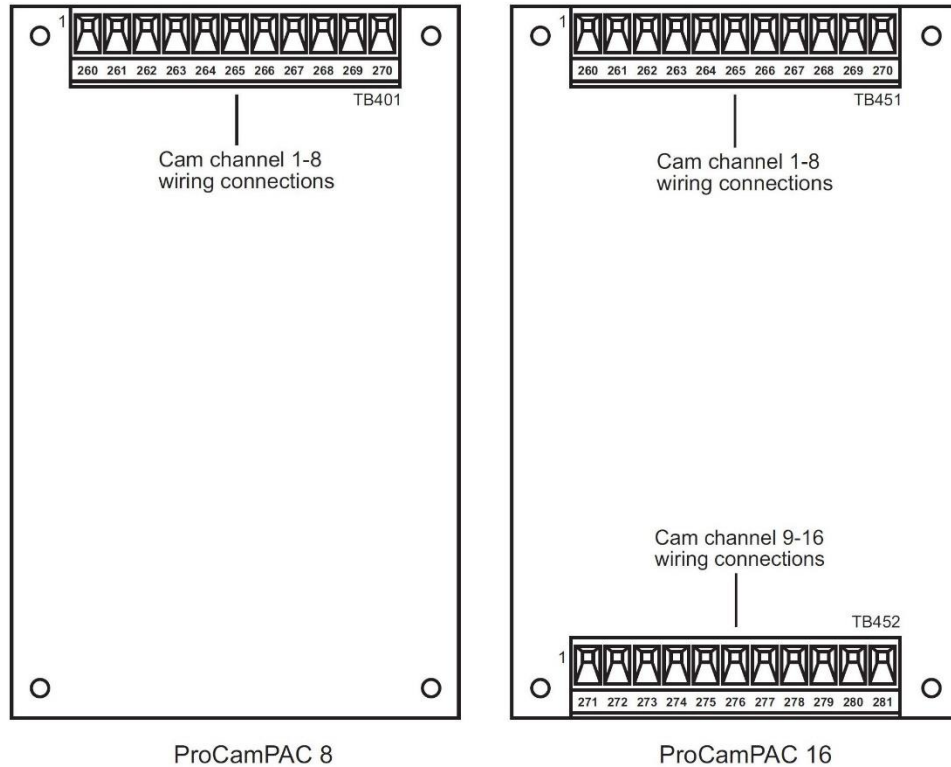


Figure 2-13. ProCamPAC Boards (8- and 16-Channel): Location of Components

6. Remove the appropriate connector(s) from its socket on the ProCamPAC board (TB401 for an 8-channel ProCamPAC, TB451 and TB452 for a 16-channel ProCamPAC). Connect wires from the 12-conductor cable(s) to the pin locations on the appropriate terminal blocks, as shown in Table 2-7 (for the 8-channel option) or Table 2-7 and Table 2-8 (for the 16-channel option). See also wiring diagram Figure 3 at the end of the manual.

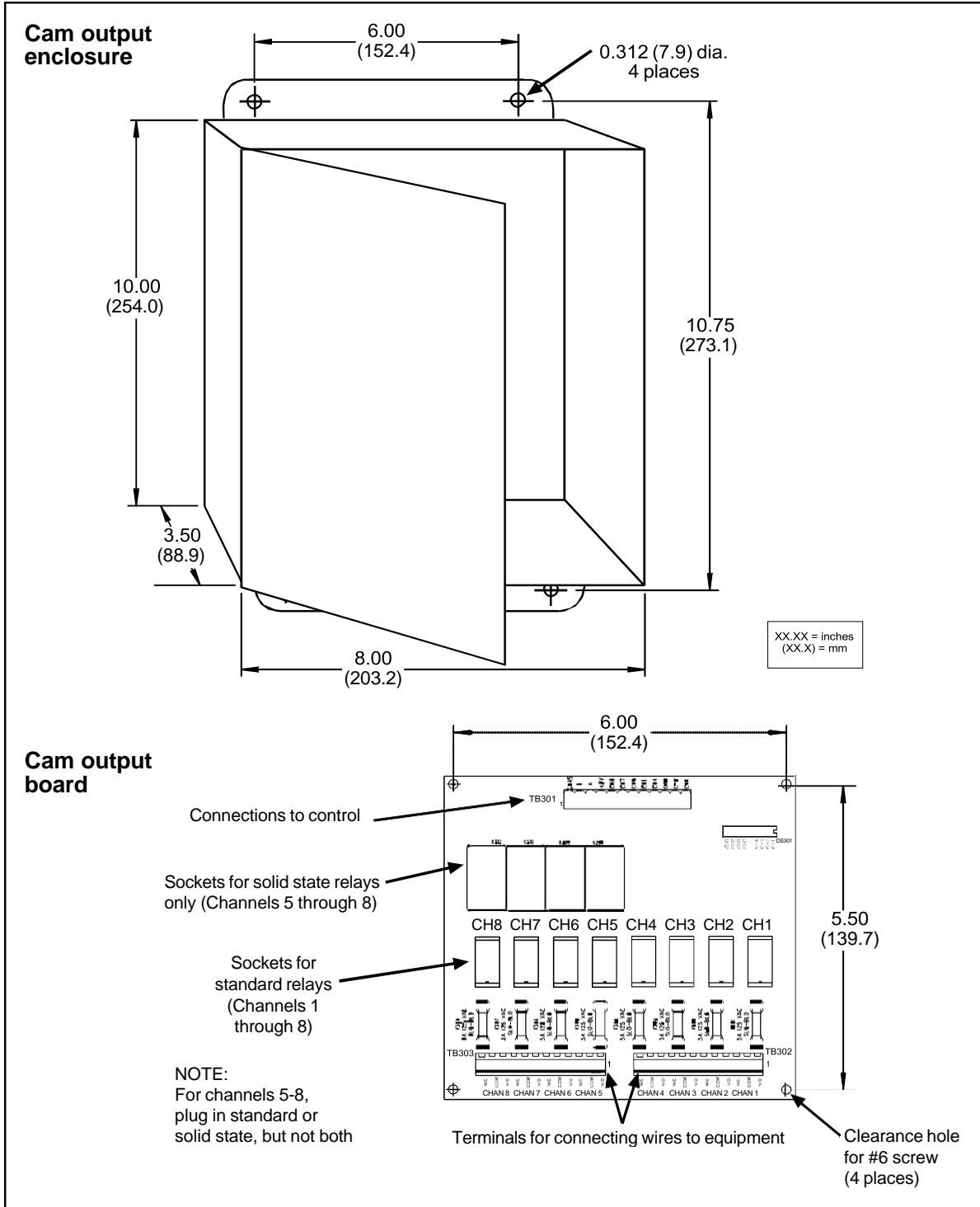


Figure 2-14. ProCamPAC Output Assembly

Table 2-7. ProCamPAC to Cam Output Assembly SMARTPAC PRO Wiring, Cams 1-8

Wire	8-cam: ProCamPAC TB401 (cams 1-8) 16-cam: ProCamPAC TB451 (cams 1-8) (Pin #)	1st Cam Output Board TB301 (Pin #)
		CHAS (1)
White	Relay Pwr (270)	A (3)
Black	GND (269)	B (2)
Red	+5 (268)	+5 Vdc (4)
Tan	Ch 8 (267)	Ch 8 (5)
Pink	Ch 7 (266)	Ch 7 (6)
Gray	Ch 6 (265)	Ch 6 (7)
Blue	Ch 5 (264)	Ch 5 (8)
Yellow	Ch 4 (263)	Ch 4 (9)
Orange	Ch 3 (262)	Ch 3 (10)
Purple	Ch 2 (261)	Ch 2 (11)
Brown	Ch 1 (260)	Ch 1 (12)

Table 2-8. ProCamPAC to Cam Output Assembly SMARTPAC PRO Wiring, Cams 9-16

Wire	16-cam: ProCamPAC TB452 (cams 9-16) (Pin #)	2nd Cam Output Board TB301 (Pin #)
		CHAS (1)
White	Relay Pwr (281)	A (3)
Black	GND (280)	B (2)
Red	+5 (279)	+5 Vdc (4)
Tan	Ch 16 (278)	Ch 8 (5)
Pink	Ch 15 (277)	Ch 7 (6)
Gray	Ch 14 (276)	Ch 6 (7)
Blue	Ch 13 (275)	Ch 5 (8)
Yellow	Ch 12 (274)	Ch 4 (9)
Orange	Ch 11 (273)	Ch 3 (10)
Purple	Ch 10 (272)	Ch 2 (11)
Brown	Ch 9 (271)	Ch 1 (12)

7. Plug the connector(s) back into the socket(s).
8. Run the cable(s) through conduit to TB301 in the ProCamPAC Output enclosure, using the knockouts directly above the connector.
9. Remove the TB301 connector from its socket, and connect wires from the 12-conductor cable(s) as shown in Table 2-7 (for 8-channel ProCamPAC) or Table 2-7 and Table 2-8 (for 16-channel ProCamPAC). A wire from CHAS to a lug on the ProCamPAC Output enclosure should already be connected (unless you bought the board assembly only).

10. Plug the connector(s) back into its socket.
11. To connect the relays to your equipment, use connectors TB302 and TB303.

Specific connections depend on the type of relay you use. For 120 VAC relays, you can connect wires from your equipment to “C” and either the N/O (normally open) or N/C (normally closed) side of the relay

All solid state relays work only when the C and the N/O terminals are connected. Polarity must be correct for DC solid state relays (refer to Table 2-9.)

Table 2-9. Connections to Relays

Module	How To Connect	Type
Electro-mechanical Relay	One wire to C, one wire to N/O or N/C, polarity does not matter	SPDT
DC Solid State	– to C, + to N/O	SPST
AC Solid State	One wire to C, one wire to N/O, polarity does not matter	SPST

WARNING

INCORRECT SUPPRESSOR INSTALLATION MAY CAUSE RELAYS TO REMAIN ENERGIZED

Ensure that suppressors are correctly installed. They must not be installed across the relay contacts inside the ProCamPAC Output enclosure. If a suppressor is installed across the relay contacts and it fails shorted, the equipment controlled by that relay will remain energized.

Failure to comply with these instructions could result in death or serious injury.

12. To reduce electrical noise and to extend the life of the relays, do the following:

AC loads:

Install arc suppressors across each inductive load (motors, coils, etc.) that is connected to a cam relay (see Figure 2-15). Suppressors are supplied with each relay. Install the suppressors across the load or as close to the load as possible. Attach suppressors by connecting leads across existing terminals or junction points.

DC loads:

Install a diode across each DC load, (see Figure 2-16)

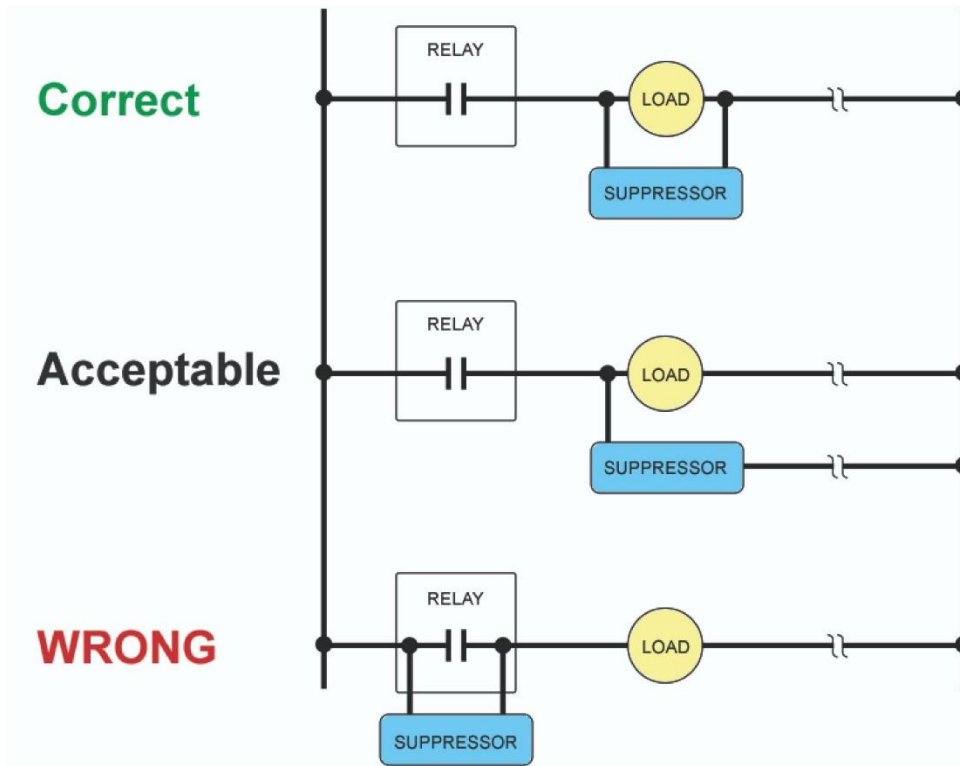


Figure 2-15. Installing Suppressors Across an AC Load

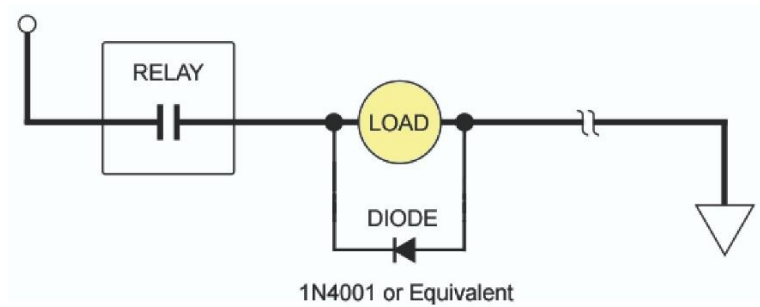


Figure 2-16. Installing a Diode Across a DC Load

Wiring Setup Mode Circuit

SmartPAC PRO Setup mode allows you to disable green sensors and parts/batch counters, using a remote switch. Typically, the Setup mode circuit is enabled when Inch mode is selected on your clutch/brake control. When you inch the press, SmartPAC PRO will not stop the press when a fault condition is detected. The Setup mode terminal can be wired to an extra contact on the Inch position of the Stroke Select keyswitch of your press control, or you can use an external switch to activate the circuit. If you intend to use the Setup mode circuit, plan how you will run your wiring for this connector now so you do not have to disconnect conduit or rerun wires through conduit later.

For Setup mode, you must provide contact closure when a non-Wintriss press control is in Inch mode. Connect a wire from SmartPAC PRO terminal block TB5, terminal #252 (labelled IN/SU) to one side of a normally open switch (see Table 2-10, and Figure 4 at the end of the manual). Connect the other side of the switch to GND (TB5, terminal #247). Refer to your electrical prints or the manual for your press control to plan your wiring.

Table 2-10. Aux I/O (TB5) Wiring

Pin #	Signal
245	+24 V
246	POSITION SENSOR
247	GND
248	ZERO
249	REMOTE RESET
250	GND
251	LOCKOUT
252	INCH/SETUP
253	OP STA 2
254	OP STA 1

Wiring a Remote Reset Switch (Optional)

Like the Setup mode terminal, the Remote Reset terminal can be wired to a normally open switch to activate the circuit. Be sure to plan how you will run your wiring for this connector so that you do not have to disconnect conduit or re-run wires through conduit later. Connect a wire from SmartPAC PRO TB5, terminal #249 (labelled RST) to a normally open switch (see Table 2-10, and wiring diagram Figure 4 at the end of the manual). Connect another wire from the switch to GND (TB5, terminal #250). SmartPAC PRO is reset with a momentary connection to ground.

Wiring a Sensor-Disabled Output (Optional)

You can wire a Sensor-disabled Output such as a warning light to a customer-supplied solid-state relay to warn personnel that the die protection capability, if installed, is disabled.

Connect the positive input wire from your user-supplied 12VDC solid-state relay to terminal #302 (Relay Pwr) on TB553 on the DiProPAC board. Connect the negative input wire from the relay to terminal #306 (Aux 1) on TB553. You cannot use more than 8 mA for your relay.

Wiring the ProCamPAC Output with Your Mechanical Top Stop Cam Switch (Optional)

⚠ DANGER

PROGRAMMABLE CAM SWITCH NOT FOR SAFETY USE

- Use SmartPAC PRO's programmable cam switch to control auxiliary functions only. The SmartPAC PRO programmable cam capability should never be used to provide timing signals for any safety use including clutch/brake control or muting of light curtains.
- Ensure that the clutch/brake control is control reliable on its own. The wiring shown below does not affect or improve the safety of the system. This optional top-stop wiring only aids in adjusting the top stop and in utilizing the auto advance feature to mimic Auto-compensated Top Stop (ACTS).
- Test the system after wiring, as described below, to ensure proper functioning of the Top-stop circuit.

Failure to comply with these instructions could result in death or serious injury.

The diagrams provided in Figure 2-17 show how to wire ProCamPAC and your mechanical cam switch for Top Stop. This optional top-stop wiring only aids in adjusting the top stop and in utilizing the auto advance feature to mimic Auto-compensated Top Stop (ACTS).

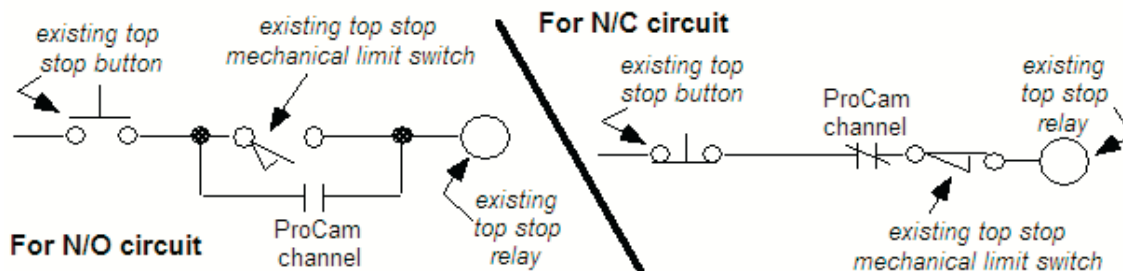


Figure 2-17. Optional Top-Stop Wiring

Check your wiring by performing the appropriate test:

- *For an N/O circuit:* Temporarily program the ProCamPAC channel used for this wiring so that it is “off” (open) all the time (i.e., On = 0°, Off = 0°). Confirm that the press will top- stop.
- *For an N/C circuit:* Temporarily program the ProCamPAC channel used for this wiring so that it is “on” (closed) all the time (i.e., On = 1°, Off = 0°). Confirm that the press will top- stop.

Zeroing the Resolver

NOTICE

PRESS MUST BE AT TDC WHEN ZEROING RESOLVER

Verify that the press is at top dead center (i.e., at $0^\circ \pm 2^\circ$) before you zero the resolver. If the press is not at TDC, your timing settings may be wrong.

You must perform this procedure the first time you power up SmartPAC PRO and whenever you install a new resolver.

If the ram is already at top dead center (TDC), perform the procedure in *Setting the Resolver Zero Position*, page 81. Otherwise, first inch the ram to TDC, following the procedure in *Moving the Ram to Top Dead Center (TDC) procedure*, next.

Turning on Power to SmartPAC PRO

To turn on power to SmartPAC PRO, do the following:

1. Make sure there is no die in the press.
2. Turn the PROG/RUN keyswitch to PROG.
3. Power up the SmartPAC PRO.

The green Power light on the SmartPAC PRO front panel illuminates, the display shows various startup screens, and the Brake Warning LED flashes at approximately two-second intervals while SmartPAC PRO completes its startup routine. This can take up to one minute. Eventually, the Main Program Menu appears, Figure 2-18.

NOTICE

- If an error message displays when SmartPAC PRO starts up, press RESET.
- If the error message continues to appear after your press RESET, find the message in Chapter 8 and follow the instructions for correcting the problem. If you cannot find the error message or cannot fix the problem, contact Wintriss Tech. Support.

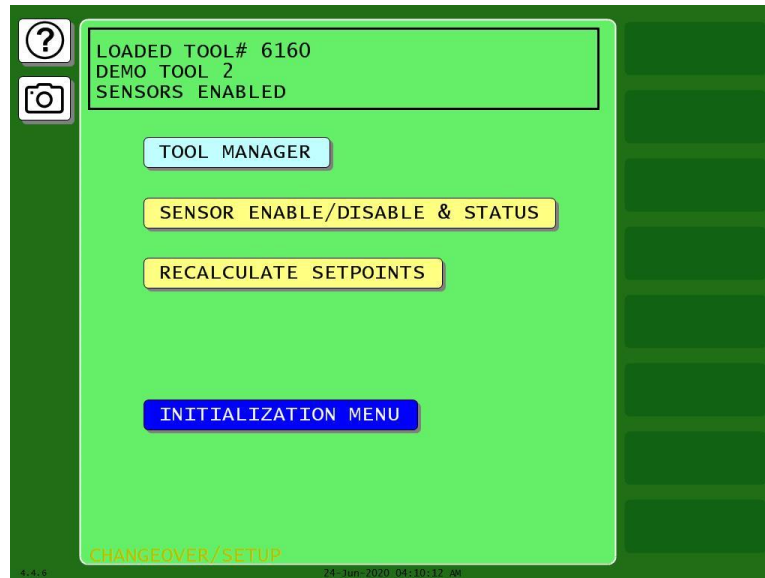


Figure 2-18. Main Program Menu

4. If the SmartPAC PRO display remains off, do the following:
 - **If the green Power light on SmartPAC PRO does not illuminate**
Turn off power to SmartPAC PRO, and recheck all power connections. Check that the connectors are correctly seated on both ends of the cables between the SmartPAC PRO board and the display. Power up SmartPAC PRO again. If the display remains off, contact Wintriss Tech. Support.
 - **If the green Power light illuminates, but the display remains off**
Power down SmartPAC PRO, and check that the connectors are correctly seated on both ends of the cables between the SmartPAC PRO board and the display. Power up SmartPAC PRO again. If the display remains off, contact Wintriss Tech. Support.

Verifying Installation of DiProPAC and/or ProCamPAC (Optional)

If you installed DiProPAC and/or ProCamPAC on SmartPAC PRO, you need to verify that the installation was done correctly and that the option is available. Do the following:

1. On the SmartPAC PRO Main Program Menu, select INITIALIZATION MENU; then press INSTALLED OPTIONS. The Installed Options screen, shown in Figure 2-19 displays.

Check to see that DiProPAC and/or ProCamPAC is on the list.

- If it is on the list, go to the next section.
- If DiProPAC is not on the list, go to *Adding or Upgrading DiProPAC or ProCamPAC Option*, page 64, and verify that you performed the installation properly. Check that the option board is plugged into the correct connector. If you still cannot fix the problem, call Wintriss Tech Support.

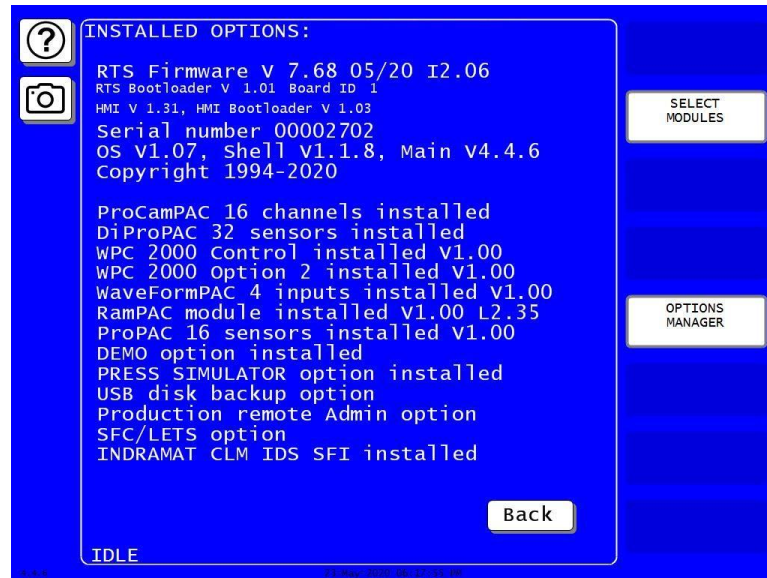


Figure 2-19. Installed Options Screen (yours may list different options)

Moving the Ram to Top Dead Center (TDC)

If the ram is not at TDC, you must first inch the press to $0^\circ \pm 2^\circ$ before you can zero the resolver. Since SmartPAC PRO is now connected to your stop circuits, you must load a tool in order to inch the press.

1. Access Program mode and create a new tool, following the steps in *Creating a New Tool*, page 136.
2. Enter a counter preset of 10,000 for the tool, following the directions in *COUNTERS*, page 142.
3. Load the tool, following the instructions in *Loading a Tool*, page 138.
4. Turn the PROG/RUN keyswitch to RUN, and inch the press to $0^\circ \pm 2^\circ$.

NOTICE

USE A DIAL INDICATOR TO DETERMINE TDC

Do not rely on the SmartPAC PRO display to indicate when the press has reached TDC. Until the resolver is zeroed, displayed values are inaccurate. Use a dial indicator or some other means to determine 0° .

5. When the press is at TDC, perform the next procedure.

Setting the Resolver Zero Position

To zero the resolver with the press at TDC, perform the following steps:

1. On the SmartPAC PRO Main Initialization Menu select RESOLVER ZERO. The screen shown in Figure 2-20 displays.
2. The value shown in the CURRENT RESOLVER ANGLE field should be as close as possible to

0°, preferably between 355° and 5°, but anywhere between 330° and 30° is acceptable.

If the current resolver angle is outside the range of 330° to 30°, loosen the tension on your drive mechanism and turn the resolver shaft by hand (either direction is acceptable) until the resolver angle is as close to zero as possible. Then tighten the drive mechanism, making sure not to change the resolver angle reading.

3. With the Resolver Zero display on the screen, press SET RESOLVER ZERO POSITION. SmartPAC PRO electronically adds or subtracts the offset, and the CURRENT ZERO CORRECTION reading should change to match CURRENT RESOLVER ANGLE.

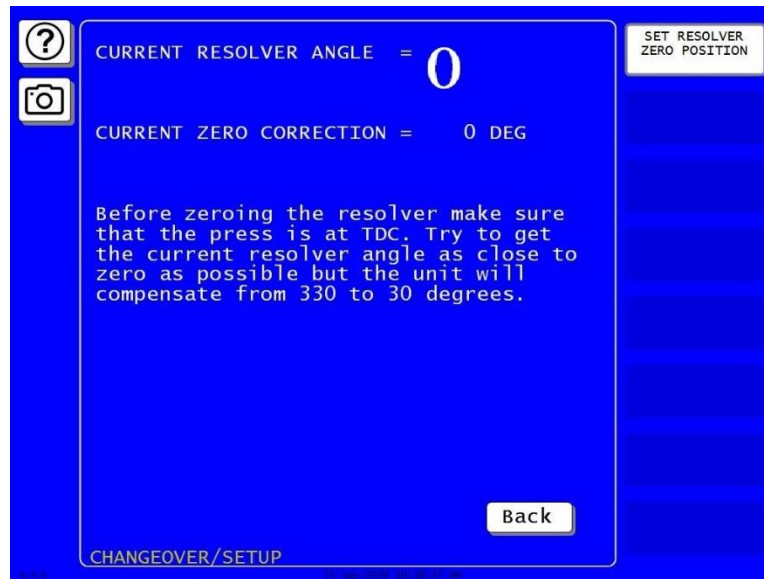


Figure 2-20. “Resolver Zero” Screen

4. Press Exit when you are finished. You are returned to the Main Initialization Menu.

Installing the Position Sensor (Optional)

CAUTION

MISALIGNMENT OF RESOLVER AND CRANKSHAFT

If you have installed the position sensor, enable it during initialization and leave it enabled even though it is optional for SmartPAC PRO operation. If you disable the position sensor to clear an error message, misalignment between the resolver and crankshaft will go undetected.

Failure to comply with these instructions could result in property damage.

The position sensor is an optional feature that allows position of the resolver to be checked on every stroke. This feature consists of a magnet, which is usually mounted on the crankshaft, and a magnetic switch, which is mounted on a stationary part of the press past which the magnet passes as the crankshaft turns. The magnetic switch must be mounted so that it senses the magnetic field at the same point on every stroke.

SmartPAC PRO compares the timing of this signal with the angle of the resolver. If the resolver angle changes relative to this signal, SmartPAC PRO knows that the resolver drive has slipped or broken or

the resolver itself has failed and issues an Emergency Stop command, simultaneously displaying an error message.

Find a mounting location that allows the magnet to move past the switch once on every stroke and close enough for the switch to sense the presence of the magnet. A gap between switch and magnet of between 1/8 in. and 3/16 in. (about 3–5 mm) is recommended. The position sensor must be mounted so that it is not connected to the resolver shaft or sprocket or any of the drive components leading to the resolver and continue to operate if the resolver or its drive mechanism fails. The position sensor must be installed only after the resolver is zeroed.

To generate an adequate position signal, the magnet should be mounted so the switch senses it for at least 10° to 15° of the stroke. For best results at higher press speeds, mount the magnet on a shaft of 2 in. to 3 in. (about 50–75 mm) diameter. As shown in Figure 2-21, the larger the diameter of the shaft, the shorter the “dwell,” the period during which the switch senses the magnet. To obtain a longer dwell, therefore, mount the magnet on a shaft of smaller diameter.

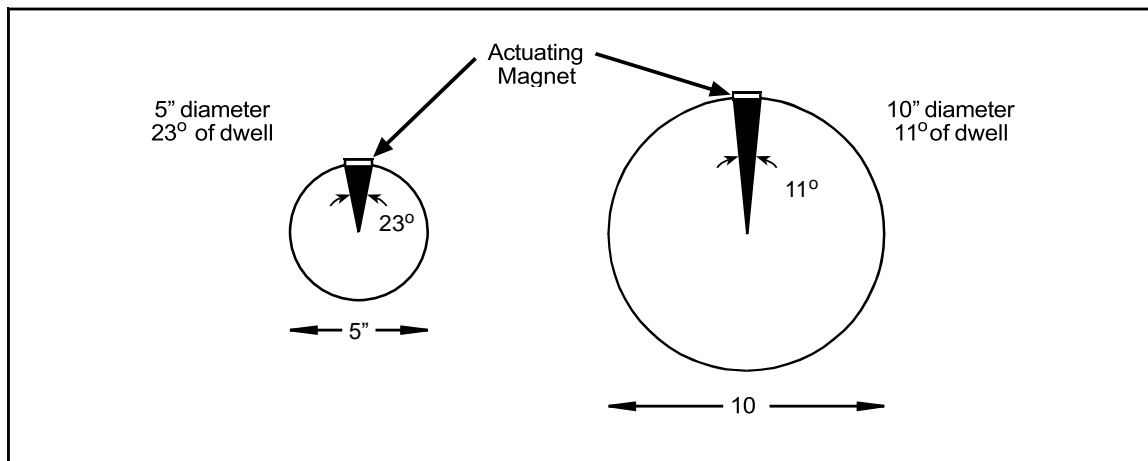


Figure 2-21. Position Sensor Dwell on Different Diameter Shafts

To install the position sensor, do the following:

1. Make sure that the resolver has been zeroed (see *Zeroing the Resolver*, page 79).
2. Turn on power to SmartPAC PRO.
3. Turn the PROG/RUN keyswitch to PROG. The Main Program Menu displays.
4. Select “INITIALIZATION MENU”, then press “POSITION SENSOR” button. The Position Sensor screen, shown in Figure 2-22, displays.
5. Check to make sure that the setting for the POSITION SENSOR MODE item is DISABLED. If it isn’t, press ENTER to toggle to the DISABLED setting.

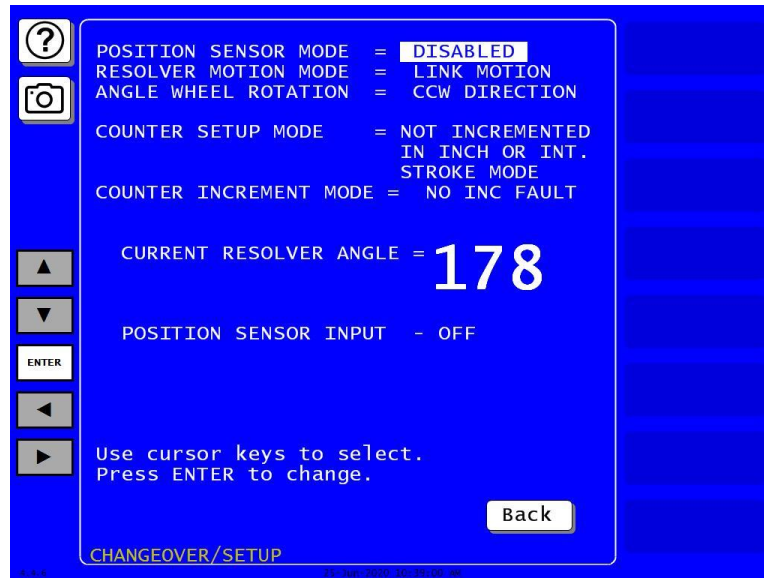


Figure 2-22. Position Sensor Screen

6. Press RESET twice to return to the Main Program Menu.
7. Create a tool, following the steps in *Creating a New Tool*, page 136.
8. Enter a counter preset of 10,000 for the tool, following the directions in *COUNTERS*, page 142.
9. Load the tool, following the instructions in *Loading a Tool*, page 138.
10. Access the Position Sensor screen again (see steps 4 and 5).
11. Check the CURRENT RESOLVER ANGLE setting. If it is not zero (0), inch the press until it reads zero.

NOTICE

The crankshaft angle reading should increase as you inch the press. If it decreases (359°, 358°, 357°, for example), swap the black and yellow wires (terminals 213 and 216) on connector TB3 on the SmartPAC PRO board (see Table 2-1, page 59 and Figure 2-6, page 56).

NOTICE

The press must be at top dead center (0°) before the position sensor can be installed. Make sure that the CURRENT RESOLVER ANGLE setting is 0° before proceeding to the next step.

12. Shut off power to SmartPAC PRO and the press control.
13. Mount the magnetic switch so that the magnet rotates 1:1 with the crankshaft of the press. The ideal location is on the crankshaft itself.
14. Temporarily mount the magnet, plastic side up, so it is centered beneath the magnetic switch as shown in Figure 2-23.

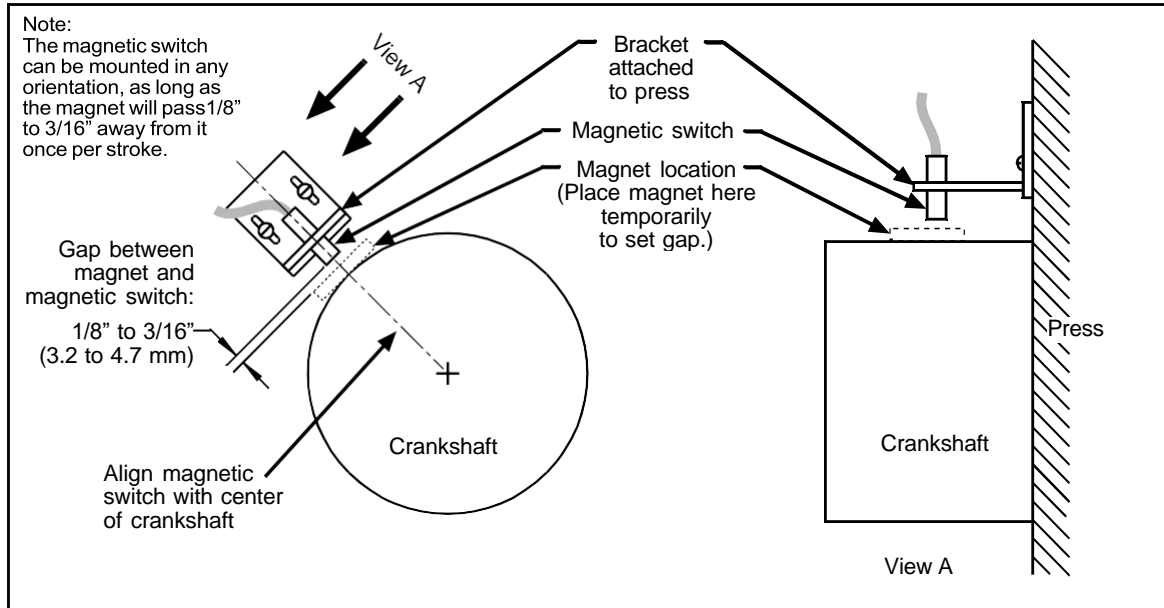


Figure 2-23. Position Sensor Installation

15. Wire the switch to SmartPAC PRO terminal block TB5 (see Table 2-10, page 77 and Figure 4 at the end of the manual). The black wire goes to terminal 247 (GND), the white or clear wire goes to terminal 246, and the red wire goes to terminal 245.
16. Power up SmartPAC PRO and turn the PROG/RUN keyswitch to PROG.
17. Access the Position Sensor screen again (see steps 4 and 5).
18. With the highlight bar on the DISABLED setting for the POSITION SENSOR MODE item, press ENTER to toggle to the ENABLED setting.
19. Making sure that the magnet is centered beneath the magnetic switch, check the reading next to the POSITION SENSOR INPUT item. If the reading is ON, go to the next step. If the reading is OFF, there is a problem. Try the following remedies:
 - Double-check the wiring.
 - Make sure that the ram hasn't moved since you installed the sensor. If it has, move the ram to TDC (i.e., 0°) and re-install the magnet (see step 14).
 - If the ram hasn't moved, check the distance between the magnetic switch and the magnet. Re-adjust if necessary.
 - If a "Position Sensor Incorrect" error message displays after you try running the press (see step 22), the position sensor may not have enough dwell to provide an adequate signal at high speeds. Try mounting the magnet on a smaller shaft (see Figure 2-23).
 - If none of these steps changes the POSITION SENSOR INPUT setting to ON, the magnetic switch may be bad. Try another switch if one is available. Otherwise, call Wintriss Tech. Support for help.
20. Press EXIT and Turn the PROG/RUN keyswitch to RUN.
21. Inch the press through a few strokes to verify that the position sensor works properly and SmartPAC PRO does not produce position sensor fault messages.

- Inch the press while watching the Position Sensor LED, located beneath the Input Check Voltage Switch on the SmartPAC PRO board. Stop the press when the LED comes ON and make a note of the ON angle. Continue to inch the press until the LED goes OFF, and make a note of the OFF angle. The sensor should be ON at 0°, and, preferably, 0° should occur at the midpoint of the ON period.

NOTICE

Do not use a ferrous screw to mount the position sensor. A ferrous screw can cause false signals.

- If the position sensor appears to be working properly, permanently mount the magnet, plastic side up, using a non-ferrous metal screw. A brass screw (6-32) is supplied. Use a No. 36 drill and a 6-32 tap.

Final Checkout

Before using SmartPAC PRO, you need to follow these instructions to ensure that your unit is working properly. Do not proceed to the next step or group of steps until the item you are testing checks out.

Set Up a “Test” Tool

- Create a “Test” tool, following the steps in *Creating a New Tool*, page 136.
- Enter a counter preset of 10,000 for the tool, following the directions in *COUNTERS*, page 142.
- Load the tool, following the instructions in *Loading a Tool*, page 138, then turn the PROG/RUN keyswitch to RUN.

Check and Set Direction of Rotation of Resolver

- Inch the press. Watch the crankshaft angle reading inside the crank angle clock at the lower left of the display. The crankshaft angle should increase as you inch the press. If it decreases (359°, 358°, 357°, for example), swap the black wire and yellow wire (terminals 213 and 216) on connector TB3 on the SmartPAC PRO board (see Table 2-1, page 59).

Check for Position Sensor (If Installed) Error Messages

- If a position sensor is installed and a position sensor fault occurs, refer to step 19 of the procedure in *Installing the Position Sensor (Optional)*, page 82. For other error messages, go to *Chapter 8* and follow the instructions for solving the specific problem. When you have corrected the error, press RESET and run the press again for a few strokes, checking for error messages.
 - If no error messages display, go to step 6.
 - If error messages continue to display, and you cannot correct the fault, call Wintriss Tech. Support.

Check the Top-stop Circuit

- Set the stroke counter preset to a small value (e.g., 10), referring to *COUNTERS*, page 142; then, run the press in continuous mode until the preset value is reached. Check to make sure that the press top-stops and that a message indicating that the preset was reached is displayed (see

Chapter 8 for counter preset messages).

- If the press top-stopped correctly, go to step 7.
- If the press did not top-stop and SmartPAC PRO displayed a message, there is a wiring problem in your top-stop circuit. Recheck all wiring and trace the cause of the problem.

Check the Emergency-stop Circuit

7. Perform the 90° stop-time test to verify that the emergency-stop circuit is working, referring to the procedure starting on page 158.
 - If the press stops correctly, go to step 8.
 - If the press does not stop, there is a wiring problem in your emergency-stop circuit. Recheck all wiring and trace the cause of the problem.

Check Cam Channels (ProCamPAC Only)

8. Create some test settings for your cam channels in Program mode (see *Run Mode: CAM SWITCH (ProCamPAC)*, page 232), load the tool settings, and switch to Run mode to run the press. Ensure that the equipment (feed, blow off, lube, etc.) controlled by each channel is operating appropriately according to the settings you made.

Test Complete

9. If you get to this step, SmartPAC PRO is working correctly. Clear any error messages by pressing RESET, then delete the test tool. You can now create a tool in SmartPAC PRO, program settings for it, load it, and begin to make parts using your new SmartPAC PRO.

What Next?

To program and use your SmartPAC PRO, follow the instructions in the remaining chapters of this manual. Go to *Chapter 3* to make Initialization settings for your SmartPAC PRO.

Wiring Tables for Other SmartPAC PRO Connections

Table 2-11. SFI Port (1) and Module Port (2) (TB6) Wiring

Pin #	Signal	Port
235	+RXD1	SFI PORT (1)
236	-RXD1	
237	TXD1	
238	+TXD1	
239	-TXD1	
240	GND	
241	+RXD2	MODULE PORT (2)
242	-RXD2	
243	+TXD2	
244	-TXD2	

Table 2-12. Special Port (3) and Comm Test Port (4) (TB7) Wiring

Pin #	Signal	Port
224	+RXD3	SPECIAL PORT (3)
225	-RXD3	
226	TXD3	
227	+TXD3	
228	-TXD3	
229	GND	
230	+RXD4	PORT (4)
231	-RXD4	
232	TXD4	
233	+TXD4	
234	-TXD4	

Table 2-13. Spare 1 Port (5) and WPC Port (6) (TB8) Wiring

Pin #	Signal	Port
330	-TXD6	WPC PORT (6)
329	+TXD6	
328	-RXD6	
327	+RXD6	
326	GND	
325	-TXD5	
324	+TXD5	SPARE 1 PORT (5)
323	TXD5	
322	-RXD5	
321	+RXD5	

Table 2-14. CAN Bus Wiring

HMI Board TB6		RTS Board TB1 (CAN BUS)	
Pin#	Signal	Pin#	Signal
1	+CN	1	CN-
2	no connection	2	Shield
3	-CN	3	CN+

Chapter 3 – SmartPAC PRO Initialization Mode

This chapter shows you how to make settings in SmartPAC PRO Initialization mode. Initialization settings, which are entered via the Main Initialization Menu (see Figure 3-1), control operation of SmartPAC PRO for all tools. You make settings for individual tools in Program mode, Chapter 4.

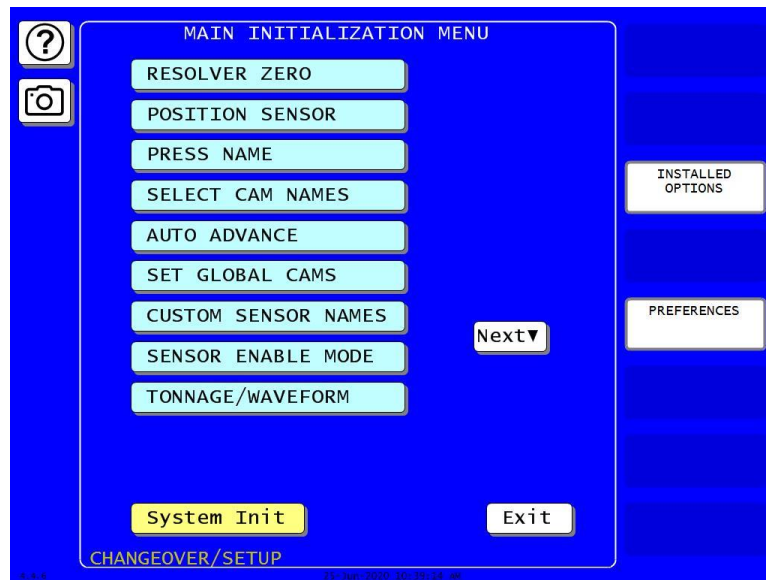


Figure 3-1. Main Initialization Menu

(Includes some options. Your display may look different.)

Enter the Initialization Mode by selecting “Initialization Menu” from the SmartPAC PRO main programming menu.

The following sections cover zeroing the resolver, enabling the position sensor, setting the brake monitor, controlling security access, setting communications parameters, and other operations. It also documents functions related to programmable cams and die protection, such as entering custom cam channel and sensor names and setting global cams.

If you have SmartPAC PRO options installed, also make Initialization settings for them. Refer to the user manuals for the options you have purchased for instructions.

NOTICE

The following sections show you how to use the selections available on the Main Initialization Menu to set initialization parameters for SmartPAC PRO with ProCamPAC and DiProPAC.

- DiProPAC: Chapter 6, DiProPAC in Initialization Mode, page 169
- ProCamPAC: Chapter 7, *Initialization*, page 212

NOTICE**SET THE INTERNAL CLOCK IN SMARTPAC PRO**

When you initialize your SmartPAC PRO, be sure to set the clock to the correct date and to your local time according to the instructions in *SET CLOCK*, page 123.

RESOLVER ZERO

This item enables you to zero the resolver. You must zero the resolver when you first install SmartPAC PRO and whenever you replace the resolver. For instructions on how to zero the resolver, refer to *Zeroing the Resolver*, page 79, in Chapter 2.

POSITION SENSOR

(INITIALIZATION – POSITION SENSOR)

CAUTION**MISALIGNMENT OF RESOLVER AND CRANKSHAFT**

If you have installed the position sensor, enable it during initialization and leave it enabled even though it is optional for SmartPAC PRO operation. If you disable the position sensor to clear an error message, misalignment between the resolver and crankshaft will go undetected.

Failure to comply with these instructions could result in property damage.

This item allows you to enable a position sensor, if one is installed, specify whether counters are to be incremented in Inch mode during setup, and make other settings. Parameters are set on the screen shown in Figure 3-2. The following sections show you how to set each parameter.

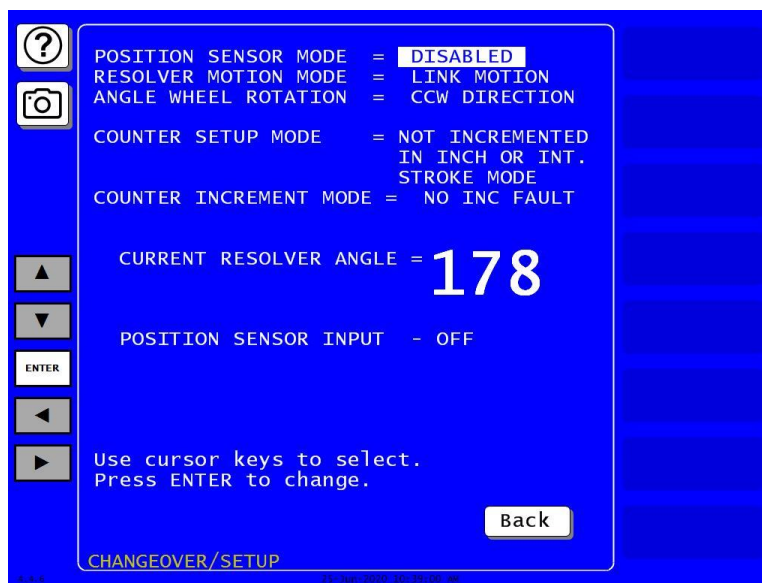


Figure 3-2. Position Sensor Screen

POSITION SENSOR MODE

(INITIALIZATION – POSITION SENSOR)

To set the POSITION SENSOR MODE parameter, follow these instructions:

1. Use the arrow keys (▲▼) to highlight the POSITION SENSOR MODE setting. Press ENTER to toggle between ENABLED and DISABLED.
 - If you installed a position sensor, set this to ENABLED. The POSITION SENSOR INPUT item should read ON when the position sensor magnet is centered beneath the magnetic switch (see page 82).
 - If you did not install a position sensor, set this entry to DISABLED, which is the factory setting.
2. Press Back when done.

RESOLVER MOTION MODE (Normal Motion – Link Motion)

(INITIALIZATION – POSITION SENSOR)

This item controls whether SmartPAC PRO adapts to the action of a link-motion press. The default setting is “NORMAL MOTION.” If your SmartPAC PRO is installed on a link-motion press, for instructions go to *Using SmartPAC PRO with a Link-motion Press*, page 129.

ANGLE WHEEL ROTATION (Clockwise – Counterclockwise)

(INITIALIZATION – POSITION SENSOR)

This setting controls the rotational direction of the crank angle clock on the SmartPAC PRO display. The default setting is “CW” (Clockwise). If you want the crank angle clock to rotate in a counterclockwise direction press ENTER with the ANGLE WHEEL ROTATION item selected and “CW DIRECTION” displayed.

COUNTER SETUP MODE

(INITIALIZATION – POSITION SENSOR)

This item allows you to enable or disable counter setup mode if you have made the appropriate wiring connections to make SmartPAC PRO “setup mode ready” (see *Wiring Setup Mode Circuit*, page 77.) To set this parameter, do the following:

1. Press ENTER to toggle between two settings:
 - “IS INCREMENTED IN ALL MODES” – Parts and batch counters will increment on every stroke no matter what mode (i.e., Inch, Single-stroke, or Continuous) you are in.

- “NOT INCREMENTED IN INCH MODE” – The Parts counter and batch counters whose increment mode is programmed as GOOD PARTS will not increment when you are in Inch mode.
- “NOT INCREMENTED IN INCH OR INT. STROKE MODE” – The Parts counter and batch counters whose increment mode is programmed as GOOD PARTS will not increment when you are in Inch mode or interrupted stroke.

NOTICE

The Strokes counter increments regardless of the mode you are in.

2. When the setting you want is displayed, press Back.

Counter Increment Mode

This item allows you to specify whether the Good Parts counter increments during a fault condition. The default setting, NO INC FAULT, prevents the counter from incrementing when there is a fault. To set this parameter, do the following:

1. Press ENTER to toggle between two settings:
 - “NO INC FAULT” – The Parts counter and batch counters whose increment mode is programmed as GOOD PARTS will increment on every stroke except when there is a fault condition. This is the default setting.
 - “INC ALWAYS” – The Parts counter and batch counters whose increment mode is programmed as GOOD PARTS will increment on every stroke even if a fault condition is present.
2. When the setting you want is displayed, press Back.

INSTALLED OPTIONS

(INITIALIZATION – INSTALLED OPTIONS)

This item enables you to view the options that are installed on your SmartPAC PRO, Figure 3-3, including the number of cam channels and sensors.

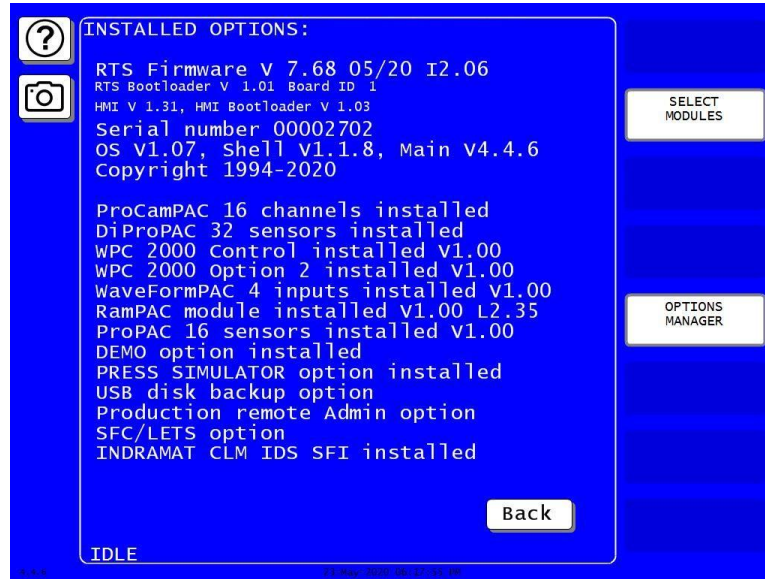


Figure 3-3. Installed Options Screen
Your screen will look different.

If you ordered the alternate language option, this screen provides a SELECT LANGUAGE button to select the language in which you want SmartPAC PRO screens displayed, if you have the appropriate option. When you press the Select Language button, a screen similar to Figure 3-4 displays.



Figure 3-4. Select Language Screen

To select a language, highlight it, and press Exit.

OPTIONS MANAGER

(INITIALIZATION – INSTALLED OPTIONS – OPTIONS MANAGER)

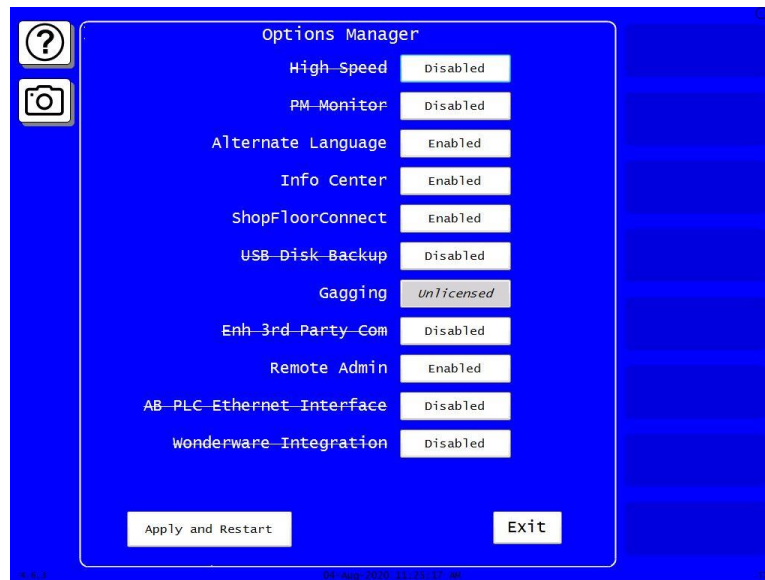


Figure 3-5. Options Manager Screen

1. On the INSTALLED OPTIONS screen, press OPTIONS MANAGER. The Options Manager screen opens.
 - Each option that is installed can be enabled or disabled.
 - Options not installed are marked Unlicensed.
2. To enable or disable an option, press the box next to the option name to toggle between Enabled and Disabled.
3. When finished on this screen, press Apply and Restart to accept the changes. SmartPAC PRO restarts with the new settings. To leave this screen without making any changes, press Exit. You return to the Installed Options screen.

PRESS NAME

(INITIALIZATION – PRESS NAME)

This item enables you to name the press on which SmartPAC PRO is installed. When you select PRESS NAME, the on-screen keyboard appears, allowing you to enter the press name. Press Enter when done.

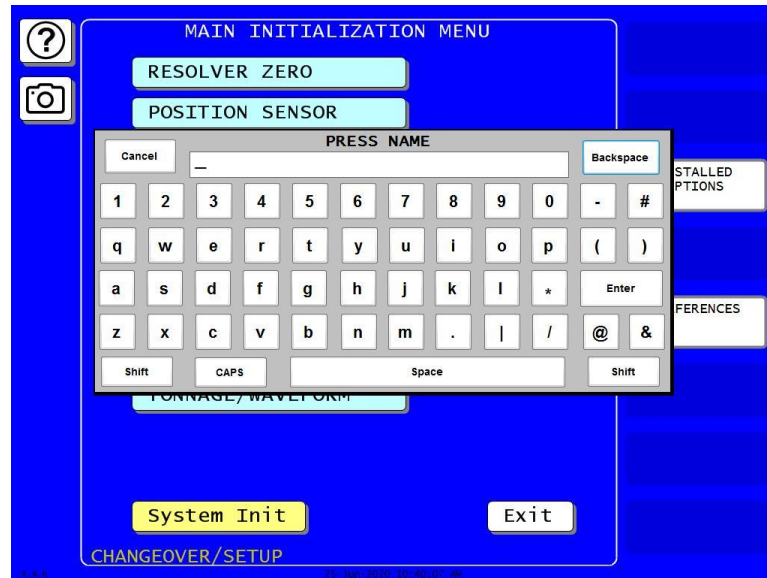


Figure 3-6. Press Name Entry Window

SET BRAKE MONITOR (Optional with WPC 2000 Integration)

(INITIALIZATION – PRESS CONTROL – PRESS PARAMETERS)

This item enables you to set the limits for your press's stopping time and starting time if your SmartPAC PRO is integrated with WPC 2000 press control. These settings are made on the Press Control Parameter screen, Figure 3-7.

The stopping time is the time that it takes the crankshaft to stop once the dual safety valve (DSV) has been de-energized. The Brake Monitor checks the stopping time of the press on each time it stops. If the stopping time comes within 10 milliseconds of the stop time limit, the Brake Warning LED on the SmartPAC PRO front panel blinks. This warning alerts maintenance personnel to perform the necessary repairs on the press.

Whenever the press's stopping time exceeds the stop time limit, SmartPAC PRO displays a "STOP TIME EXCEEDED" message and prevents the press from operating further until the problem has been corrected.

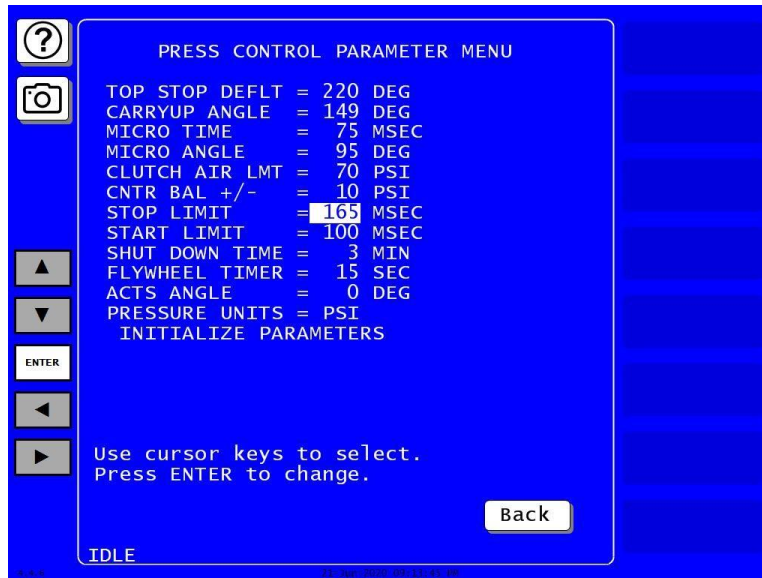


Figure 3-7. Press Control Parameter Menu

The starting time of your press is the time it takes for the crankshaft to start turning after the DSV has been energized. If the starting time exceeds the limit you set on the Brake Monitor screen, SmartPAC PRO displays a “LOSS OF ROTATION DETECTED” message and prevents the press from starting.

The stop time and start time limits set in Initialization are displayed on the Stop Time Status screen in Run mode (see *BRAKE MONITOR*, page 156).

Calculating the Stop Time Limit (Optional with WPC 2000 Integration)

The value you set as the stop time limit on the Brake Monitor screen must factor in the normal wear on your brake to prevent SmartPAC PRO from generating stop time faults when the stopping time increases only a little. The stop time limit can be easily calculated based on the actual stopping time of your press. To perform this calculation, do the following:

1. In Run Mode, perform the procedure *Determining the Stopping Time of Your Press*, page 157.

NOTICE

ADD 10% FOR OLD BRAKES, 20% FOR NEW BRAKES

The rule of thumb for calculating the stop time limit is to add 20% of the stopping time to your press's stopping time if your brakes are new, 10% if your brakes are old.

2. Multiply the stopping time value you recorded in step 1 by 0.20 (i.e., 20%) for a new brake or 0.10 (i.e., 10%) for an old brake, and add the result to the stopping time value. This is your stop time limit.

Example 1

Your recorded stopping time is 207 mS and your brake is old. Take 10% of 207 (i.e., $0.10 \times 207 = 20.7$, rounded to 21) and add the result to 207 (i.e., $21 + 207 = 228$). Your calculated stop time limit is 228 mS.

Example 2

Your recorded stopping time is 175 mS and your brake is new. Take 20% of 175 (i.e., $0.20 \times 175 = 35$) and add the result to 175 (i.e., $35 + 175 = 210$). Your calculated stop time limit is 210 mS.

Setting Stop Time and Start Time Limits(Optional with WPC 2000 Integration)

(INITIALIZATION – PRESS CONTROL – PRESS PARAMETERS)

To set the stop time and start time limits, do the following:

1. Select PRESS CONTROL on the Main Initialization Menu. The WPC Initialization Menu screen appears.
2. Press PRESS PARAMETERS. The Press Control Parameter menu appears.
3. Use the up and down (▲▼) arrows to highlight the value for STOP LIMIT. Press ENTER. A numeric entry window appears.
4. Key in a value (maximum is 1000 milliseconds) and press Enter. You are returned to the Press Control Parameter menu with the value you entered displayed.
5. Use the up and down (▲▼) arrows to highlight the value for START LIMIT. Press Enter. A numeric entry window appears.
6. Key in a value (maximum is 1000 milliseconds) and press Enter. You are returned to the Press Control Parameter menu showing the value you entered.
7. Press Back twice to return to the Main Initialization Menu.

TOOL INFORMATION

(INITIALIZATION – TOOL INFORMATION)

The TOOL INFORMATION item on the Main Initialization Menu allows you to set up a name, unit of measurement, and number of decimal places for up to six items you wish to document for each tool. You enter specific values and up to thirty characters of special information for each tool in Program and Run modes.

NOTICE

Tool Information screens only maintain information about the tool. They do not control any aspect of press operation.

NOTICE

This feature is not available if you have the optional PLC interface installed. You can add a note in the Tool Notes at the bottom of the Tool Data Summary screen in Program mode. See *Adding a Note to the Tool Data Summary*, page 140.

SECURITY ACCESS

(INITIALIZATION – SECURITY ACCESS)

The SECURITY ACCESS item on the Main Initialization Menu allows you to control user access to SmartPAC PRO operating modes and settings. You set user access on the Security Access Menu, Figure 3-8.

For most items on the Security Access Menu, you can specify three types of access:

- **PROGRAM AND RUN MODES.** Allows users to change settings in both Program and Run modes. This access type is the least secure.
- **PROGRAM MODE ONLY.** Allows users to change settings only in Program mode (i.e., when the PROG/RUN keyswitch is in the PROG position). To prevent users from entering the Program mode, you should remove the PROG/RUN keyswitch with the switch in the RUN position.
- **PASSWORD REQUIRED.** Allows users to change settings only after they have entered a password. This access type is the most secure.

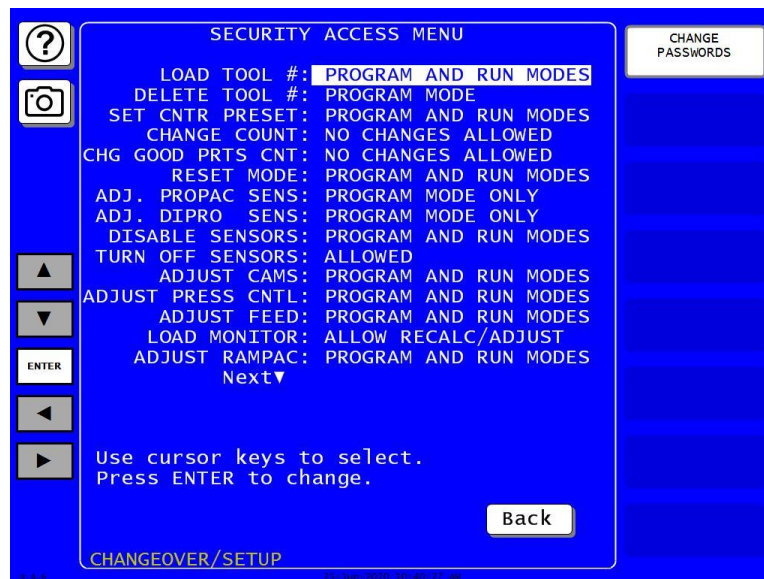


Figure 3-8. Security Access Menu

The following items on the Security Access Menu allow you to select other access options (see Table 3-1. Security Access Settings for a complete list of security access settings):

- CHANGE COUNTS and CHG GOOD PRTS CNT. These items allow you to specify NO CHANGES ALLOWED, which prevents changes to actual counter values for strokes, good parts, total hits, and batch counters (CHG COUNTS) or for good parts only (CHG GOOD PRTS CNT). This setting is applicable in either Program or Run mode.
- INIT. PASSWORD. This item allows you to require a password for user access to the Main Initialization Menu. To require a password, select MUST BE USED. Otherwise, select NOT REQUIRED.
- LOAD MONITOR. This item has four options: ALLOW RECALC/ADJUST, ALLOW RECALC ONLY, NO RECALC/ADJUST, and PASSWORD REQUIRED.
- CHG TOOL TEMPLATE. This item has two options: PASSWORD REQUIRED and PASSWORD NOT REQUIRED.

When you attempt to access a menu that is password-protected, SmartPAC PRO displays a window, Figure 3-9, that asks you to enter your password.

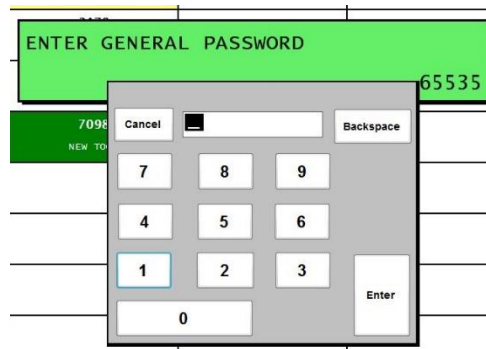


Figure 3-9. “Enter Your Password” Screen

NOTICE

IF YOU FORGET OR DO NOT KNOW YOUR PASSWORD(S)

Call Wintriss Tech. Support at the telephone number on the cover of this manual. Give the Tech. Support person the 5-digit number from the “Enter your password” display. In Figure 3-9, the number is “65535”.

Table 3-1. Security Access Settings

Optional modules included; your menu may be different

Security Access Menu Item	Security Access Settings
LOAD TOOL #	PROGRAM AND RUN MODES PROGRAM MODE ONLY PASSWORD REQUIRED
DELETE TOOL #	PROGRAM MODE NOT ALLOWED PASSWORD REQUIRED

Security Access Menu Item	Security Access Settings
SET CNTR PRESET	PROGRAM AND RUN MODES PROGRAM MODE ONLY PASSWORD REQUIRED
CHANGE COUNTS	PROGRAM AND RUN MODES PROGRAM MODE ONLY PASSWORD REQUIRED NO CHANGES ALLOWED
CHG GOOD PRTS CNT	PROGRAM AND RUN MODES PROGRAM MODE ONLY PASSWORD REQUIRED NO CHANGES ALLOWED
RESET MODE	PROGRAM AND RUN MODES PROGRAM MODE ONLY PASSWORD REQUIRED
CHG TOOL TEMPLATE	PASSWORD REQUIRED PASSWORD NOT REQUIRED
ADJ PROPAC SENS	PROGRAM AND RUN MODES PROGRAM MODE ONLY PASSWORD REQUIRED
ADJ DIPRO SENS	PROGRAM AND RUN MODES PROGRAM MODE ONLY PASSWORD REQUIRED
DISABLE SENSORS	PROGRAM AND RUN MODES PROGRAM MODE ONLY PASSWORD REQUIRED
TURN OFF SENSORS	ALLOWED NOT ALLOWED PASSWORD REQUIRED
ADJUST CAMS	PROGRAM AND RUN MODES PROGRAM MODE ONLY PASSWORD REQUIRED
LOAD MONITOR	ALLOW RECALC/ADJUST ALLOW RECALC ONLY NO RECALC/ADJUST PASSWORD REQUIRED
ADJUST RAMPAC	PROGRAM AND RUN MODES PROGRAM MODE ONLY PASSWORD REQUIRED
ADJ. TOOL INFO PROGRAM AND RUN MODES	PROGRAM MODE ONLY PASSWORD REQUIRED
INIT. PASSWORD	NOT REQUIRED MUST BE USED

Setting Security Access

NOTICE

DO NOT ENABLE INIT. PASSWORD UNTIL YOU HAVE CHECKED YOUR PASSWORDS

Field upgraded SmartPAC PROs may have different passwords than those listed in this manual. If you do not know the Initialization password and change the INIT. PASSWORD item to MUST BE USED, you will not be able to access the Main Initialization Menu.

NOTICE

BE CAREFUL WHEN SETTING RESET MODE SECURITY ACCESS

If you select the PROGRAM MODE ONLY or PASSWORD REQUIRED setting for the RESET MODE item, the operator will not be able to reset SmartPAC PRO in Run mode when the press stops as the result of a malfunction.

To make security access settings, do the following:

1. Select SECURITY ACCESS on the Main Initialization Menu to display the Security Access Menu, Figure 3-8. Note that the factory settings allow all actions to be performed in both Program and Run modes.
2. To change the security access of an item, select the item, then press ENTER one or more times until the type of access you want displays.
3. Press Exit to save your settings and return to the Main Initialization Menu.

Changing Passwords

SmartPAC PRO allows you to set up to four different passwords:

- General Password – Provides access to all SmartPAC PRO menus and settings unless one or more of the following specific passwords is also required
- Init. Password – Provides access to the Main Initialization Menu
- PM Password – Provides access to the PM (Preventive Maintenance) Monitor setup in Program mode (see Appendix A)
- Tool Template Password – Provides access to the Tool Template (see *Copying Tool Template to a New Tool*, page 137) Passwords must be numeric and can be from one to four digits in length.

NOTICE

DEFAULT PASSWORDS

Your SmartPAC PRO comes from the factory with all passwords set to the default password "1234." If you have upgraded your SmartPAC PRO in the field, your passwords may be different.

To change passwords, perform the following steps:

1. On the Security Access Menu, Figure 3-8, page 98 press CHANGE PASSWORDS to display the Set Passwords Menu, Figure 3-10.

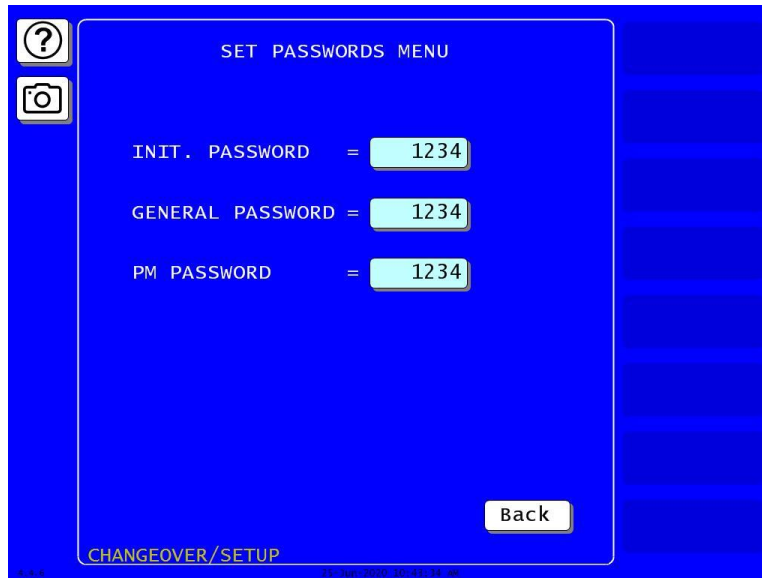


Figure 3-10. Set Passwords Menu

1. Select the password you want to change. The on-screen keyboard displays.
2. Key in the new password, following the instructions in the window, and press ENTER. You are returned to the Set Passwords Menu.

BACKUP/RESTORE

(INITIALIZATION – BACKUP/RESTORE)

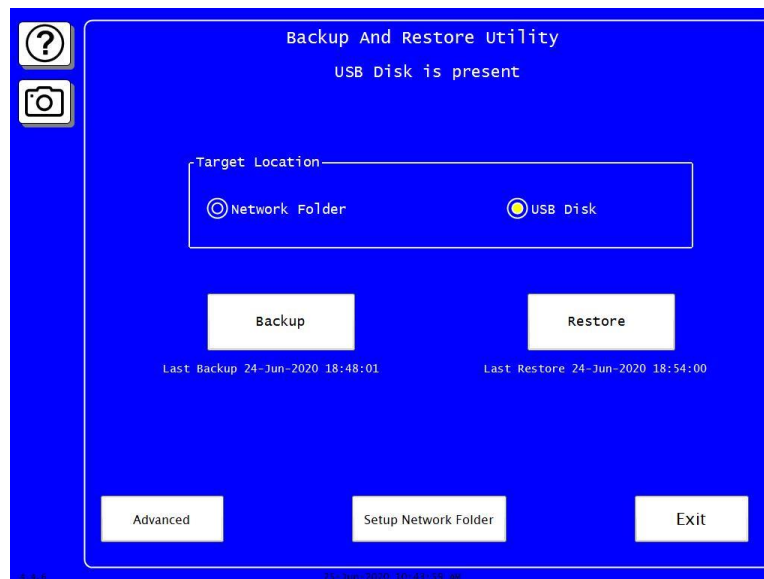


Figure 3-11. Backup and Restore Utility Screen

This feature enables you to back up and restore tools programmed on your SmartPAC PRO. Tools may be backed up to a network drive, or, if you have ordered the USB Backup/Restore option to a USB disk inserted in the SmartPAC PRO board.

This feature also backs up the SmartPAC PRO Initialization parameters.

Instructions for backing up tools to a network drive are provided on the Wintriss Web site (http://www.wintriss.com/wcg/automation/smartview/smartview_setup.html). Instructions for backing up tools to a USB disk are provided below.

Backing Up Tools to a USB Disk

The USB disk you use for backup must have at least 8 MB of free space in order to store all tools and Initialization parameters on a SmartPAC PRO.

1. Plug a USB disk with the necessary free space into USB connector on the SmartPAC PRO's front panel
2. Select the BACKUP/RESTORE item on the Main Initialization Menu. The Backup and Restore Utility screen appears, Figure 3-11. The date of the last backup (if one was performed) is displayed on the screen.
3. For Target Location, select USB Disk.
4. Press Backup and follow the instructions on the screen.

Backing Up Tools to a Network Folder

1. Set up a folder for backup/restore over your network according to Setting Up Network Folder for Backup and Restore, below.
2. On the Backup and Restore Utility screen, select Network Folder as the target location.
3. Press Backup. The tool information is backed up to the network folder you set up.

Setting Up Network Folder for Backup and Restore

(INITIALIZATION – BACKUP/RESTORE – SETUP NETWORK FOLDER)

The screenshot shows a 'Backup/Restore Setup' window with a blue background. On the left side, there are two icons: a question mark and a camera. The main area contains the following fields and controls:

- Server IP Address: 192.168.100.10
- Domain: wintriss
- User Name: support
- Password: ***** (with a Show Chars checkbox to its right)
- Shared Folder Path: Data\Manufacturing\wintrissMfg\TestToolBackup
- Below the Shared Folder Path field is a 'Browse' button.
- Below the 'Browse' button is an 'Apply Changes' button.
- In the bottom right corner is an 'Exit' button.

Figure 3-12. Backup/Restore Setup Network Folder Screen

1. In the Backup/Restore Utility screen, Figure 3-11, press Setup Network Folder. The Backup/Restore Setup screen appears, Figure 3-12.
2. Enter the information specified on the screen. Contact your IT staff if needed.
3. Press Apply Changes.
4. Press Exit to return to the Backup and Restore Utility screen.

Restoring Tools from a USB Disk

NOTICE

You should need to perform a restore only if the SmartPAC PRO tool and Initialization programming has been corrupted or if the SmartPAC PRO board has been replaced. The restore process overwrites programming for all your tools and Initialization settings with the tool and Initialization settings saved during the most recent backup. In performing a restore, you may lose information that has taken you considerable time to input.

NOTICE

The files on the USB disk are serialized and they must match the serial number on the SmartPAC PRO.

To restore backed-up tools to a SmartPAC PRO, do the following:

1. Insert the USB disk containing the tools backup into the USB connector.
2. Select the BACKUP/RESTORE item on the Main Initialization Menu. The Backup and Restore Utility screen appears. The date of the last backup (if one was performed) is displayed on the screen.
3. Press Restore. When the operation is done, “Restore Completed” appears below the screen title.
4. Press Exit to return to the Main Initialization Menu.

Restoring Tools from a Network Folder

NOTICE

You should need to perform a restore only if the SmartPAC PRO tool and Initialization programming has been corrupted or if the SmartPAC PRO board has been replaced. The restore process overwrites programming for all your tools and Initialization settings with the tool and Initialization settings saved during the most recent backup. In performing a restore, you may lose information that has taken you considerable time to input.

NOTICE

The files on the USB disk are serialized and they must match the serial number on the SmartPAC PRO.

If you backed up tools to a network folder (see *Backing Up Tools to a Network Folder*, page 103) do the following to restore them to SmartPAC PRO:

1. On the Backup and Restore Utility screen, select Network Folder as the target location.

2. Press Restore. The tool information is restored to the SmartPAC PRO from the network folder. “Restore Completed” appears below the screen title.
3. Press Exit to return to the Main Initialization Menu.

Backup and Restore, Advanced

(INITIALIZATION – BACKUP/RESTORE – ADVANCED)

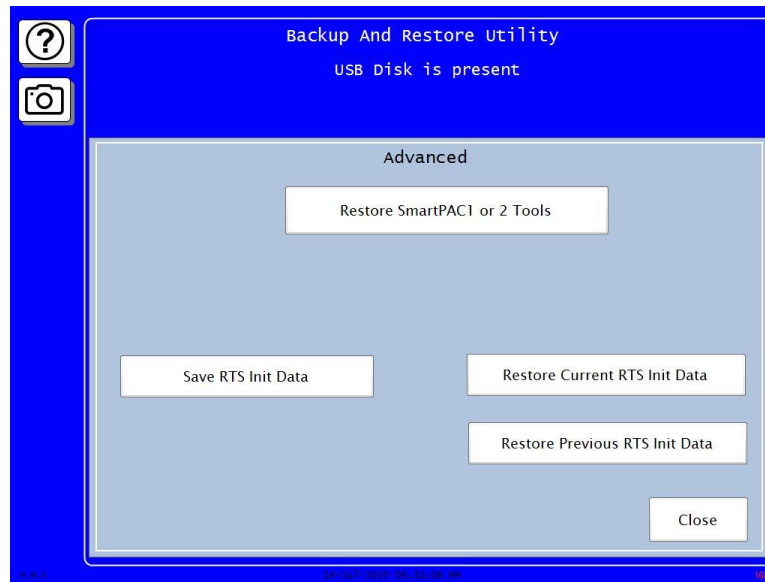


Figure 3-13. Backup and Restore Utility Advanced Screen

On the Backup and Restore Utility screen, Figure 3-11, press Advanced.

From this screen you can perform the operations listed in Table 3-2

Table 3-2. Advanced Backup/Restore Operations

Operation	To perform the operation, press this button
Restore tools information from original SmartPAC (SmartPAC 1) or SmartPAC 2. Used when you replace an older version SmartPAC with SmartPAC PRO	Restore SmartPAC1 or 2 Tools
Back up (save) RTS initialization data	Save RTS Init Data
Restore the current RTS initialization data	Restore Current RTS Init Data
Restore the previous RTS data.	Restore Previous RTS Init Data

SETUP DATA COMMS/SFC (Optional)

(INITIALIZATION – SETUP DATA COMMS/SFC)

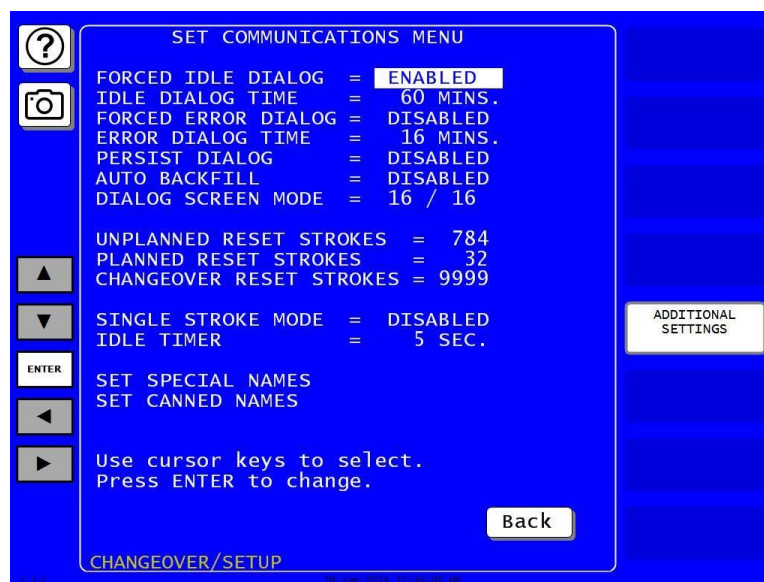


Figure 3-14. Set Communications Menu, Showing Default Values.

The SETUP DATA COMMS menu appears on the Main Initialization Menu only when firmware for the ShopFloorConnect or the 3rd party Communications option is installed. It allows you to set the parameters for ShopFloorConnect data communications. The instructions for using this menu are included in the ShopFloorConnect and 3rd Party Communication Firmware documentation.

To access the menu, in the main initialization menu, press SETUP DATA COMMS/SFC. The Set Communications Menu screen appears.

Press the up and down (▲▼) arrows to highlight the desired setting. Make the setting as described in Table 3-3.

Table 3-3. Communications Settings

Dialog item	Making the setting
FORCED IDLE DIALOG	Press Enter. Press Enter to toggle between ENABLED and DISABLED.
IDLE DIALOG TIME	Key in the value on the onscreen keypad. Press Enter.
FORCED ERROR DIALOG	Press Enter. Press Enter to toggle between ENABLED and DISABLED.
ERROR DIALOG TIME	Key in the value on the onscreen keypad. Press Enter.
PERSIST DIALOG	Press Enter. Press Enter to toggle between ENABLED and DISABLED.
AUTO BACKFILL	Press Enter. Press Enter to toggle between ENABLED and DISABLED.

Dialog item	Making the setting
DIALOG SCREEN MODE	<p>Press Enter to toggle between 32 CUSTOM and 16/16. Indicates whether downtime reasons are created on the screens accessible from the SET SPECIAL NAMES and SET CANNED NAMES menu items (see below) or in ShopFloorConnect Administrator.</p> <p>There are two settings:</p> <p style="padding-left: 40px;">16 /16: Downtime reasons are created in SmartPAC</p> <p style="padding-left: 40px;">32 CUSTOM: Downtime reasons are created in SFC</p> <p>When the “16 / 16” setting is selected, you can create only 16 custom downtime reasons, and only those reasons, plus the canned names, can be included in the Downtime by Reason Report.</p> <p>The “32 CUSTOM” setting enables you to create up to 32 custom reasons, all of which can appear in the Downtime by Reason Report. When the “32 CUSTOM” setting is selected, the SET SPECIAL NAMES and SET CANNED NAMES items do not display</p>
UNPLANNED RESET STROKES	Key in the value on the onscreen keypad. Press Enter.
PLANNED RESET STROKES	Key in the value on the onscreen keypad. Press Enter.
CHANGEOVER RESET STROKES	Key in the value on the onscreen keypad. Press Enter.
SINGLE STROKE MODE	Press Enter to toggle between ENABLED and DISABLED.
IDLE TIMER	Key in the value on the onscreen keypad. Press Enter.
SET SPECIAL NAMES (visible when Dialog Screen Mode is 16/16)	<p>Press the (▲▼◀▶) arrows to highlight the desired special name or sequence number (see Figure 3-16). Press ENTER. Key in the name or sequence number. Press Enter.</p> <p>Note: To clear all the names and values, press CLEAR ALL. Press Back when done.</p>
SET CANNED NAMES (visible when Dialog Screen Mode is 16/16)	<p>Press the up and down (▲▼) arrows to highlight the sequence value next to the desired special name. Press Enter. Key in the name or sequence. Press Enter.</p> <p>Note: To clear all the names and values, press CLEAR ALL. Press Back when done.</p>

Entering Special Names and Sequence Numbers

(INITIALIZATION – SETUP DATA COMMS/SFC – SET SPECIAL NAMES)

NOTICE

In Dialog Screen Mode, press Enter to toggle between 32 CUSTOM and 16/16. The 16/16 setting allows you to set 16 custom names with sequence numbers and to set the sequence number for the 16 canned names.

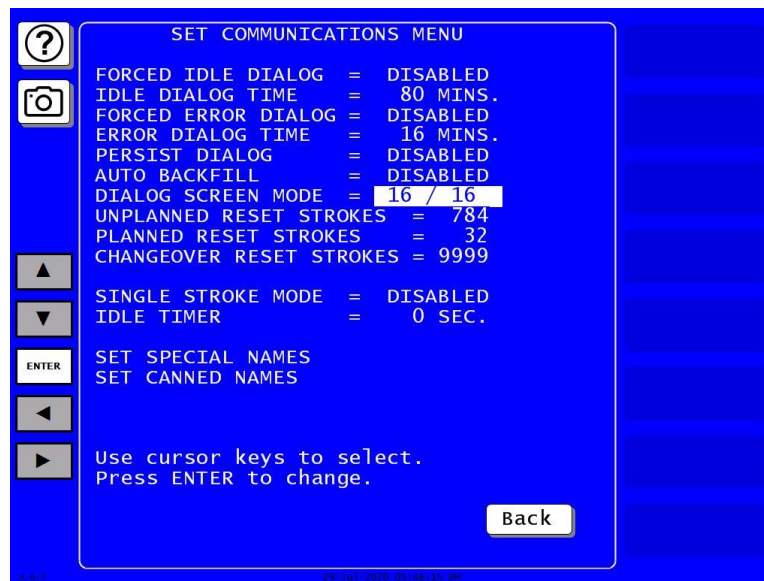


Figure 3-15. Set Communications Menu, Dialog Screen Mode 16/16

On the Set Communications Menu screen, set DIALOG SCREEN MODE to 16/16.

1. Press the (▲▼) arrows to select SET SPECIAL NAMES.
2. Press ENTER. The Dialog Special Name Choice Menu screen appears.
3. Press the (▲▼) arrows to select a special name (1–16).
4. Press the (◀▶) arrows to highlight the name or sequence number.
5. Press ENTER. Key in the name or sequence number on the onscreen keyboard.
6. Press Enter.
7. When finished entering special names and sequence numbers, press Back to return to the Set Communications menu.



Figure 3-16. Dialog Special Name Choice Menu

Entering Sequence Numbers for Canned Names

(INITIALIZATION – SETUP DATA COMMS/SFC – SET CANNED NAMES)

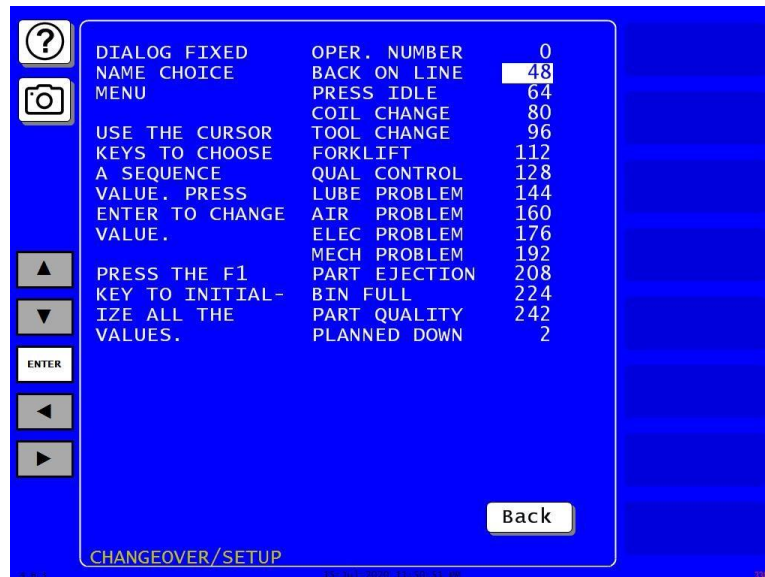


Figure 3-17. Dialog Fixed Name Choice Menu

You can enter numbers to indicate the order in which the canned (predetermined) names show up on the dialog menu.

1. Press the (▲▼) arrows to select SET CANNED NAMES.
2. Press ENTER. The Dialog Fixed Name Choice Menu screen appears.
3. Press the (▲▼) arrows to highlight the number next to a canned name on the list.
4. Press ENTER. Key in the desired sequence number on the onscreen keyboard.

5. Press Enter.
6. When finished entering canned name sequence numbers, press Back to return to the Set Communications menu.

Additional Settings, SFC (Optional)

(INITIALIZATION – SETUP DATA COMMS/SFC – ADDITIONAL SETTINGS)

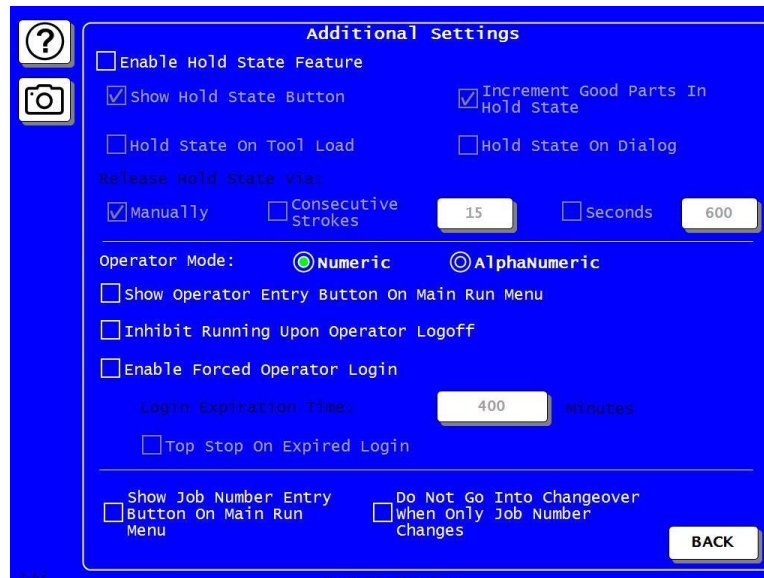


Figure 3-18. Additional Settings Screen

On the SETUP DATA COMMS/SFC (Optional) screen, Figure 3-14, press ADDITIONAL SETTINGS.


Make the setting as described in Table 3-4. When done making settings, press BACK. The settings are saved and the screen returns to the Set Communications Menu, Figure 3-14.

NOTICE

These settings are optional but provide expanded functionality beyond the original settings.

Table 3-4. SFC Additional Settings

Dialog item	Making the setting
<input type="checkbox"/> Enable Hold State Feature	<p>If unchecked, all Hold State Features are disabled and have no effect.</p> <p>If checked, the lower check boxes become available for selection.</p> <p>Note: If only the Enable Hold State Feature is checked and none of the lower check boxes are checked, the default is Show Hold State Button and Release Manually</p>

Dialog item	Making the setting						
<input type="checkbox"/> Show Hold State Button	<p>If checked, a button related to the Hold State feature appears on the lower left side of the Run mode screens.</p> <p>This button has a lock icon on it that shows the status of the state held or to manually hold/release a state.</p> <p>The color of the button indicates the state of the machine</p> <table border="0"> <tr> <td>Green: Running</td> <td>Blue: Idle</td> </tr> <tr> <td>Red: Unplanned downtime</td> <td>Yellow: Changeover</td> </tr> <tr> <td>Purple: Planned downtime</td> <td></td> </tr> </table> <p>For information about machine states, see https://wintriss.com/sfc/oeo-monitoring-system.html</p> 	Green: Running	Blue: Idle	Red: Unplanned downtime	Yellow: Changeover	Purple: Planned downtime	
Green: Running	Blue: Idle						
Red: Unplanned downtime	Yellow: Changeover						
Purple: Planned downtime							
<input type="checkbox"/> Increment Good Parts In Hold State	<p>If checked, the Good Parts count increments while the state is held.</p> <p>Whether this is checked or not, the stroke count increases whether the state is held or not.</p>						
<input type="checkbox"/> Hold State On Tool Load	<p>If checked, the state (changeover) is automatically held after a Tool is loaded.</p>						
<input type="checkbox"/> Hold State On Dialog	<p>If checked, the Dialog item selected is automatically held.</p>						
<p>Release Hold State Via:</p>	<p><input type="checkbox"/> <u>Manually</u> If checked, press the hold state button to release the current state.</p> <p><input type="checkbox"/> <u>Consecutive Strokes</u> If checked, once the number of strokes (shown in entry box) are achieved (without any control faults) then the state is released and automatically goes into the run state. Touch the entry box and enter the number of strokes. Range: 1-10,000.</p> <p><input type="checkbox"/> <u>Seconds</u> If checked, once the number of seconds (shown in entry box) elapse the state is released and automatically goes into the run state. Touch the entry box and enter the number of seconds. Range: 1-90,000</p>						
<p>Operator Mode</p>	<p>Touch button to choose operator identifier mode:</p> <p><input type="radio"/> <u>Numeric</u>: 0 to 9,999,999</p> <p><input type="radio"/> <u>AlphaNumeric</u>: up to 20 characters (numbers and/or letters)</p>						
<input type="checkbox"/> Show Operator Entry Button on Main Run Menu	<p>If checked, a function button appears on right side of the main run menu, Figure 3-19, that enables you to change the operator identifier without navigating to the Dialog Menu.</p>						

Dialog item	Making the setting
<input type="checkbox"/> Inhibit Running Upon Operator Logoff	If checked, the SmartPAC's top stop relay opens when an operator logs off (enters zero) and remains open until a valid operator identifier is entered.
<input type="checkbox"/> Enable Forced Operator Login	If checked, the operator will be forced to login again after the set expiration time (below) has elapsed. <u>Login Expiration Time</u> Length of time in minutes after which the operator login expires and the operator is forced to login again. Touch the entry box and enter the time. The allowable range is 1 to 1500 minutes.
<input type="checkbox"/> Top Stop on Expired Login	If checked, SmartPAC initiates a top stop when the operator login expires
<input type="checkbox"/> Show Job Entry Button On Main Run Menu	If checked, a function button appears on the right side of the main Run menu, Figure 3-19, that enables you to change just the job number, without navigating to the Load New Tool screen.
<input type="checkbox"/> Do Not Go Into Changeover When Only Job Number Changes	If checked, the state does not go into changeover as it normally does when the job number changes.

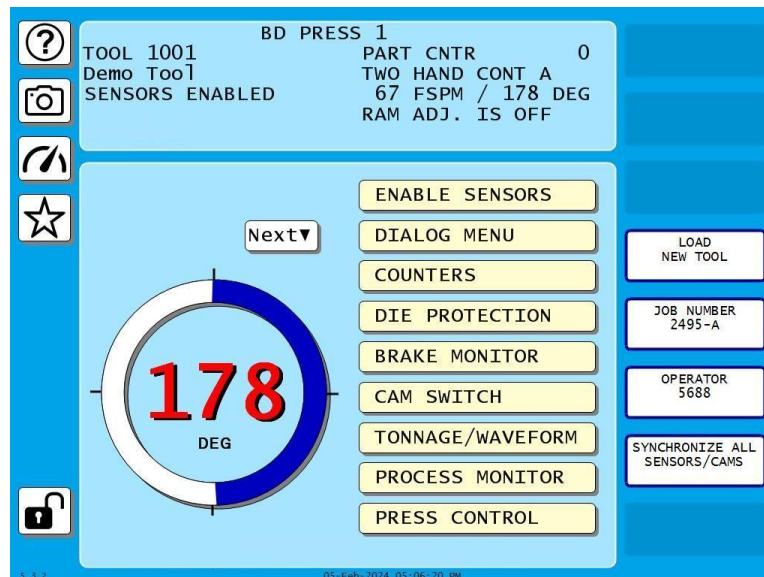


Figure 3-19. Run Screen Showing Job Number and Operator Function Buttons

SETUP NETWORK

(INITIALIZATION – SETUP NETWORK)

NOTICE

Your network administrator must connect SmartPAC PRO to your network before you can use e-mail messaging or SmartView remote viewing utility. For e-mail, your network must have a valid SMTP mail server.

If your network requires static IP addresses, your network administrator should call Wintriss Tech. Support.

The SETUP NETWORK item on the Main Initialization Menu allows you to set up SmartPAC PRO's E-mail and SmartView functions and to make other settings necessary to configure a SmartPAC PRO network. You make these settings on the Network Setup Utility screen, Figure 3-20.

NETWORK SETUP UTILITY

ENABLE EMAIL

ENABLE SMARTVIEW

SETUP EMAIL INFO CENTER

GAP FRAME (PRESS TYPE) REMOTE ADMIN SETTINGS

Local Area Connection Disconnected

NETWORK NAME	SPRO-18216456	
TCP/IP ADDRESS	169.254.54.165	(DHCP) CHANGE
MAC ADDRESS	00-13-95-27-7C-0A	

Network Settings 2 Not Installed

TCP/IP ADDRESS	000.000.000.000	(TYPE)
MAC ADDRESS	00.00.00.00.00.00	

Back

Figure 3-20. Network Setup Utility

SETUP EMAIL

(INITIALIZATION – SETUP NETWORK – SETUP EMAIL)

Figure 3-21. Messaging Setup

SmartPAC PRO's E-mail function allows you to send e-mails to individuals in your SmartPAC PRO network and to other recipients, such as Wintriss Tech. Support, via the Internet. If you plan to use E-mail, follow the instructions below. If you need information about your network, contact your IT department.

1. Press SETUP NETWORK on the Main Initialization Menu. The Network Setup Utility screen appears.
2. Press the checkbox next to ENABLE EMAIL so it is check-marked.
3. Press SETUP EMAIL. The Messaging Setup screen appears.
4. Press each entry box and key in the information using the onscreen keyboard.
 - For secure login with user name and password, check the box next to Secure Login.
 - For the additional security of SSL (secure sockets layer), check the box next to Use SSL.
5. When done, press Apply Changes.

Set up your e-mail recipient list and predefined message list as described in the following sections.

Setting up the Recipient List

(INITIALIZATION – SETUP NETWORK – SETUP EMAIL – RECIPIENT LIST)

NOTICE

Be sure to press Save after you add names and e-mail addresses to the list.

1. In the Messaging Setup screen (see previous section), press Recipient List. The Recipients screen appears, Figure 3-22.
2. Press the entry box under Name.
3. Key in the name on the onscreen keyboard. Press Done.
4. Press the entry box under Address.
5. Key in the e-mail address on the onscreen keyboard. Press Done.
6. Press Add. The name and e-mail address are added to the recipients list.
7. When you are done entering names and e-mail addresses, press Save.
8. Press Exit to return to the Main Initialization Menu.

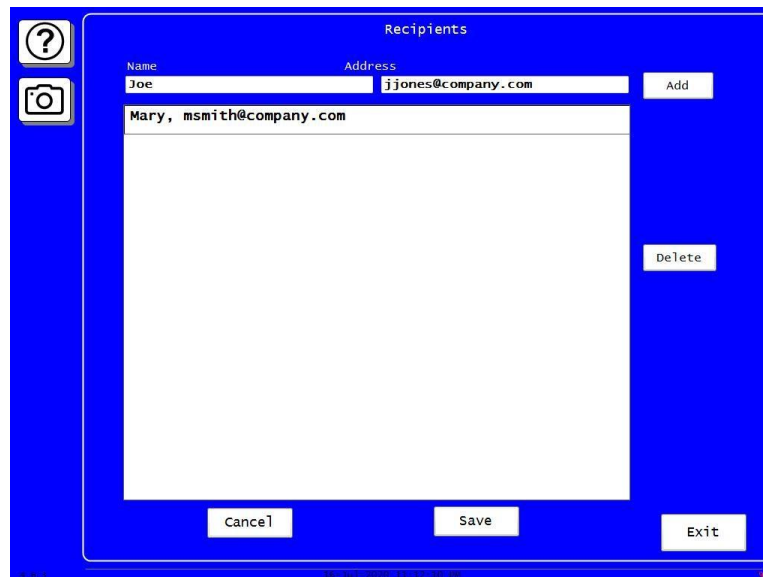


Figure 3-22. E-mail Recipients

Entering Predefined Messages

NOTICE

Be sure to press Save when you finish adding predefined messages to the list.

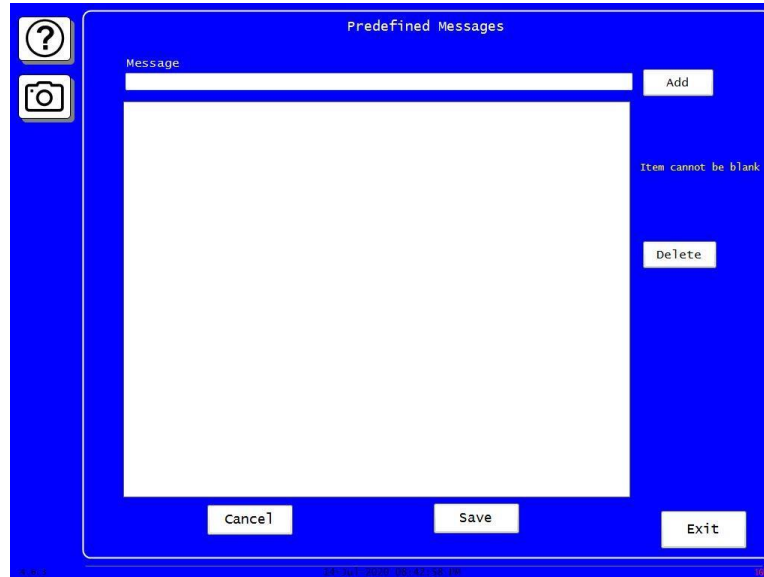


Figure 3-23. Predefined Messages Screen

1. In the Messaging Setup screen (see *SETUP EMAIL*, page 114), press Message List. The Predefined Messages screen appears, Figure 3-23.
2. Press the entry box under Message.
3. Key in the message on the onscreen keyboard. Then, press Done.
4. Press Add. The message is added to the recipients list.
5. When you are done entering names and e-mail addresses, press Save.
6. Press Exit to return to the Main Initialization Menu.

INFO CENTER

(INITIALIZATION – SETUP NETWORK – INFO CENTER)

NOTICE

If you need information about the INFO CENTER items, contact your IT department.

The screenshot shows the 'Info Center Setup' window. It features a blue background with a white border. On the left side, there are two icons: a question mark and a camera. The main area contains the following fields and controls:

- Server IP Address:** 192.168.100.10
- Domain:** wintriss
- User Name:** Support
- Password:** *****
- Show Chars:**
- Shared Folder Path:** data\Manufacturing\WintrissMfg\TestInfoCenter
- Buttons:** Browse, Apply Changes, Exit

Figure 3-24. Info Center Setup Screen

Set up SmartPAC PRO to use the Info Center as follows:

1. Press SETUP NETWORK on the Main Initialization Menu. The Network Setup Utility screen appears.
2. Press INFO CENTER. The Info Center screen appears.
3. Fill in the items on this screen. Press each entry box and key in the information on the onscreen keyboard. Press Done.
4. When finished, press Apply Changes. Press Exit to return to the Network Setup Utility screen.

SMARTVIEW FUNCTION

(INITIALIZATION – SETUP NETWORK – ENABLE SMARTVIEW)

SmartPAC PRO's SmartView function enables individuals on your network to remotely view the status of each press. If you plan to use SmartView, do the following to enable this function:

1. Press the box next to ENABLE SMARTVIEW so it is checkmarked.
2. Press Back to return to the Main Initialization Menu.

If you don't plan to use SmartView, leave the ENABLE SMARTVIEW box unchecked.

PRESS TYPE

(INITIALIZATION – SETUP NETWORK – Select STRAIGHT SIDE or GAP FRAME)

Your entry for the PRESS TYPE item is used by the SmartView remote viewing to select the graphic it uses to illustrate the type of press (i.e., straight side or gap frame) on which SmartPAC PRO is installed. This graphic appears in the press information summary on the SmartView Main Page.

To set the press type, do the following:

1. Press the button next to PRESS TYPE to toggle between STRAIGHT SIDE and GAP FRAME.
2. When finished on this screen, press Back to return to the Main Initialization Menu.

REMOTE ADMIN SETTINGS

(INITIALIZATION – SETUP NETWORK – REMOTE ADMIN SETTINGS)

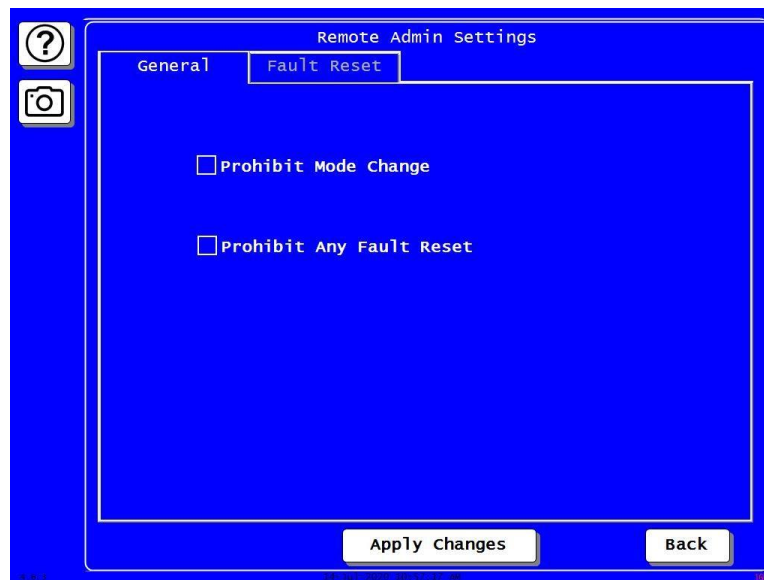


Figure 3-25. Remote Admin Settings Screen

1. In the Network Setup Utility screen, press REMOTE ADMIN SETTINGS. The Remote Admin Settings screen appears.
2. Press General to access the General tab.
3. Press to check or uncheck the boxes next to one or both of the following:
 - Prohibit Mode Change
 - Prohibit Any Fault Reset (see next section)
4. Press Back to return to the Network Setup Utility screen.

Making Remote Admin Fault Reset Settings

(INITIALIZATION – SETUP NETWORK – REMOTE ADMIN SETTINGS – FAULT RESET)

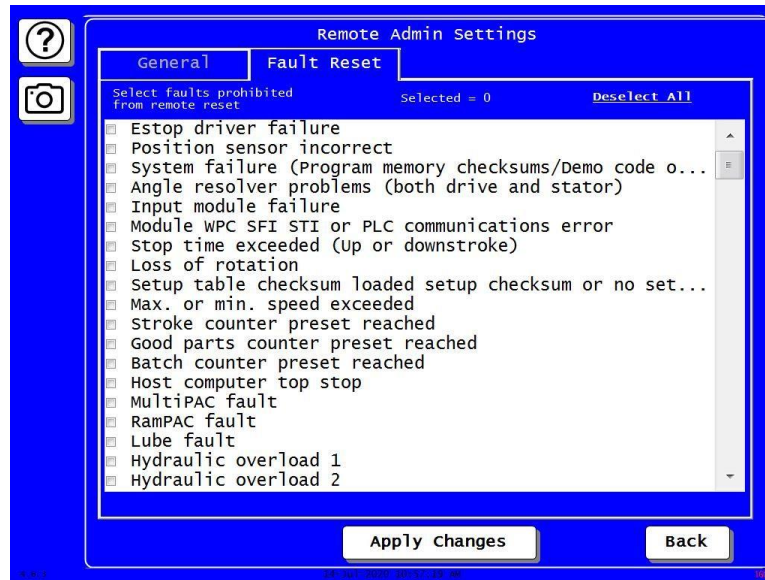


Figure 3-26. Fault List for Prohibiting Fault Reset

If you leave the box unchecked next to Prohibit Any Fault Reset (see previous section), you can select faults to prohibit from remote reset.

1. In the Remote Admin Settings screen, press the Fault Reset tab. A list of faults appears, with a checkbox next to each.
2. Press to check the boxes of the faults to prohibit from remote reset. To see additional faults, scroll down using the scroll bar at the right of the list.
3. When finished, press Apply Changes.
4. Press Back to return to the Network Setup Utility screen.

CHANGE NETWORK SETTINGS

(INITIALIZATION – SETUP NETWORK - CHANGE)

Figure 3-27. Change Network Settings: Local Area Connection

This item is for use by your Information Technology or Information Systems person. Call Wintriss Tech. Support for assistance in making advanced network settings.

In the Network Setup Utility screen press CHANGE. The Network Settings Local Area Connection screen appears.

Network Setting	Comment
Connection Status	Indicates whether SmartPAC PRO is connected to the network.
Address Type	Press in the entry box to toggle between DHCP and Static.
IP Address	Press in the entry box and key in the IP address. Press Enter when done.
Subnet Mask	Press in the entry box and key in the subnet mask. Press Enter when done.
Default Gateway	Press in the entry box and key in the default gateway. Press Enter when done.

When finished entering changes on this screen, press Apply Changes. A message appears: “Please wait, Rebooting...” SmartPAC PRO restarts.

DIAGNOSTICS

(INITIALIZATION – DIAGNOSTICS)

The DIAGNOSTICS item on the Main Initialization Menu gives you access to the Diagnostics Menu, Figure 3-28, which you use primarily when you are working with Wintriss Tech. Support for initial setup or troubleshooting.

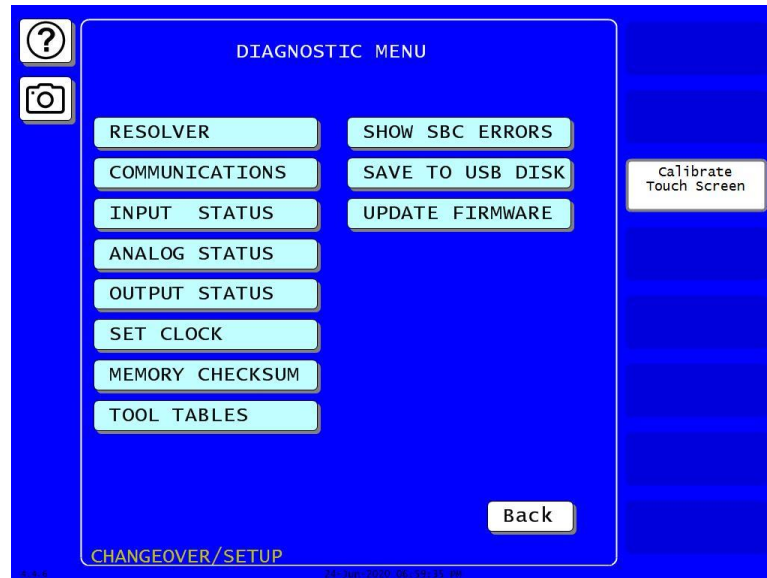


Figure 3-28. Diagnostics Menu

This section documents only the following items:

- COMMUNICATIONS, which allows you to run a communications loopback test
- SET CLOCK, which allows you to set SmartPAC PRO's internal clock to local time
- SAVE TO USB DISK, which allows you to save screen captures and other items to a USB disk
- UPDATE FIRMWARE, which allows you to upload revised firmware to SmartPAC PRO

COMMUNICATIONS

(INITIALIZATION – DIAGNOSTICS – COMMUNICATIONS)

When you select COMMUNICATIONS from the Diagnostics Menu, the Communications Data Viewer screen, shown in Figure 4-20, displays.

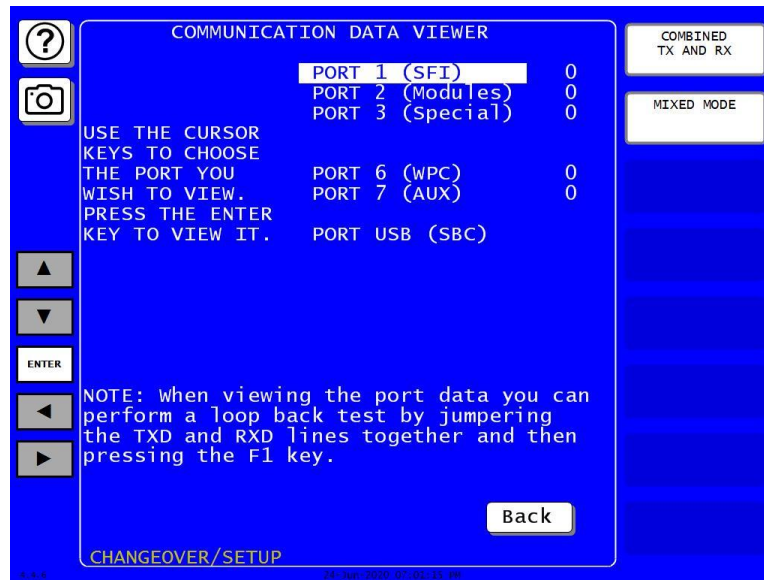


Figure 4-20. Communications Data Viewer Screen

This screen allows you to verify communications between SmartPAC PRO and its installed modules, including SFI and WPC.

Press the button at upper right to toggle between COMBINED TX AND RX and SPLIT TX AND RX. Press the button below to toggle between MIXED MODE and HEX MODE.

In the combined view, Transmit and Receive data are shown together, Transmit data displayed as blue on a white background and Receive data displayed as white on blue. This view shows the data as it is transmitted and received in real time. Press RESET BUFFER to view the data starting at the beginning of the buffer.

In the split view, Transmit data is shown in the upper half of the screen, Receive data in the lower half. In this view, the data is always shown starting at the beginning of the buffer.

Normal communications between SmartPAC PRO and the selected module (e.g., SFI) is indicated by both Transmit and Receive data being displayed on the screen. If no data or only partial data is displayed, SmartPAC PRO and the other module are not communicating properly.

If the Transmit and Receive Data screen indicates a communications problem, you can perform a “loopback test.” Contact Wintriss Technical Support for more information.

SET CLOCK

(INITIALIZATION – DIAGNOSTICS – SET CLOCK)

When you select the SET CLOCK item on the Diagnostics Menu, the Set the Clock screen displays, Figure 4-20).

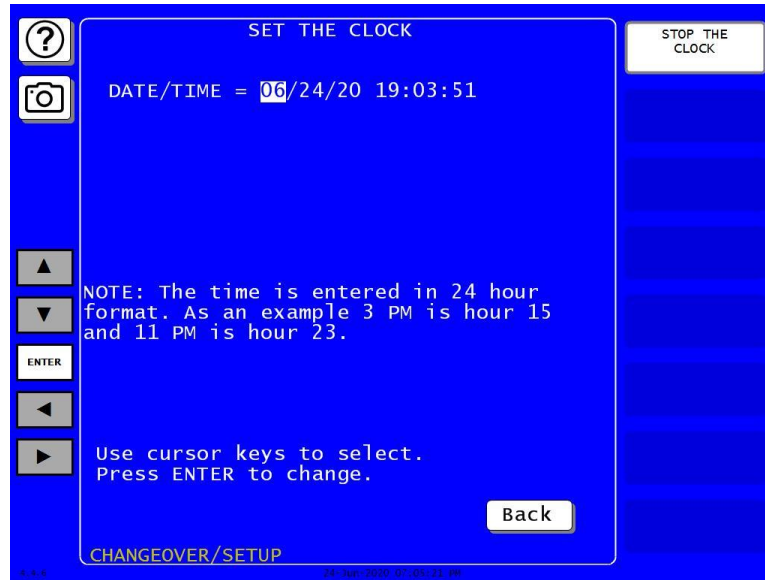


Figure 4-20. Set the Clock Screen

On this screen you can set the date in month/day/year (mm/dd/yy) format and the time in military hours/minutes (hh:mm) format (i.e., 1:30 p.m. = 13:30, 11:00 p.m. = 23:00). To do so, perform these steps:

1. Press the arrows (◀▶) to highlight the segment of the date or time that you want to change; then press ENTER. The On-screen keyboard displays.
2. Key in a value and press ENTER. You are returned to the Set the Clock screen showing the date or time segment you selected in step 1.
3. Repeat steps 1 and 2 for other date/time segments.

NOTICE

To stop the clock, press STOP THE CLOCK. The label changes to START THE CLOCK. To restart the clock, press START THE CLOCK.

4. Press Back when you are done to return to the Diagnostics Menu.

SAVE TO USB DISK

(INITIALIZATION – DIAGNOSTICS – SAVE TO USB DISK)

This item enables you to save the error/event log, screen captures, and other data maintained in a special SmartPAC PRO buffer to a USB disk. Once the data has been saved, you can remove the USB disk, transfer the information to a computer, and e-mail it to Wintriss Tech. Support or to another recipient. This function is useful if your SmartPAC PRO is not networked. To save information to a USB disk, do the following:

1. Make sure a USB disk is installed in the USB connector on the SmartPAC PRO 's front panel.
2. Access the Main Initialization Menu, select DIAGNOSTICS, and when the Diagnostics Menu displays, select SAVE TO USB DISK. The following messages appear in succession:

PLEASE WAIT WHILE THE DATA IS BEING TRANSFERRED TO THE USB DISK. THIS MAY TAKE UP TO ONE MINUTE TO COMPLETE . . .

THE USB DISK TRANSFER HAS FINISHED AND WAS SUCCESSFUL. The USB disk device can now be removed.

3. When the second message appears, press OK to return to the Diagnostics Menu. You can then remove the USB disk.

UPDATE FIRMWARE

(INITIALIZATION – DIAGNOSTICS – UPDATE FIRMWARE)

To update the firmware in your SmartPAC PRO, contact Wintriss Tech. Support and refer to *Appendix B*, page 265.

System Init

(INITIALIZATION – SYSTEM INIT)

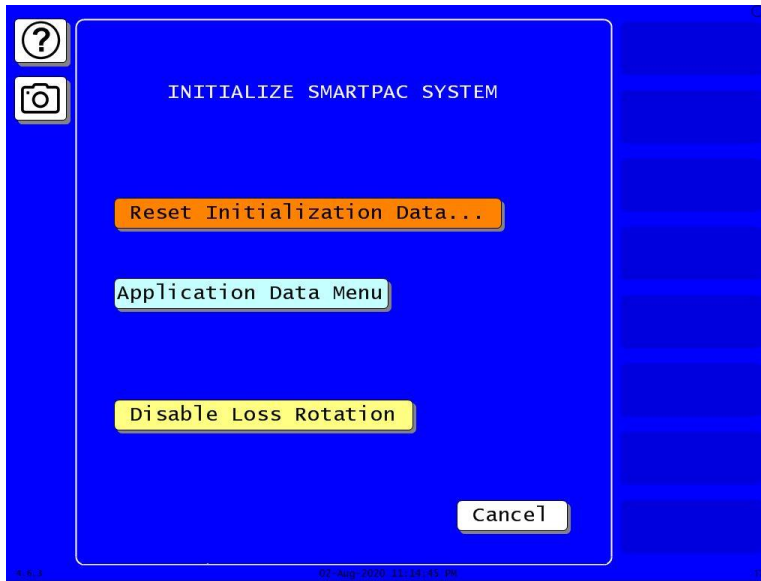


Figure 3-29. Initialize SmartPAC System Screen

Follow the instructions in the sections below for

- *Reset Initialization Data*, next section, to clear initialization data from SmartPAC PRO and modules.
- *Application Data Menu*, page 127, to delete tools, dashboards, favorites and/or screen captures
- *Disable Loss Rotation*, page 129

Reset Initialization Data. . .

(INITIALIZATION – SYSTEM INIT – RESET INITIALIZATION DATA – Select Modules to Initialize [to clear data])

To clear initialization data from SmartPAC PRO, follow these steps.

1. In the Initialization screen, press SYSTEM INIT. The Initialize SmartPAC System screen appears, Figure 3-29.
2. Press RESET INITIALIZATION DATA...; the Modules Available to Initialize window opens.
3. In this window are buttons for modules you may want to clear initialization data from. Buttons are labeled “[Module Name] excluded.”

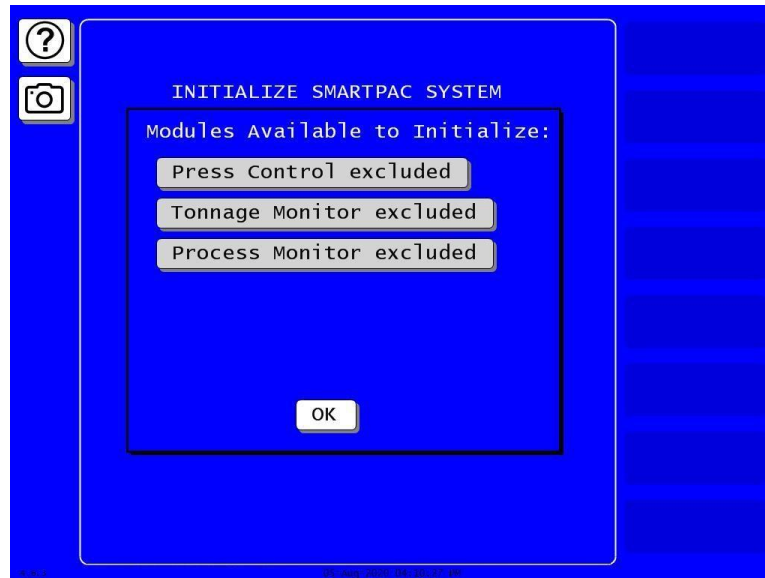


Figure 3-30. Modules Available to Initialize

4. For each module you want to clear data for, press its button. A warning box appears.
 - If you are sure you want to clear this module's data, press OK. The module button turns orange and is labeled "[Module Name] included," Figure 3-31. This means the module's data *will* be cleared.
 - If you do not want to clear this module's data, press Cancel.

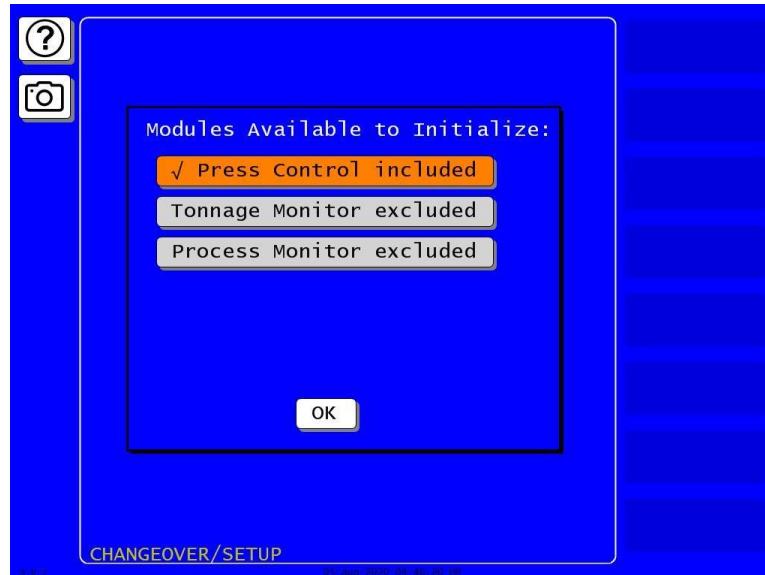


Figure 3-31. Modules, Press Control Selected

5. After you have selected the modules you want cleared in addition to SmartPAC initialization data, press OK. A warning window appears, Figure 3-32.
6. Press OK to clear the initialization data. To exit without clearing the data, press Cancel and the screen returns to the Main Initialization Menu.



Figure 3-32. Reset Initialization Warning

Application Data Menu

(INITIALIZATION – SYSTEM INIT – APPLICATION DATA MENU – TOOLS TAB)

Deleting Tools

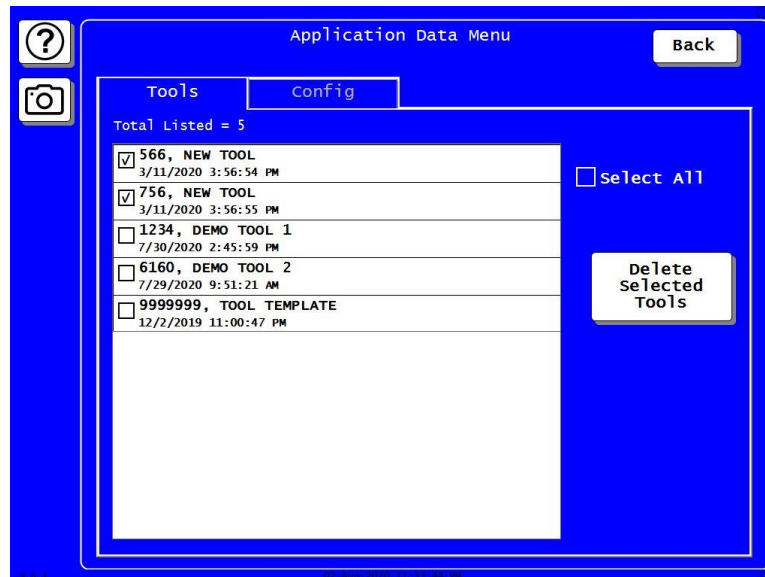


Figure 3-33. Application Data Menu, Tools

To delete one or more tools, you can use the Application Data Menu:

1. In the Initialize SmartPAC System screen, Figure 3-29, page 125, press Application Data Menu. The Application Data Menu screen appears, Figure 3-33.
2. Press the Tools Tab.
3. Press the box for each tool you want to delete, check-marking it. To select all the tools, press the box next to Select All.
4. Press Delete Selected Tools. A warning box appears, Figure 3-34.
 - If you want to delete the selected tools, press Yes.
 - If you do not want to delete the selected tools, press No.

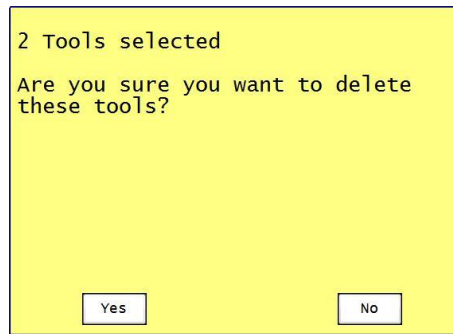


Figure 3-34. Tool Deletion Confirmation

5. Press Back to return to the Main Initialization Menu.

Delete All Dashboards, Favorites, or Screen Captures

(INITIALIZATION – SYSTEM INIT – APPLICATION DATA MENU – CONFIG TAB)

1. In the Initialize SmartPAC System screen, Figure 3-29, page 125, press Application Data Menu. The Application Data Menu screen appears, Figure 3-33.
2. Press the Config Tab, Figure 3-35

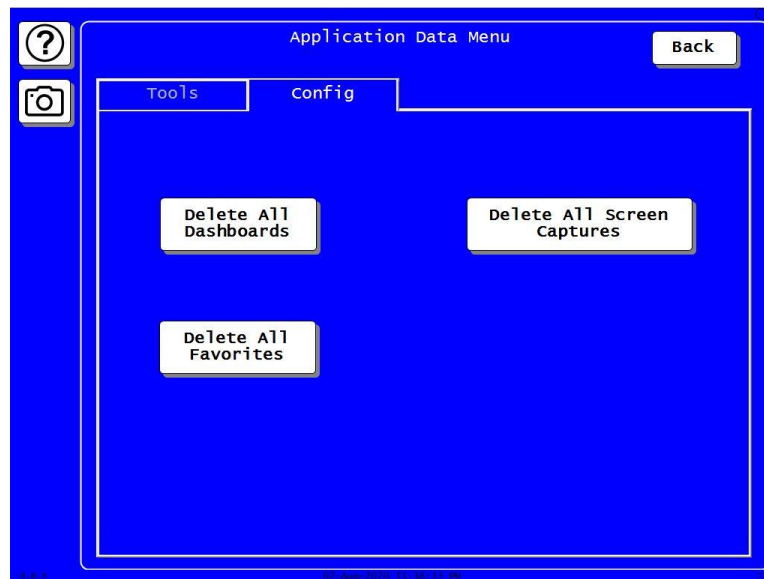


Figure 3-35. Application Data Menu, Configuration

3. To delete all dashboards, favorites or screen captures, press the appropriate button. A warning box appears.
 - If you want to delete the items, press Yes.
 - If you do not want to delete the items, press No.
4. Press Back to return to the Main Initialization Menu.

Disable Loss Rotation

(INITIALIZATION – SYSTEM INIT – DISABLE/ENABLE LOSS ROTATION)

Press Disable Loss Rotation to prevent loss-of-rotation errors.

Using SmartPAC PRO with a Link-motion Press

If your SmartPAC PRO is installed on a link-motion press, you need to determine whether to use NORMAL MOTION or LINK MOTION for your RESOLVER MOTION MODE setting (see page 91) and, if you are using a servofeed with a Wintriss ServoFeed Interface (SFI), how to compensate for the different upstroke and downstroke speeds on your link-motion press.

To determine the proper RESOLVER MOTION MODE setting to use, run the press in Continuous mode (if applicable) and observe the press speed.

- If press speed varies between the upstroke and downstroke, set RESOLVER MOTION MODE to LINK MOTION (refer to *Setting Link Motion*, below)
- If press speed does not vary during the stroke, leave RESOLVER MOTION MODE set to NORMAL MOTION and install and zero the resolver so that bottom dead center equals 180°. This setting will likely result in a top-dead-center reading of less than 360°, but this value is acceptable in these circumstances. Refer to Chapter 2 for instructions on installing and zeroing the resolver.

Setting Link Motion

If press speed in Continuous mode varies during the stroke, set RESOLVER MOTION MODE to LINK MOTION as follows:

1. Access the Main Initialization Menu, then select POSITION SENSOR.
2. Move the highlight bar to the RESOLVER MOTION MODE item, and press ENTER to toggle the setting to LINK MOTION.
3. Press Exit to return to the Main Initialization menu. Turn the PROG/RUN keyswitch to RUN, and run the press to observe the behavior of the Press Speed value.

NOTICE

If WaveFormPAC is installed on your press and RESOLVER MOTION MODE is set to LINK MOTION, WaveFormPAC comparison screens will not display the Ram Velocity.

Using a ServoFeed Interface with Link Motion

If you have a link-motion press and are using a servofeed with a Wintriss Servofeed Interface (SFI), you can compensate for the change in speed between the upstroke and downstroke. In a link-motion press, the upstroke is substantially faster than the downstroke, the downstroke being slowed to improve forming operations. There are two methods you can use to compensate for the variation in speed. Perform the following procedure to find out which method to use, then refer to the appropriate section.

1. Access the Main Initialization Menu, and select FEED CONTROL.
2. On the Feed Control screen that displays, check to see if SETTLING TIME is one of the parameters shown.
 - If SETTLING TIME appears on the screen, go to *Settling Time Compensation for Link Motion* (next section)
 - If SETTLING TIME does not appear, go to *Press Speed Compensation for Link Motion*, page 131.

Settling Time Compensation for Link Motion

If SETTLING TIME is a Feed Control Initialization parameter, follow the instructions below to compensate for speed variation. Once you have set the Settling Time to the appropriate value for one tool, you can use the Feed Advisor for all other tools on this press.

1. Access the Main Initialization Menu, and select FEED CONTROL.
2. On the Feed Control screen that displays, select SETTLING TIME and set it to 30 mS.
3. Switch to Program Mode, select the tool that is currently loaded, then, on the Tool Programming Menu, select FEED CONTROL (see *Changing Settings for a Loaded Tool*, page 138).
4. On the Servo-Feed Parameters screen, select FEED ADVISOR, then on the Servo-Feed Advisor screen, select CALCULATE.
5. Press Exit to return to the Tool Programming Menu. Then, press LOAD THIS TOOL to load the tool. Cycle the press and notice whether feeding is complete at the correct time.
 - If feeding is complete at the correct time, you are finished with settling time compensation for link motion.
 - If feeding is completed too late, access the Main Initialization Menu, select FEED CONTROL, and increase the SETTLING TIME value by 3 mS. Then return to Program mode, and use Feed Advisor to calculate a new value with this setting (see steps 3 and 4). Load the tool number, and run the press to observe the feeding again. Continue to increase the settling time by 3-mS increments until feeding is complete at the correct time.
 - If feeding is completed too soon, access the Main Initialization Menu, select FEED CONTROL, and decrease the SETTLING TIME value by 3 mS. Then return to Program mode, and use Feed Advisor to calculate a new value with this setting (see steps 3 and 4). Load the tool number, and run the press to observe the feeding again. Continue to decrease the settling time by 3-mS increments until feeding is complete at the correct time.

Press Speed Compensation for Link Motion

NOTICE

Perform the press speed compensation procedure for each tool if Settling Time is not an initialization parameter for this SFI.

If SETTILING TIME is not a Feed Control Initialization parameter, follow the instructions below to compensate for speed variation. You must perform this procedure for every tool the first time you program it.

1. Access Program mode and select the tool that is currently loaded, then, on the Tool Programming Menu, select FEED CONTROL (see *Changing Settings for a Loaded Tool*, page 138).
2. On the Servo-Feed Parameters screen, select FEED ADVISOR, then on the Servo-Feed Advisor screen, select PRESS SPEED, and enter a value 10% greater than the actual press speed.
3. When you have changed the PRESS SPEED value, select CALCULATE.
4. Press Exit to return to the Tool Programming Menu, then load the tool. Cycle the press and notice whether feeding is complete at the correct time.
 - If feeding is complete at the correct time, you are finished with press speed compensation for link motion.
 - If feeding is completed too late, switch to Program Mode, increase Press Speed in the Feed Advisor by 3%, and calculate a new value with this setting (see steps 2 and 3). Load the tool number, and run the press to observe the feeding again. Continue to increase Press Speed in the Feed Advisor by 3% increments until feeding is complete at the correct time.
 - If feeding is completed too soon, switch to Program Mode, decrease Press Speed in the Feed Advisor by 3%, and calculate a new value with this setting (see steps 2 and 3). Load the tool number, and run the press to observe the feeding again. Continue to decrease Press Speed in the Feed Advisor by 3% increments until feeding is complete at the correct time.

Chapter 4 – SmartPAC PRO Program Mode

This chapter shows you how to make settings in SmartPAC PRO Program mode. The Program Mode settings - which are entered via the Main Program Menu (see Figure 4-1) - control SmartPAC PRO operation for an individual tool.

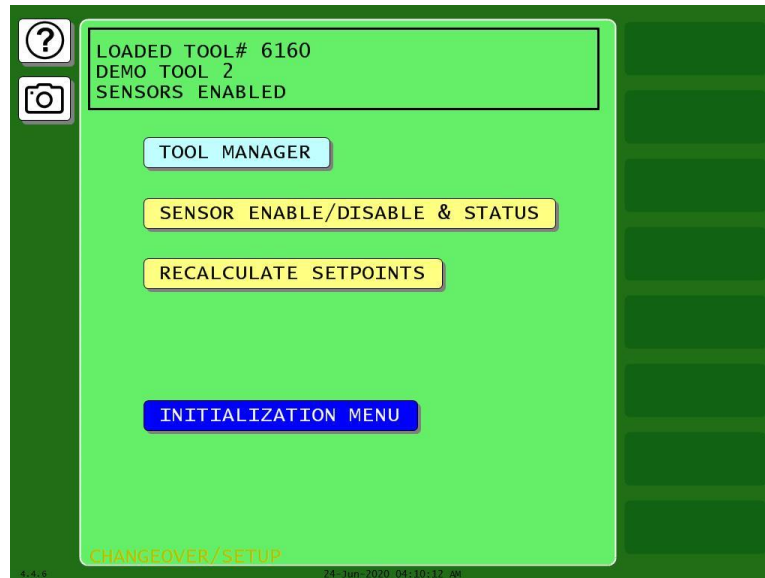


Figure 4-1. Main Program Menu

The following sections show you how to create, program, modify, delete, and load individual tools. You are instructed how to enter tool names, set counters, and other SmartPAC PRO options. The die protection and programmable limit switch settings are covered in Chapters 6 and 7.

Once you have programmed and loaded a tool, you can switch to the RUN mode to run that tool on your press, *Chapter 5*. In Run mode, you can also make adjustments to some settings.

Entering and Exiting Program Mode

- To enter Program Mode, turn the PROG/RUN keyswitch on the front panel to “PROG.”
- To exit Program and enter Run Mode, turn the keyswitch to “RUN.”
- To exit Program and enter Initialization Mode, turn the keyswitch to “PROG” and press the INITIALIZATION MENU button.

The first display you see in Program mode is the Main Program Menu, Figure 4-1. From this menu, you can access the following screens or functions:

- Tool Manager, next section
- Sensor Enable/Disable and Status screen (if DiProPAC is installed), Chapter 6
- Initialization Menu, Chapter 3

TOOL MANAGER

(PROGRAM – TOOL MANAGER)

The TOOL MANAGER item on the Main Program Menu enables you to view, edit, create, copy, delete and load tools. You perform these functions on the Tool Manager screen (see Figure 4-2), which displays when you select TOOL MANAGER.

Once you have created a tool, you must program it before the tool can be loaded. You program tools on the Tool Program Menu, Figure 4-11, page 141, which you access from the Tool Manager screen by pressing EDIT TOOL.

The Tool Manager screen displays a list of the tools that have already been created. The currently loaded tool is highlighted.

To view, edit, load, delete, create, or copy a tool, press the appropriate button; see detailed instructions in the sections below.

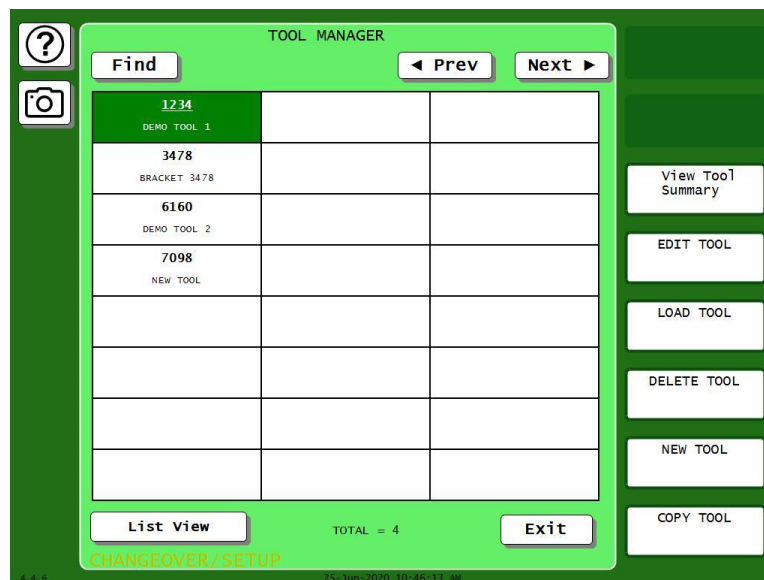


Figure 4-2. Tool Manager Screen

Tool Manager List View

For more detail about the tools, press List View to show the information in Figure 4-3. The currently loaded tool is highlighted in yellow.

Sort the tools by number, name, etc., by pressing the desired category item at the top of the list.

For details about a tool, press the tool number and a detail window appears, Figure 4-4. From this window you can perform the operations described in the sections below, such as view, edit, load, delete or copy the tool. To see a detailed summary of the tool data, such as counter presets, cams and sensors, go to *Viewing Tool Data Summary*, page 139.

TOOL NUMBER	TOOL NAME	# of Cams	# of Sensors	Total Hits	Last Modified
1001	Demo Tool	7	8	0	07/14/2020 17:35:27
1002	Demo Tool	7	8	0	07/14/2020 15:16:25
1003	Demo Tool	7	8	0	07/14/2020 15:16:25
1004	Demo Tool	7	8	0	07/14/2020 15:16:25
1005-ABC	Demo Tool	7	8	0	07/14/2020 15:16:25
1006	Demo Tool	7	8	0	07/14/2020 15:16:25
1007	Demo Tool	7	8	0	07/14/2020 15:16:25
1008	Demo Tool	7	8	0	07/14/2020 15:16:25
1009	Demo Tool	7	8	0	07/14/2020 15:16:25
1010-ABC	Demo Tool	7	8	0	07/14/2020 15:16:25

Figure 4-3. Tool Manager List View

1004
Demo Tool
of Cams = 7
of Sensors = 8
Total Hits = 0
7/14/2020 3:16:25 PM

- View Tool Summary
- EDIT TOOL
- LOAD TOOL
- DELETE TOOL
- NEW TOOL
- COPY TOOL

cancel

Figure 4-4. Tool Manager List View, Tool Detail

Loaded tool highlighted in yellow; detail shown for tool highlighted in green.

Creating a New Tool

(PROGRAM – TOOL MANAGER – Select Tool – NEW TOOL)

NOTICE

You can create a new tool using a copy of an existing tool or a copy of the Tool Template. See *Copying Tool Template to a New Tool*, page 137.

To create a setup for a new tool, do the following:

1. On the Tool Manager screen, press New Tool. The Numeric Entry keypad displays, Figure 4-5.
2. Key in desired tool number and press ENTER. Please note that tool numbers cannot be duplicated.
3. The new tool will now appear in the Tool Manager, but will have no settings associated with it. Before you can load and run this setup, you must program settings for this tool. See *Tool Program Menu*, page 141.

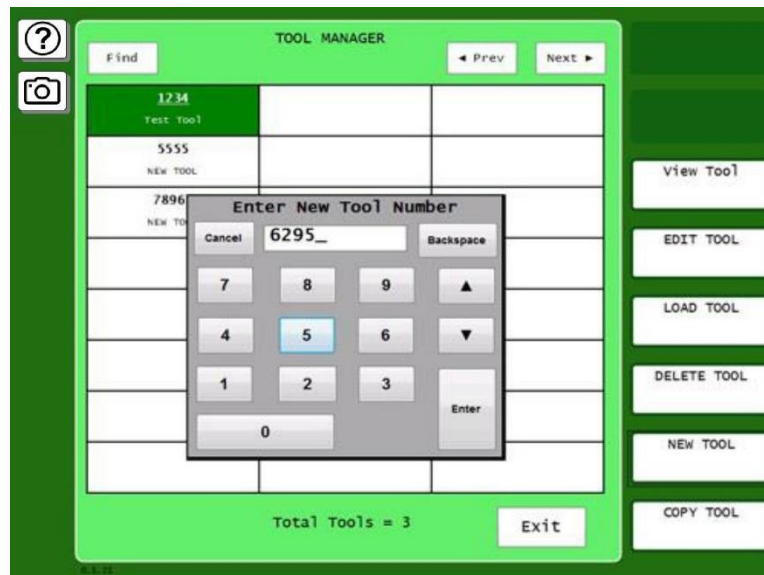


Figure 4-5. Tool Manager Screen with Numeric Entry Window

Copying an Existing Tool

(PROGRAM – TOOL MANAGER – Select Tool – COPY TOOL)

If you want to copy the settings programmed for an existing tool to a new tool, perform the following steps:

1. On the Tool Manager screen, touch the existing tool that you wish to copy.
2. Press the “COPY TOOL” button in the bottom right corner of the screen. The Numeric Entry Keypad displays, along with a message indicating the copy source tool number, Figure 4-6.
3. Key in the desired tool number for the new tool, and press Enter.



Figure 4-6. Copying an Existing Tool

4. The newly copied tool will now appear in the Tool Manager. Before you run it, you will need to edit the settings unique to this tool. See *Tool Program Menu*, page 141.

Copying Tool Template to a New Tool

(PROGRAM – TOOL MANAGER – Select Tool Template, # 9999999 – COPY TOOL)

Tool Template, which is assigned tool number 9999999, is a tool you can program with settings common to two or more tools. When used with the COPY TOOL function, Tool Template allows you to duplicate the same collection of settings across multiple tools. Tool Template is not used to run the press.

NOTICE

PASSWORD PROTECTION FOR TOOL TEMPLATE

To prevent unauthorized changes, you can set *SECURITY ACCESS*, page 98, so that a password is required to change the Tool Template.

Loading a Tool

(PROGRAM – TOOL MANAGER – Select Tool – LOAD TOOL)

⚠ DANGER

ANCILLARY EQUIPMENT MAY OPERATE WHEN TOOL IS LOADED

Ensure that all personnel stand clear when you load a tool.

Failure to comply with these instructions will result in death or serious injury

To load a tool, perform the following steps:

1. On the Tool Manager screen, highlight the tool you want to load, and press LOAD TOOL button. The warning window shown in Figure 4-7 displays.



Figure 4-7. Load Tool Warning Message

2. Press OK to load the tool. A message appears indicating that the tool is being loaded.

NOTICE

- If an error message displays, go to Chapter 8 and follow the instructions for correcting the problem.
- If the error is not covered in Chapter 8, or you cannot fix the problem, call Wintriss Tech. Support.

Changing Settings for a Loaded Tool

(PROGRAM – TOOL MANAGER – Select Tool – EDIT TOOL)

To change settings for a loaded tool, do the following:

1. With the currently loaded tool highlighted on the Tool Manager screen, press the EDIT TOOL button. The Tool Program menu is displayed. To Change settings for the tool, follow the instructions in *Tool Program Menu*, starting page 141.
2. When you have made your changes and backed out of the Tool Program Menu, the Load Tool Warning window (see Figure 4-7) displays. Press ENTER to load the tool.

NOTICE

RELOAD CURRENTLY LOADED TOOL IF YOU CHANGE IT

If you change settings for a tool that is currently loaded, you should load the tool again after you make the changes. If you do not re-load the tool, the old settings will be used until you load the tool again.

Deleting a Tool

(PROGRAM – TOOL MANAGER – Select Tool – DELETE TOOL)

To delete a tool, perform the following steps:

1. On the Tool Manager screen, highlight the tool you want to delete, and press the DELETE TOOL button. The window shown in Figure 4-8 appears, asking you to confirm that you want to delete the tool.



Figure 4-8. Delete Tool Confirmation Message

2. Press Yes to continue the deletion process. A message displays indicating that the tool has been deleted, and you are returned to the Tool Manager screen with the deleted tool removed.

Viewing Tool Data Summary

(PROGRAM – TOOL MANAGER – Select Tool – VIEW TOOL SUMMARY)

The screenshot shows the "Tool Data Summary" screen. It features a green header with a question mark icon, a "Preview Info Center" button, and an "Exit" button. The main content area is white with a green border. It displays the following information:

TOOL NUMBER = 1235 TOOL NAME = 12355
Last Modified = 7/13/2020 6:44:56 PM

Counter	Preset	Increment Angle	Increment Mode	Output Mode	Pulse Time (mSec)
Stroke	1000000	270°	Stroke	Top Stop	
Good Parts	2400	270°	Stroke	Top Stop	
Batch 1	25	270°	Stroke	Top Stop	
Batch 2	1	270°	Stroke	Top Stop	
Batch 3	0	270°	Stroke	Top Stop	
Total Hits	0	270°	Stroke	Top Stop	

Parts Per Stroke = 1, Strokes Per Part = 1
Auto Batch Pre-Load Off

Cam #	NAME	Cam Type	Event	Multiple On/Offs
1	Not Used			
2	Channel 2	Global On/Off	210° To 270°	
3	Not Used			
4	Channel 4	Global On/Off	261° To 288°	
5	Not Used			
6	Not Used			
7	Not Used			
8	Not Used			
9	Channel 9	Global On/Off	65° To 106°	
10 - 16	Not Used			

4.6.2 13-Jul-2020 08:02:35 PM

Figure 4-9. Tool Data Summary Screen

1. To see a summary of the tool data, in the Tool Manager screen, Figure 4-2, press View Tool Summary. The Tool Data Summary screen opens, Figure 4-9.
2. Scroll down as needed to see the whole summary, which may include
 - counter and preset information.
 - die protection sensor information (if DiProPAC option installed)
 - programmable cam information (if ProCamPAC option installed)

- press control parameters (if SmartPAC PRO is integrated with WPC 2000)
- tonnage monitor information (if a tonnage monitor option is installed)

Adding a Note to the Tool Data Summary

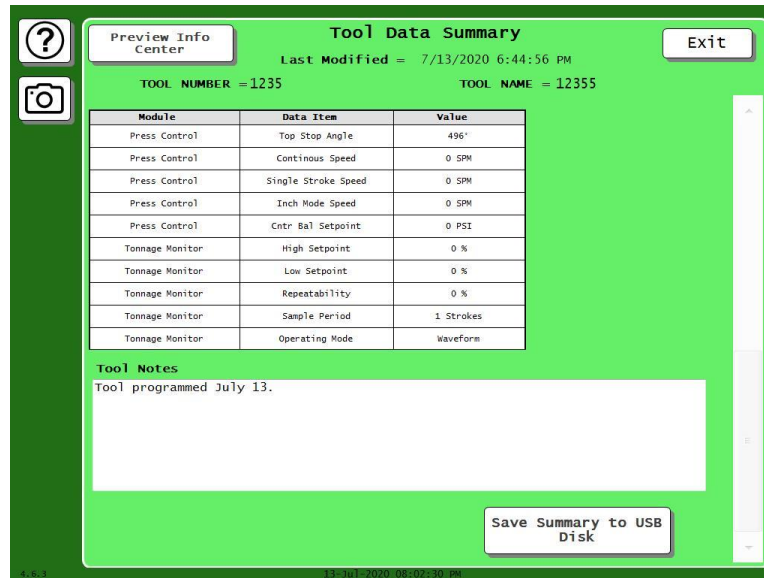


Figure 4-10. Tool Data Summary Screen, Scrolled to Bottom

At the bottom of the screen, to which you may need to scroll down, you can enter additional information in the Tool Notes area, Figure 4-10.

1. Touch inside the Tool Note area and the on-screen keyboard appears.
2. Key in the desired information.
3. Press Done.

Saving Tool Data Summary to USB Disk

To save the tool data summary on a USB disk:

1. Insert a USB disk into the SmartPAC PRO's USB connector.
2. Scroll down to the bottom of the Tool Data Summary screen, Figure 4-10.
3. Press Save Summary to USB Disk.

Tool Program Menu

(PROGRAM – TOOL MANAGER – Select Tool – EDIT TOOL)

The Tool Program Menu, Figure 4-11, displays whenever you

- Copy settings from an existing tool (e.g., Tool Template) to a new tool
- Highlight a tool in TOOL MANAGER and press EDIT TOOL.

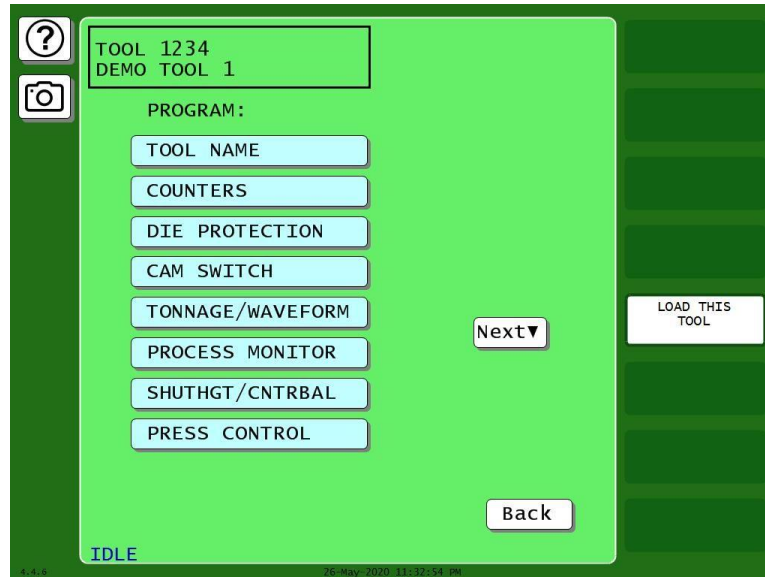


Figure 4-11. Tool Program Menu

(Includes some options. Your display may look different.)

The following sections show you how to make settings for each of the items on the menu.

NOTICE

RELOAD CURRENTLY LOADED TOOL IF YOU CHANGE IT

If you change settings for a tool that is currently loaded, you should load the tool again after you make the settings. If you do not re-load the tool, the old settings will be used.

TOOL NAME

(PROGRAM – TOOL MANAGER – Select Tool – EDIT TOOL – TOOL NAME)

This item on the Tool Program Menu allows you to assign a name to a tool. To do so, perform the following steps:

1. On the Tool Program Menu, press TOOL NAME. The on-screen keyboard appears, Figure 4-12.



Figure 4-12. On-screen keyboard

2. Type in a tool name, and press enter when you are done. You are returned to the Tool Program menu.

COUNTERS

(PROGRAM – TOOL MANAGER – Select Tool – EDIT TOOL – COUNTERS)

The counters maintain counts of press cycles (strokes), good parts, and the total number hits on each die that is run in the press. Secondary counters called “Batch Counters” can initiate various actions when a preset number of strokes has been reached. Settings are made via the Counters screen, Figure 4-13.

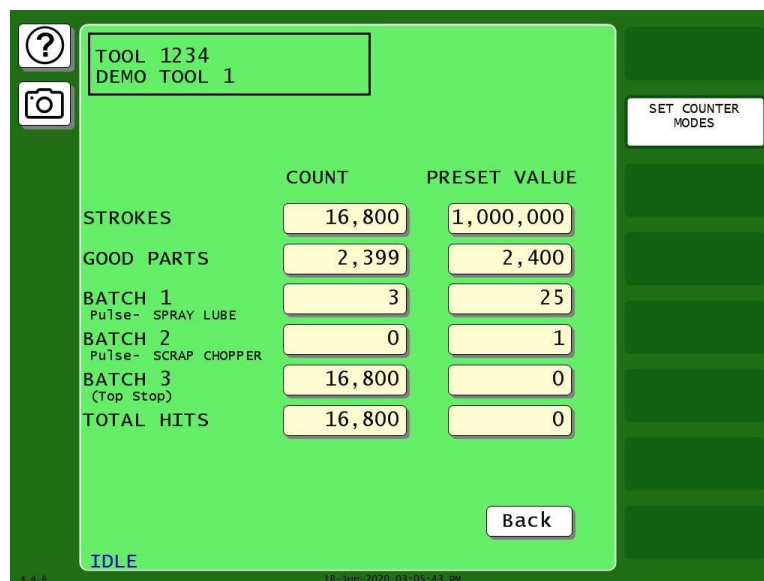


Figure 4-13. Counters Screen

SmartPAC PRO uses the following counters:

Strokes counter

Counts the number of cycles made by the press. When the user-programmed preset value has been reached, SmartPAC PRO top-stops the press and displays a message. The counter resets to zero (0) when the message has been cleared.

Good Parts counter

Counts the number of strokes made by the press; however it will NOT increment if a fault was detected by the AutoSetPAC, WaveFormPAC, DiProPAC, or ProPAC during the stroke. SmartPAC PRO top-stops the press and displays a message when the programmed preset value has been reached. When the message has been cleared, the counter resets to zero (0).

Total Hits counter

This counter is useful for tracking when die maintenance is required. The Total Hits Counter keeps a running total of the number of hits on the currently loaded tool. It is incremented each time the press makes a cycle while the tool is loaded. When the programmed preset has been reached, a flashing message displays in the Status Box in Run mode. This is the only counter that stores and “carries over” the actual count when the tool is unloaded and rerun again at a later date.

Batch counters

There are three Batch Counters which can be selectively incremented by either the Strokes or Good Parts counter. Each batch counter can be set to initiate one of three actions when the programmed preset is reached: Top Stop, Toggle, or Pulse.

When a Batch counter is set to TOP STOP, SmartPAC PRO top-stops the press and displays a message, as it does for Strokes and Good Parts counters. This setting is useful when stopping the press to change bins before resuming production.

NOTICE

BATCH COUNTER SET TO TOGGLE OR PULSE AFFECTS A PROCAMPAC OUTPUT.

See *Chapter 7 – Using ProCamPAC Programmable Cams*.

When a Batch counter is set to TOGGLE, SmartPAC PRO switches the state of a ProCamPAC output from Open to Closed or from Closed to Open. This option is useful for activating a parts diverter.

When a Batch counter is set to PULSE, SmartPAC PRO actuates a ProCamPAC output for a specified length of time (up to 9999 milliseconds) when the preset is reached. You can connect this output to any device that needs to be turned on once every fixed number of strokes

Each batch counter is assigned to a specific ProCamPAC channel:

- Batch 1 to Channel 6
- Batch 2 to Channel 7
- Batch 3 to Channel 8.

If you set a Batch counter to either TOGGLE or PULSE, the ProCamPAC channel controlled by that counter is displayed on the Counters screen, Figure 4-13.

The crankshaft angle at which Strokes, Good Parts, Total Hits, and Batch counters is incremented can also be programmed.

Setting Preset Values

Counter presets specify the count at which SmartPAC PRO initiates one of three programmed actions (i.e., Top-stop, Toggle, or Pulse). To enter counter presets, do the following:

1. On the Tool Program Menu, select COUNTERS to display the Counters screen.

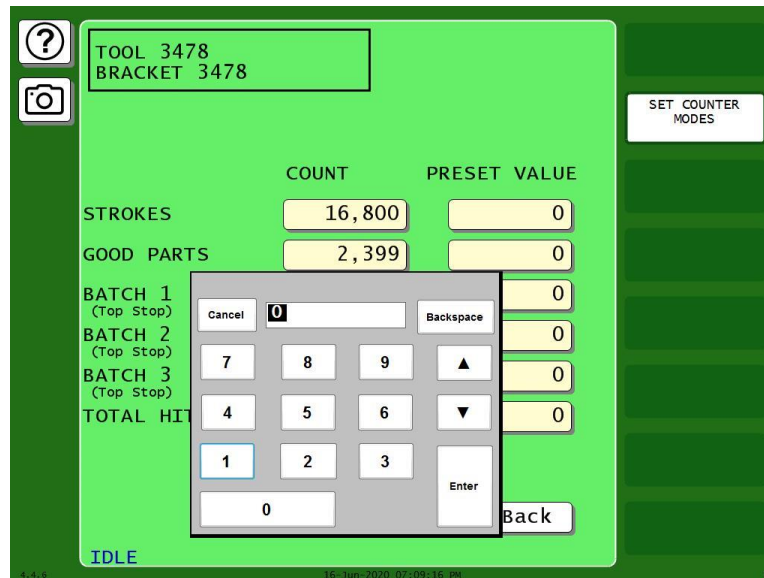


Figure 4-14. Count Preset Entry

2. Press the PRESET VALUE you want to enter. The Numeric Entry window displays, Figure 4-14.
3. Key in a preset value and press ENTER. The value you entered displays in the PRESET VALUE field you selected. Setting the preset to 0 disables the output function (top stop, toggle, or pulse) for the counter.
4. Repeat steps 2 and 3 for each counter preset you want to program.

Changing Count Values

Under some circumstances, you may need to adjust the count upward or downward, or you may want to start the count at some value other than zero. To change count settings, do the following:

NOTICE

ARE YOU "LOCKED OUT"?

If you cannot change count values, security access for the CHANGE COUNTS function may be set to NO CHANGES ALLOWED. See *SECURITY ACCESS*, page 98.

1. On the Counters screen, select the setting displayed in the COUNT column of the counter you want to adjust. The Numeric Entry window displays, Figure 4-14.
2. Key in a new value and press ENTER. Repeat for each count you want to change.

Clearing the Total Hits Counter

Since the Total Hits counter does not reset to zero (0) when its preset is reached, you must reset the counter manually. To do so, perform the following steps:

1. On the Counters screen, select the setting displayed in the COUNT column for TOTAL HITS.
2. Press Backspace to set the count to 0, and then Enter.

Setting Batch Counter Output and Increment Modes

If you set a Batch counter preset value on the Counters screen, you must also specify the output and increment modes for that counter if they differ from the factory settings. By default, output mode is set to TOP STOP, increment mode to STROKE. To change these settings, perform the following steps:

NOTICE

PULSE and TOGGLE settings are available only when ProCamPAC is an installed option. If you attempt to make these settings when your system does not have a programmable cam, SmartPAC PRO will display a message indicating that the settings are not available. See *Chapter 7* for information about ProCamPAC.

On the Counters screen, press SET COUNTER MODES. The Counter Mode Selections screen displays, Figure 4-15.



Figure 4-15. Set Counter Modes Screen

1. Use the up/down and left/right arrow buttons to move the highlight bar to the setting in the OUTPUT MODE column for the Batch counter you want to program, then press ENTER to toggle among the three options (i.e., TOP STOP, TOGGLE, and PULSE) until the setting you want is displayed.

NOTICE

When you select TOGGLE or PULSE, the ProCamPAC channel associated with output from that batch counter displays on the Counters, Figure 4-13, page 142. See *Chapter 7* for information about ProCamPAC outputs.

2. If you select PULSE as the output mode in step 2, move the highlight bar to the PULSE TIME (MSEC) column, and press ENTER. The Numeric Entry displays.
3. Key in a value for the cam channel On time in milliseconds (maximum value, 9,999 mS, or about 10 seconds), then press ENTER. The value you keyed in displays in the PULSE TIME (MSEC) column for the specified Batch counter.
4. Move the highlight bar to the INCREMENT MODE column, then press ENTER to toggle between the STROKE and GOOD PARTS options until the setting you want is displayed.
5. Repeat steps 2 through 5 for other Batch counters, as necessary.
6. Press Back to return to the Counters screen.

Setting Counter Increment Angle

The crankshaft angle at which counters are incremented is set at the factory to a default value of 270°. This value is satisfactory for counting parts, but if you have programmed Batch counter outputs to control automation, increment angles for those counters should be set to the angle at which you want the automation to activate. The Counter Mode Selections screen allows you to set a common increment angle for Strokes, Good Parts, and Batch 1 counters and separate increment angles for Batch 2 and Batch 3 counters. To change default increment angles, do the following:

1. On the Counter Mode Selections screen, move the highlight bar to the increment angle value for the counter you want to adjust (e.g., Batch 2), then press ENTER. The Numeric Entry window displays.
2. Key in a new increment angle value, then press ENTER. The value you entered is displayed on the Counter Mode Selections screen.
3. Repeat steps 1 and 2 for other counters, as necessary.

Setting Parts per Stroke or Strokes per Part

SmartPAC PRO allows you to control how the Strokes and Good Parts counters increment in relation to each other. You can specify the number of parts made during each stroke, in which case the Good Parts counter will increment in multiple units (e.g., 2, 3, etc.) for each increment of the Strokes counter. This setting is useful in multiple-up die applications.

Conversely, you can specify the number of strokes required to make each part, causing the Good Parts counter to increment only once for multiple increments (e.g., 2, 3, etc.) of the Strokes counter. This setting is useful in die applications with a gagged cutoff.

To set the number of parts made per stroke or number of strokes required to make a part, do the following:

1. On the Counter Mode Selections screen, press the ADVANCED MODES button. The Advanced Counter Mode Selections screen, Figure 4-16.

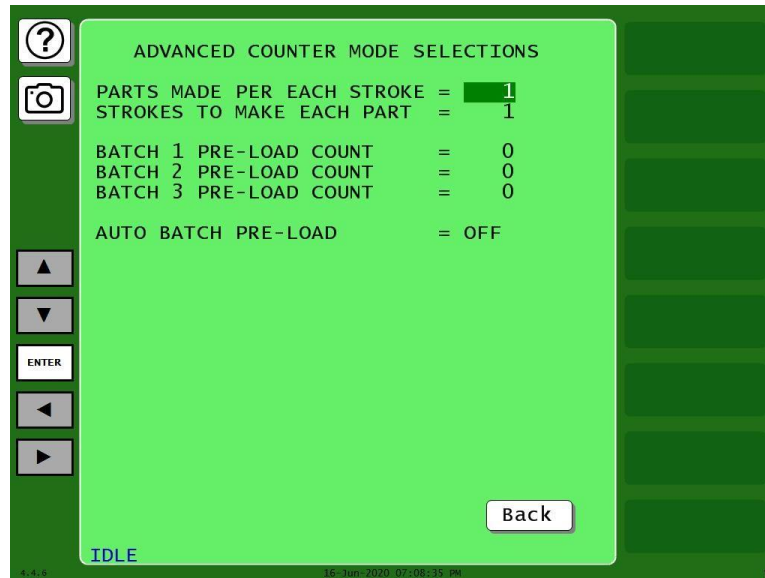


Figure 4-16. Advanced Counter Mode Selections Screen

2. Select the value displayed for the item you want to program (i.e., PARTS MADE PER EACH STROKE or STROKES TO MAKE EACH PART). The Numeric Entry window displays.
3. Key in the value you want and press ENTER. The value you keyed in displays in the field you selected in step 2.
4. Press Exit to return to the Counter Mode Selections screen.

Setting Batch Pre-Load Counts

If you are setting up a tool for gaging operations, you can specify a pre-load count for each Batch counter on the Advanced Counter Mode Selections screen. This pre-load value displays in the COUNT field for each Batch counter you specify, decreasing by that value the number of strokes (or good parts) required to reach the preset value. You can reset these pre-load values in Run mode when the Batch preset is reached (see *COUNTERS*, page 155) as long as you set the CHANGE COUNTS parameter on the Security Access Menu in Initialization to PROGRAM AND RUN MODES (see *SECURITY ACCESS*, page 98).

To set batch pre-load counts, do the following:

1. Select the pre-load count value for the batch you want (e.g., Batch 1, Batch 2, etc.). The Numeric Entry window displays.
2. Key in a pre-load count value and press ENTER. The value you keyed in displays on the Advanced Counter Mode Selections screen.
3. Make sure that the AUTO BATCH PRE-LOAD field is set to OFF.
4. Press Exit to return to the Counter Mode Selections screen.

DIE PROTECTION (Optional)

(PROGRAM – TOOL MANAGER – Select Tool – EDIT TOOL – DIE PROTECTION)

NOTICE

To initialize, program and use die protection, see *Chapter 6 – Using DiProPAC Die Protection (Optional)*, page 167.

CAM SWITCH (Optional)

(PROGRAM – TOOL MANAGER – Select Tool – EDIT TOOL – CAM SWITCH)

NOTICE

To initialize, program and use programmable cams, see *Chapter 7 – Using ProCamPAC Programmable Cams*, page 211.

PRESS SPEED

(PROGRAM – TOOL MANAGER – Select Tool – EDIT TOOL – PRESS SPEED)

This item on the Tool Program Menu enables you to program maximum and minimum speed limits for each tool you run on a variable-speed press. These limits apply to all operating modes - Continuous, Single-stroke, and Inch.

When the speed of the press exceeds the maximum limit, SmartPAC PRO stops the press and displays the fault message “Maximum press speed exceeded.” When press speed drops below the minimum limit, SmartPAC PRO stops the press and displays the fault message “Minimum press speed exceeded.” These fault message are documented in *Chapter 8*.

You make speed settings on the Press Speed Parameters screen, Figure 4-17.

To set maximum and minimum speed limits for a tool, do the following:

1. Select PRESS SPEED on the Tool Program Menu. The Press Speed Parameters screen displays (Figure 4-17).
2. Select the MAXIMUM PRESS SPEED value. The Numeric Entry window displays.
3. Key in the desired value, following the directions in the window, and press ENTER. The window closes, and your entry appears in the MAXIMUM PRESS SPEED field.



Figure 4-17. Press Speed Parameters Screen

NOTICE

- The value you enter in the MAXIMUM PRESS SPEED field must be greater than the Minimum Press Speed value. If the Maximum Speed setting is less than or equal to the Minimum Speed value, SmartPAC PRO changes the Maximum Speed to one Stroke per Minute greater than the Minimum Speed.
- To disable speed control, set both Maximum and Minimum Speed values to zero (0).

4. Select the MINIMUM PRESS SPEED value, and key in your entry in the Numeric Entry window. When the window closes, your entry appears in the MINIMUM PRESS SPEED field.
5. When you are finished, press EXIT to return to the Tool Program Menu.

TOOL INFORMATION

(PROGRAM – TOOL MANAGER – Select Tool – EDIT TOOL – TOOL INFORMATION)

The Tool Information screen allows you to enter up to six parameters and up to two lines of memo text. The names, units of measurement, and number of decimal places for the parameters are set in Initialization mode (see *TOOL INFORMATION*, page 97).

SENSOR ENABLE/DISABLE & STATUS (Optional)

NOTICE

In the DiProPAC chapter programming section, see *SENSOR ENABLE/DISABLE & STATUS*, page 202.

Chapter 5 – SmartPAC PRO Run Mode

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This chapter shows you how to use the SmartPAC PRO in the Run mode, which is the mode you select to run production. Instructions include how to adjust settings for individual tools and monitor press parameters such as speed and sensor status. Run mode displays are accessible via the Main Run Menu, which is shown in Figure 5-1.

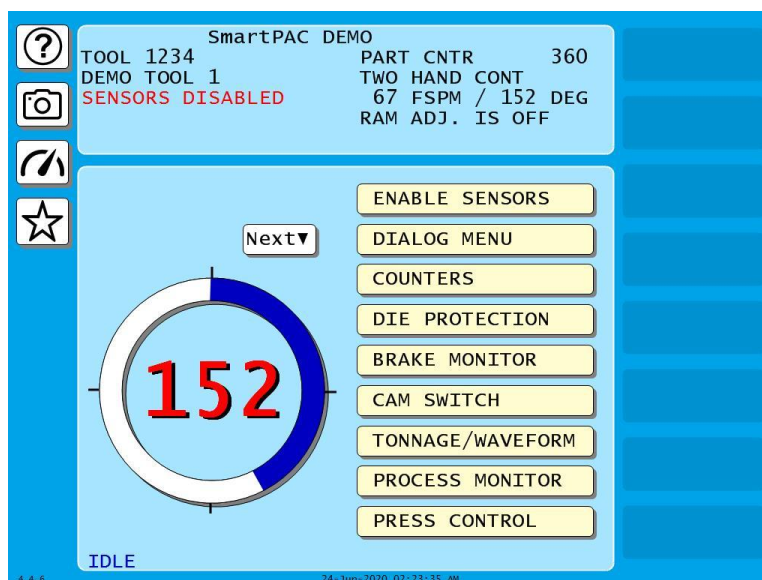


Figure 5-1. Main Run Menu

(Includes some options. Your display may look different.)

In Run mode, you can view and adjust settings only for the tool that is currently loaded. You cannot create new tool numbers or modify settings for an unloaded tool as you can in Program mode.

Some functions that you can perform in Run mode, such as loading a tool and adjusting sensor and cam timing, are also provided in Program mode. Duplicating these functions allows operators to perform essential tasks in Run mode without giving them access to Program mode. Operators can be locked out of Program mode by turning the PROG/RUN keyswitch to RUN and then removing the key.

To prevent unauthorized personnel from changing settings or loading tool numbers, you can lock out choices on the Run menu or require a password for access. See *SECURITY ACCESS*, page 98.

The following sections show you how to load a tool, adjust counters, and speed settings for the tool, perform the 90° stop-time test to determine the longest stopping time of the press, and view tool information and the error log. The chapter also covers enabling and disabling sensors, displaying multiple faults, and sending e-mail messages. The Run Mode settings for DiProPAC and ProCamPAC are covered in Chapters 6 and 7.

Entering and Exiting Run Mode

Follow the instructions shown in Table 5-1 to enter and exit Run mode.

Table 5-1. Instructions for Entering and Exiting Run Mode

To Enter Run Mode	To Exit Run Mode
From Program mode: Turn the PROG/RUN keyswitch to RUN.*	To switch to Program mode: Turn the PROG/RUN keyswitch to PROG.*

* If you turn the key and nothing happens, press Reset, Exit, or Back repeatedly until SmartPAC PRO changes modes.

Settings Locked or Password Required

When a Run mode setting is locked, the screen shown in Figure 5-2 displays if the PASSWORD REQUIRED access type has been set for that item on the Security Access Menu in Initialization (See *SECURITY ACCESS*, page 98).

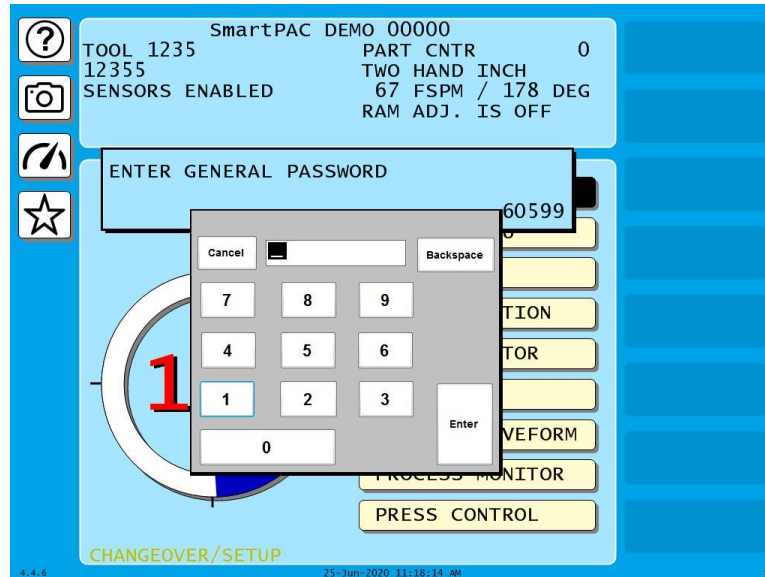


Figure 5-2. “Enter Your Password” Screen

When you enter the correct password, you are given access to the item.

When a Run mode item’s security access is set to PROGRAM MODE ONLY, NO CHANGES ALLOWED, ALLOW RECALC ONLY, or NO RECALC/ADJUST, you are prevented from gaining access to that item. No message is displayed to indicate that the setting is locked, but when you press ENTER to access the item or press the arrows (▲▼◀▶) to make an adjustment, nothing happens. When the LOAD NEW TOOL item is locked out, that entry does not appear on the Main Run Menu.

Displaying Multiple Faults

Whenever more than one fault occurs in response to a press condition, the message for the first fault displays in a window on the Main Run Menu and a button appears in the lower left corner of the screen. To view the multiple errors, press DISPLAY ALL ERRORS. A large red message window opens, as shown in Figure 5-3, with each fault listed in sequence beneath the caption “ALL PENDING ERRORS.” To close the window, press EXIT.

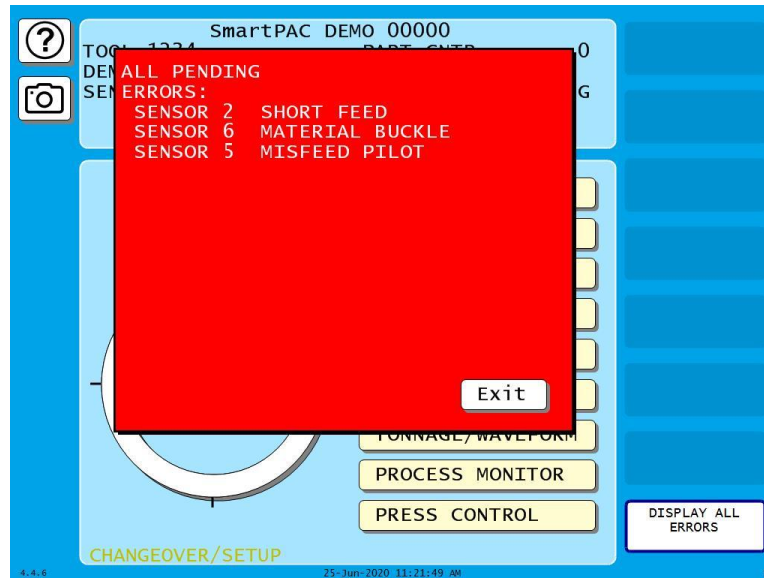


Figure 5-3. Display All Errors Message Window

DISABLE (ENABLE) SENSORS (Optional)

(RUN – DISABLE/ENABLE SENSORS)

NOTICE

See the DiProPAC chapter Run Mode section, *DISABLE (ENABLE) SENSORS*, page 204. DiProPAC has an optional “sensors disabled” output that turns on when the sensors are disabled. See Chapter 2 for installation details.

NOTICE

If you temporarily disable sensors, be sure to re-enable them before you resume making parts.

In the Main Run screen the top button enables or disables sensors.

- If it is labeled **DISABLE SENSORS**, press to enable sensors.
- If it is labeled **ENABLE SENSORS**, press to disable sensors. When sensors are disabled, “SENSORS DISABLED” flashes red in the status box at the top of the screen.

COUNTERS

(RUN – COUNTERS)

This menu selection allows you to make adjustments to counter settings made in Program mode. Adjustments are entered on the Counters screen (see Figure 5-4), which displays when you select the COUNTERS item on the Main Run Menu.

NOTICE

ARE YOU LOCKED OUT?

Access to items on the Counters screen may be limited to Program mode or may require a password. The security access settings in Initialization mode determine when changes can be made. See *SECURITY ACCESS*, page 98.

	COUNT	PRESET VALUE
STROKES	0	1,000,000
GOOD PARTS	0	2,400
BATCH 1 (Top Stop)	0	25
BATCH 2 (Top Stop)	0	1
BATCH 3 (Top Stop)	0	0
TOTAL HITS	0	0

SmartPAC DEMO 00000
 TOOL 1235 12355 PART CNTR 0
 TWO HAND CONT
 67 FSPM / 178 DEG
 RAM ADJ. IS OFF

SENSORS DISABLED

Back

CHANGEOVER/SETUP

4.4.6 25-Jun-2020 11:23:04 AM 1

Figure 5-4. Counters Screen

On this screen, you can change or reset the values for the strokes, good parts, batch and total hits counters and presets if you have the appropriate security access. For instructions on entering counter and preset values, see COUNTERS, page 142.

If you have set the CHANGE COUNTS parameter on the Security Access Menu in Initialization to PROGRAM AND RUN MODES (see *SECURITY ACCESS*, page 98), you can reset batch counts to the values you have programmed for batch pre-loads (see Setting Batch Pre-Load Counts, page 147). When the CHANGE COUNTS feature is enabled for Run mode, the label RELOAD BATCH COUNTERS button displays near the top right corner of the screen. To reset batch counts to their pre-load values, simply press the button. Pre-load values display in the Count field for the batches you have programmed with those values.

When messages display indicating that counter presets have been reached, Press Reset to clear the message. See *Counter Preset Reached Messages*, page 238.

NOTICE

When the Total Hits counter reaches its preset value, a flashing message, "Total Hits Preset," appears in the Status Box at the top of the screen. To clear this message, set the Total Hits preset to zero (0), then reset this value to the desired quantity. See COUNTERS, page 142.

DIE PROTECTION (Optional)**NOTICE**

See the DiProPAC chapter Run Mode section, page 204.

- Adjust the Ready Signal for Green sensors
- Adjust the Ready Signal for Green Special sensors


BRAKE MONITOR** DANGER****RECALCULATE SAFETY DISTANCE WHEN STOP TIME CHANGES**

- Perform a 90° Stop Test any time you change the stop time limit (see *Performing the 90° Stop-time Test*, page 158).
- Recalculate the safety distance based on the new stop time limit and adjust or reinstall safeguarding devices according to the new safety distance.

Failure to comply with these instructions will result in death or serious injury.

SmartPAC PRO's built in Brake Monitor enables you to view your press's starting time, stopping time, and stopping angle and perform the 90° stop-time test to determine the longest stopping time of the press. You can also view the start time and stop time limits set in Initialization (see *SET BRAKE MONITOR (Optional with WPC 2000 Integration)*, page 95, in Chapter 4). You view this information and perform this procedure on the Stop Time Status screen, which is shown in Figure 5-5.

NOTICE

For help with the Stop Time Status screen, press  when the screen is displayed.

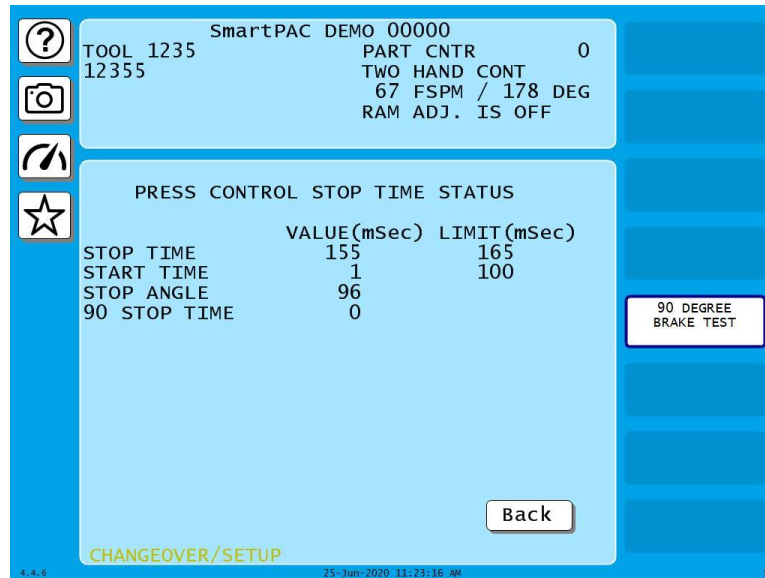


Figure 5-5. Stop Time Status (Brake Monitor) Screen

Stopping time is the time that it takes the crankshaft to stop once the dual safety valve (DSV) has been de-energized. Starting time is the time it takes for the crankshaft to start turning after the DSV has been energized. Instructions for setting start time and stop time limits and documentation of SmartPAC PRO's responses to start time and stop time faults are provided in *SET BRAKE MONITOR (Optional with WPC 2000 Integration)*, page 95.

Stopping angle is the number of degrees that it takes the press to stop. It is equal to the ram's stopping position in degrees minus the crankshaft position when the DSV is de-energized. (Stopping angle does *not* compensate for the complete rotation of the press when it takes more than 360° to stop.) The stopping angle value helps you when you set up the top-stop cam. For example, if the stopping angle is 100°, you would set the top-stop cam to turn on at 260°.

Determining the Stopping Time of Your Press

You need to determine the stopping time of your press at Top Stop in order to calculate the stop time limit to set in Initialization. To do so, perform the following steps:

1. Install the heaviest upper die you use on your press. Adjust the counterbalance per the press manufacturer's instructions if your press has a counterbalance.
2. Turn the PROG/RUN keyswitch to RUN to access Run mode, then select BRAKE MONITOR on the Main Run Menu. The Stop Time Status screen displays.
3. Start the press in Continuous mode, and run the press until it reaches normal operating speed.
4. Top-stop the press and record the value (in milliseconds) displayed in the STOP TIME VALUE (MSEC) field.
5. Repeat steps 3 and 4 five more times. Use the highest stop-time reading from your tests as the value to use in calculating the stop time limit (see Calculating the Stop Time Limit, page 96).

Performing the 90° Stop-time Test

The 90° stop-time test is required by OSHA regulation 1910.217 and ANSI standard B11.1-2009 to set the proper safety distance for personnel-guarding devices including light curtains, two-hand controls, and type-B movable barriers. This test is performed at the press's most critical stopping point: 90°. Follow these steps to perform the 90° stop-time test:

1. Install the heaviest upper die you use on your press. Adjust the counterbalance per the press manufacturer's instructions if your press has a counterbalance

NOTICE

Before you can switch to Run mode, a tool must be programmed and loaded in Program mode (see *TOOL MANAGER*, page 134).

2. Turn the PROG/RUN keyswitch to RUN to access Run mode, then select BRAKE MONITOR on the Main Run Menu. The Stop Time Status screen displays.
3. Run the press in Continuous mode. If the press has a variable speed drive, set press speed to the highest value you will normally use.
4. Press the Up (▲) arrow to start the 90° stop-time test. The following message displays at the bottom of the screen:

90 DEGREE BRAKE TEST
ARMED PRESS EXIT TO
CANCEL TEST

5. When SmartPAC PRO emergency-stops the press, which occurs the next time the press reaches 90°, record the number in the 90 STOP TIME VALUE (MSEC) field on the Stop Time Status screen.
6. Repeat the test at least 5 more times.
7. Record the highest reading from all your tests. This is the value you should use in calculating the safety distance.
8. Press EXIT when you are finished to return to the Main Run Menu.

Calculating the Safety Distance

DANGER

OBSERVE THE CORRECT SAFETY DISTANCE

- Calculate the safety distance carefully according to either the OSHA 1910.217 or the ANSI B11.1, 2009 standard, depending on your company's policy.
- If using light curtains, they should be mounted at least 7.5 in. (191 mm) from the hazardous area, regardless of the calculated safety distance.

Failure to comply with these instructions will result in death or serious injury.

Once you know your press's stopping time, you can calculate the safety distance at which to mount your light curtains (see the applicable light curtain user manual for more information). The safety distance is the minimum distance from the pinch point (or hazardous area) of the press at which light

curtains can be installed and still be able to stop the press before the operator can penetrate the light beam and reach the pinch point (see Figure 5-6).

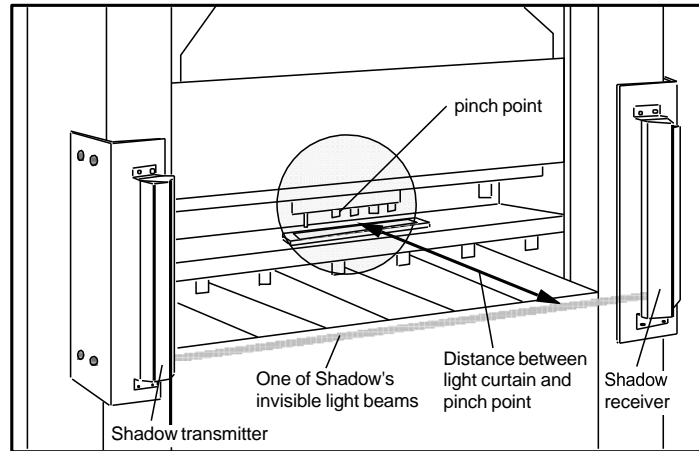


Figure 5-6. View of Light Curtains and Press Showing Safety Distance

PRESS SPEED

(RUN – PRESS SPEED)

This feature enables you to adjust speed limits that have been programmed for a selected tool running on a variable speed press. Speed limits apply to all Run operating modes – Continuous, Single-stroke, and Inch. Adjustments are made on the Press Speed Parameters screen, shown in Figure 5-7.

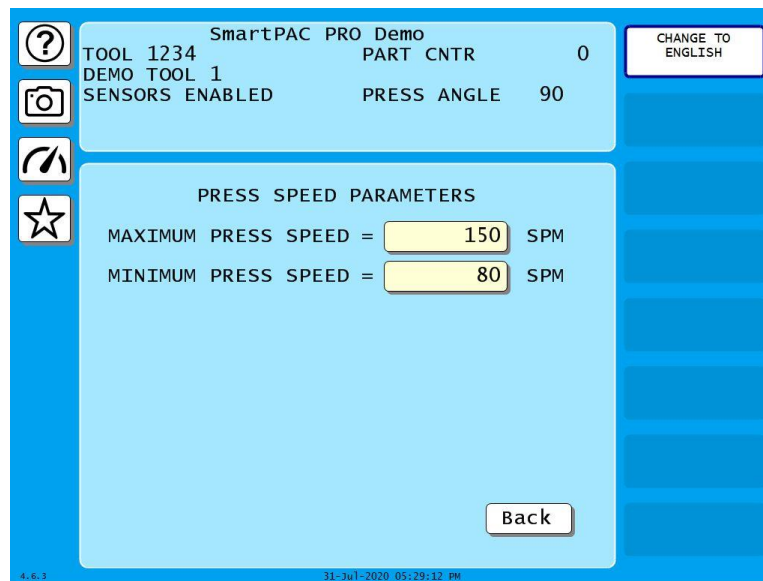


Figure 5-7. Press Speed Parameters Screen

When the speed of the press exceeds the maximum speed limit, SmartPAC PRO stops the press and displays the fault message “Maximum press speed exceeded.” When press speed drops below the minimum speed limit, SmartPAC PRO stops the press and displays the fault message “Minimum press speed exceeded.” These fault messages are documented in *Chapter 8*.

To adjust maximum and minimum press speed limits, do the following:

1. Select PRESS SPEED on the Main Run Menu. The Press Speed Parameters screen displays.

NOTICE**ARE YOU LOCKED OUT?**

Access to items on this screen may be limited to Program mode or may require a password. The security access settings in Initialization mode determine when changes can be made. See *SECURITY ACCESS*, page 98.

2. Select the MAXIMUM PRESS SPEED value. The On-screen keyboard displays.

NOTICE

- The value you enter in the MAXIMUM PRESS SPEED field must be greater than the Minimum Press Speed value. If the Maximum Speed setting is less than or equal to the Minimum Speed value, SmartPAC PRO changes the Maximum Speed to one Stroke per Minute greater than the Minimum Speed.
- To disable speed control, set both Maximum and Minimum Speed values to zero (0).

3. Key in a new value, following the directions in the window, and press ENTER. The window closes, and your change appears in the MAXIMUM PRESS SPEED field.
4. Select the MINIMUM PRESS SPEED value, and key in a new entry in the On-screen keyboard. When the window closes, your change appears in the MINIMUM PRESS SPEED field.
5. When you are finished, Press EXIT to return to the Tool Program Menu.

TOOL INFORMATION

(RUN – TOOL INFORMATION)

This feature allows you to display user-supplied setup or other information about the currently loaded tool.

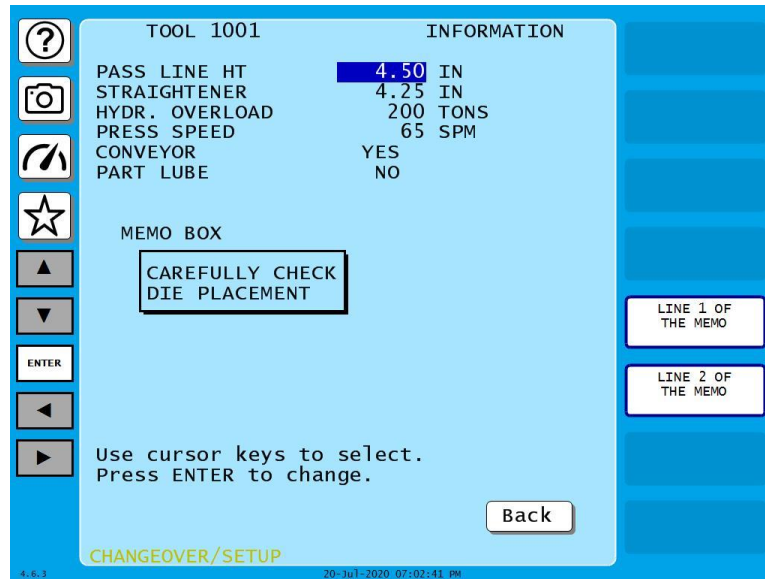


Figure 5-8. Tool Information Screen

If allowed by Security Access, you can change settings in Run Mode

ERROR/EVENT LOG

(RUN – ERROR/EVENT LOG)

This item enables you to view a list, called the Error/Event Log (see Figure 5-9), that displays in reverse chronological order the 200 most recent errors or events that have occurred at within SmartPAC PRO.

The Error/Event Log is useful as a troubleshooting aid. Each time the press is stopped due to a fault, the log records the error message, which gives the reason for the stop, and the stroke count and crankshaft angle at which the stop occurred. When a new tool is loaded, the log displays the tool number. If SmartPAC PRO is connected to a computer network and e-mail is enabled, the log also shows messages sent by SmartPAC PRO. When SmartPAC PRO is networked, you can send the Error/Event Log to Wintriss Tech. Support. Error messages displayed on the Error/Event Log are documented in Chapter 7.

To view the Error/Event Log, do the following:

1. Select ERROR/EVENT LOG on the Main Run Menu to display the Error/Event Log.
2. Press the up and down arrows (▲▼) to scroll through the errors and events. When an error is selected, the full text of the error message is displayed in the blue window at the bottom of the screen.

DATETIME	ANGLE	COUNT	ERROR/EVENT TEXT
06/24/2020 02:21:30	178	19562	S16-SENSOR 8 END OF STOCK sensor has been opened at 178 Deg RED FAULT, This N/C
06/24/2020 02:21:28	178	19562	S16-SENSOR 8 END OF STOCK sensor has been opened at 178 Deg RED FAULT, This N/C
06/24/2020 02:21:27	178	19562	S16-SENSOR 8 END OF STOCK sensor has been opened at 178 Deg RED FAULT, This N/C
06/24/2020 02:21:24	178	19562	S16-SENSOR 8 END OF STOCK sensor has been opened at 178 Deg RED FAULT, This N/C
06/24/2020 02:21:23	N/A	N/A	Dipro sensors disabled
06/24/2020 02:21:21	N/A	N/A	New tool loaded # 1234
06/24/2020 00:44:51	N/A	N/A	Initialization mode entered
06/24/2020 00:32:23	N/A	N/A	Initialization mode entered
06/24/2020 00:32:04	271	19547	S04-BATCH 1 COUNTER PRESET REACHED
06/24/2020 00:31:39	271	19522	S04-BATCH 1 COUNTER PRESET REACHED
06/24/2020 00:31:15	271	19497	S04-BATCH 1 COUNTER PRESET REACHED
06/24/2020 00:30:51	271	19472	S04-BATCH 1 COUNTER PRESET REACHED
06/24/2020 00:30:26	271	19447	S04-BATCH 1 COUNTER PRESET REACHED
06/24/2020 00:30:02	271	19422	S04-BATCH 1 COUNTER PRESET REACHED
06/24/2020 00:29:38	271	19397	S04-BATCH 1 COUNTER PRESET REACHED
06/24/2020 00:29:13	271	19372	S04-BATCH 1 COUNTER PRESET REACHED

Figure 5-9. Error/Event Log

LOAD NEW TOOL

(RUN – LOAD NEW TOOL)

⚠ DANGER

ANCILLARY EQUIPMENT MAY OPERATE WHEN TOOL IS LOADED

Ensure that all personnel stand clear when you load a tool.

Failure to comply with these instructions will result in death or serious injury.

NOTICE

“LOAD NEW TOOL” does not appear on the Main Run Menu if LOAD TOOL # has been set to PROGRAM MODE ONLY on the Security Access Menu in Initialization mode. See SECURITY ACCESS, page 98.

The LOAD NEW TOOL menu selection enables you to load a new tool when the press is stopped. (You cannot load a new tool when the press is running. If you attempt to do so, SmartPAC PRO will display an error message, indicating that the press must be stopped before a tool can be loaded.)

When you select LOAD NEW TOOL, the Tool Manager screen, shown in Figure 5-10, displays.

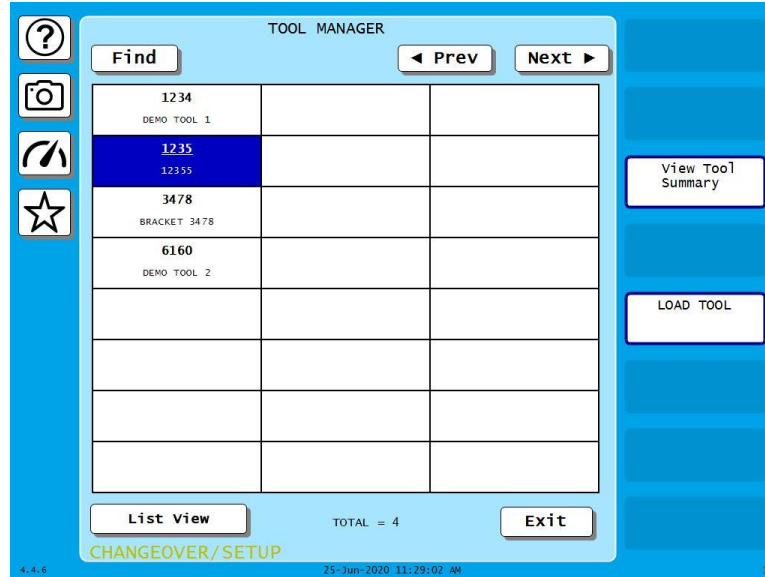


Figure 5-10. Tool Manager Screen

Follow these steps to load a new tool:

1. Select LOAD NEW TOOL from the Main Run Menu. The Tool Manager screen displays.
2. Highlight the tool you want and press LOAD TOOL. A warning window displays, Figure 5-11.



Figure 5-11. Load Tool Warning Window

3. Press OK. A message displays, indicating that the tool is being loaded, then you are returned to the Main Run Menu with the tool you loaded shown in the Status Box.

NOTICE

If an error message displays, go to Chapter 8 and follow the instructions for correcting the problem. If the error is not covered in Chapter 8, or you cannot fix the problem, call Wintriss Tech. Support.

MESSAGING

(RUN – MESSAGING)

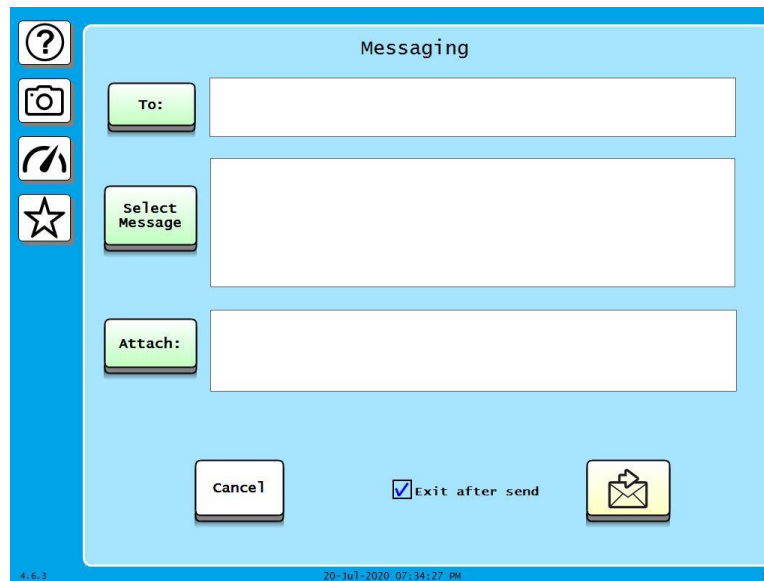


Figure 5-12. Messaging Screen

You can send e-mails from the Run menu. Set up e-mail addresses and predefined messages in Initialization, under SETUP NETWORK. See *SETUP EMAIL*, page 114.

Selecting Recipients

1. On the Run menu press **Messaging**. The Messaging screen appears, Figure 5-12. If you want to stay in the Messaging screen after sending, uncheck the box labeled **Exit after send**.

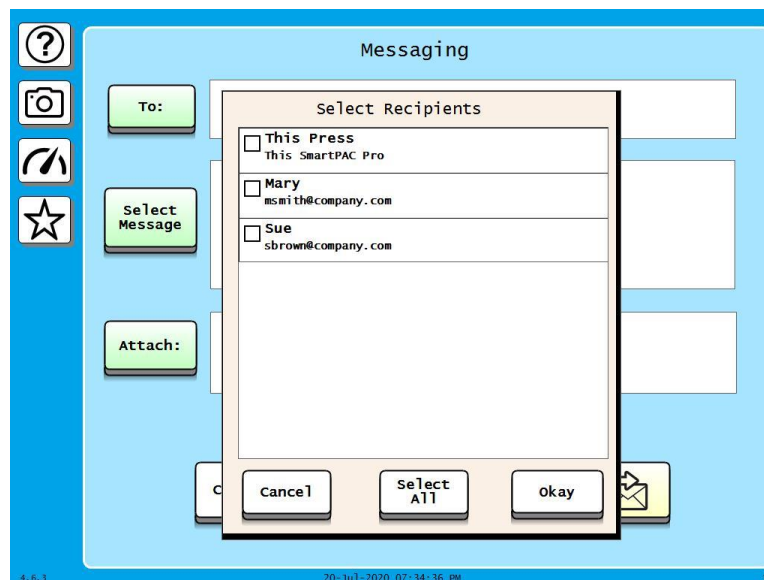


Figure 5-13. Select Recipients

2. Press **To:**. The Select Recipients window opens, Figure 5-13.

3. Press to checkmark the desired recipients.
4. When finished, press **okay** to return to the Messaging screen.

Selecting Message

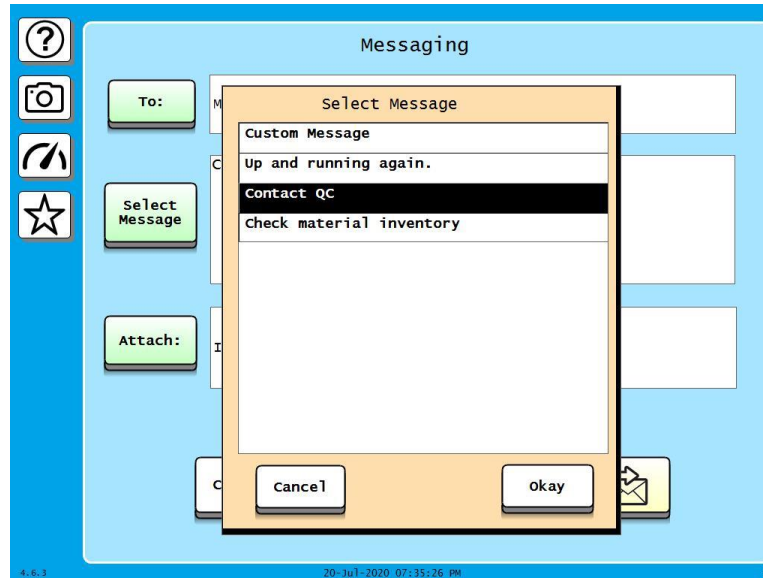


Figure 5-14. Select Message Window

5. Press **Select Message**. The Select Message screen appears, Figure 5-14.
6. Press the desired message to select it or press **Custom Message** to key in a different message.
7. Press **okay**.
 - If you selected a predefined message, you are returned to the Messaging screen.
 - If you selected **Custom Message**, key in the message on the onscreen keyboard and press **Done** to return to the Messaging screen. Then, press **okay**.

Selecting Attachments

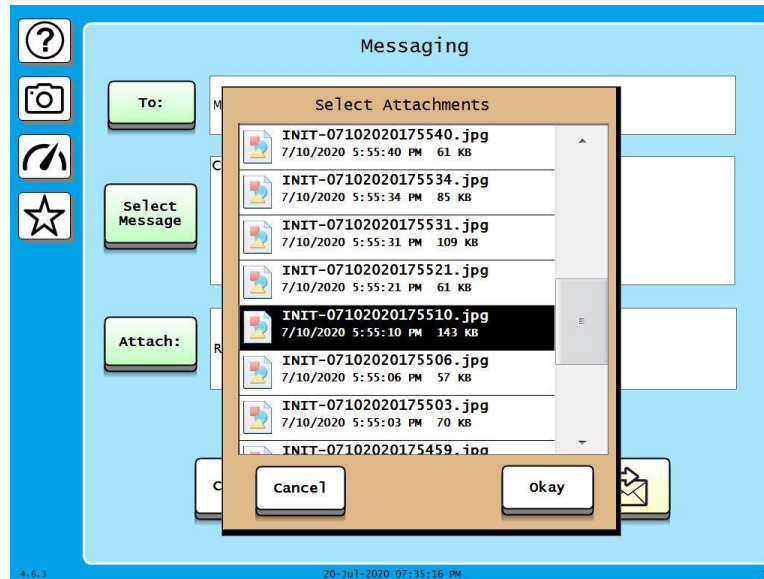


Figure 5-15. Select Attachments Window

8. If you want to attach one file stored on SmartPAC PRO, such as a screen capture or error log entry, press Attach:. A window opens showing the available files.
9. Press the file you want to attach.
10. Press okay.

Sending the Message



Figure 5-16. Sending the Message

When you finish preparing the message, press the send button that shows an envelope and an arrow, circled in Figure 5-16. A message displays: Please wait, sending. . . After sending is complete, Send Success appears. A message sent to This Press appears as a square, yellow note on the screen.

Chapter 6 – Using DiProPAC Die Protection (Optional)

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NOTICE

OPTIONAL MODULES PROCAMPAC AND DIPROPAC INCLUDED IN MANUAL

When you order your SmartPAC PRO, you may include the DiProPAC die protection and/or ProCamPAC programmable cam switch option. This manual includes instructions for installing and using both modules. Remember that they are options and might not be included in your system.

If you ordered SmartPAC PRO with other optional modules such as AutoSetPAC load monitor or ProPAC process monitor, refer to the user manual for that option for complete details on its installation and use.

NOTE ADDED FEATURES FOR DIPROPAC

- Unlimited number of custom names, able to be set in Program mode
- Tool enable mode for each tool can be set in Program mode
- Changes to red and yellow sensors: auto reset, bypass angle, minimum actuation time
- Changes to green (cyclic) sensors: independent ready signals, startup counter for green special, masking,
- Added sensor type: Green Flex
- Sensors disabled indication in all Run mode die protection screens
- "Copy a Sensor" button added

When configured with the DiProPAC option, SmartPAC PRO can monitor up to 32 sensors, to detect malfunctions such as stock buckling, misfeeds, and improper part ejection.

Set timing for sensor inputs (DiProPAC Only). You can specify how you want installed sensors to monitor press operation. Up to 32 sensors can be used, allowing detection of malfunctions such as stock buckling, misfeeds, and improper part ejection.

DiProPAC in Initialization Mode

The following sections show you how to use the selections available on the Main Initialization Menu to set initialization parameters for SmartPAC PRO with DiProPAC.

Sensor Names

DiProPAC provides twelve preset sensor names for you and allows you to create as many custom sensor names as you need. A custom name you create can be for use on a single tool or it can be on a “global” name list available to all tools. See Table 6-1 and *Entering Global Sensor Names*, page 170.

The preset sensor names are

UNNAMED	AIR PRESSURE	END OF STOCK
MATERIAL BUCKLE	MISFEED	MISFEED PILOT
OVER FEED	PART EJECTION	SHORT FEED
SLUG DETECTION	STRIPPER	CYLINDER RETURN

Table 6-1. Sensor Names

Preset names	Custom name, global	Custom name, individual
Use when programming any sensor on any tool	Available for sensors on all tools	Used only on the tool for which it was created.
Preset in the SmartPAC PRO	Create in Initialization mode or in program mode when programming a sensor for a tool	Create in Program mode when programming a sensor for the tool

Entering Global Sensor Names

In Initialization mode, you can create a “global” list of sensor names available to all your tools. In Program mode, you can create sensor names used only with individual tools, or add them to the global sensor name list. See *Naming the Sensor*, page 189.

To enter the global sensor names in Initialization mode, follow the instructions below.

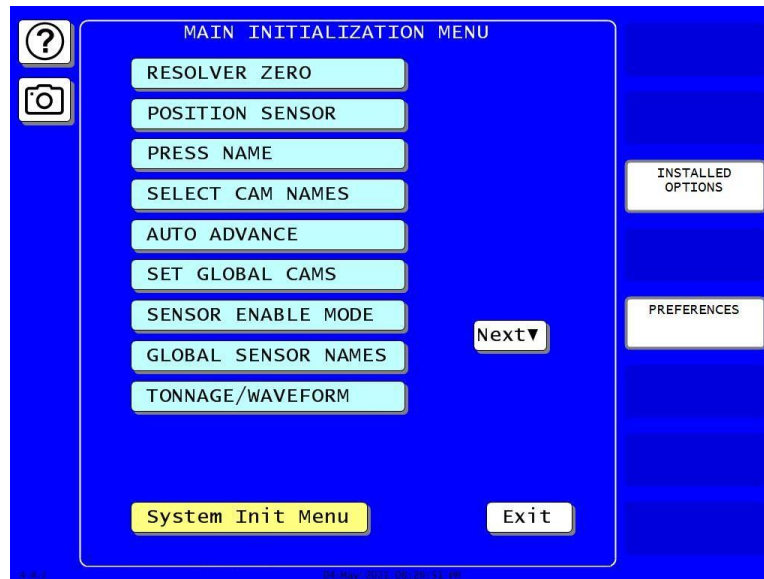


Figure 6-1. Main Initialization Menu

1. In the Main Initialization Menu, press GLOBAL SENSOR NAMES. The Global Sensor Names screen appears. If no global sensor names have been entered, the screen looks like Figure 6-2.



Figure 6-2. Global Sensor Names List, Empty

- To add a new global sensor name, press NEW ENTRY. An entry keyboard appears, Figure 6-3.

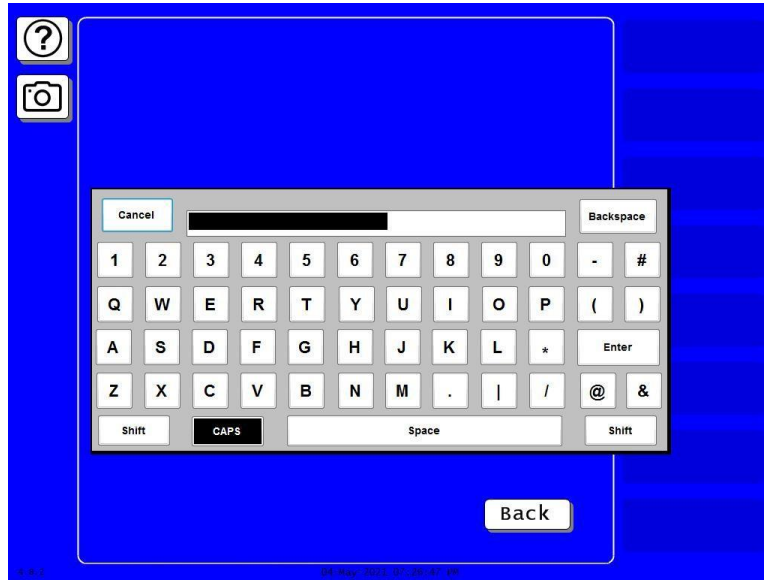


Figure 6-3. Entry Keyboard for Global Sensor Name

- Key in the sensor name you want, as in Figure 6-4. Press Enter when done. The Global Sensor Names screen appears, showing the name you added, Figure 6-5.

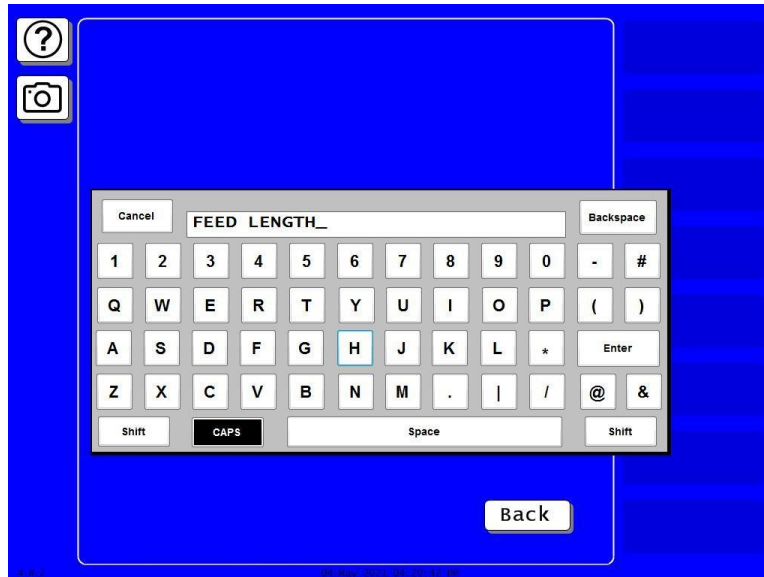


Figure 6-4. Entry Keyboard Showing New Global Sensor Name



Figure 6-5. Global Sensor Names Screen Showing Name Added

Repeat these steps to add the other global sensor names you want to use. You can add an unlimited number of sensor names.

SENSOR ENABLE MODE

SENSOR ENABLE MODE allows you to select the way in which your die protection sensors are enabled. This item also allows you to enable Setup mode if this feature has been wired during installation. You make these settings on the Die Protection Mode Selection Menu, Figure 6-6. You can later change the sensor enable mode for any tool in Program mode (*Selecting Sensor Enable Mode by Tool in Program Mode*, page 175).

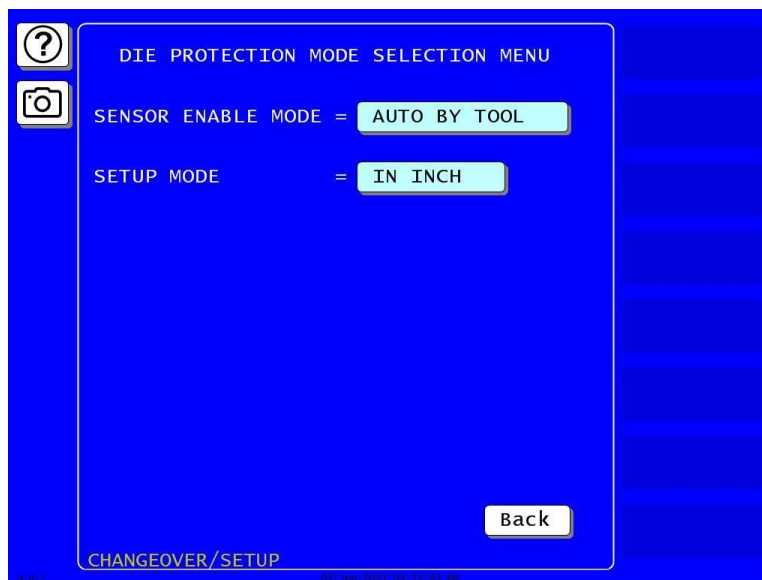


Figure 6-6. Die Protection Mode Selection Menu

Selecting Sensor Enable Mode

You can select one of three modes for enabling die protection sensors:

- **MANUAL ENABLE.** When this option is selected, sensors are not automatically re-enabled after the press is restarted following a setup or other procedure in which the sensors have been temporarily disabled. You must enable or disable sensors manually in Program and Run modes. See *SENSOR ENABLE/DISABLE & STATUS*, page 202, and *DISABLE (ENABLE) SENSORS*, page 204.
- **AUTO BY TOOL.** When this option is selected, DiProPAC automatically re-enables all sensors programmed for a specific tool whenever the press is restarted. You specify in Program mode the number of strokes to allow after the press starts before DiProPAC re-enables all sensors for the tool (see *Setting the “Auto Enable by Tool” Counter Value*, page 191).
- **AUTO BY SENSOR.** When this option is selected, DiProPAC automatically re-enables each sensor programmed for a specific tool, sensor by sensor. You specify in Program mode for each sensor the number of strokes to allow after the press is restarted before DiProPAC re-enables that sensor (see *Setting the Stroke Count for Auto Enable by Sensor*, page 193).

To select a Sensor Enable mode, do the following:

1. Press **SENSOR ENABLE MODE** on the Main Initialization Menu. The Die Protection Mode Selection Menu appears, Figure 6-6.
2. Press the **SENSOR ENABLE MODE** item repeatedly until the setting you want is displayed, then press **Back** to return to the Main Initialization Menu.

Enabling Setup Mode

Setup mode allows you to run the press in Inch without incrementing the good parts and batch counters or triggering a fault condition in the green sensors. This mode, as its name indicates, is used during setup. You enable Setup mode by selecting the Inch setting with the Stroke Select keyswitch on the front panel of the SmartPAC PRO.

NOTICE

To enable Setup mode, your Stroke Select keyswitch must be wired to the Setup mode input, terminal #252 on TB5 (see *Wiring Setup Mode Circuit*, page 77).

To enable Setup mode, do the following:

1. Press **SENSOR ENABLE MODE** on the Main Initialization Menu. The Die Protection Mode Selection Menu displays, Figure 6-6.
2. Press **SETUP MODE** item repeatedly to toggle the setting among **DISABLED**, **IN INCH**, and **IN INCH/INT.STRK** (interrupted stroke). Press **Back** to return to the Main Initialization Menu.

DiProPAC Die Protection in Program Mode

(PROGRAM – TOOL MANAGER – Select Tool – EDIT TOOL – DIE PROTECTION)

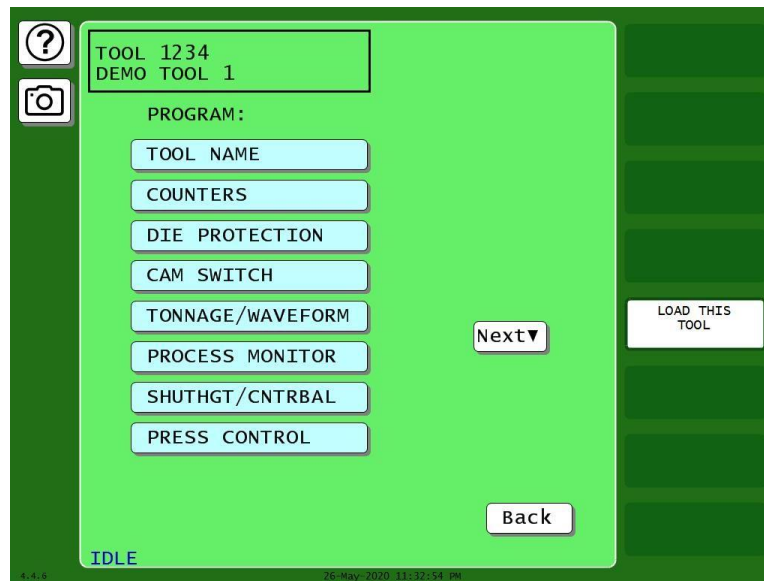


Figure 6-7. Main Program Menu for a Tool

This item appears on the Tool Program Menu only when DiProPAC is installed. It enables you to program up to 8, 16, or 32 die protection sensors. You make settings via the Die Protection Sensor Menu, Figure 6-8.

When this screen opens, it shows eight or sixteen sensors. If you have a 32-sensor unit, press NEXT SENSOR GROUP to open a new screen showing the additional sensors.

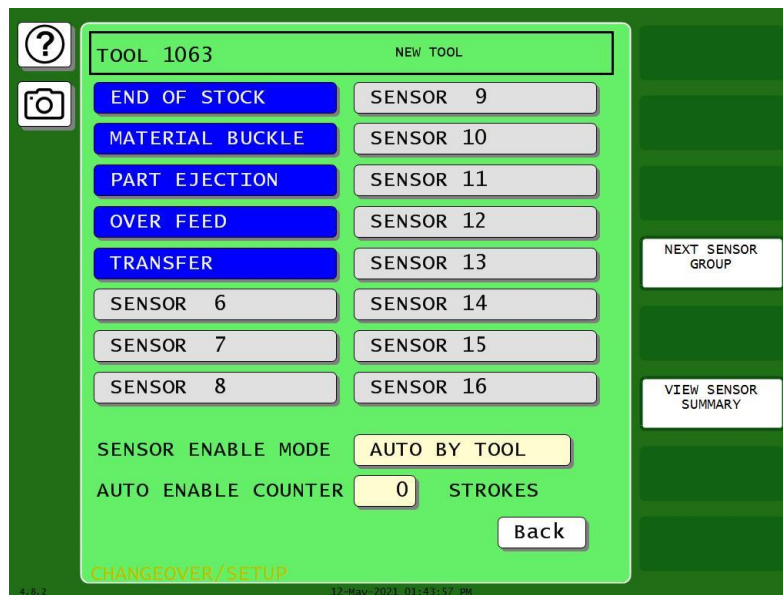


Figure 6-8. Die Protection Sensor Menu for Tool 1063, Sensors 1-16 (DiProPAC 16-sensor option shown. Your display may look different.)

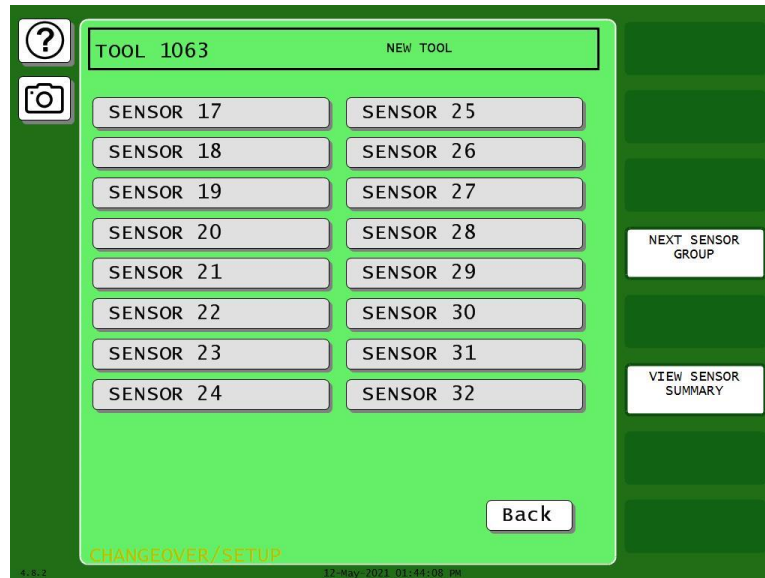


Figure 6-9. Die Protection Sensor Menu for Tool 1063, Sensors 16-32
(DiProPAC 32-sensor option shown. Your unit may not have this screen.)

Selecting Sensor Enable Mode by Tool in Program Mode

The sensor enable mode setting you make in initialization (*SENSOR ENABLE MODE*, page 172) applies to all the sensors on all the tools. If you want to change the enable mode for one or more tools, you can do so in Program mode. Follow the instructions below.

1. In the Die Protection Program screen for the desired tool, Figure 6-10, press the **SENSOR ENABLE MODE** item repeatedly until **AUTO BY TOOL** appears
2. To change the number of strokes for auto enable, press the **AUTO ENABLE COUNTER** item. A numeric entry window appears. Key in the desired number of strokes and press **ENTER**.

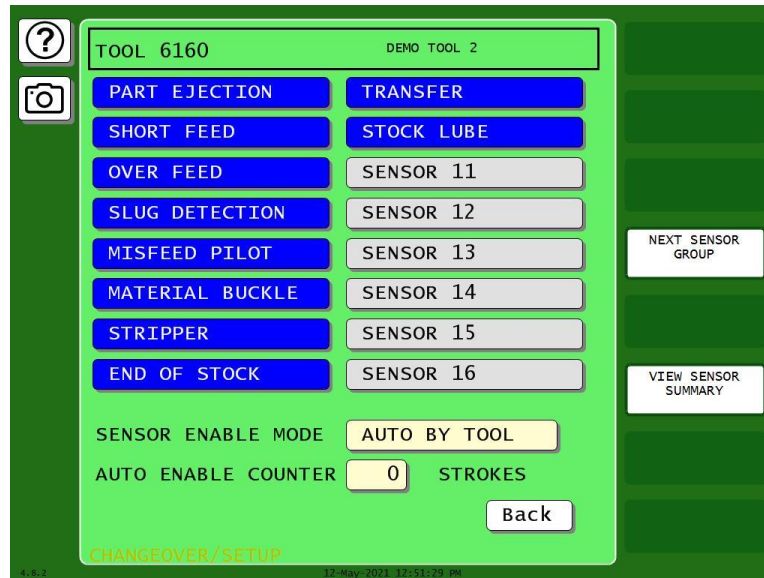


Figure 6-10. Die Protection Tool Programming Screen for Tool 6160 Showing Sensor Enable Mode

Understanding Sensor Terminology

In order to make proper sensor settings on the SmartPAC PRO, you need to be familiar with basic sensor terminology. Some of the terms that appear on the programming screens are explained in the following sections.

Ready Signal

Events such as part ejection, blow-off, or feed advance are expected to occur at certain times during the cycle. The die can be damaged if these events do not occur at the proper angle. The Ready Signal is a timing signal you specify for a sensor to tell the SmartPAC PRO when to expect that sensor to actuate. If the event doesn't occur during this Ready Signal, the SmartPAC PRO stops the press. You set a Ready signal only for green sensors, which monitor events that must occur on every stroke.

Sensor Types

NOTICE

For more detailed information on Sensor Types, visit <https://wintriss.com/wcg/knowledgebase/dieprotection.html>.

Sensors used with die protection systems are classified as red, yellow, or green. For SmartPAC PRO with DiProPAC, there are five types of green sensors – green, green quick check, green constant, green special, and green flex – all of which require an event to occur on every stroke or at least once during a set number of strokes.

When you make settings for a tool, you select the sensor type for each sensor connected to SmartPAC PRO. You can program any combination of reds, yellows, or greens. See *Setting Sensor Type*, page 194, to set the sensor type for your sensors.

Static Sensors: Yellow and Red Sensors

Red and yellow sensors are easy to program: First name the sensor, select Red or Yellow, and select the stop type. Their operation is simple, too: If a Yellow sensor turns On, or a Red sensor turns Off, the press stops. Because these sensors operate independently of the crankshaft, you do not set a Ready signal for them.

Yellow Sensors

Yellow sensors are normally open. When a yellow sensor closes (actuates), SmartPAC PRO sends a Stop command to the press.

Red Sensors

Red sensors are normally closed (actuated). A Stop command is sent to the press whenever a red sensor turns off.

In addition to their basic function, Yellow and Red sensors also offer the following options.

Auto Reset (Static Sensors)

Many hand-fed operations use Red (normally closed) sensors to ensure the part is properly placed in the die. When the part is in place, the Red sensors are “ON”, and the press is allowed to run. However, each time the operator removes the finished part, a fault occurs, requiring the operator to reset the error on every stroke. This isn’t really an error; it’s a normal part of the operation.

For such applications, an “Auto-Reset” function has been added to the static sensors. When Auto Reset is enabled for a sensor, the error is automatically cleared when the sensor input is appropriately satisfied. Under the scenario described above, the sensor would display a fault (and the stop relays would open) when the operator removes the part, but would automatically reset the fault (and close the stop relays) when the new part is properly in place – negating the need for the operator to press Reset before stroking the press.

Under normal operation, the sensors function as they always have. When a fault occurs, the press stops. Fault messages are recorded in SmartPAC PRO’s Event Log, so errors that automatically reset before the operator has a chance to see them can be found in the Event Log.

The Auto Reset capability can be enabled from the sensor’s program summary screen, Figure 6-13. The default setting is OFF.

An additional setting – FAULT REQUIRED / FAULT NOT REQUIRED – is useful when Auto Reset is used for part-in-place sensors. Selecting FAULT REQUIRED ensures that the operator removes the finished part (which generates a fault) each stroke.

When FAULT REQUIRED is enabled, you must specify the timing window during which the error should occur. For hand-fed operations with part-in-place sensors, this is usually a timing window a few degrees on either side of Top Dead Center (0°). See Figure 6-11. FAULT REQUIRED Enabled and Figure 6-12. FAULT REQUIRED Timing Signal for screen shots of this feature.



Figure 6-11. FAULT REQUIRED Enabled

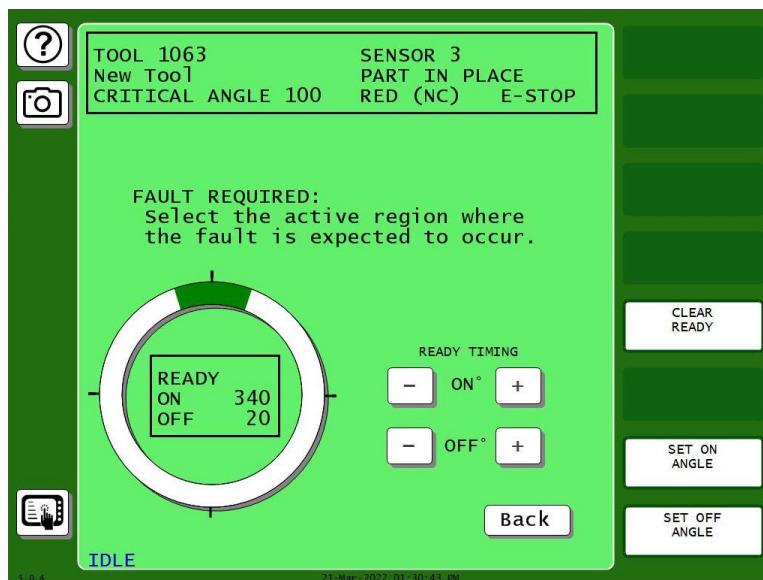


Figure 6-12. FAULT REQUIRED Timing Signal



Figure 6-13. Sensor Program Screen, Auto Reset = OFF

Bypass Angle (Static Sensors)

Sometimes it is useful to use a Bypass Angle to prevent nuisance stops, for example, when using a proximity sensor to monitor material buckle. When the material is near the sensor (not buckled), the sensor is ON, and it is set up as a Red sensor. However, sometimes when the die opens, the material jumps off the sensor enough to cause a nuisance stop.

In such cases, you can program the optional Bypass Angle for Yellow and Red sensors. During the bypass, SmartPAC PRO ignores the sensor, so any fault during that window will not cause a nuisance stop. During the rest of the stroke, SmartPAC PRO monitors the sensor normally.

To set the Bypass Angle, follow these steps:

1. In the Sensor Program Screen, Figure 6-13, press the ADD button for BYPASS ANGLE. The Bypass Angle screen appears.
2. Use one of these ways to set the bypass angle (the portion of the stroke when the sensor is ignored):
 - the plus (+) and minus (–) buttons on the screen
 - SET ON ANGLE and SET OFF ANGLE buttons. Press SET ON ANGLE and key in the ON angle on the keypad that appears. Press Enter. Press SET OFF ANGLE and key in the OFF angle on the keypad that appears. Press Enter.

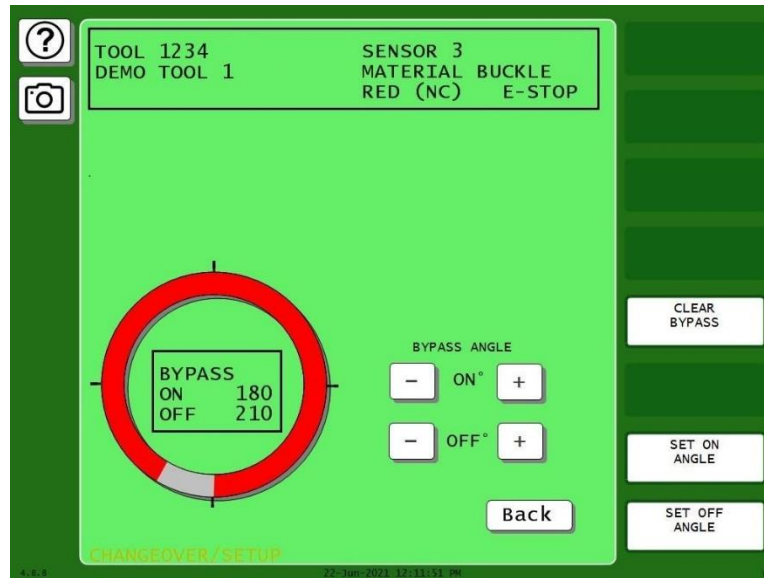


Figure 6-14. A Red Sensor Bypassed from 180° to 210°. Actuations Within That Window Are Ignored.

A Bypass Angle can be added on the sensor program screen, Figure 6-13. The default setting is for no bypass angle. If a bypass angle is required, press ADD to program a bypass window. To remove a previously programmed bypass, press CLEAR BYPASS on the bypass angle programming screen, Figure 6-14. This will remove the bypass window and return the “ADD” button on the sensor programming summary screen.

MINIMUM ACTUATION TIME (Static Sensors)

The Bypass Angle is effective when you know the approximate angle during which a nuisance fault can occur. For applications that experience nuisance faults on static sensors at random times during the stroke, use the Minimum Actuation Time setting. This feature enables the DiProPAC to ignore short actuations of static sensors but will stop the press when a fault persists for longer than the specified minimum actuation time. The value can be set from 10 to 2500 ms. The default value is 0, which turns this feature off.

Set the Minimum Actuation Time in the Sensor Program screen, Figure 6-13.

1. Press the MIN ACTUATION item. A numeric entry window appears
2. Key in the minimum actuation time.
3. Press enter. The Sensor Program screen shows the value you entered.

Cyclic Sensors: Green Sensors

Green sensors monitor cyclic events that must occur during a certain portion of each stroke or intermittently every designated number of strokes. Examples are part ejection, stock feed, and part transfer.

SmartPAC PRO stops the press if a green sensor fails to actuate during its Ready Signal, or if it actuates at the wrong time.

There are five types of green sensors detailed below.

- *Standard Green Sensors*, next section
- *Green Quick Check Sensors*, page 182
- *Green Constant Sensors*, page 182
- *Green Special Sensors*, page 183
- *Green Flex Sensors*, page 184

Masking is an additional modification for most of these green sensors, *Masking*, page 185.

NOTICE

SETTING INDEPENDENT READY SIGNALS FOR GREEN SENSORS.

Previous versions of SmartPAC PRO placed limitations on the setting of ready signals for sensors 17- 32. This is no longer the case. You can give each sensor a different ready signal if you like.

Standard Green Sensors

A standard green sensor must turn on, at least momentarily, at some point during the Ready Signal, and turn off - at least momentarily - at some point outside the Ready signal.

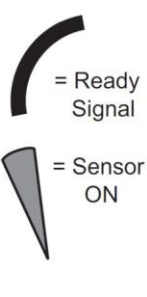
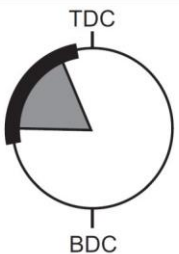
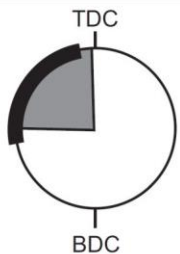
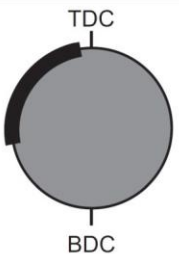
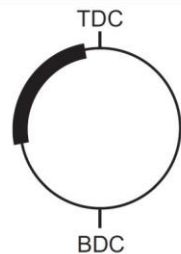
KEY	OK	OK	not allowed (press stops)	not allowed (press stops)
 <p>= Ready Signal</p> <p>= Sensor ON</p> <p>Green Sensor</p>	 <p>Sensor ON only inside ready signal.</p>	 <p>Sensor is ON inside ready signal and stays on for a time after the end of ready signal, but turns OFF before next ready signal.</p>	 <p>Sensor never goes OFF.</p> <p>Stop signal sent at beginning of ready signal.</p>	 <p>Sensor never goes ON.</p> <p>Stop signal sent at end of ready signal.</p>

Figure 6-15. Ready Signal Programming for a “Green” Sensor

Green Quick Check Sensors

A “green quick check” sensor must actuate during the Ready signal and only during the Ready signal. In other words, the sensor must turn on and turn off within the Ready signal.

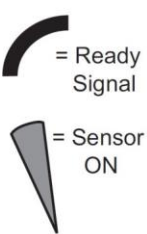
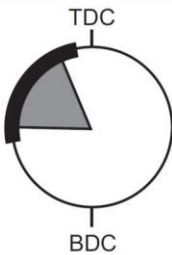
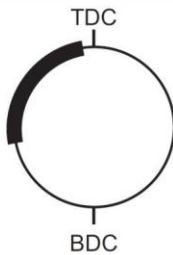
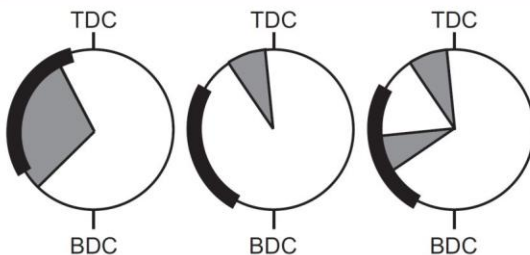
KEY	OK	not allowed (press stops)	not allowed (press stops)
 <p>= Ready Signal</p> <p>= Sensor ON</p> <p>Green Quick Check Sensor</p>	 <p>TDC</p> <p>BDC</p> <p>Sensor goes ON only inside ready signal.</p>	 <p>TDC</p> <p>BDC</p> <p>Sensor never goes ON.</p> <p>Stop signal sent at end of ready signal.</p>	 <p>TDC</p> <p>TDC</p> <p>TDC</p> <p>BDC</p> <p>BDC</p> <p>BDC</p> <p>Sensor is ON outside ready signal.</p> <p>Stop signal sent when sensor is ON outside ready signal.</p>

Figure 6-16. Ready Signal Programming for a “Green Quick Check” Sensor

Green Constant Sensors

When you set a sensor input to “green constant,” the sensor must turn on before the Ready signal begins and turn off after the Ready signal ends, remaining actuated continuously during the entire Ready signal.

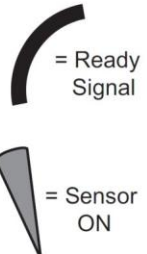
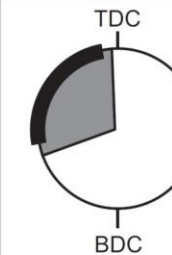
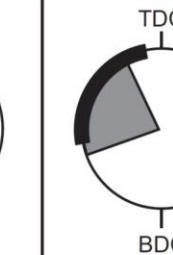
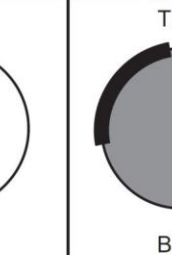
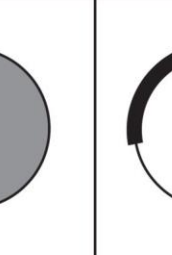
KEY	OK	not allowed (press stops)	not allowed (press stops)	not allowed (press stops)
 <p>= Ready Signal</p> <p>= Sensor ON</p> <p>Green Constant Sensor</p>	 <p>TDC</p> <p>BDC</p> <p>Sensor stays ON during entire ready signal and goes OFF at least momentarily outside the ready signal.</p>	 <p>TDC</p> <p>BDC</p> <p>Sensor goes OFF before ready signal ends.</p> <p>Stop signal sent immediately.</p>	 <p>TDC</p> <p>BDC</p> <p>Sensor never goes OFF outside ready signal.</p> <p>Stop signal sent at beginning of ready signal.</p>	 <p>TDC</p> <p>BDC</p> <p>Sensor never goes ON.</p> <p>Stop Signal sent at end of ready signal.</p>

Figure 6-17. Ready Signal Programming for a “Green Constant” Sensor

Green Special Sensors

Settings: Special [stroke] count and Startup [stroke] count

Green special sensors are designed to detect events – such as slug ejection/stacking – that occur intermittently while the machine runs, but not necessarily on every stroke.

Slug stacking cannot be monitored with a standard green sensor unless the slugs eject on every cycle. A red or yellow sensor is equally ineffective because the sensor changes state whenever a slug is ejected.

Instead of actuating once per stroke like a typical green sensor, **the green special sensor must actuate at least once during a preset number of strokes**. Rather than setting a Ready signal, you set the maximum number of strokes that the press can make without the sensor actuating. If needed, you can also set a number of strokes to elapse before the green special starts its first monitoring cycle.

For example, if your die clears the slugs from a particular ejection hole approximately every four strokes, set a Green Special sensor input for a five-stroke window. If no slugs are ejected after five strokes, SmartPAC PRO sends a Stop command to the press.

In some applications, you need to delay the monitoring of a Green Special sensor upon startup. For example, when a sensor is using the green special sensor type to monitor parts or slugs coming out of the press on a conveyor. You might want to verify that something is coming out of the press every 5th stroke, but it takes ten strokes after startup for the first part to reach the end of the conveyor where the sensor is located.

In this example, set the Green Special counter to 5, and the startup counter to 10 (Figure 6-18).

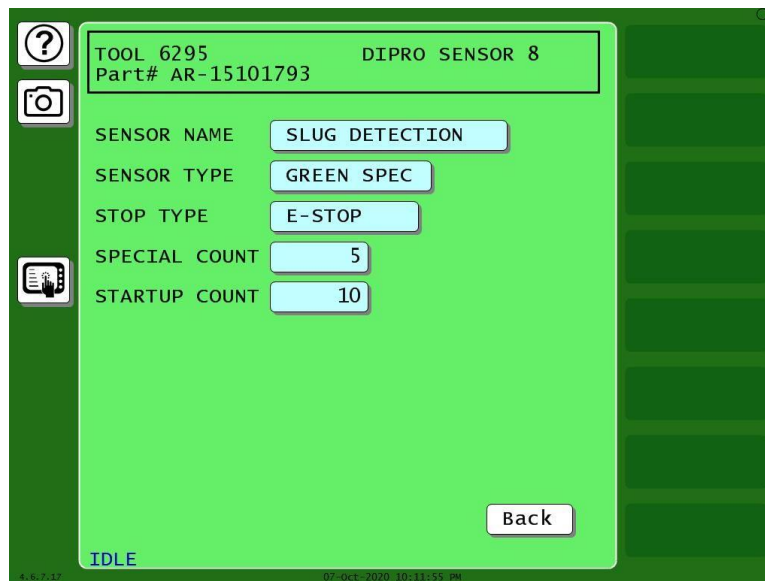


Figure 6-18. Green Special Sensor with Startup Counter = 10

Green Flex Sensors

The Green Flex Sensor is a versatile cyclic sensor monitoring type. In addition to the standard green (cyclic) sensor requirements – i.e. it must turn on sometime during the ready signal and turn off somewhere outside the ready signal – there are four new conditional options:

- You can specify the required state of the sensor at the start of the ready window. The choices are “Sensor must be ON”, “Sensor must be OFF”, or “Sensor can be either ON or OFF”.
- You can specify the required state of the sensor at the end of the ready window. The choices are “Sensor must be ON”, “Sensor must be OFF”, or “Sensor can be either ON or OFF”.
- You can set the sensor to require a specific number of actuations inside the ready window. You have the option of requiring either the exact number of actuations (pulses) specified, or *at least* the number of pulses specified.
- The masking feature is included, *Masking*, page 185.

Examples of how to use the Green Flex sensor:

Feed detection on a higher speed press.

In this case, the end of the ready signal is used to verify that the strip has fully fed, and the start of the ready signal is used to detect feed slippage at the start of the feed on the next cycle. Using the Green Flex sensor type, set it so the sensor “Must be OFF” at the start of the ready (to verify that the feed started) and “Must be ON” at the end (to verify that the strip fed).

Set the ready signal OFF angle for when the feed cycle is supposed to finish, and set the ON angle for shortly after the feed is supposed to start on the next stroke, so if the feed slips at the start of the feed cycle (by far the most likely time for it to happen), the press can be stopped while there’s still time.

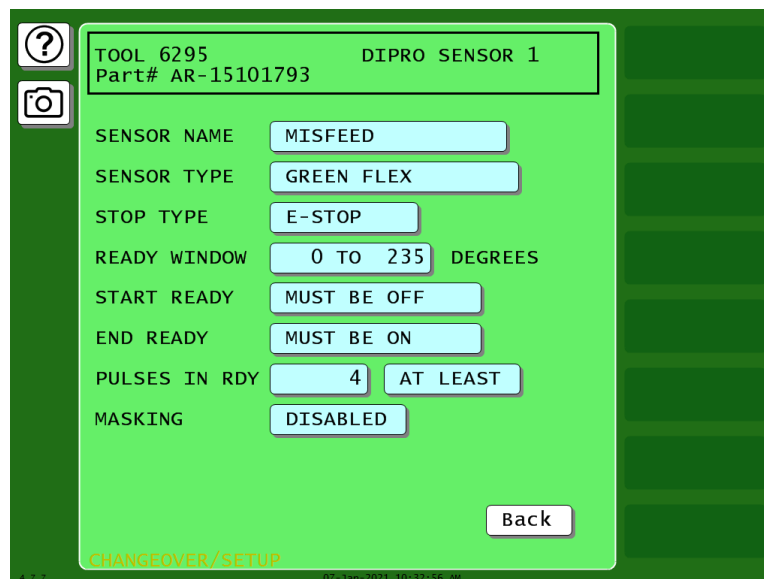


Figure 6-19. Sensor Program Screen for a Green Flex Sensor

Preventing error in sensing strip feed

In some dies, there are several strip features that actuate a sensor as they pass by during the feed. For example, if the part has a row of four holes, the last of which is being used to indicate full feed progression, you can set the sensor to be a Green Flex, set the number of required pulses to 4, and set it so that it “Must be ON” at the end of the ready signal.

The feed must fully advance for this sensor input to be satisfied.

Masking

It is occasionally necessary to use die protection sensors to monitor events that occur regularly but not on every stroke. Applications that use gaggging, zig-zag feeds, or where multiple cycles are needed to produce a part include events that need to be monitored on certain cycles and ignored on others.

A new “masking” feature is available on all green sensor types (except the Green Special). The masking feature is not part of the normal programming “flow” for the green sensors. Instead, it shows up as a selection on the sensor program screen. The default is “DISABLED”. When masking is disabled, the green sensor is monitored on every stroke.

Here is an example of how the masking feature might be used:

A part requires four press cycles to be produced. On the fourth cycle, a cutoff punch is gagged in, and the finished part is cut off the strip and falls onto a conveyor. The part ejection sensor detects the part as it drops onto the conveyor during the upstroke.

If an unmasked standard Green sensor type is used for this application, it would generate an error on three out of four cycles, so masking is required. The ready signal is set to ON at 213° and OFF at 318°, and the sensor is set to emergency stop the press when a fault is detected.

Here’s how the masking would be used for this application:

1. On the sensor program screen (Figure 6-20), enable masking by pressing the button next to MASKING to change from DISABLED (the default) to ENABLED. Three new selections appear: MONITOR FOR, MASK FOR, and PRELOAD (Figure 6-21).
2. To set the order of masking and monitoring, press SWITCH ORDER OF MONITOR/MASK” to change between monitoring first and masking first.
3. In the example application, four strokes are required to make the part, with the part being cut off on the fourth stroke, so set the masking to MASK FOR 3 Strokes, MONITOR FOR 1 Strokes, with 0 PRELOAD strokes, Figure 6-21.



Figure 6-20. Sensor Program Screen showing the Masking feature disabled (default setting)



Figure 6-21. Standard Green Sensor Type with Masking Enabled.

This sensor will check for part ejection every fourth stroke.

Programming Sensor Settings

Setting Enable Mode

In initialization you may have set a global enable mode that applies to all tools, *Entering Global Sensor Names*, page 170. In Program mode, you can change it for each tool, if you want. The options are

- MANUAL ENABLE – You manually enable sensors in Run mode
- AUTO BY TOOL – All sensors for this tool are enabled after the number of strokes you specify
- AUTO BY SENSOR – Each sensor is enabled after the number of strokes you set for it.

On the tool's Sensor List screen, at the bottom, the enable mode is the one set in Initialization. To change it, press the button next to SENSOR ENABLE MODE. As you press it repeatedly, it changes the enable mode.

- If you select MANUAL ENABLE, no further action is needed.
- If you select AUTO BY TOOL, below the sensor names, enter the number of strokes after which the sensors are enabled. Press the box next to AUTO ENABLE COUNTER and key in the number of strokes. Then, press Enter.
- If you select AUTO BY SENSOR, when you program each sensor, enter a number of strokes into the AUTO ENABLE COUNTER for each it. If you do not enter a number of strokes, the auto enable count defaults to zero.

COPY A SENSOR

To program a sensor, first you select the input, then name the sensor, then select the sensor type. There is now a COPY SENSOR function button on the sensor type selection screen. When selected, a list of previously programmed sensors shows up. Simply select an existing sensor from the list and the new sensor will copy the rest of the settings from the previously programmed sensor (except the name).

This is different than a “linked” sensor (like we used to use for sensors 17-32) in that the newly copied sensor can be adjusted independently from its “parent” sensor.

This feature is a timesaver in applications like stripper position detection and transfer, where many sensors share the same sensor type, timing, and stop type settings.



Figure 6-22. The Sensor Type Screen Showing COPY A SENSOR



Figure 6-23. This Tool's Previously Programmed Sensors from Which You Can Copy the Timing and Stop Type

On the Die Protection Sensor Menu, you select a sensor to program and then enter settings for the sensor: name, sensor type, stop type, and, if applicable, ready window or special count. The settings you enter determine which screens display, and programming for each sensor is likely to use a slightly different series of screens. The following sections show you how to make these sensor program settings:

- Assign a name to each sensor, and enter custom sensors, page 189.
- *Setting the “Auto Enable by Tool” Counter Value*, page 191, or *Setting the Stroke Count for Auto Enable by Sensor*, page 193
- Set the sensor type (i.e., red, yellow, green, etc.), page 194.
- Set stop type (i.e., Emergency Stop, Top Stop, and Smart Stop), page 195.
- Set the critical angle for a sensor programmed as Smart Stop, page 196.
- Set the Ready signal for a green sensor, page 198.
- Set the stroke count for a green special sensor (page 199).
- Change sensor settings (page 200).
- View the sensor summary (page 201).
- Delete sensors (page 201).

Naming the Sensor

While you are programming a tool, you can select a name for each sensor.

1. In the Program mode main screen, press TOOL MANAGER. The Tool Manager screen appears.
2. Press the tool you want to program to highlight it. Press EDIT TOOL. The Tool Program screen appears.
3. Press DIE PROTECTION. The tool’s sensor list appears.

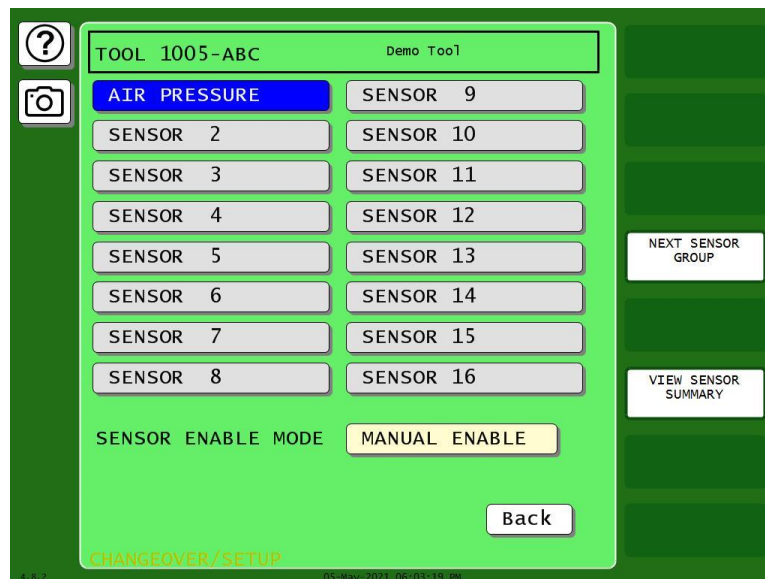


Figure 6-24. Sensor List for a Tool

4. Press the Sensor number you want to program. A list of names appears, including the preset names and any global sensor names you have previously entered (*Entering Global Sensor Names*, page 170). Use the scroll bar at right to move up and down the list.

- If you want to use one of those names, press it. The sensor type screen appears. Go to *Setting Sensor Type*, page 194.
- If you want to enter a new sensor name, press NEW ENTRY. The New Sensor Name Entry Keyboard appears. Go to step 5.

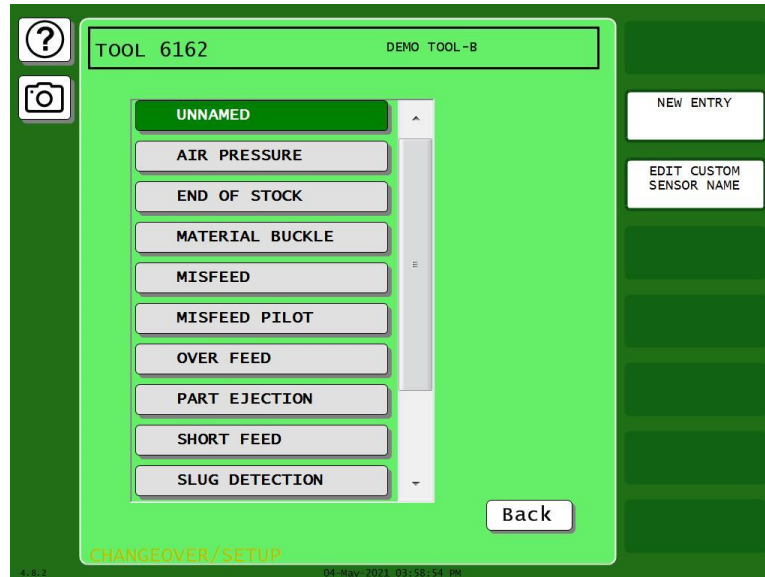


Figure 6-25. Sensor Name List

5. Key in the sensor name you want, up to 20 characters. Press Enter. A confirmation window opens (Figure 6-27).

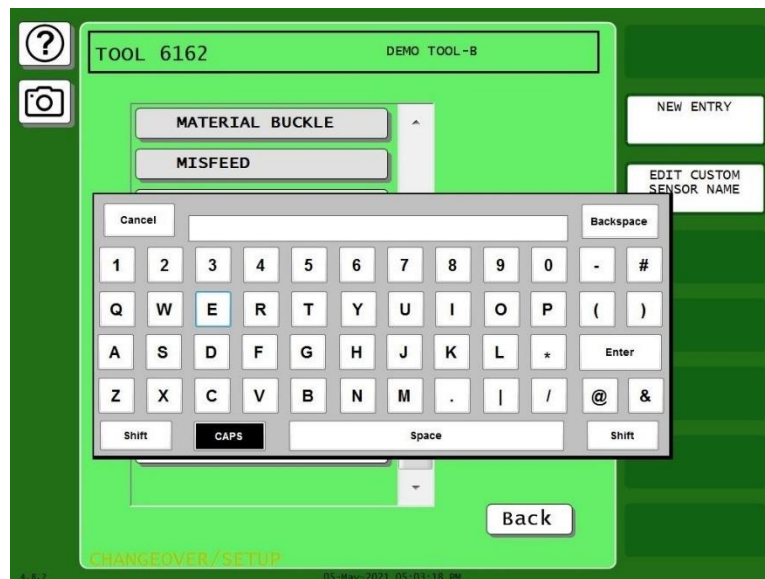


Figure 6-26. New Sensor Name Entry Keyboard

6. The confirmation window asks if you would like to add the new name to the global sensor name list.
 - If you want to add it to the list, press YES.
 - If you do not want to add it to the list, press NO.



Figure 6-27. Confirmation Window for Adding Name to Global List

Setting the “Auto Enable by Tool” Counter Value

If you have set Sensor Enable Mode in Initialization to AUTO BY TOOL (see *Programming Sensor Settings*, page 187), you must set the Auto Enable by Tool counter when you first access the Die Protection Sensor Menu. The Auto Enable by Tool counter specifies the number of strokes the press must make before all sensors in the tool are re-enabled following a DISABLE SENSORS command. See *SENSOR ENABLE/DISABLE & STATUS*, page 202, and *DISABLE (ENABLE) SENSORS*, page 204.

To set the Auto Enable by Tool counter, do the following:

1. Select DIE PROTECTION on the Tool Program Menu. The Die Protection Sensor Menu displays, page Figure 6-28, with the AUTO ENABLE COUNTER field at lower left of the screen.

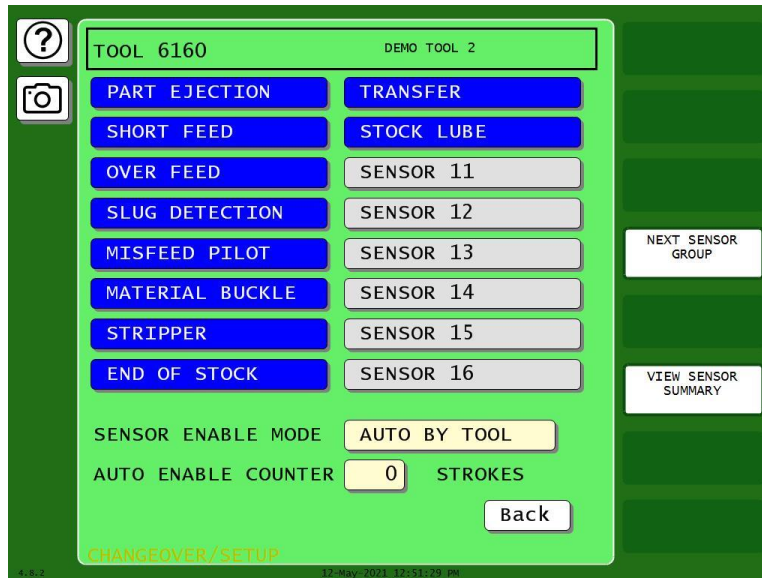


Figure 6-28. Die Protection Sensor Menu with Auto Enable by Tool Counter

2. Select the AUTO ENABLE COUNTER field. The Numeric Entry window displays.
3. Key in the value you want (maximum is 99) and press ENTER. The value displays in the AUTO ENABLE COUNTER field.
4. Press the button for the sensor you want to program.
 - If that sensor has not been programmed, SmartPAC PRO walks you through the programming steps as described in the following sections.
 - If that sensor has already been programmed, the Sensor Program screen appears, Figure 6-29. Press the item you want to change, make the change, and then press Back to return to the Sensor Program screen. Press Back when you have finished making changes to the sensor.



Figure 6-29. Sensor Program Screen (for Previously Programmed Sensors)

Setting the Stroke Count for Auto Enable by Sensor

After you enter a sensor name, if Sensor Enable Mode is set to AUTO BY SENSOR in Initialization (see page 172), the Auto Enable by Sensor Stroke Count screen displays, Figure 6-30.

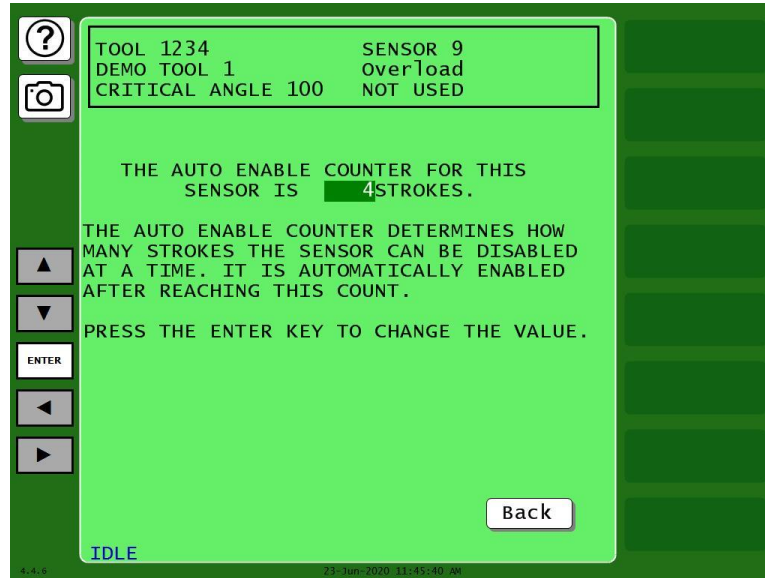


Figure 6-30. Auto Enable by Sensor Stroke Count Screen

This screen allows you to set the Auto Enable by Sensor counter, which specifies the number of press strokes necessary to re-enable the sensor following a `DISABLE SENSORS` command. See *SENSOR ENABLE/DISABLE & STATUS*, page 202, and *DISABLE (ENABLE) SENSORS*, page 204.

To set the Auto Enable by Sensor counter, do the following:

1. On the Auto Enable by Sensor Counter screen, press Enter. A Numeric Entry window displays.
2. Key in the value you want (maximum is 99) and press Enter. This saves the number of strokes value you entered. The Sensor Type screen appears; see next section.

Setting Sensor Type

After you select a sensor name and, if AUTO ENABLE BY SENSOR is the Initialization setting, specify the Auto Enable stroke count, the Sensor Type screen, Figure 6-31, displays with the name you selected for the sensor shown at the right of the Status Box beneath the sensor number.



Figure 6-31. Sensor Type Screen

You can select one of six types of sensor (see *Setting Sensor Type*, page 194, for details), or you can select NOT USED, in which case that sensor is not programmed for the tool.

To set the sensor type, do the following:

Press to select the sensor type you want. The Sensor Stop Type screen appears (see next section).

If you select NOT USED, you are returned to the Die Protection Sensor Menu, Figure 6-28, and the name of the sensor you started to program is reset to SENSOR 1, SENSOR 2, etc.

Setting the Sensor Stop Type

When you select a sensor type, the Sensor Stop Type screen displays, Figure 6-32. The Sensor Stop Type screen allows you to specify how the press is to be stopped when the die protection sensor detects a fault.



Figure 6-32. Sensor Stop Type Screen

Select one of three Stop Type settings for the sensor: emergency stop, top stop, or smart stop, described below.

- Emergency Stop (E-Stop):** SmartPAC PRO stops the press as soon as a sensor fault is detected. You should use this setting for any die-threatening event that occurs before the critical angle, the point in the crankshaft rotation after which a stop signal to the press cannot prevent the die from closing. A typical Emergency Stop application is a sensor that monitors part ejection on the upstroke. Setting this sensor to an Emergency Stop ensures that the ram will stop on the next stroke before the die closes.
- Top Stop:** SmartPAC PRO stops the press at the top of its stroke after a sensor fault is detected. You should use this setting for events that do not threaten the die or that occur between the critical angle and bottom dead center (BDC). A typical Top Stop application is a sensor that monitors a feed like a roll feed that takes place well into the downstroke. Setting this sensor to a Top Stop ensures that the press does not stick on the bottom as a result of a stop signal being sent just as the ram is about to contact the material.
- Smart Stop:** SmartPAC PRO performs either a Top Stop or Emergency Stop depending on the angle at which the sensor fault is detected. SmartPAC PRO top-stops the press if the fault is detected after the critical angle but before bottom dead center (BDC). If the fault is detected after BDC but before the critical angle, SmartPAC PRO performs an emergency stop. A typical Smart Stop application is a sensor that monitors short feeds, which can occur either before or after the critical angle. When you select SMART STOP as the stop type, you must specify the critical angle.

NOTICE

If your press is equipped with hydraulic overload protection, the risk of sticking the press on bottom is negligible. Selecting E-stop for ALL die-threatening events – even those that occur between the critical angle and BDC – will help to minimize die damage.

To set the stop type for a sensor, do the following:

On the Sensor Stop Type screen, select the stop type you want (i.e., EMERGENCY STOP, TOP STOP, or SMART STOP).

- If you select SMART STOP and the critical angle has not yet been set, you are taken to the Critical Angle Programming screen (see next section).
- If you select EMERGENCY STOP or TOP STOP and the sensor you are programming is a Green, Green Quick Check, or Green Constant sensor, you are taken to the Ready Signal Programming screen (see *Setting the Ready Signal for a Green Sensor*, page 198).
- If you selected EMERGENCY STOP or TOP STOP and the sensor you are programming is a Green Special sensor, you are taken to the Green Special Sensor Stroke Count screen (see *Setting the Counter Value for a Green Special Sensor*, page 199).
- If you select EMERGENCY STOP or TOP STOP and the sensor you are programming is a red or yellow sensor, you are finished, and the Sensor Settings screen displays, on which all your programmed sensor settings are shown (see *Viewing and Changing Sensor Settings*, page 200).

Setting the Critical Angle for a Sensor Set to SMART STOP

When you program a sensor for a Smart Stop, you must also set the critical angle SmartPAC PRO uses to determine whether an Emergency Stop or Top Stop command is sent to the press. The critical angle you program for the first sensor set to Smart Stop is used as the critical angle for all sensors set to Smart Stop for that tool. If you change the Critical Angle setting for one Smart Stop sensor, the new critical angle is applied to all Smart Stop sensors for that tool.

To set the critical angle for the first sensor set to SMART STOP for a tool, do the following:

1. On the Sensor Stop Type screen, select SMART STOP. The Critical Angle Programming screen displays, Figure 6-33.
2. Decrement the CRITICAL ANGLE default value of 185°, using the Down (▼) cursor key, until the value you want is displayed. SmartPAC PRO accepts Critical Angle values between 0° and 184°.
3. Press Enter when you are done.
 - If the sensor you are programming is a Green, Green Quick Check, or Green Constant sensor, the Ready Signal Programming screen displays (see next section).
 - If the sensor you are programming is a red or yellow sensor, you are finished, and you are taken to the Sensor Settings screen (see *Viewing and Changing Sensor Settings*, page 200).

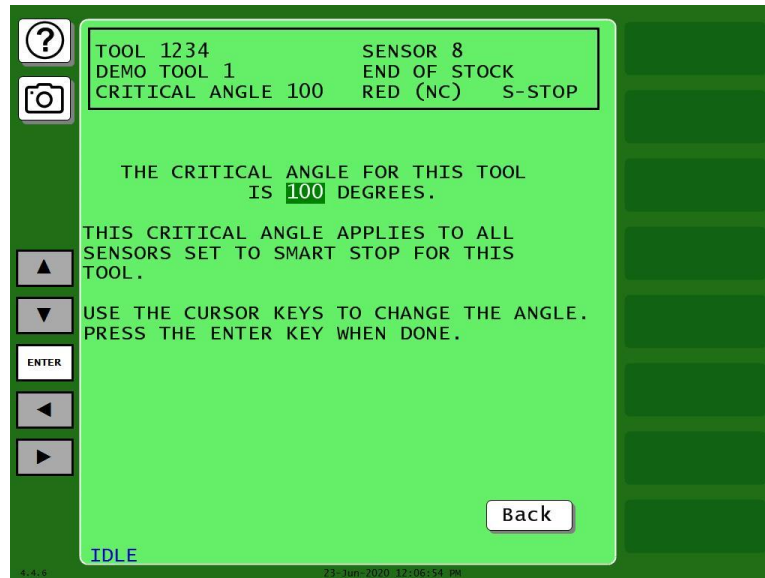


Figure 6-33. Critical Angle Programming Screen

NOTICE

The Critical Angle default of 185° cannot be used as your Smart Stop critical angle setting. If you attempt to enter 185° as the critical angle, a window will open, asking you to enter a different value.

After you have programmed one or more Smart Stop sensors, you can change the critical angle by performing these steps:

1. On the Die Protection Sensor Menu, select a sensor programmed as Smart Stop. The Sensor Settings screen displays, Figure 6-29, page 192.
2. Select SMART STOP. The Sensor Stop Type screen displays with SMART STOP highlighted.
3. Press Set Critical Angle to display the Critical Angle Programming screen.
4. Change the Critical Angle setting, using the Up (▲) and Down (▼) cursor keys.

Setting the Ready Signal for a Green Sensor

After you select the stop type for a Green, Green Quick Check, Green Constant, or Green Flex sensor, the Ready Signal Programming screen displays, Figure 6-34.

The Ready signal is the timing window during which the sensor must actuate to prevent SmartPAC PRO from sending a stop signal to the press. The example below shows the Ready signal On at 260° and Off at 20°.

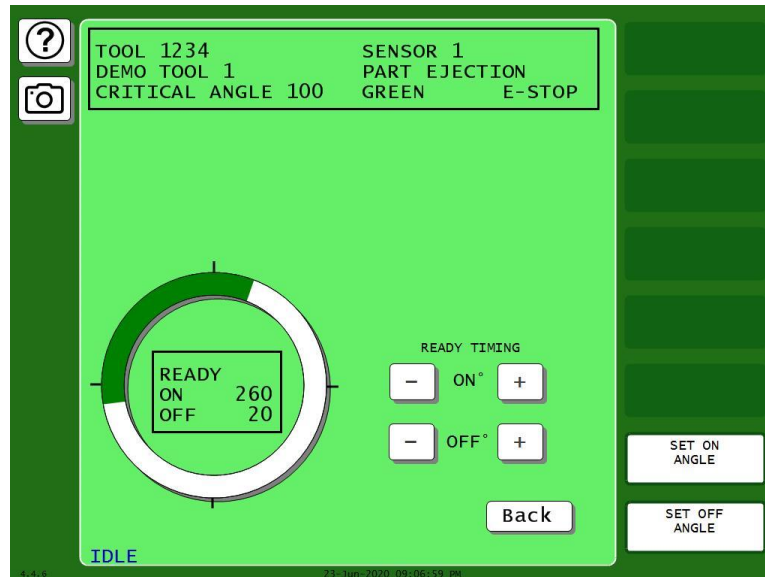


Figure 6-34. Ready Signal Programming Screen

To set the Ready signal, use either the plus and minus buttons or the buttons labelled SET ANGLE ON and SET ANGLE OFF, as follows:

1. Set the Ready On angle:
 - Press the plus and minus (+/-) buttons to adjust on angle shown inside the clock display circle to the desired value.

OR

 - Press SET ON ANGLE. A numeric entry window opens. Key in the desired ON angle and press Enter.
2. Set the Ready OFF angle in a similar way.
3. When you have finished setting the Ready On and Ready Off angles, press Back. The Sensor Program screen displays, showing the sensor settings you made, Figure 6-29, page 192.
4. If you want to change any settings, refer to *Viewing and Changing Sensor Settings*, page 200.

Otherwise, press Exit to return to the Die Protection Sensor Menu. The highlight bar automatically scrolls down to the next sensor displayed on the menu.

Setting the Counter Value for a Green Special Sensor

When you select GREEN SPECIAL as the sensor type, the Green Special Sensor Stroke Count screen displays, Figure 6-35. On this screen, you set the number of strokes that the press can make before the Green Special sensor must actuate.



Figure 6-35. Green Special Sensor Stroke Count Screen

NOTICE

For more information about Green Special sensors, refer to *Understanding Sensor Terminology*, page 176.

To set the Green Special sensor stroke count, do the following:

1. Press the box next to the word STROKES. A numeric entry window appears.
2. Key in the desired stroke count (maximum value is 99). Press Enter.
3. Press Back. The Sensor Program screen displays, Figure 6-29, page 192, showing the settings you made.
 - If you want to change any of the settings, refer to Viewing and Changing Sensor Settings (next section).
 - Otherwise, press Back again to return to the Die Protection Sensor Menu.

Viewing and Changing Sensor Settings

When you finish making settings for a sensor, you are taken to a screen like the one shown in Figure 6-36, which displays all the settings for the sensor.



Figure 6-36. Sensor Program Screen

This screen is also displayed whenever you select a previously programmed sensor on the Die Protection Sensor Menu.

To change sensor settings, do the following:

1. On the Die Protection Sensor menu, Figure 6-29, press the setting you want to change. The screen on which that setting is programmed displays. For example, if you select the **SENSOR NAME** setting, the Sensor Name List screen displays, Figure 6-25, page 190.
2. Change the setting on the displayed screen, and press back when you are finished to return to the Sensor Program screen.
3. Repeat steps 1 and 2 for each setting you want to change.
4. Press Back when you have finished to return to the Die Protection Sensor Menu.

Viewing the Sensor Summary

You can view a summary of the settings that have been made for all programmed sensors shown on the Die Protection Sensor Menu, including the critical angle that has been set for the tool. To view the summary, do the following:

On the Die Protection Sensor Menu, press VIEW SENSOR SUMMARY. The Sensor Summary screen displays, Figure 6-37. This screen shows the sensor name, sensor type, stop type, and the Ready signal On and Off angles (if applicable) for all of the programmed sensors. It also shows the stroke count for green special and the number of strokes during the ready angle for green flex.



Figure 6-37. Sensor Summary Screen

Deleting a Sensor

To delete a Die Protection sensor, do the following:

1. On the Die Protection Sensor Menu, select the sensor you want to delete. The Sensor Settings screen displays.
2. Select the Sensor Type. The Sensor Type screen appears.
3. Select NOT USED. You are returned to the Die Protection Sensor Menu with the name of the sensor you selected in step 1 removed and a caption specifying the sensor number (e.g., SENSOR 1, SENSOR 2, etc.) displayed.

SENSOR ENABLE/DISABLE & STATUS

This item, which appears on the Main Program Menu only when DiProPAC is installed, enables you to view the status of your die protection sensors, enable or disable all the sensors shown on the screen, and turn a selected sensor On or Off. You perform these tasks on the Sensor On/Off Status screen, Figure 6-38.

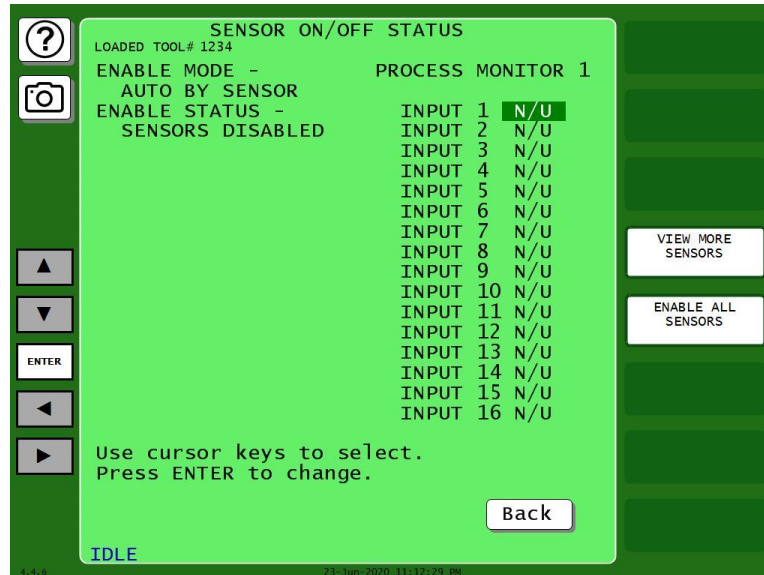


Figure 6-38. Sensor On/Off Status

Viewing Sensor Status

To view the status of your sensors, do the following:

1. Press **SENSOR ENABLE/DISABLE & STATUS** on the Main Program Menu. The Sensor On/Off Status screen displays showing status settings for sensors 1 through 8 or 1 through 16. Sensors may have one of three status settings: OFF, ON or N/U (Not Used).
2. To view sensors 17 through 32 (if a 32-sensor DiProPAC is installed), press **VIEW MORE SENSORS**.
3. Press **Back** to return to the Main Program Menu.

NOTICE

When a tool is loaded, or when SmartPAC PRO is powered up, all programmed sensors are turned on and enabled.

Enabling or Disabling All Sensors

When you access the Sensor On/Off Status screen, a message is displayed at the left, below the screen title indicating whether sensors are enabled or disabled.

When the message is SENSORS ENABLED, SmartPAC PRO is communicating with all the sensors that are programmed and turned on. When the message is SENSORS DISABLED, SmartPAC PRO is not communicating with the sensors.

A button at the top of the main Run menu allows you to enable or disable all sensors. If the sensors are enabled, the button is labelled “DISABLE ALL SENSORS.” If the sensors are disabled, the button is labelled “ENABLE ALL SENSORS.” Press that button to enable or disable all sensors.

NOTICE

You can also enable or disable all sensors in Run mode. See *DISABLE (ENABLE) SENSORS*, page 204.

Turning a Sensor Off or On

To turn a selected sensor Off or On, do the following:

1. On the Sensor On/Off Status screen, highlight the sensor you want.
2. Press ENTER to toggle between the OFF and ON settings until the setting you want is displayed.
3. Press RESET to return to the Main Program Menu.

NOTICE

- Sensors that show an N/U status have not been programmed. You cannot change their status.
- If you turn a sensor Off on the Sensor On/Off Status screen, the sensor will turn on when you reload the tool.

In Run mode, you can see which sensors are turned Off by viewing sensor status. If you select a sensor in Run mode that is turned Off, SmartPAC notifies you with the following message:

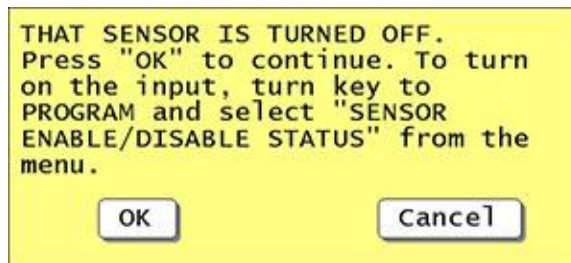


Figure 6-39. “Sensor Turned Off” Message

Run Mode

DISABLE (ENABLE) SENSORS

NOTICE

DiProPAC has an optional “sensors disabled” output that turns on when the sensors are disabled. See *Wiring a Sensor-Disabled Output (Optional)*, page 77.

This item allows you to manually enable your sensors when they are disabled, or to disable your sensors when they are enabled. When sensors are enabled, the message “SENSORS ENABLED” is displayed at the left of the Status Box on the Main Run Menu, and the menu item is labelled DISABLE SENSORS. When sensors are disabled, the message “SENSORS DISABLED” appears at the left of the Status Box, and the menu item is labeled ENABLE SENSORS (as shown in Figure 6-40).

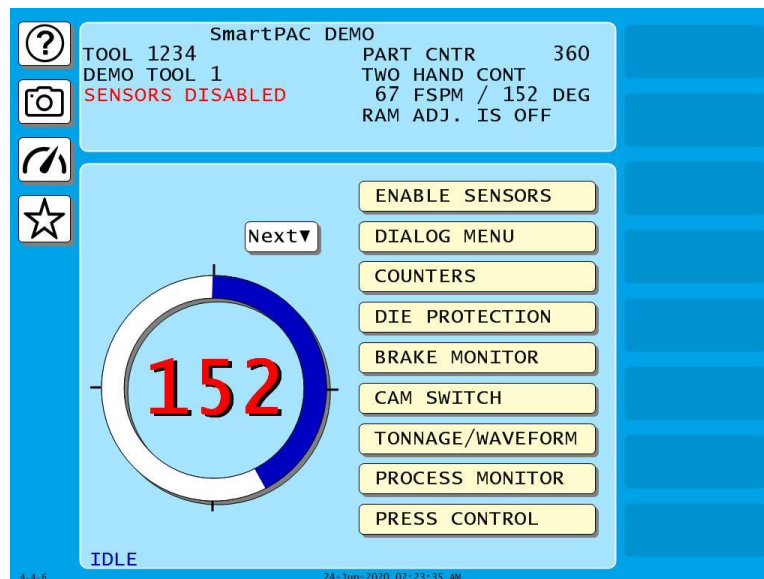


Figure 6-40. Main Run Menu with SENSORS DISABLED in the Status Bar and ENABLE SENSORS on the Menu

To disable or enable sensors, do the following:

4. Press DISABLE SENSORS or ENABLE SENSORS item on the Main Run Menu.
 - If you are enabling sensors, the message at the left of the Status Box changes from SENSORS DISABLED to SENSORS ENABLED.
 - If you are disabling sensors, the confirmation window shown in Figure 6-41 displays.
5. Press the OK Button to confirm that you want to disable the sensors. The message at the left of the Status Box changes from SENSORS ENABLED to SENSORS DISABLED.

You can manually enable or disable sensors no matter which setting (i.e., Manual, Auto by Tool, or Auto by Sensor) is selected for Sensor Enable Mode in Initialization (see *Selecting Sensor Enable Mode*, page 173). If either of the Auto Enable options is selected, you should refer to *Setting the “Auto Enable by Tool” Counter Value*, page 191, or *Setting the Stroke Count for Auto Enable by*

Sensor, page 193, to make the appropriate setting for the tool.

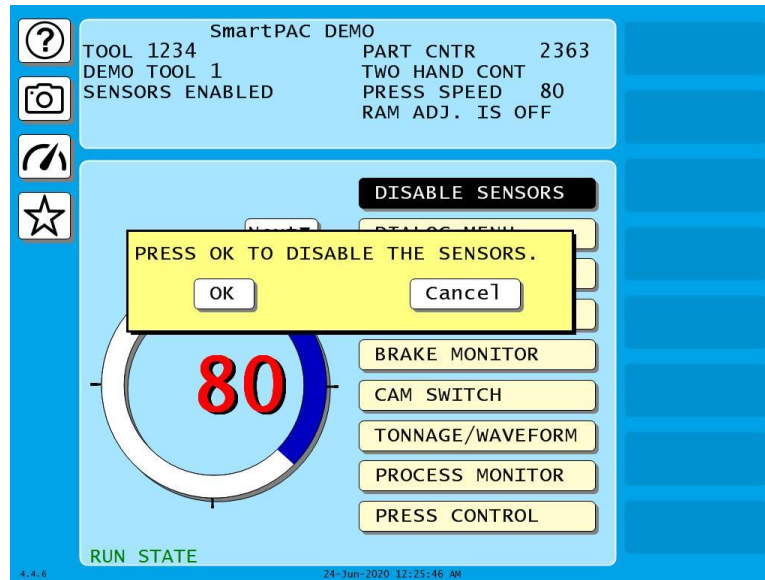


Figure 6-41. Disable Sensors Confirmation Message

In order to protect the tool, sensors should always be enabled except during setup and troubleshooting when they can be temporarily disabled. You can wire (see *Wiring Setup Mode Circuit*, page 77) and enable (see *Enabling Setup Mode*, page 173) a setup mode circuit that allows you to run the press in Inch during setup with green sensors disabled. When Setup Mode is active, the message SENSORS IN SETUP MODE is displayed in the Status Box in place of the SENSORS ENABLED message.

NOTICE

If you temporarily disable sensors, be sure to re-enable them before you resume making parts.

NOTICE

For help with the Die Protection Menu and the screens accessible from it, press the ? key when the applicable screen is displayed.

The Die Protection selection on the Main Run Menu appears only when a DiProPAC module is installed. It allows you to view the status of your die protection sensors, and to adjust the Ready signals for green sensors and the stroke preset for green special sensors.

NOTICE

ARE YOU LOCKED OUT?

Access to items on the Die Protection Menu may be limited to Program mode or may require a password. The security access settings in Initialization mode determine when changes can be made. See *SECURITY ACCESS*, page 98.

To change programmed settings on the Die Protection Menu, you first select a sensor from the list of sensors displayed. Sensors set to UNUSED in Program mode are not shown.

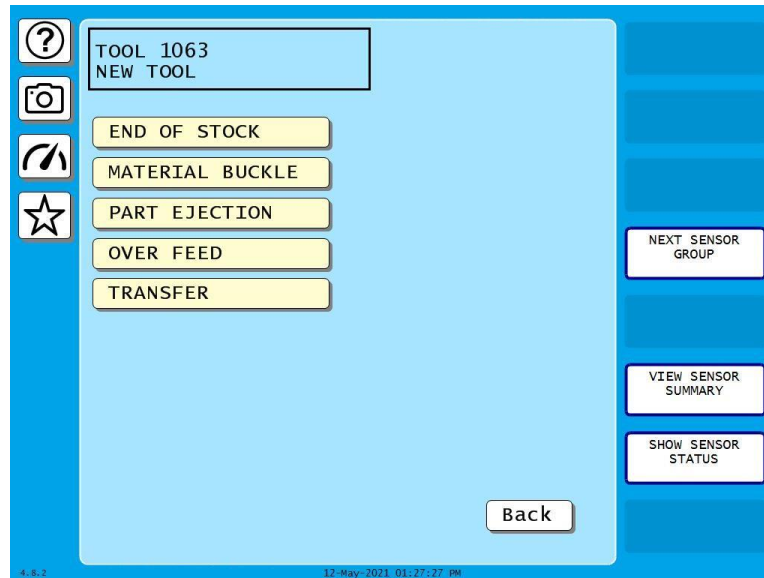


Figure 6-42. Sample Die Protection Run Mode Menu
(Your menu will look different)

Adjusting the Ready Signal for Green Sensors

When you select a green, green quick check, or green constant sensor on the Die Protection Menu, the Ready Signal Programming screen, shown in Figure 6-43, displays.

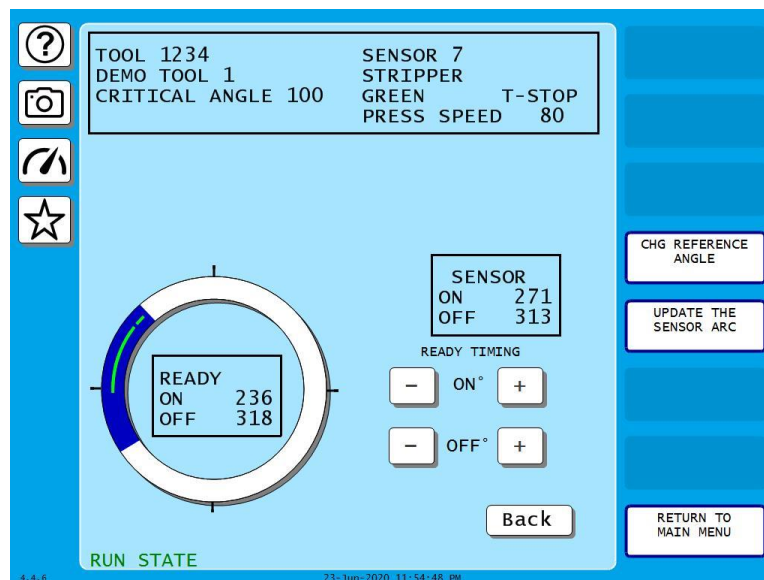


Figure 6-43. Ready Signal Programming Screen

The functionality of this screen differs slightly from that of the Ready Signal Programming screen in Program mode. When you run the press, the angles at which the selected sensor turns on and off during each stroke are shown in the window labeled SENSOR at the right of the screen, and the number of degrees that the sensor is on is represented graphically by a green arc on the crank angle clock. These displays allow you to fine-tune the Ready signal settings made in Program mode.

Another difference is that the On and Off cursors move around the crank angle clock more slowly when you press the plus and minus keys, enabling you to set Ready On and Ready Off angles more precisely.

The On/Off actuation angles displayed in the Sensor window are not updated on every stroke. For green and green quick check sensors, SmartPAC PRO displays the earliest On and latest Off angles for the current sequence of press strokes (until you press UPDATE THE SENSOR ARC), updating the display only when the sensor turns on before the previous earliest On signal or turns off after the previous latest Off signal.

For green constant sensors, SmartPAC PRO displays the latest On and earliest Off angles, updating the display only when the sensor turns on after the previous latest On angle and turns off before the previous earliest Off angle.

EXAMPLE

If the On angle for a green quick check sensor fluctuates between 190° and 195° from stroke to stroke, SmartPAC PRO continuously displays 190° as the sensor's On value. However, if the On angle changes to 189°, SmartPAC PRO displays the On angle as 189° on the next stroke.

To clear the actuation angles displayed for a sensor, press UPDATE THE SENSOR ARC. If the press is stopped, the Sensor window displays zeros. If the press is running, SmartPAC PRO displays the actuation angles for the next stroke.

NOTICE

Pressing the Update the Sensor Arc button may not properly update sensor actuations when you are using a mechanical sensor, which vibrates constantly during the stroke. It is better to use an electronic sensor that is not prone to constant contact bounce.

Pressing CHG REFERENCE ANGLE changes the reference angle used to determine earliest/latest On and Off signals from 0°, the default, to 180°. Executing this function may be necessary to correct On readings for green and green quick check sensors that actuate before and stay actuated after TDC. When 0° is the reference angle, there can be no earliest On angle for a sensor that turns on before and off after 0° since angles just before TDC (e.g., 330°) are numerically greater than those just after TDC (e.g., 30°). You should press CHG REFERENCE ANGLE whenever the On/Off settings in the Sensor window do not match the start and end points of the green actuation arc on the clock diagram.

To adjust the Ready signal for green sensors, do the following:

1. On the Die Protection Menu, select the desired sensor. The Ready Signal Programming screen displays.

NOTICE

If you have turned off the sensor in Program mode, a message displays indicating that the sensor is turned off. Press OK to clear the message.

2. Run the press.
3. Observe the On and Off angles displayed in the Sensor window and the green actuation arc shown on the crank angle clock.

NOTICE

To update the sensor's On/Off readings, press UPDATE THE SENSOR ARC.

To change the reference angle from 0° to 180°, press the Chg Reference Angle button. The reference angle is used to determine earliest and latest On/Off readings.

4. Adjust the sensor's Ready On and Ready Off angles based on the actual On and Off angle readings, using the plus and minus (+/-) buttons. See *Setting the Ready Signal for a Green Sensor*, page 198, for more about changing the Ready On and Off angles.
5. Press Back to return to the Die Protection Menu.

Adjusting the Stroke Preset for Green Special Sensors

To adjust the green special sensor preset value for press strokes, do the following:

1. On the Die Protection Menu, select the desired Green Special sensor. The Green Special Sensor Stroke Count screen displays. This screen is identical to the Green Special Sensor Stroke Count screen in Program mode (see Chapter 5) except that it displays additional information in the Status box.
2. Press the value in the strokes box. A numerical entry window opens.
3. Key in the desired number of strokes and press Enter.
4. Press Back when you are finished to return to the Die Protection Menu.

Viewing the Sensor Summary

You can view a summary of your die protection sensors by pressing View Sensor Summary. The screen that displays is similar to the Sensor Summary screen accessible in the Program mode (see Figure 6-44).

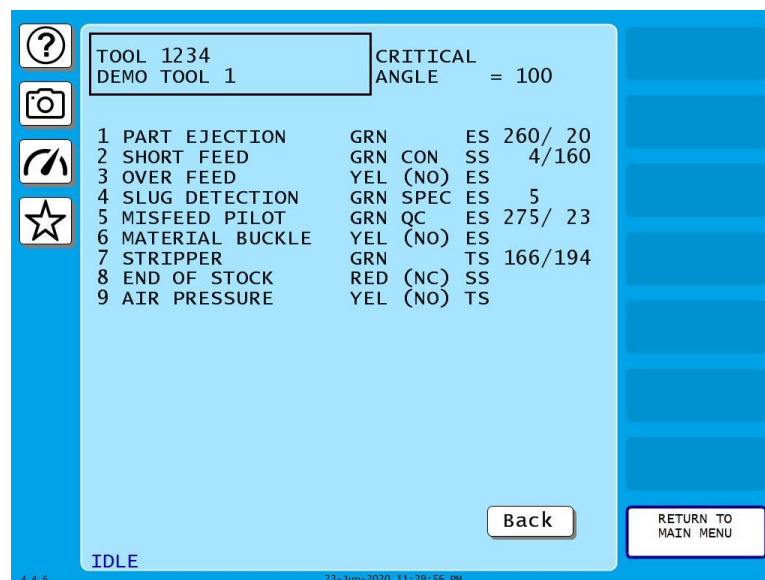


Figure 6-44. Sensor Summary Screen

Viewing Sensor Status

You can view the current state of all your sensors by pressing SHOW SENSOR STATUS to display the Sensor Status screen, shown in Figure 6-45.

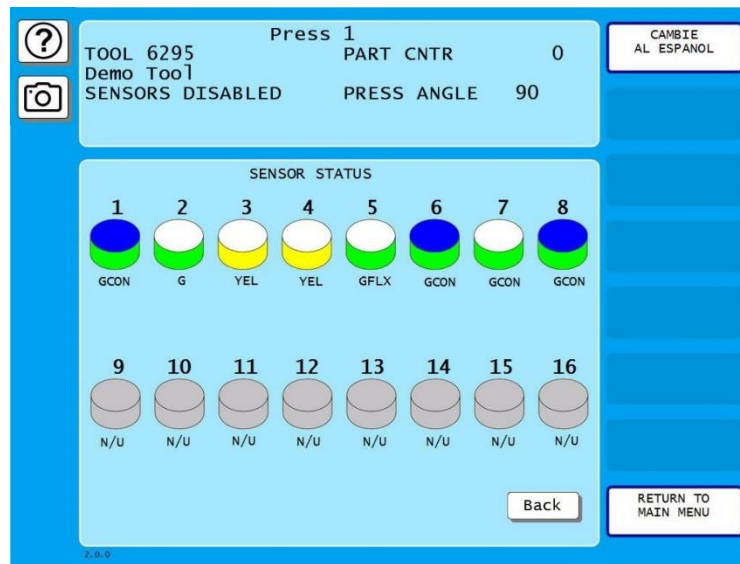


Figure 6-45. Sensor Status Screen

The Sensor Status screen shows the status of every sensor for a loaded tool. Sensor inputs are identified by the numbers. The type of sensor connected to each input is indicated by the following abbreviations, which appear beneath the blocks representing the sensors.

- G = Green
- GQC = Green Quick Check
- GCON = Green Constant
- GS = Green Special (Number of required strokes is shown to the right of “GS”)
- GF = Green Flex
- RED = Red
- YEL = Yellow
- N/U = Not Used

If the sensor block is blue, the sensor is actuated. If it is white, the sensor is not actuated.

The Sensor Status screen is designed so that you can quickly check the status of all your sensors.

When you select the screen with the press running, the actuation blocks for green sensors will flash as they actuate once every stroke. (You might not see this on every stroke if the press speed is faster than the screen refresh rate). An actuation block for a green special sensor will flash intermittently as it actuates.

A red sensor actuation block is always actuated except when there is a sensor fault since it is normally grounded. Actuation blocks for yellow sensors are actuated only during a fault condition.

The Sensor Status screen shows any change in the state of an input whether the input is being used or not, so the actuation block for an unused sensor may turn blue if a sensor has been connected to that input by mistake.

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NOTICE

OPTIONAL MODULES PROCAMPAC AND DIPROPAC INCLUDED IN MANUAL

When you order your SmartPAC PRO, you may include the DiProPAC die protection and/or ProCamPAC programmable cam switch option. This manual includes instructions for installing and using both modules. Remember that they are options and might not be included in your system.

If you ordered SmartPAC PRO with other optional modules such as AutoSetPAC load monitor or ProPAC process monitor, refer to the user manual for that option for complete details on its installation and use.

When the ProCamPAC option is installed, SmartPAC PRO provides cam timing for feed, pilot release, air blow-off, and other press equipment. ProCamPAC also includes global cams for press

control functions, an ON WITH DSV cam type, and multiple on/off cycles per cam.

ProCamPAC Programmable Cam Switch

⚠ DANGER

PROGRAMMABLE CAM SWITCH NOT FOR SAFETY USE

Use SmartPAC PRO's programmable cam switch to control auxiliary functions only. The SmartPAC PRO programmable cam capability should never be used to provide timing signals for any safety use including clutch/brake control or muting of light curtains.

Failure to comply with these instructions will result in death or serious injury.

The optional ProCamPAC module enables you to connect up to eight or sixteen cam channels to your equipment. ProCamPAC consists of a PC board that you install in your SmartPAC PRO and a separate assembly that contains the relays that open and close on signals from SmartPAC PRO. Different types of relays can be used depending upon the voltages of your equipment and your special needs. Refer to Chapter 2 for details on wiring the cam channels.

The AC power supply wires to SmartPAC PRO should be run separately from the DC control wires going to the ProCamPAC Output Assembly. Never use the SmartPAC PRO power terminals as a junction point to provide power for external devices. In most cases, the AC power supply wires should be connected directly to the press control cabinet. Do not use the ProCam output enclosure as a junction box for the AC control wires. Provide a separate junction box for this purpose.

Initialization

The following sections show you how to use the selections available on the Main Initialization Menu to set initialization parameters for SmartPAC PRO with ProCamPAC.

SELECT CAM NAMES (ProCamPAC)

NOTICE

CAM NAMES ENTERED IN INITIALIZATION APPLY TO ALL TOOLS

The names you assign to cam channels in Initialization apply to all tools. If, for example, you "custom-name" Channel 1 as "Bypass 3," then Channel 1 is "Bypass 3" for every tool loaded.

Do the following to assign cam channel names:

1. Press **SELECT CAM NAMES** on the Main Initialization Menu. The Cam Channel Name Menu displays, Figure 7-1. The first time you access this screen, all channels are named "UNNAMED."



Figure 7-1. Cam Channel Name Menu

Your display may look different.

2. Select a channel using the cursor keys and press ENTER. The screen showing a list of names appears, Figure 7-2. Press and move the scroll bar at the right of the list to see additional names.

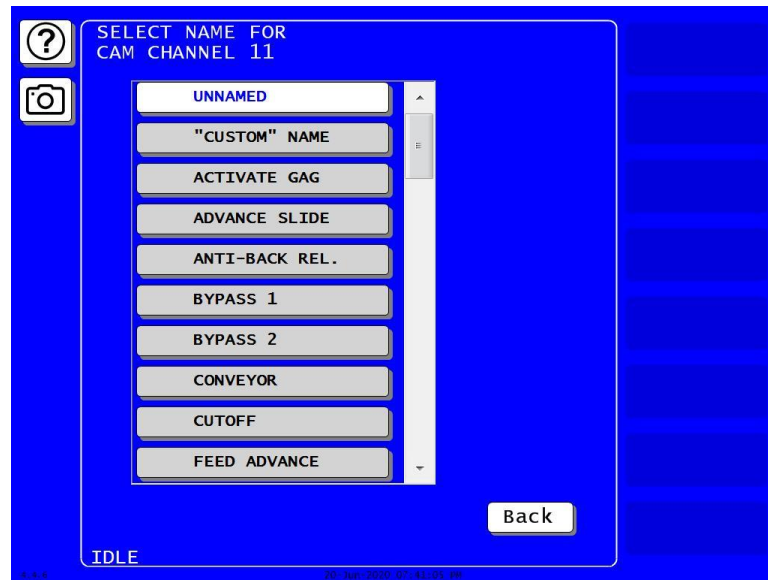


Figure 7-2. Cam Channel Name Selection Screen

3. Press the name that best describes the function of the selected cam channel. You are returned to the Cam Channel Name Menu with the name you selected displayed for the selected channel.

If you want to add a different cam channel name, press “CUSTOM” NAME on the names list. The on-screen keyboard appears. Key in the custom name and press ENTER. This returns you to the Cam Channel Name Menu, which shows the custom name for the cam channel you selected.

NOTICE

You can plug a computer keyboard into the SmartPAC PRO USB port to enter cam channel names.

- When you are done naming channels, press Back to return to the Main Initialization Menu.

AUTO ADVANCE and Slow RPM (ProCamPAC)

The Auto Advance menu (Figure 7-3), accessed from the Main Initialization Menu, enables you to set parameters that control the timing for up to two cam channels that are programmed as Auto Advance.

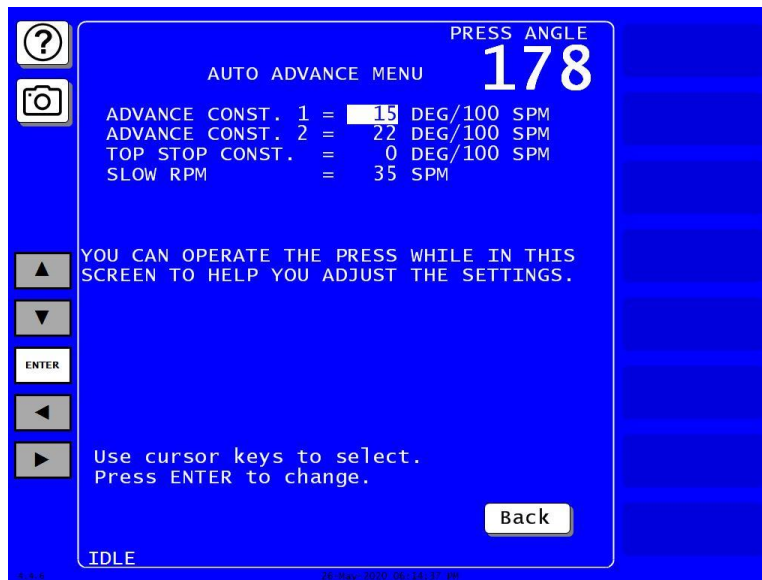


Figure 7-3. Auto Advance Menu

Auto Advance is a ProCamPAC feature that allows you to provide accurate timing for speed-sensitive functions on variable speed presses, such as feed advance, pilot release, advance slide, part lube, and conveyors. Auto Advance is particularly useful on presses with speed ranges from several hundred to over a thousand strokes-per-minute (SPM).

A channel programmed as Auto Advance automatically advances cam timing as the speed of the press increases and delays the timing as speed decreases. The rate of advance or delay is controlled by an advance constant, a specified number of degrees of advance for each 100 SPM increase in press speed.

You can set two advance constants on the Auto Advance Menu. Advance Constant 1 is applied to the lowest numbered cam channel programmed as Auto Advance. Advance Constant 2 is applied to the next lowest numbered Auto Advance channel.

You must also specify the minimum press speed at which auto advance will be applied. This value is entered in the SLOW RPM field on the Auto Advance Menu. SmartPAC PRO uses the Slow RPM value as a starting point in the auto advance process. If the value you enter for Slow RPM is inaccurate, SmartPAC PRO will not auto advance the programmed cam channels at the right time.

The Auto Advance Menu allows you to adjust your Auto Advance and Slow RPM settings while the

press is running. When the press is stroking, the press speed in SPM is displayed in the upper right corner of the screen under the caption PRESS SPEED. When an Auto Advance cam is turned on, the press angle is displayed in the same location under the caption PRESS ANGLE. The PRESS ANGLE display enables you to see the effect of different Advance Constant and Slow RPM settings.

Calculating the Auto Advance Constant

To calculate the auto advance constant for a specified cam channel, follow these steps:

1. Determine the fastest speed (RPMa) of your press and the angle at which the cam should turn on at this speed (Aa).
2. Determine the slowest speed (RPMb) of your press and the angle at which the cam should turn on at this speed (Ab).

NOTICE

If either stopping angle occurs after 0°(or 360°), then add 360° to the angle. For instance, if the press stops at 12°, the stopping angle is actually 12°+360°or 372°

3. Subtract the two angle values. We will call this result “Ac.”

$$Aa - Ab = Ac$$

4. Subtract the two press speeds. We will call this result “RPMc.”

$$RPMa - RPMb = RPMc$$

5. Divide Ac (the difference between the angles) by RPMc (the difference between the press speeds), and multiply that value by 100. That is the number of degrees per 100 RPM.

$$Ac / RPMc \times 100 = \#^\circ / 100 \text{ RPM}$$

Example: Calculating the Auto Advance Constant for a Pilot Release Cam

Your slowest speed is 50 RPM and the pilot release angle at that speed is 100°. Your fastest speed is 100 RPM and the pilot release angle at that speed is 75°. Subtract 50 RPM from 100 RPM: $100 - 50 = 50$

$$\text{Subtract } 75^\circ \text{ from } 100^\circ: 100 - 75 = 25$$

Divide the difference in angles by the difference in RPM, and multiply this by 100:

$$25 / 50 \times 100 = 50$$

Your advance constant is 50° / 100 RPM.

Setting Auto Advance Constants and Slow RPM

To set the auto advance constants and slow RPM value, do the following:

1. Select AUTO ADVANCE on the Main Initialization Menu. The Auto Advance Menu appears, Figure 7-3.

2. With the highlight bar on ADVANCE CONST. 1, press ENTER. The on-screen keypad appears.
3. Key in a value (maximum is 500); then press ENTER.
4. Repeat steps 2 and 3 for ADVANCE CONST. 2 (maximum value is 500) and SLOW RPM (maximum value is 2000).
5. When you are done, press Back to return to the Main Initialization Menu.

NOTICE

AUTO ADVANCE IS ADJUSTABLE

SmartPAC PRO allows you to adjust Auto Advance and Slow RPM settings in Initialization mode while the press is running. The angle at which an Auto Advance cam turns on is shown in the upper right corner of the screen under the caption PRESS ANGLE, enabling you to see the effect of different settings.

SET GLOBAL CAMS (Optional)

DANGER

PROGRAMMABLE CAM SWITCH NOT FOR SAFETY USE

Use SmartPAC PRO's programmable cam switch to control auxiliary functions only. The SmartPAC PRO programmable cam capability should never be used to provide timing signals for any safety use including clutch/brake control or muting of light curtains.

Failure to comply with these instructions will result in death or serious injury.

This item, which appears on the Main Initialization Menu only when ProCamPAC is installed, allows you to make settings for selected cam channels that apply to all tools programmed on your SmartPAC PRO. To program a global cam, do the following:

NOTICE

If you want to name the cam channel, do so before you program it as a global cam. Enter the cam name as instructed in *SELECT CAM NAMES (ProCamPAC)*, page 212.

1. Select SET GLOBAL CAMS on the Main Initialization Menu. The Global Cams menu, shown in Figure 7-4, displays. An asterisk (*) indicates the channels that are already programmed as global cams.



Figure 7-4. Global Cams Menu

Asterisk (*) Indicates Global Cams

1. Select the cam you want to program. The Global Cam Timing Type screen displays, Figure 7-5.



Figure 7-5. Global Cam Timing Type Screen

2. Select the type of cam timing you want to program for this channel, referring to *Run Mode: CAM SWITCH (ProCamPAC)*, page 232 for instructions.
3. When you have finished programming the global cam, press Exit.

ProCamPAC in Program Mode

NOTICE

BATCH COUNTERS AND PROCAMPAC

See the Program chapter *Batch counters*, page 143, for the effect batch counter settings for PULSE or TOGGLE have on the cams.



Figure 7-6. Program Menu

Programmable Cam Switch (ProCamPAC)

⚠ DANGER

PROGRAMMABLE CAM SWITCH NOT FOR SAFETY USE

Use SmartPAC PRO's programmable cam switch to control auxiliary functions only. The SmartPAC PRO programmable cam capability should never be used to provide timing signals for any safety use including clutch/brake control or muting of light curtains.

Failure to comply with these instructions will result in death or serious injury.

This item enables you to program up to 8 (for 8-channel ProCamPAC) or 16 (for 16-channel ProCamPAC) cam channels. Cam channel settings are made via the Cam Channel Menu, Figure 7-7.

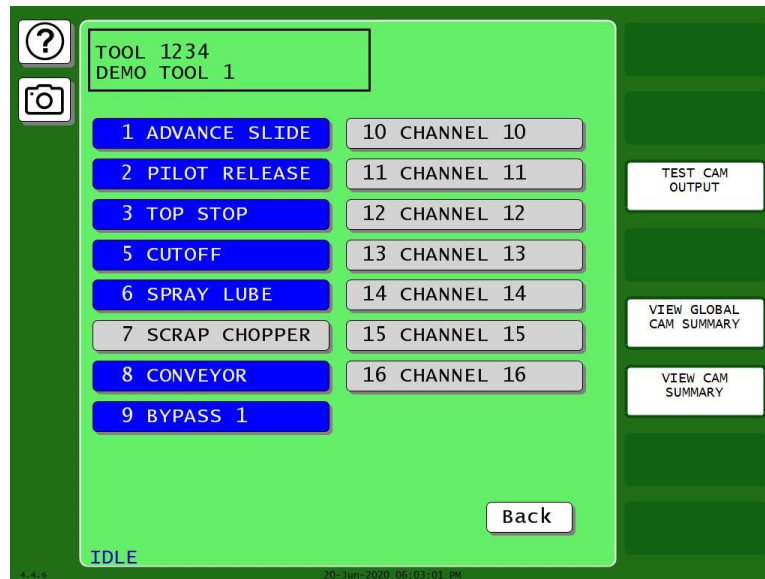


Figure 7-7. Sample Cam Channel Menu

(Yours may appear different)

The names you have assigned to cam channels in Initialization are displayed on the Cam Channel Menu in place of the default channel numbers (see *SELECT CAM NAMES (ProCamPAC)*, page 212).

Channel numbers that are missing from the menu have been programmed as “global” cams in Initialization; see *SET GLOBAL CAMS (Optional)*, page 216. To view global cam channels, press the View Global Cam Summary button.

Selecting a Cam Channel

To make cam settings, you must first select a cam channel. To do so, perform the following steps:

1. Press CAM SWITCH on the Tool Program Menu. The Cam Channel Menu displays, Figure 7-7.
2. Press the cam channel to program. The Cam Channel Program Type Menu displays, Figure 7-8.



Figure 7-8. Cam Channel Program Type Menu

Instructions for programming cam channels using each of the program types shown on the Cam Channel Program Type Menu are provided in the following sections.

Making an ON/OFF Setting

The PROGRAM ON/OFF ANGLES item on the Cam Channel Program Type Menu enables you to program the crankshaft angles at which a selected cam channel turns on and off. You can program up to four on/off sequences per stroke. To make a single on/off setting for a selected cam channel, perform the following steps. (To make multiple on/off settings, see *Setting Multiple ON/OFF Cycles*, page 221):

1. Select PROGRAM ON/OFF ANGLES on the Cam Channel Program Type Menu. The Cam Channel On/Off Program screen displays, Figure 7-9.
2. Press the plus and minus (+/-) buttons to adjust on angle shown inside the clock display circle to the desired value.

OR

Press SET ON ANGLE. A numeric entry window opens. Key in the desired ON angle and press Enter. The On angle value is displayed in the window inside the clock display.

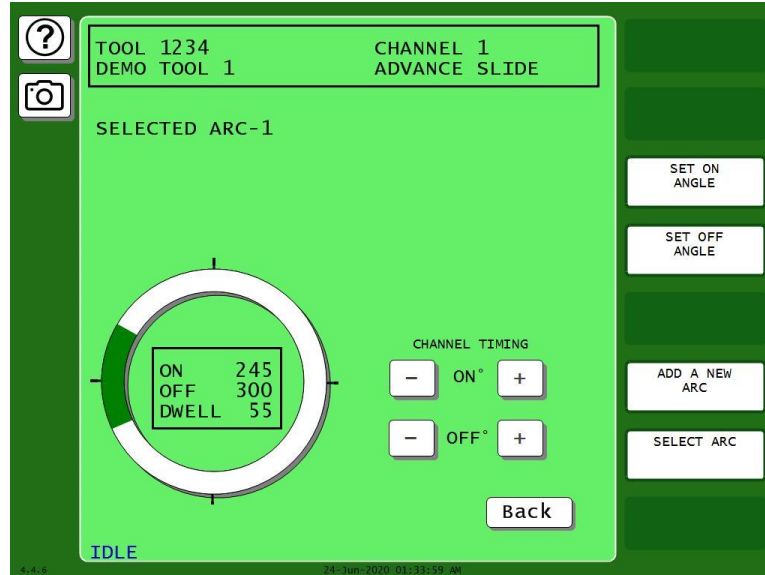


Figure 7-9. Cam Channel On/Off Program Screen

3. Set the Off angle in similar fashion.
4. Press Back when you are finished to return to the Cam Channel Program Type Menu.

Setting Multiple ON/OFF Cycles

SmartPAC PRO with ProCamPAC enables you to set more than one On/Off event (or cycle) for selected cam channels. You can program up to four On/Off events for a single channel.

To set more than one on/off cycle for a cam channel, do the following:

1. Make the first On/Off setting as instructed in *Making an ON/OFF Setting*, page 220. Figure 7-10 shows the Cam Channel On/Off Program screen set for an On angle of 299° and an Off angle of 327°. Note the caption at the upper left of the screen indicating that Arc 1 is selected.

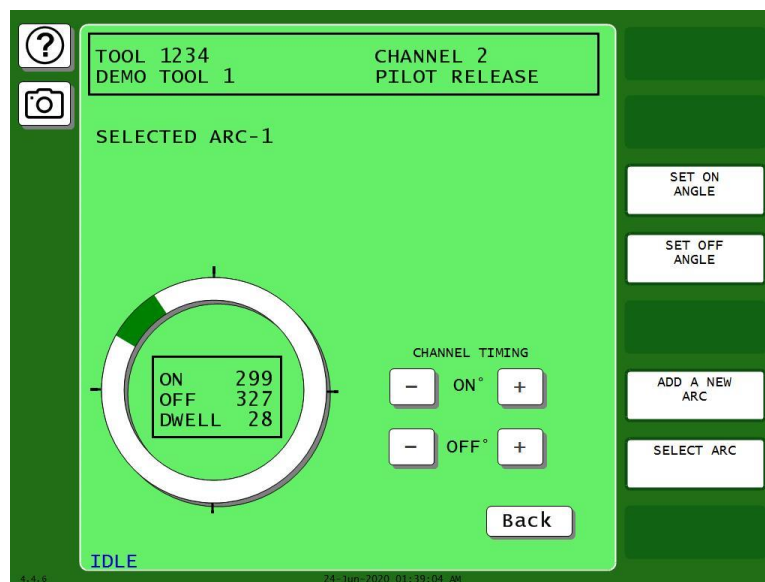


Figure 7-10. Cam Channel On/Off Program Screen: One On/Off Arc

- Press ADD A NEW ARC on the Cam Channel On/Off Program screen to program a second On/Off cycle. The arc you set in step 1 (i.e., Arc 1) turns dark gray. You can program a new arc, initially set at on and off at 0°. and the caption at the left of the screen changes to SELECTED ARC-2.

NOTICE

A new arc always starts at 0°. If one of the arcs you want to program is located near 0°, program it last. If you find that you have too many arcs at 0°, delete channel settings (*Deleting Channel Settings*, page 231) and start over again.

- Program the second arc. Figure 7-11 shows the Cam Channel On/Off Program screen with Arc 2 programmed for an On Angle of 76° and an Off angle of 117°.

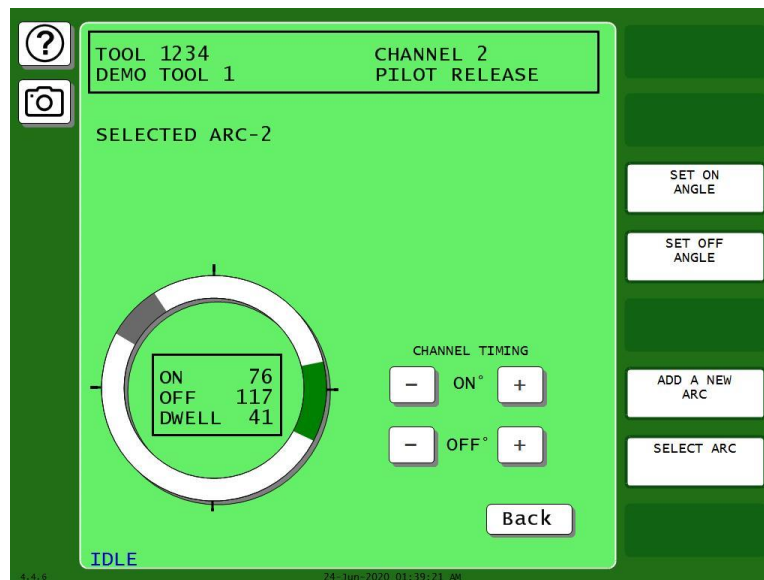


Figure 7-11. Cam Channel On/Off Program Screen: Two On/Off Arcs

- Repeat steps 2 and 3 to add additional arcs. Figure 7-12 shows the Cam Channel On/Off Program screen with a third arc programmed for an On angle of 26° and an Off angle of 60°.
- If you want to adjust On/Off settings for a previously programmed arc, press “Select Arc” one or more times until the highlighting for that arc turns green, then adjust the On and/or Off angles.

NOTICE

To delete an On/Off arc for a multi-arc cam channel, you must delete all settings for the channel (see *Deleting Channel Settings*, page 231). Then, program the On/Off outputs again.

- Press Back when you have finished to return to the Cam Channel Program Type Menu.

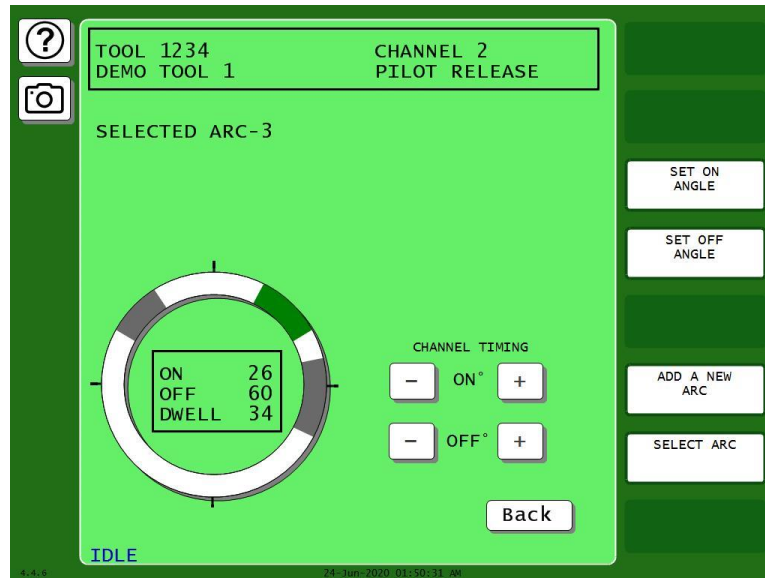


Figure 7-12. Cam Channel On/Off Program Screen: Three On/Off Arcs

Making a Timed Output Setting

The PROGRAM TIMED OUTPUT item on the Cam Channel Program Type Menu enables you to program the crankshaft angles at which a selected cam channel turns On and the time, or dwell, in milliseconds that the channel stays On.

A Timed Output setting is independent of press speed – with On/Off cam outputs, the dwell time decreases with press speed. Timed outputs' dwell time is constant regardless of press speed. They are recommended for functions such as controlling air and lubrication. This type of cam output also ensures that the channel will turn off after the programmed time. With On/Off cam settings, the channel stays on if the press stops within the On/Off window, potentially wasting air or lube.

To set a Timed Output for a cam, do the following:

1. Select PROGRAM TIMED OUTPUT on the Cam Channel Program Type Menu. The Cam Channel Timed Output Program screen, shown in Figure 7-13, displays.
2. Set the On angle on the crank angle clock, using the On-angle plus and minus (+/-) buttons to adjust on angle shown inside the clock display circle to the desired value.
3. Set the On time using the On-time (MS) plus and minus (+/-) buttons to adjust the On time shown inside the clock display circle to the desired value. Maximum is 500 mS, or 0.5 seconds.
4. Press Back when you are finished to return to the Cam Channel Program Type Menu.

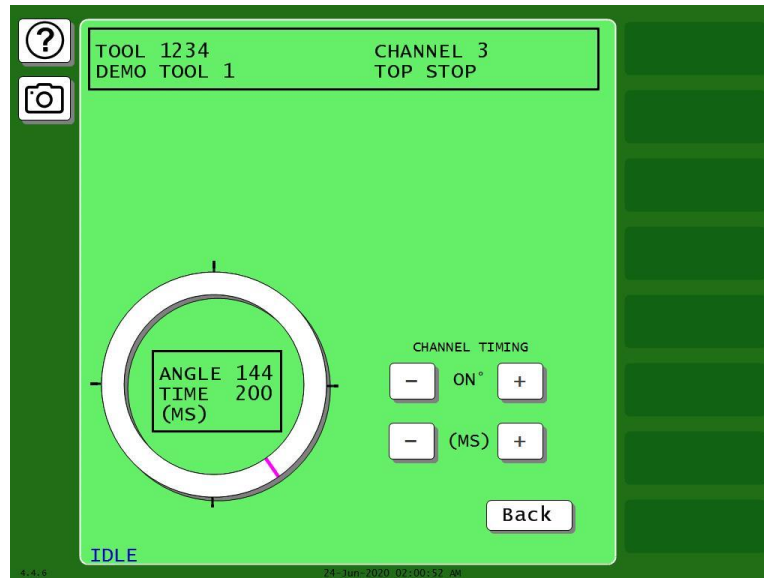


Figure 7-13. Cam Channel Timed Output Program Screen

NOTICE

FOR APPLICATIONS REQUIRING MORE THAN 500 MILLISECONDS

If you have an application where an On time of more than 500 milliseconds is required, do the following. Program one of the batch counters to a preset of “1,” set the Counter Increment Angle to the desired On angle and the Output Mode to PULSE. Then program the Pulse Time to the cam On time you want (e.g., 600 mS). See *Setting Batch Counter Output and Increment Modes*, page 145.

Making an Auto Advance Setting

NOTICE

You can program up to two Auto Advance output settings in Program mode. The first advance constant set in Initialization mode controls the lowest-numbered Auto Advance channel in Program mode. Likewise, the second advance constant controls the next numerically higher Auto Advance channel. If channels 3 and 5, for example, are programmed as Auto Advance, channel 3 will use the first advance constant, channel 5 the second advance constant. See *AUTO ADVANCE and Slow RPM (ProCamPAC)*, page 214, for more information.

The PROGRAM AUTO ADVANCE item on the Cam Channel Program Type Menu enables you to program up to two cam channels as Auto Advance and to set On and Off angles for those channels. Auto Advance cam settings automatically compensate for changes in press speed, advancing cam timing as the speed of the press increases, delaying timing as speed decreases. An Auto Advance cam channel is often used for Top Stop because it ensures that the press will top-stop at the same angle regardless of varying press speeds. Auto Advance settings may also be used for feed, pilot release, lube, and other speed-sensitive applications.

1. Select PROGRAM AUTO ADVANCE on the Cam Channel Program Type Menu. The Cam Channel Auto Advance Program screen displays, Figure 7-14.

- Set the AutoOn angle on the crank angle clock, using the plus and minus buttons (+/-) for Channel Timing On.

The precise AutoOn angle value is displayed in the window inside the clock display. In Figure 7-14, the AutoOn angle is set to 260°.

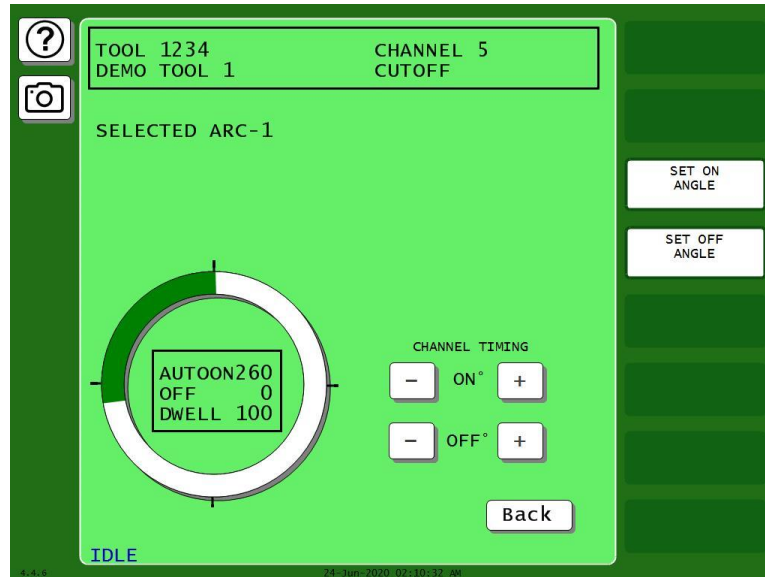


Figure 7-14. Cam Channel Auto Advance Program Screen

- Set the Off angle on the crank angle clock in similar fashion, using the plus and minus buttons (+/-) for Channel Timing Off. The precise Off angle value is displayed in the window inside the clock display. In Figure 7-14, the Off angle is set to 0°.
- Press Back when you are finished to return to the Cam Channel Program Type Menu.

Setting DSV ON Channel Timing

The PROGRAM DSV ON item on the Cam Channel Program Type Menu enables you to set a cam output to turn ON when the press's DSV (clutch valve) is energized and turn off when the press stops. You can also set the amount of time (in seconds) after the press stops that a DSV On cam channel remains on (OFF DELAY), as well as a delay time (in seconds) between when the DSV is energized and the output turns ON (ON DELAY). You can also specify a delay before a DSV On cam channel turns on when the Dual Safety Valve is energized and the press starts and turns off when the DSV is de-energized and the press stops.

The MANUAL PAUSE TIME setting allows you to specify a duration of time (in seconds) during which the output can be temporarily turned OFF (paused) by the operator in the run mode. This function is useful in applications where a parts conveyor is filling a bin, and the operator wishes to swap a full bin with an empty with the press running, while not spilling parts onto the floor. You make the settings on the Cam Channel DSV On Program Screen, which is shown in Figure 7-15.

DSV On cam channel programming is useful for controlling conveyors and other accessories that must operate for a short time after the press stops. In addition to setting a specific time for the On/Off delays and pause time, you can also select the OUTPUT FOLLOWS RESOLVER MOTION setting, which keeps the cam channel on until resolver rotation falls to 6 SPM. When this operation mode is selected, the On/Off delay settings are not used, but the Manual Pause Time is still available.



Figure 7-15. Cam Channel DSV On Program Screen

To program an ON WITH DSV output, do the following:

1. Select PROGRAM DSV ON from the Cam Channel Program Type Menu.
2. Select the operation mode by pressing the button labelled OFF STATE. The choices toggle between DELAYED and FOLLOW RESOLVER MOTION. DELAYED is the default setting, and the most often-used mode.
3. Specify the ON DELAY TIME. This is an optional value that will delay the activation of the output for a specified number of seconds after the machine starts (DSV turns on). A numeric entry window opens. Key in the desired On Delay Time and press Enter. The value is displayed in the button.
4. Specify the OFF DELAY TIME. This is an optional value that will delay the deactivation of the output for a specified number of seconds after the machine stops (DSV turns Off). A numeric entry window opens. Key in the desired Off Delay Time and press Enter. The value is displayed in the button.
5. Specify the MANUAL PAUSE TIME. This is an optional value that will allow the operator to temporarily turn the output off in the Run Mode for the specified amount of time in seconds. A numeric entry window opens. Key in the desired Manual Pause Time and press Enter. The value is displayed in the button.
6. Press FINISH when you are done to return to the Cam Channel Program Type Menu.

Programming a Toggle Output

The TOGGLE OUTPUT item on the Cam Channel Program Type Menu enables you to set an output to stay ON for a preset number of strokes, then stay OFF for a preset number of strokes. This output type is commonly used to control a part diverter to direct parts into an empty bin when one bin fills up, allowing the operator to replace the full bin without stopping the press. The following settings are available for this output (see the Program Screen in Figure 7-16. Toggle Output Programming Screen):

- **ACTIVATION ANGLE** – This setting controls the angle at which the toggle will take place.
- **SYNCHRONIZE TO** – This setting determines which counter controls the toggle. Generally, use **STROKE COUNTER** if this output will be controlling automation not related to part sorting, or **GOOD PARTS** if the toggle output will be used to divert parts.
- **STAY ON FOR / STAY OFF FOR** – These settings control the number of strokes/parts for the output to stay ON and OFF. Note that the values for ON and OFF are separate. For the bin diverter example above, you'd set the ON and OFF for the same value. On the other hand, if you wanted to divert 10 parts from every 10,000 for QC inspection, the values would be 10 and 9990.
- **SWITCH ORDER ON/OFF** – This button enables you to specify the condition of the output at startup. The default is OFF before ON.



Figure 7-16. Toggle Output Programming Screen

Press the FINISH button when you are done making the settings.

Setting an ON/OFF Counter Output

The ON/OFF COUNTER item on the Cam Channel Program Type Menu enables you to program the crankshaft angles at which the cam channel turns on and off, but rather than actuate on every stroke, the ON/OFF Counter output can be set to actuate once every preset number of strokes. This output type is useful for controlling such items as gaging operations or indexing tables that need to operate periodically at specific angles (see the Program Screen in Figure 7-17. ON/OFF Counter Settings).

To make the settings for an ON/OFF Counter for a selected cam channel, perform the following steps.

1. Press SET ON ANGLE. A numeric entry window opens. Key in the desired ON angle and press Enter. The ON angle value is displayed in the window inside the clock display.
2. Set the Off angle in similar fashion.

3. Press COUNT PRESET. A numeric entry window opens. Key in the desired number of cycles between output actuations and press Enter.
4. Press the SYNCHRONIZE button to specify whether the count is controlled by the STROKE or GOOD PARTS counter (the button toggles between these two values). Use GOOD PARTS if the output will be used to control part flow, and STROKE if the output will be controlling automation such as a gagging operation.
5. The optional COUNTER PRELOAD setting will apply a count preload towards the preset that will be applied when the SYNCHRONIZE ALL SENSORS/CAMS button is pressed on the Main Run menu.
6. Press FINISH when you are done to return to the Cam Channel Program Type Menu.



Figure 7-17. ON/OFF Counter Settings

Setting a Pulsed Counter Output

The PULSED COUNTER item on the Cam Channel Program Type Menu enables you to program the crankshaft angles at which a selected cam channel turns On and the time, or dwell, in milliseconds that the channel stays On, but rather than actuate on every stroke, the PULSED COUNTER output can be set to actuate once every preset number of strokes.

A Pulsed Counter Output setting is independent of press speed – with On/Off cam outputs, the dwell time decreases with press speed. Timed outputs' dwell time is constant regardless of press speed. They are recommended for functions such as controlling air and lubrication items that need to be operated periodically, but not on every stroke. This type of cam output also ensures that the channel will turn off after the programmed time. With On/Off cam settings, the channel stays on if the press stops within the On/Off window, potentially wasting air or lube.

To set a Pulsed Counter Output for a cam, do the following:

1. Select PROGRAM TIMED OUTPUT on the Cam Channel Program Type Menu. The Cam Pulsed Counter Program screen, shown in Figure 7-18. Pulsed Counter Settings, displays.

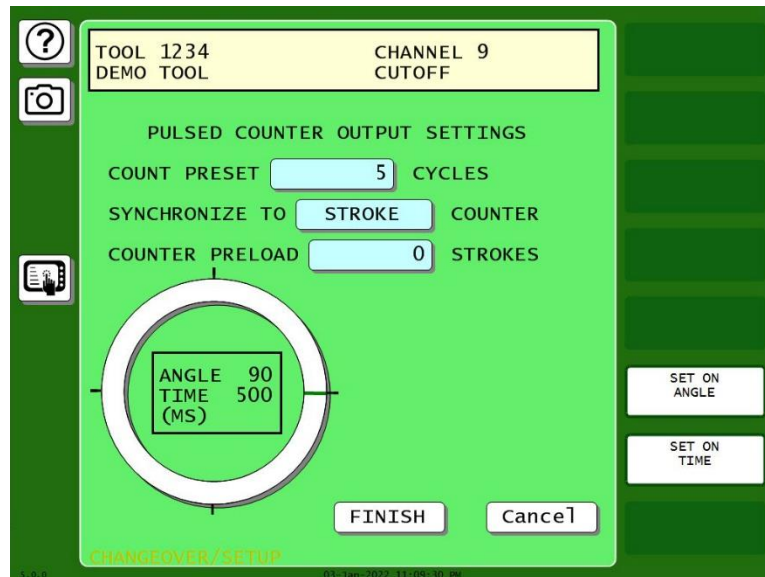


Figure 7-18. Pulsed Counter Settings

2. Press SET ON TIME. A numeric entry window opens. Key in the desired dwell time (in milliseconds) and press Enter. The ON.
3. Press COUNT PRESET. A numeric entry window opens. Key in the desired number of cycles between output actuations and press Enter.
4. Press the SYNCHRONIZE button to specify whether the count is controlled by the STROKE or GOOD PARTS counter (the button toggles between these two values). Use GOOD PARTS if the output will be used to control part flow, and STROKE if the output will be controlling automation such as a gagging operation.
5. The optional COUNTER PRELOAD setting will apply a count preload towards the preset that will be applied when the SYNCHRONIZE ALL SENSORS/CAMS button is pressed on the Main Run menu.
6. Press FINISH when you are done to return to the Cam Channel Program Type Menu.

Setting a Triggered Output

The TRIGGERED OUTPUT item on the Cam Channel Program Type Menu enables you to program a TOGGLE, ON/OFF COUNTER, or PULSED COUNTER output type to operate one time in response to an internal or external trigger. Each time the trigger occurs, the output will operate – as programmed - one time in response.

To make the settings for a Triggered Output for a selected cam channel, perform the following steps.

1. Select the output type. The choices are Toggle, On/Off Counter (w/Delay), and Pulsed Counter (w/Delay). The programming and behavior of these output types are described above.
2. Select the trigger source by pressing the TRIGGER button. A menu will pop up with several choices. (See Figure 7-19. Trigger Source Menu):

- **LOAD TOOL** – The output will operate as programmed one time after the tool is loaded and the press is started.
- **IDLE TIME** – The output will operate as programmed any time the press sits idle (not running) for the specified amount of time. You will set the idle time (in minutes) on the next screen.
- **SENSOR INPUT** - The output will operate as programmed one time any time a signal is present on the specified DiProPAC sensor input. You will select the sensor input to be used on the next screen. **NOTE:** This choice is only available if your SmartPAC PRO is equipped with the optional DiProPAC module.
- **SENSOR FAULT** - The output will operate as programmed one time any time a fault (of any kind) occurs on one of the specified DiProPAC sensor inputs. You will select the sensor input(s) to be used on the next screen. **NOTE:** This choice is only available if your SmartPAC PRO is equipped with the optional DiProPAC module.



Figure 7-19. Trigger Source Menu

3. Set the Delay (in strokes). If you selected On/Off Counter or Pulsed Counter, you have the option to set a delay. If you set a delay, the output will activate the specified number of delay strokes after the trigger occurs.
4. Make the settings for your selected output type. Refer to the earlier sections for your selected output type above.
5. Press COUNT PRESET. A numeric entry window opens. Key in the desired number of cycles between output actuations and press Enter.

Deleting Channel Settings

The DELETE CHANNEL SETTINGS item on the Cam Channel Program Type Menu enables you to delete programmed settings for a selected cam channel. When you delete cam channel settings, all programmed angles and times return to 0 (zero).

To delete settings for a selected cam channel, do the following:

1. Select DELETE CHANNEL SETTINGS on the Cam Channel Program Type Menu. The following window displays, asking you to confirm that you want to delete cam settings.



Figure 7-20. Cam Channel Deletion Confirmation Window

2. Press CLEAR to delete the channel. You are returned to the Cam Channel Menu.

Viewing the Cam Summary

Once cam channels have been programmed, you can view their settings on a summary screen accessible from the Cam Channel Menu. To view this screen, do the following:

Press **View Cam Summary** on the Cam Channel Menu. The Cam Summary screen shown in Figure 7-21 displays with the name, program type, and programmed settings shown for each programmed cam channel. Global cams are not displayed on this screen (see *Viewing Global Cams*, below).



Figure 7-21. Cam Summary Screen

Viewing Global Cams

Global cams, which are programmed in Initialization mode (see *SET GLOBAL CAMS (Optional)*, page 216), are cam channels that can be used with any tool set up on your SmartPAC PRO. Global cams can be programmed for any channel except channels 6, 7 and 8 and, once set, cannot be programmed for individual tools. You cannot change global cam settings in Program mode, but you can view them as you are programming other cams.

To view global cams, do the following:

Press VIEW GLOBAL CAM SUMMARY on the Cam Channel Menu. The Global Cam Summary screen (see Figure 7-22) displays with the name, program type, and programmed settings shown for each channel set as a global cam.



Figure 7-22. Global Cam Summary Screen

Run Mode: CAM SWITCH (ProCamPAC)

⚠ DANGER

PROGRAMMABLE CAM SWITCH NOT FOR SAFETY USE

Use SmartPAC PRO's programmable cam switch to control auxiliary functions only. The SmartPAC PRO programmable cam capability should never be used to provide timing signals for any safety use including clutch/brake control or muting of light curtains.

Failure to comply with these instructions will result in death or serious injury.

The CAM SWITCH selection on the Main Run Menu enables you to adjust timing for each programmed cam channel. It is present only when ProCamPAC is installed. Adjustments are made via the Cam Switch Menu, Figure 7-23.

The Cam Switch Menu displays a list of cam channels that have been set up in Program mode. If you have assigned names to your cam channels in Initialization mode, those names are shown. Channels programmed as Global cams are not shown (see *SET GLOBAL CAMS (Optional)*, in Chapter 4).

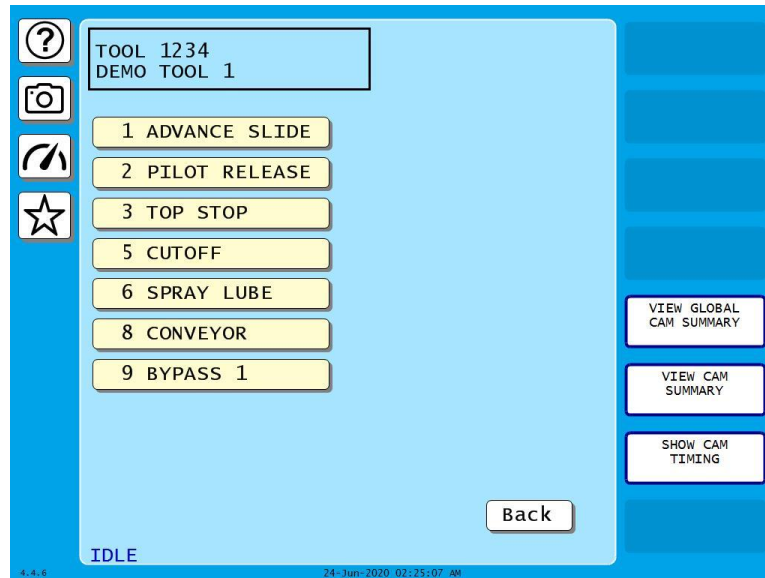


Figure 7-23. Cam Switch Menu

To adjust cam timings for the loaded tool, do the following:

1. On the Cam Switch Menu, select the channel you want to adjust. The Cam Channel Program screen appropriate to the program type of the selected cam channel displays.

NOTICE

ARE YOU LOCKED OUT?

Access to items on this screen may be limited to Program mode or may require a password. The security access settings in Initialization mode determine when changes can be made. See *SECURITY ACCESS*, page 98.

2. Adjust cam timings for the selected channel, following the instructions for the particular output type as described in *ProCamPAC in Program Mode*, page 218:
3. When you are finished, press Back to return to the Cam Switch Menu.

Viewing Cam Timing

You can view a real-time graphic display of the timing settings for your cams by pressing SHOW CAM TIMING. A screen similar to Figure 7-24.

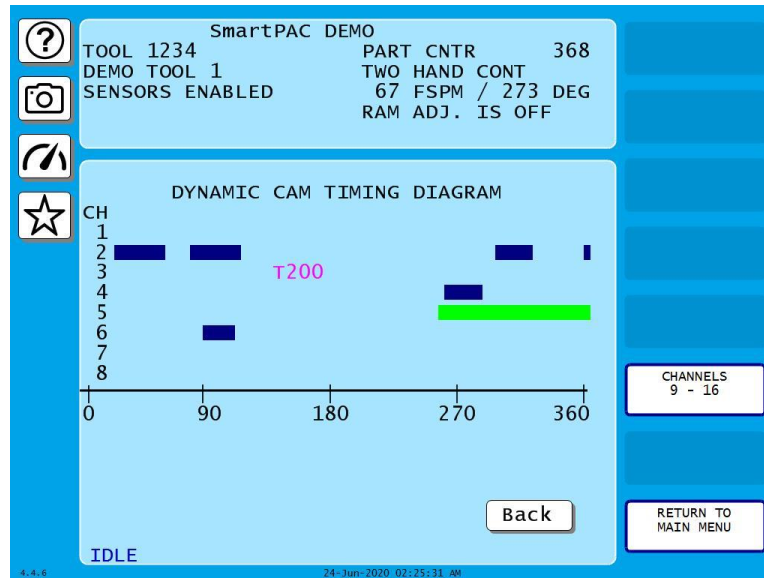


Figure 7-24. Cam Timing Screen

Cam channels are displayed by number on the Y-axis. Only eight channels can be displayed at a time, so if a 16-channel ProCamPAC is installed, you must press CHANNELS 9-16. The X-axis displays the number of degrees of crankshaft rotation (from 0° to 360°) at which channels turn on and off.

Channel On/Off and Auto Advance timing is shown as a colored horizontal bar, the end points of which, when read against the crank angle “ruler” on the X-axis, specify on and off settings for that channel. The bar for On/Off channels is blue, the bar for Auto Advance channels green with the letter “A” at each end. When the dwell for an Auto Advance channel is very short, the A’s may display with no bar between them. As press speed increases, the bar for Auto Advance channels moves to the left.

Channels with Timed outputs are shown in pink characters beginning with the letter “T,” the position of which, when viewed against the crank angle “ruler,” indicates the On angle, followed by a number (e.g., 200), which indicates the channel’s On time in milliseconds.

The Cam Timing screen is updated once every second.

Viewing the Global Cam Summary

You can view a summary of the Global cams by pressing the **View Global Cam Summary** button. The screen that displays is similar to the Global Cam Summary screen in the Program mode (see Figure 7-25).

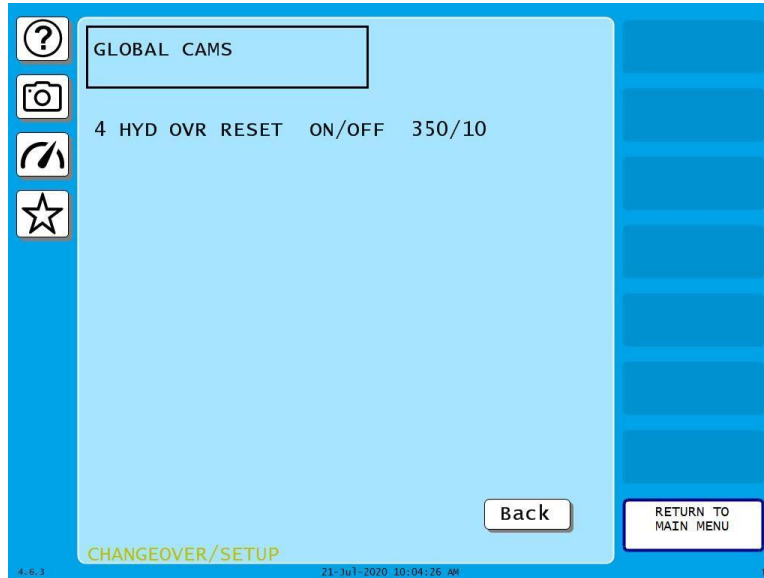


Figure 7-25. Global Cam Summary Screen

Viewing the Cam Summary

You can view a summary of the other cams by pressing VIEW CAM SUMMARY. The screen that appears is similar to the Cam Summary screen accessible in the Program mode (see Figure 7-26).

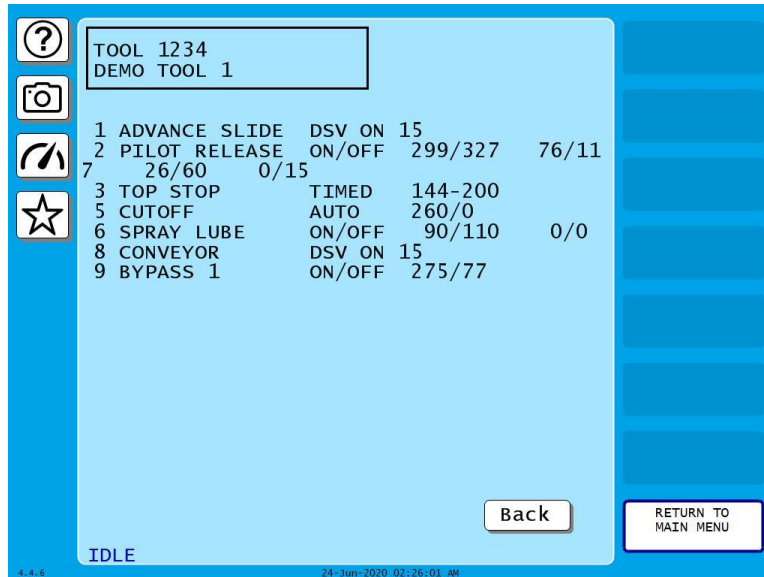


Figure 7-26. Cam Summary Screen

Chapter 8 – SmartPAC PRO Fault Messages

NOTICE

IMPORTANT INFORMATION TO PROVIDE WHEN CALLING WINTRISS TECH. SUPPORT

When you contact Wintriss Controls for technical assistance, be ready to provide the following information to expedite a resolution to the problem: product name (e.g. SmartPAC PRO); installed options (e.g. DiProPAC, ProCamPAC, etc.); and firmware version number (e.g., Vs. 2.00). You can determine the last two items by accessing the Installed Options screen in Initialization mode (INSTALLED OPTIONS, page 93).

This chapter documents the fault messages that display on the SmartPAC PRO screen or in the Error/Event Log, providing a brief explanation of each message and a remedy for correcting the problem.

Responding to the Brake Warning LED

When the Stopping Time of the press increases to within 10 mS of the Stop-time Limit set in Initialization (see SET BRAKE MONITOR, page 95), the amber Brake Warning LED on the SmartPAC PRO front panel (Figure 1-1) will flash. Illumination of this LED often means that the brake is worn and/or defective. To respond, do the following:

1. Contact your maintenance crew immediately and have them investigate the condition of the brake.
2. If the brake checks out, your Stop-time Limit is too tight, not allowing for normal wear. Set a new Stop-time Limit, Setting Stop Time and Start Time Limits, page 97.
3. Power down the SmartPAC PRO, then power it back up to turn off the Brake Warning LED.

When the Stopping Time exceeds the Stop-time Limit, the “Stop time exceeded” message displays (see page 242).

Responding to Fault Messages

When an error occurs, a red message window like the one shown in Figure 8-1 is displayed. The error windows indicate the exact nature of the error and provide a brief explanation.



Figure 8-1. Error Code Message

If the press stops because one of the counter presets has been reached, a yellow message window like the one shown in Figure 8-2 displays.



Figure 8-2. Counter Preset Message

When an error message displays, correct the malfunction or other problem, consulting the Problem and Remedy descriptions for the appropriate error message in the sections that follow. When the problem has been corrected, press Exit (or Remote Reset Button, if installed) to clear the message. If the problem has been solved, you will be able to run the press. Otherwise, you will get the fault message again.

If the problem persists, contact Wintriss Tech. Support. Do not attempt to run the press before correcting the problem.

In the following sections, messages are grouped in four categories:

- Messages that display when a counter preset is reached
- Messages that display for equipment or brake monitor problems
- Messages that display for programming problems
- Messages that display when a sensor signals a fault

Counter Preset Reached Messages

“S03 Good parts counter preset reached TS”

Explanation: The value set for the parts counter has been reached. The press should stop at top dead center.

Remedy: Press RESET to clear the message. The Good Parts Count will be automatically reset to 0. If your part run is complete, you need to change tooling, material, etc. before you re-start the press.

“S06 Strokes counter preset reached TS”

Explanation: The value set for the strokes counter has been reached. The count will be automatically reset to 0. The press should stop at top dead center.

Remedy: Press RESET to clear the message. If your part run is complete, you need to change tooling, material, etc. before you re-start the press.

“S0x Batch # counter preset reached TS”

Explanation: The value set for one of the three batch counters when the output type is set to TOP STOP has been reached. The press should stop at top dead center. See *Setting Batch Counter Output and Increment Modes* in Chapter 5.

Batch 1 – S04

Batch 2 – S07

Batch 3 – S08

Remedy: Press OK to clear the message.

NOTICE

When this message appears, the corresponding batch count is automatically reset to 0.

Messages for Equipment or Brake Monitor Problems

The following messages cover resolver, input circuit, and position sensor faults, problems with the way the press is running, brake monitor faults, and internal problems with SmartPAC PRO.

“S11 Loss of rotation ES”

Explanation: The resolver did not start rotating within the start time limit set in Initialization (see SET BRAKE MONITOR (Optional with WPC 2000 Integration), page 95) or stopped rotating while the press was running.

SmartPAC PRO knows when the Dual Safety Valve (DSV) is energized. If it sees that the DSV is energized but the resolver is not turning, this message appears.

One possible cause is that the resolver’s drive belt is loose or broken. Another is that you may have low air pressure to the clutch or a bad clutch. An internal SmartPAC PRO problem could also have occurred, or the resolver could be defective.

Remedy: Check the resolver, the resolver drive, and the clutch. Repair if necessary.

If these solutions do not work, an internal problem may have occurred. Call Wintriss Tech. Support.

“Angle resolver failure”

Explanation: The wiring input check circuit failure in the resolver circuit to SmartPAC PRO may be loose or bad, or the resolver may have failed. Another possible cause is that the press may be going faster than 800 SPM (or 1600 SPM, depending on the speed setting in SmartPAC PRO).

Remedy: Check the resolver wiring and connections for shorts, breaks, or loose connections; see *Wiring the Resolver*, page 58.

- If SmartPAC PRO’s rated press speed has been exceeded, reduce the speed.
- If the speed has not been exceeded, make sure that the speed has been set correctly.
- If you purchased the high-speed option (up to 1600 SPM), make sure it is enabled on the Options Manager screen, *OPTIONS MANAGER*, page 94.
- If these remedies do not correct the problem, the resolver may need to be replaced. Contact the Wintriss Tech. Support for assistance.

NOTICE

To clear this fault, you must cycle power to SmartPAC PRO.

“S12 Input check circuit failure”

Explanation: The resolver turned five times, indicating that the press was running, but SmartPAC PRO received no signal from the input check circuit. The input check circuit may not have been connected or wired properly. If this message occurs when the press stops, the brake may be worn.

Remedy: Check the wiring of the input check circuit and rewire, if necessary, following the instructions in *Connecting Stop Circuits and Input Check Circuit*, page 61. If the input check circuit is not the problem, check your brake for wear.

“S10 Position sensor incorrect ES”

Explanation: The position sensor was not closed at 0° or was not open at 180°.

The position sensor, which cross-checks the position of the resolver to ensure that it is working correctly, should be installed so that it closes at zero resolver degrees. If it does not close at 0° or is not open by 180°, the press stops and you see this message.

The resolver drive may have slipped or be broken, or the resolver or position sensor may be defective or not installed properly. Another possibility is that the position sensor may not have enough dwell to close at high speeds. The larger the diameter of the object on which the magnet is mounted, the shorter the dwell (see Figure 2-23, page 85). Also, a position sensor may be enabled in Initialization without a position sensor being installed.

Remedy: Check the wiring and installation of the resolver and position sensor (see *Installing the Resolver*, page 55, and *Installing the Position Sensor (Optional)*, page 82). If shaft diameter is the problem, mount the magnet on a smaller shaft. If a position sensor is not installed, check to make sure that the POSITION SENSOR setting in Initialization is DISABLED (see *POSITION SENSOR MODE*, page 91).

If none of the above procedures prevents this message from displaying, the sensor may be bad. Try another sensor if available. Otherwise, call the factory for help. Do not run the press until the problem is solved.

NOTICE

- If a position sensor is being used on your press, do not disable it in Initialization mode to clear the error message. Otherwise, misalignment between the resolver and crankshaft will not be detected.
- If you do not have a position sensor, be sure to disable the position sensor in Initialization mode and make no connections to pin #246 on TB5.

E-Stop errors

Explanation: If the word “ESTOP” appears in a message, one or both of the emergency stop relay circuits are not working satisfactorily and may be defective.

Remedy: Check both stop relay circuits. To reset SmartPAC PRO, turn the unit off, then on again. (You cannot use RESET to reset this error.) If the error recurs, contact Wintriss Tech. Support.

“Inboard ram test failure”

Explanation: Something is wrong with the SmartPAC PRO main processor board. The board may need to be serviced or replaced.

Remedy: Try turning the power off, then on again. (You cannot use RESET to reset this error.) If the message continues to appear, contact Wintriss Tech. Support for assistance or replacement of the board.

“Resolver signals incorrect” or “Resolver drive signal incorrect”

Explanation: There is a problem with the resolver assembly.

Remedy: Check to make sure that the Master/Slave jumper, JP101, on the SmartPAC PRO board is set to the following position (see Figure 8-3). JP101 is located underneath the ProCamPAC board if one is installed.

- MASTER for a SmartPAC PRO *without* WPC Clutch/Brake control integration
- SLAVE for a SmartPAC PRO *with* WPC Clutch/Brake control integration

Check the resolver and wiring. Make sure that the terminals are tightened on bare wire and not on insulation (see *Installing the Resolver*, page 55). If necessary, contact Wintriss Tech. Support for assistance or replacement of the resolver.

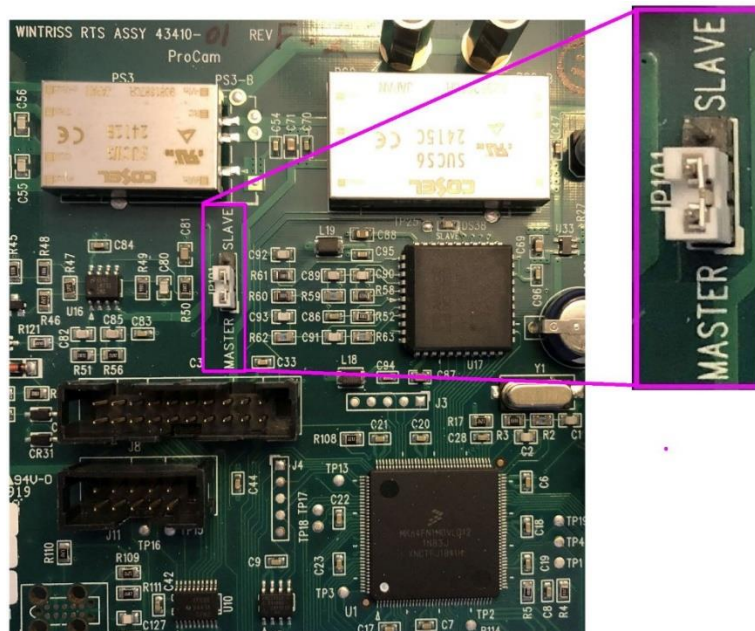


Figure 8-3. Location of JP101

“S13 Stop time exceeded”

Explanation: The stopping time of the press has exceeded the limit set in SmartPAC PRO Initialization. You should have been pre-warned of this condition by the brake warning LED, which flashes whenever the stopping time is within 10 milliseconds of the stop time limit.

This message displays when the stop time limit is not sufficient to allow for normal brake wear, or the brake is excessively worn and needs servicing. If the brake is worn, a dangerous safety problem may exist and should be corrected immediately.

Remedy: Inspect the brake for excessive wear. Perform several 90° stop-time test runs to get an actual reading for your press’s stop time. Compare these results with the results you got the last time you performed the test. Decide if the current stop time limit is realistic or needs to be changed slightly. See page 96 to calculate the correct stop time limit and page 158 to perform the 90° stop-time test. If you change the limit, you may have to relocate your light curtains and/or two-hand controls. Refer to the clutch/brake user manual for details.

If the brake is worn, you should have your maintenance personnel service the brake immediately.

Messages for Programming Problems

These messages indicate that there is a problem with the tool, the tool is not properly loaded, or there is an internal problem with SmartPAC PRO.

“No tool number has been loaded”

Explanation: You are attempting to access Run mode without a tool being loaded. A tool must be loaded before you can enter Run mode.

Remedy: Turn the PROG/RUN keyswitch to PROG to access Program mode, then load the appropriate tool, and turn the PROG/RUN keyswitch back to RUN.

“S09 Tool number table checksum error ES”

Explanation: The programming for the loaded tool has become corrupted. This error can occur when SmartPAC PRO has been turned off while you are in the middle of programming a setup, or when you have not properly exited (i.e., by pressing RESET) from a Program or Run menu.

The error can also occur when you upgrade SmartPAC PRO. Sometimes the information in the older firmware does not synchronize properly with the information in the new firmware. Settings can also be damaged due to an internal SmartPAC PRO malfunction.

SmartPAC PRO creates a “checksum” for every tool to check that the tool settings stored in memory are the same as the settings that are loaded with the tool. The checksum value calculated when tool settings are stored in memory must be the same as the value calculated when the settings are loaded.

Remedy: Access Program mode, and double-check the tool settings. If settings are correct, reload the tool.

If the error was caused because the system was turned off while in Program or Run modes, perform these steps:

1. Press RESET to clear the fault message.
2. Access Program mode, and select GO TO THE TOOL MANAGER.
3. On the Tool Manager screen, highlight the tool, and press EDIT TOOL.
4. On the Tool Program Menu, select CAM SWITCH.
5. Press RESET. SmartPAC PRO will create a new checksum for the tool.
6. Select the tool again, access the Tool Program Menu, and select CAM SWITCH. Verify that all settings are correct.
7. Reload the tool. You should no longer get this fault message.

If the problem is due to a system malfunction, the tool settings will have to be created again from scratch. If this happens more than once, contact Wintriss Tech. Support for assistance.

“S30 Program memory checksum 1 fault”

Explanation: The program memory test 1 did not produce the proper test results.

Remedy: If this occurs multiple times it could signify a hardware failure. Contact Wintriss Tech Support.

“S31 Program memory checksum 2 fault”

Explanation: The program memory test 2 did not produce the proper test results.

Remedy: If this occurs multiple times it could signify a hardware failure. Contact Wintriss Tech Support.

Messages for Sensor Faults

“Green sensor missed”

Explanation: A green or green quick check sensor did not turn on during the Ready signal nor within 50 milliseconds after the end of the Ready signal. No stroke angle is displayed for this error since the sensor never turned on.

Remedy: Check for the malfunction that the sensor was supposed to detect (part ejection problem, misfeed, transfer problem, etc.). If a malfunction is not the cause, check to be sure that the Ready signal is set properly for this sensor. Check that a sensor is actually plugged into this input on the DSI 2. If no sensor is connected to a sensor input, that input must be set to UNUSED. Check connections between sensors and the controller.

“Green sensor actuated late”

Explanation: A green or green quick check sensor turned on within 50 milliseconds after the end of the Ready signal.

If a green or green quick check sensor does not come on during its Ready signal, SmartPAC PRO continues to look for the sensor signal. If it sees the sensor come on within 50 milliseconds after the Ready signal ends, this message displays. The angle at which the sensor turned on is shown in the message.

Remedy: Check for the malfunction the sensor was supposed to detect (like a part ejection problem or misfeed, etc.). Check that the Ready signal is set properly, and adjust if necessary.

“Green sensor failure”

Explanation: A green or green constant sensor has stayed on from the end of one Ready signal to the beginning of the Ready signal for the next stroke. No stroke angle is shown with this fault.

Remedy: Check for a shorted sensor. Make sure the Ready signal has been set correctly. Check to see if a press or equipment malfunction is causing the sensor to stay on – for instance, a pinched wire or a part wedged against a sensor.

“Green constant fault”

Explanation: A green constant sensor turned off during its Ready signal. Green constant sensors must stay on throughout the Ready signal. The angle at which the sensor turned off is displayed.

Remedy: Check for the malfunction that the sensor was supposed to detect.

If no malfunction has occurred, check to make sure that the Ready signal is set properly. Remember, for green constant sensors, the Ready signal must be a little shorter than the sensor’s actuation angle. Check that a sensor is actually plugged into this input. Check connections between the DSI 2 and the controller.

“Green quick check sensor actuated outside ready”

Explanation: A green quick check sensor actuated or stayed on outside the Ready signal. The stroke angle at which the sensor was first detected on outside the Ready signal is shown.

Remedy: Check for the malfunction the sensor was supposed to detect (part ejection problem, misfeed, etc.). Check for a part wedged against the sensor, a shorted sensor, a pinched wire, or other cause that would keep the sensor on or cause it to go on outside its Ready signal. Make sure the Ready signal is set correctly.

“Green special fault”

Explanation: A green special sensor did not actuate (i.e., there was no contact closure to ground) within the maximum number of strokes set in Program mode.

Remedy: Check for the press or equipment malfunction that the sensor was supposed to detect. Check for any cause that would keep the sensor from going on. Make sure the maximum stroke count is set correctly, especially that it is not set too low. See *Setting the Counter Value for a Green Special Sensor*, page 199.

Fault message for yellow sensors “This N/O sensor is grounded”

Explanation: A yellow sensor turned on (i.e., there was a contact closure to ground). When this message is displayed, the angle at which the condition was detected is shown.

Remedy: Check for the press or equipment malfunction that the sensor was supposed to detect. If no malfunction has occurred, check for a shorted sensor or pinched wire.

Fault message for red sensors “This N/C sensor is open”

Explanation: A red sensor has actuated (i.e., is open to ground). When this message is displayed, the angle at which the condition was detected is shown.

Remedy: Check for the press or equipment malfunction that the sensor was supposed to detect. If no malfunction has occurred, check for a problem with the sensor. Check for loose or detached wiring at the DSI 2 or controller. Check for a severed wire from the sensor to the DSI 2 or controller.

Miscellaneous Fault Messages

“S00 Maximum press speed exceeded”

Explanation: The press is running at a speed greater than the maximum limit programmed for this tool.

Remedy: After clearing the error, either run the press at a slower speed, or adjust the limit set in Program mode (see PRESS SPEED, page 148).

“S01 Minimum press speed exceeded”

Explanation: The press is running at a speed less than the minimum limit programmed for this tool.

Remedy: After clearing the error, either run the press at a higher speed, or adjust the limit set in Program mode (see PRESS SPEED, page 148).

“S33 The resolver position is different from when the unit was turned off ES”

Explanation: This message will only appear if SmartPAC PRO detects that the resolver angle when the press is turned on is different from the angle when the press was turned off. This can happen when you move the press or upgrade SmartPAC PRO firmware.

Remedy: Press RESET to clear. If the message reappears, call Wintriss Tech. Support

“One of the sensor auto enable counters is greater than 99”

Explanation: Normally, this fault will never occur since SmartPAC PRO does not let you enter a value greater than 99. However, this message could display if there is an internal problem with SmartPAC PRO.

Remedy: First press RESET. If the message reappears, contact Wintriss Tech. Support.

“S32 Module communications fault”

Explanation: The SmartPAC PRO and the remote module at the following address are not communicating properly. - AA.

Where AA is the module address

- 1 - First AutosetPAC or WaveformPAC
- 2 - Second AutosetPAC or WaveformPAC
- 3 - Bruderer RamPAC (Old MultiPAC)
- 4 - RamPAC
- 5 - First ProPAC
- 6 - Second ProPAC

Remedy: Make sure the module in question is powered up and verify the wiring is correct per installation diagram.

“S35 Loss of Communication at Address X ES”

Explanation: SmartPAC PRO is unable to communicate with the optional module identified by “X” in the message (see Table 8-1).

Remedy: Check the wiring of the specified module. If you continue to get this error message, call Wintriss Tech. Support.

Table 8-1. Communication Errors: SmartPAC PRO Option Identified by Address Number

Message	Option Identified by Address
Loss of Communication at Address 1	AutoSetPAC or WaveFormPAC Channels 1 - 4
Loss of Communication at Address 2	AutoSetPAC or WaveFormPAC Channels 5 - 8
Loss of Communication at Address 4	RamPAC
Loss of Communication at Address 5	ProPAC

CAN Bus Fault Message

No CAN Connection Detected

Explanation: The CAN cable is loose or not connected properly between TB6 on the HMI board and TB1 on the RTS board.

Remedy: Check the cable connection. After you secure the connection, you may need to cycle the power to clear the fault.

Additional Miscellaneous Fault Codes

If any of the following faults occur, contact Wintriss Tech. Support.

S29 - EStop relay drivers failed the drop out test

S38 - PLC interface estop error ES

S39 - DiProPAC auto enable counter error ES

S40 - STI, FeedRite, Tool number interface not communicating error ES

S43 - Dialog code backfill ES

S44 - Tool ID mismatch error ES

Troubleshooting Using the Error/Event Log

The Error/Event Log, which you can view in Run mode, is a useful troubleshooting aid. You can use the Error/Event log to help you diagnose the cause of a problem, or you can send the log to Wintriss Tech. Support to help them narrow down probable causes. For more information, see *ERROR/EVENT LOG*, page 161, and the Message button in Table 1-2.

Appendix A – SmartPAC Preventive Maintenance (PM) Monitor (Optional)

This appendix explains how to initialize, set up, and use the features of the SmartPAC Preventive Maintenance (PM) Monitor. This appendix serves as an add-on to the chapters in this manual. References will be made to certain sections. Complete all the steps in each of those sections unless otherwise noted.

NOTICE

UPGRADING FIRMWARE

If you have a SmartPAC PRO system with an AutoSetPAC, you may need to upgrade the AutoSetPAC's firmware to accept the PM Monitor functionality. To determine and obtain the correct AutoSetPAC firmware, Contact Wintriss Tech. Support.

About SmartPAC PM Monitor

The SmartPAC PM Monitor is an option which allows the maintenance department to manage its time more effectively. The PM Monitor tracks up to 64 items on the press based on specific usage, rather than merely signaling when a period of time has passed. Consequently, the entire stamping process is monitored automatically, and maintenance is alerted only when equipment requires attention.

Comparison with Traditional Preventive Maintenance

Equipment used on or around the press needs to be checked at regular intervals, such as daily, weekly, or every specified number of strokes. Traditional preventive maintenance programs are based upon elapsed time and would be adequate if your presses were used in the same way all the time. However, with just-in-time manufacturing, shorter job runs, and more tool changes, presses and auxiliary equipment must frequently change the way that they operate. Each change results in varying degrees of wear and tear on the machinery. As a result, traditional PM programs are not the most effective way to handle these kinds of variations.

Here is an example. A traditional PM program may alert maintenance to inspect a press's braking system every three months. During that time, the press is idle or running a continuous coil-fed job, and the brake experiences minimal wear. As a result, any time spent checking the brake would be wasted. On the other hand, if the press were running a hand-fed job in Single-stroke mode, the many starts and stops of the machine would cause greater-than-normal brake wear, and three months would be too long to wait between inspections.

How the PM Monitor Works

In the previous example, the SmartPAC PRO PM monitor would keep track of machine stops and could be set to signal a PM alert for the braking system after 50,000 machine stops, for example. If the press is idle or running coil fed jobs, the time between alerts will be long. If the press is used for hand-fed jobs, the time between alerts will be shorter.

Up to 64 items can be set up in the PM Monitor's schedule. **Tracking units** such as machine starts or

stops, strokes, motor-on hours, cam channel actuations, die changes, tonnage overloads, etc. (depending on how SmartPAC is configured), can be assigned to each item in the schedule. The PM Monitor can also track hours, days, weeks and months for items that need to be maintained according to a specific time schedule. A **tracking frequency** is assigned to each item to tell the PM Monitor when to signal an alert. At that time, an alert message appears in SmartPAC's status bar in Run mode.

The entire PM **schedule** can be viewed in Run mode. The schedule shows each item, its units, frequency, and current value. Any items in **alert status** are highlighted. Items with alert status will be highlighted until the alert is cleared and the item is reset. The PM monitor continues to track alerted items until they are reset. Please note that SmartPAC does not stop the press when an item is in alert status. SmartPAC's PM schedule is password-protected to keep unauthorized personnel from clearing an alert.

Examples of How to Use the PM Monitor

Some examples to help you properly set up your PM monitor are provided in Table A- 1 and Table A- 2, below, which show "PM items" and "PM tracking units." If you do not find a suitable PM item name, you can program a "custom" name to match your application.

Examples below provide such "custom" suggestions. To obtain further assistance in using the PM Monitor, contact Wintriss Tech. Support.

The tracking unit "**Ch. cycles**" (for cam channels 1 through 8 or 16), can be used to track the usage of various ancillary devices controlled by SmartPAC. Some PM items might include: feeder, pilot release solenoid, and ejection cylinders.

The tracking unit "**Die changes**" can be used to track the usage of components that are directly related to changing tools at SmartPAC. Some PM item examples might include: hydraulic clamping mechanism and the ram adjust motor.

WPC press control faults F50 through F58 can be used to monitor items connected to the user-definable inputs set when SmartPAC is integrated with the Wintriss Clutch/Brake Control (WPC). Here are some examples: lube pressure, lube level, Nitrogen pressure (related to Nitrogen die spring systems).

Table A- 1. Preventive Maintenance Items

air rotary seals	main motor	feeder
brake	pilot solenoid	gibs
clutch valve	pitman bearing (1 through 4)	lube motor
counterbalance system	back shaft bearing (1 through 4)	main bearing (1 through 4)
DSV	bull gear	oil level
flywheel bearing	conveyor (1 through 6)	pinion key
lube filter	drive belts	"Custom" name
lube system		

Table A- 2. PM Tracking Units

run hours ¹	days
weeks	months
die changes	ch. cycles (1 through 16) ²
WPC press control faults, F50-F58 ³	press overloads ⁴

1. For SmartPAC (without WPC), “run hours” refers to the length of time that SmartPAC is “on”. For SmartPAC PRO with WPC, it means how long the motor is “on”. (The version of SmartPAC that you currently have is without WPC. Contact Wintriss Controls if you require WPC.)
2. Ch. cycles 1 through 16 can be used only if you have a 16-channel ProCamPAC. Only ch. cycles 1 through 8 can be used for an 8-channel configuration.
3. These are only available if you have SmartPAC PRO with WPC and if you have wired and assigned press functions to the user-definable inputs. (The version of SmartPAC that you currently have is without WPC. Contact Wintriss Controls if you require WPC.)
4. “Press overload” is only available with the AutoSetPAC option.

Installing the PM Monitor

For New Systems from the Factory

If you purchased a SmartPAC PRO system with the PM Monitor pre-installed at the factory, proceed directly to *Using the PM Monitor in Initialization Mode*, page 252.

For Existing Systems

If you ordered the PM Monitor options separately (in other words, if you already had a SmartPAC PRO, and you were just adding the PM option), you must first physically upgrade your SmartPAC PRO system for compatibility. To upgrade your SmartPAC PRO, follow these steps:

1. Purchase the option and obtain a purchased option code from Wintriss.
2. Go to the Main Program menu.
3. Press INITIALIZATION MENU.
4. Press INSTALLED OPTIONS.
5. Press OPTIONS MANAGER.
6. On the Options Manager screen, find the PM Monitor. The box next to it says “Unlicensed.”
7. Press the Unlicensed box. The License Code entry window appears.
8. Key in the license code you received. Press Enter.
 - If the entry window closes and the box next to PM Monitor says Enabled, the option is licensed. Go to step 9 to apply the change.
 - If the entry window says, “Invalid Entry!” press Backspace repeatedly to delete the code. Check that you have the correct code. Key in the code again. Press Enter. If this still does not work, press Cancel and contact Wintriss Tech Support.
9. Press Apply and Restart. When the SmartPAC PRO restarts, the PM Monitor is ready to use.

Once the purchased option has been added, proceed to *Using the PM Monitor in Initialization Mode* (below).

NOTICE

You must initialize PM Monitor before you can use it (see the next sections).

Using the PM Monitor in Initialization Mode

How to Access SmartPAC Initialization and PM Monitor

NOTICE

Before changing modes, make sure your screen shows the first display in the mode you are in. If that display is not shown, nothing will happen when you turn the Program/Run key. In that case, keep pressing the RESET key. When the first display in the mode is reached, SmartPAC will instantly switch to the new mode.

1. To get into Initialization mode, turn the Program/Run key to PROG. Press INITIALIZATION MENU.

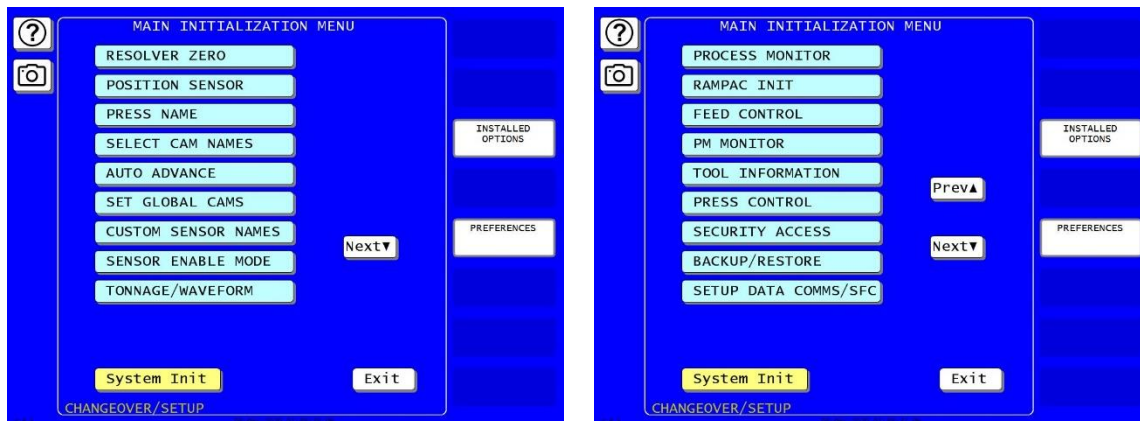


Figure A- 1. “PM Monitor” on SmartPAC PRO Initialization Menu

2. Select “PM Monitor” from the main Initialization menu (see Figure A-1). A screen will appear asking for your password.

NOTICE

The password prompt will appear EVERY time that you select “PM Monitor” from the Initialization mode.

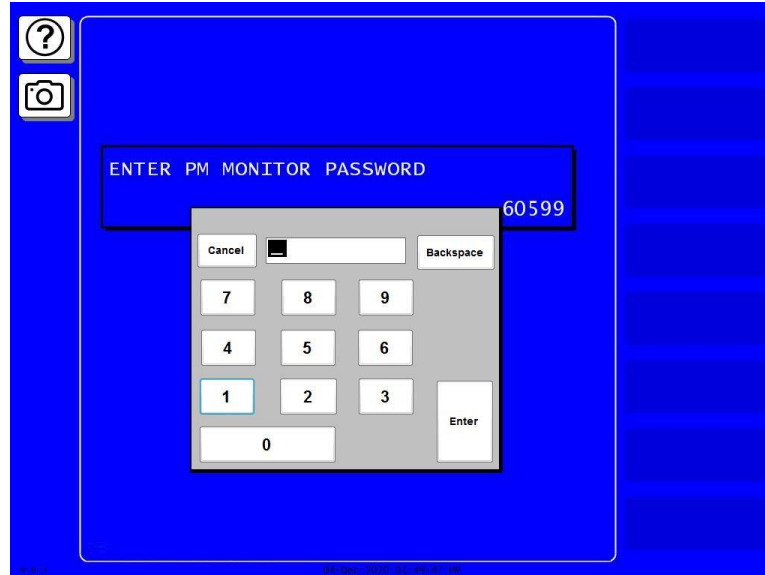


Figure A- 2. PM Password Screen

- At this point, consider the applicable alternatives below, depending on whether you have a *new system* (which includes the PM option already installed at the factory), or an *existing* SmartPAC (where you have to install and initialize this option yourself). Proceed with the one that corresponds with your system.

For Systems New from the Factory

If you purchased a SmartPAC system with the PM Monitor pre-installed at the factory, it is not necessary for you to clear/initialize the PM Monitor. However, you do need to complete the steps below as directed.

- Enter the password “1234” at the “PM password” screen. This will take you immediately to the “PM Entry” screen.
- As we mentioned above, you do not need to initialize your PM Monitor option, as it has already been done at the factory. However, it is advisable for you to change your password from the default “1234” to a different number, for security reasons.
- To do this, press GO TO THE INIT MENU.
- In the screen that opens, press CHANGE PASSWORD.
- In the numeric entry pad that opens, Figure A- 2, key in a new password up to 4 digits long.

For Existing Systems

If you ordered the PM Monitor options separately, you *must* initialize this option before you can actually use it. Complete all the steps in *Initializing the PM Monitor*, below, to initialize the PM Monitor.

NOTICE

You should already have installed the firmware upgrade. If not, go back to *Installing the PM Monitor*, page 251, before proceeding further.

Initializing the PM Monitor

1. Select “PM Monitor” from the Main Initialization Menu (see Figure A-1). A screen will appear asking for your PM Monitor password.

NOTICE

The password prompt will appear EVERY time that you select “PM Monitor” from the Initialization mode.

2. To determine the password for your system, note the number at the bottom-right corner of the password screen, and contact Wintriss Tech. Support. (*Because you have an upgraded system, the password may not be “1234.”*)

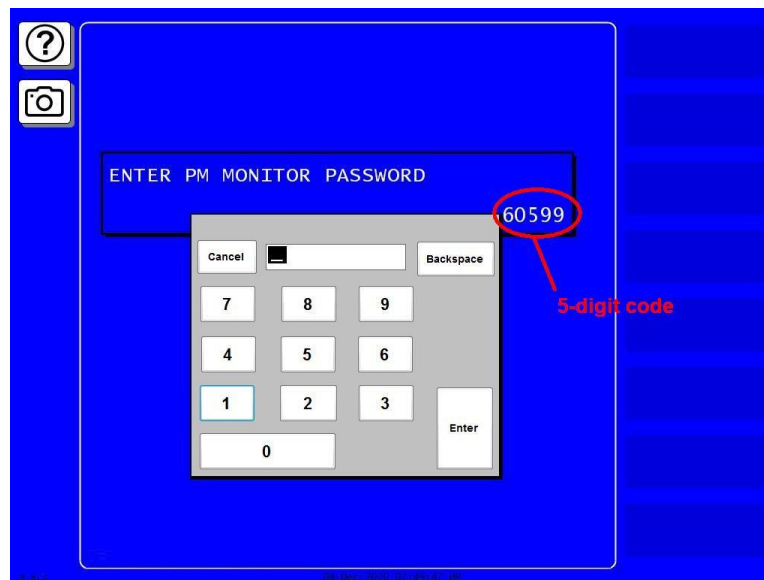


Figure A- 3. PM Password Screen Showing Password Retrieval Number

3. Enter the password that you obtained from Wintriss Controls, using the numeric keypad. This will take you to the PM Entry Screen (see below). Don’t worry if erroneous information appears on the screen, as it will disappear once you have completed step 5.

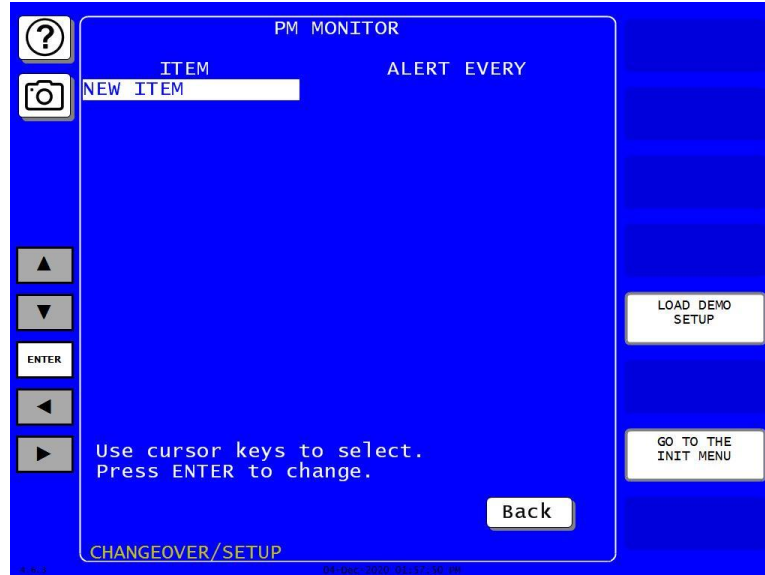


Figure A- 4. PM Monitor Screen

4. Press GO TO THE INIT MENU.
5. From this screen you can initialize the PM Monitor. To initialize, select “Clear PM Info”. (Notice that you can also change your password on this screen. To change your password, refer to the next section, Assigning a New PM Password Number. Select "Clear PM info" to initialize the PM monitor

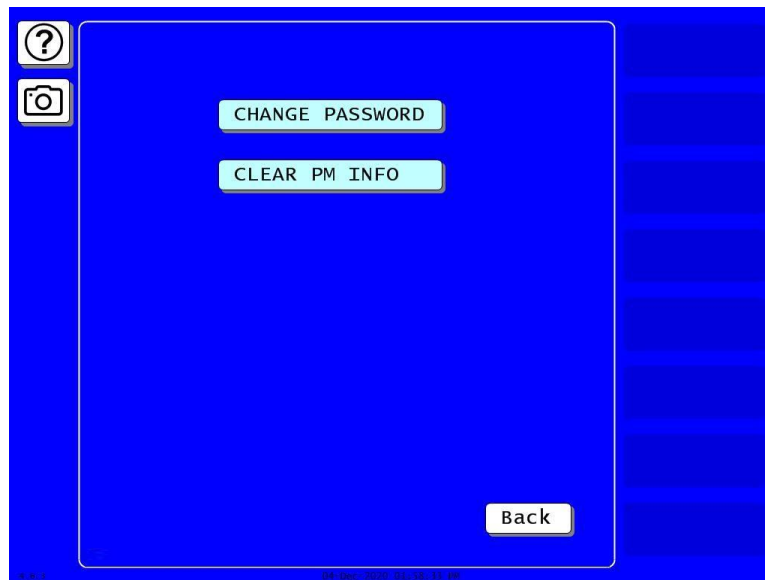


Figure A- 5. Initialize PM Screen

6. Notice the “Warning” message and accompanying instructions appearing on the screen (see below). Press the CLEAR key to initialize. (If you decide not to, then press RESET.)

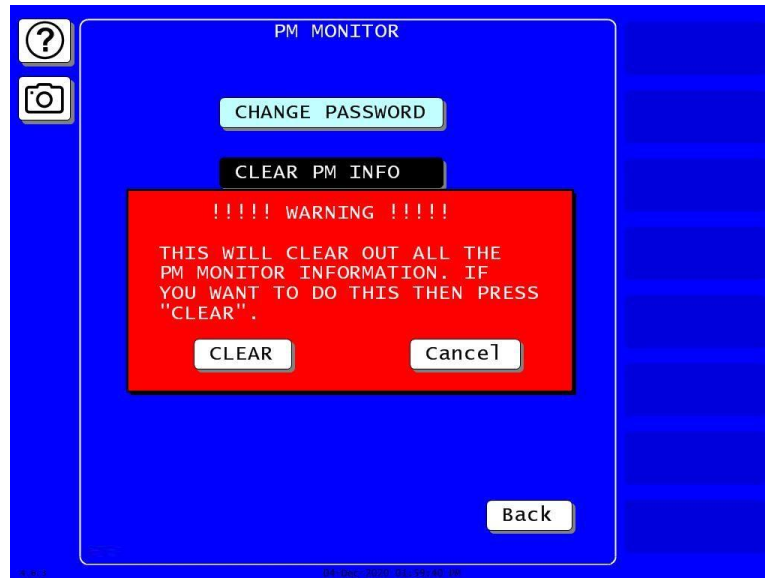


Figure A- 6. Initialize Warning Screen

7. Once you press CLEAR, you will briefly see the confirming message “INITIALIZING PM MONITOR”.
8. Next, press RESET to exit from the “Initialize PM” screen. You will be returned to the PM Entry screen. Proceed to the next section to assign a new password number.

Assigning a New PM Password Number

Before you can actually set up and use the PM Monitor, you may want to assign a new password number. (The default password is “1234”.) For security reasons, it is advisable to change the default password. Follow the steps below to change the password. You can also change the password under the Security Access item on the Main Initialization Menu (see *Changing Passwords*, page 4-28).

1. Go to the “PM Entry” screen, Figure A- 4. Press GO TO THE INIT MENU.
2. In the screen that displays, Figure A- 5, press CHANGE PASSWORD. A password entry keypad appears, Figure A- 7.



Figure A- 7. PM Monitor New Password Entry

3. Enter a new password, up to 4 digits (numeric only). Press ENTER.
4. Make sure that you record this number and keep it in a place where you can find it. Without it, you cannot change settings in the PM Monitor.
5. You are now ready to use the PM Monitor. Go to the next section.

Selecting PM Item Names

You are now ready to set up PM parameters in Initialization. You can select a name for each preventive maintenance item that adequately describes its function. SmartPAC provides more than 30 names. If there is a function for which you cannot find a suitable name, you can create a custom name. (This procedure is explained in step 5 below.)

1. Highlight “New item” on this screen. (You may be asked for a password before getting to this screen. If so, enter it.)

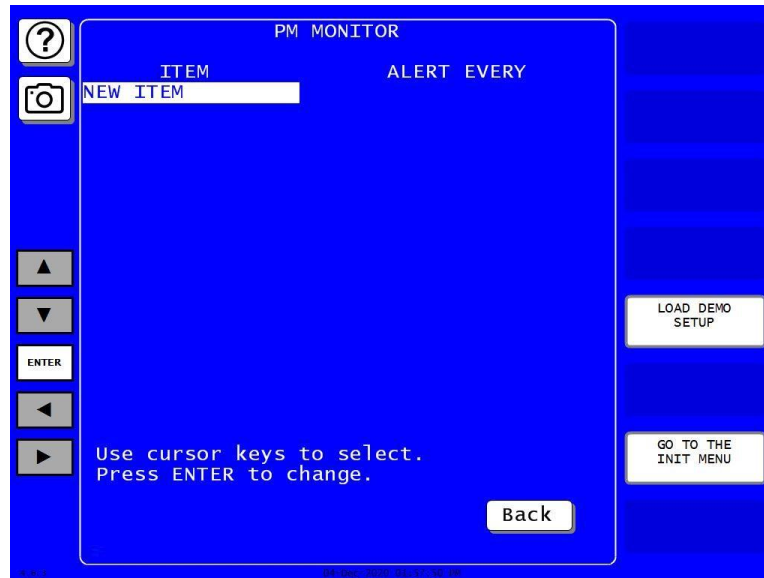


Figure A- 8. PM Monitor Screen

- Next, you will see the following display. Give the item a name that best describes its function, so first check the list for a suitable name.

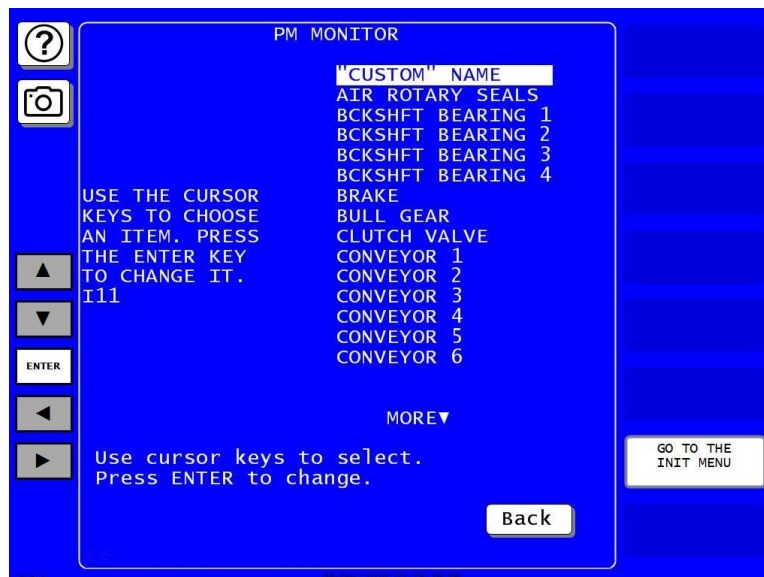


Figure A- 9. List of Available PM Names Screen

- To see the complete list of names, press the Down (▼) cursor key until the bottom name on the list is highlighted, then keep pressing it. A new name will appear each time you press the key. You can use the Up (▲) cursor key to reverse direction.
- If you do not find a suitable name but you still want to name the item, you can select “Custom Name” by highlighting it and pressing ENTER.
- When the Alphanumeric Entry window displays (see Figure A- 10), key in the custom name. The custom name can be any combination of alphanumeric characters, symbols, etc. When finished, press Enter. To leave the window without creating a name, press Cancel.

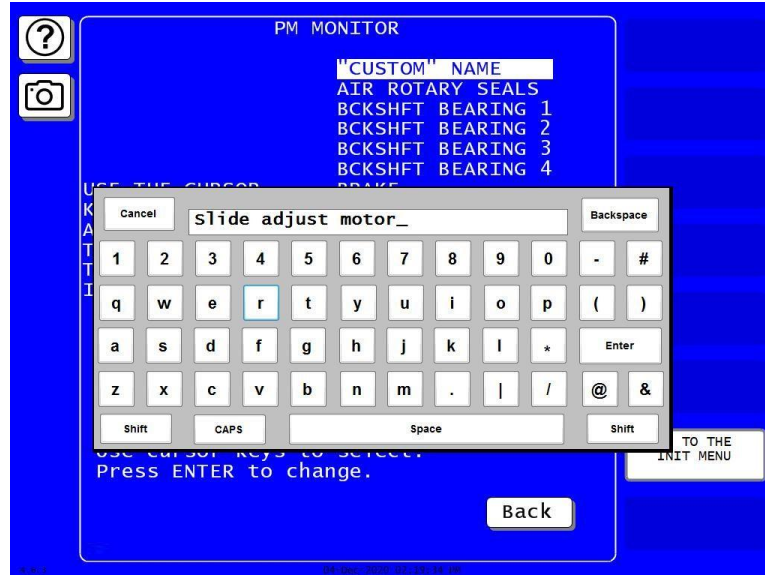


Figure A- 10. Alphanumeric Display Superimposed over PM Names Screen

6. After you name the item, you are prompted to set the PM monitor tracking units. You can select a time-based measure, such as run hours, days, weeks, or months; or you can select measures linked to the process, such as strokes, die changes, or programmable cam channel cycles. Select the most applicable tracking unit of measure.



Figure A- 11. Tracking Units Selection Screen

7. Next, the number display appears superimposed over the previous display (see Figure A- 12). Use the number keys or cursor keys to set the tracking frequency for the PM item.



Figure A- 12. Superimposed Number Display

8. In the following illustration, we entered the slide adjust motor as our first PM item, set the tracking unit of measure to be “die changes,” and the frequency at “100”. Notice that the PM name is listed just below “new item”:

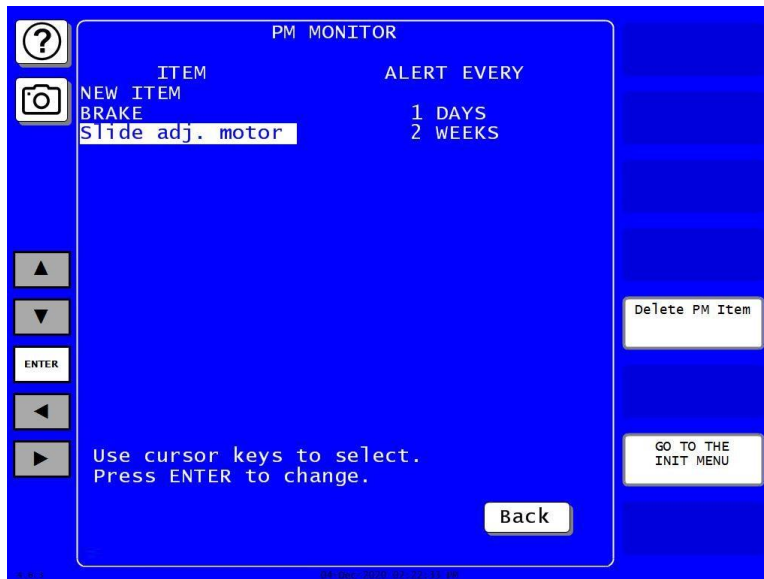


Figure A- 13. Programmed PM Item: Example

9. To set more PM items, repeat steps 1 through 8. When you are completely done initializing the PM items, press BACK to return to the Main Initialization Menu.
10. You can now go to the Run mode to view the PM Monitor status conditions. There is no PM information to set in SmartPAC’s Program mode. You made all the required settings in the Initialization mode.

Using the PM Monitor in Run mode

How to Get into SmartPAC Run Mode

To get into Run mode, turn the Program/Run key to RUN.

NOTICE

Before changing modes, make sure your screen shows the first display in the mode you are in. If that display is not shown, nothing will happen when you turn the Program /Run key. In that case, press Reset, Exit, or Back repeatedly. When the first display in the mode is reached, you will instantly switch to the new mode.

A Tool Number Must Be Loaded Before Switching to Run Mode

If no tool number has been loaded, you cannot switch from Initialization mode or Program mode to Run mode. A tool number must be loaded before SmartPAC will allow the press to run.

If you try to switch to Run mode without a tool number loaded, you will get this error message on your screen:

NO TOOL NUMBER HAS BEEN LOADED

If so, turn the Program/Run key to “PROG”. Press RESET to clear the error message. Then load a tool number. Now turn the Program/Run key to “RUN”. The Run menu, shown below, is the first display you see in Run mode. From this display you can access the PM Monitor selection.

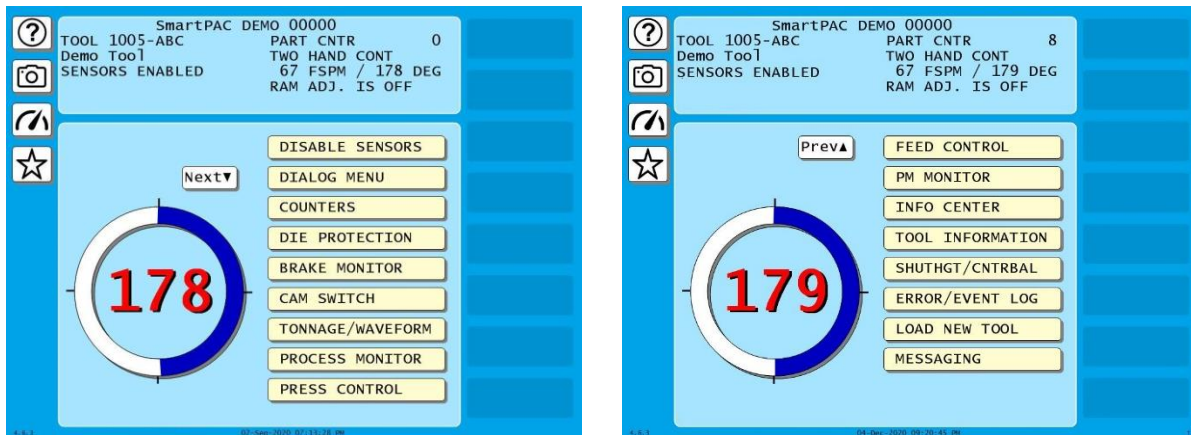


Figure A- 14. SmartPAC PRO Run Menu with PM MONITOR

(Your list of options may be different, depending on the features you have installed.)

Viewing and Modifying PM Alerts

1. Select “PM Monitor” from the first display in Run mode.
2. You will see the list of PM items that you previously assigned in Initialization. The first item is highlighted in the next example. Use the cursor keys to view the other items on the schedule. Currently the PM status for all items is “normal” (see display). This means that none of the items has reached the limits set in Initialization.

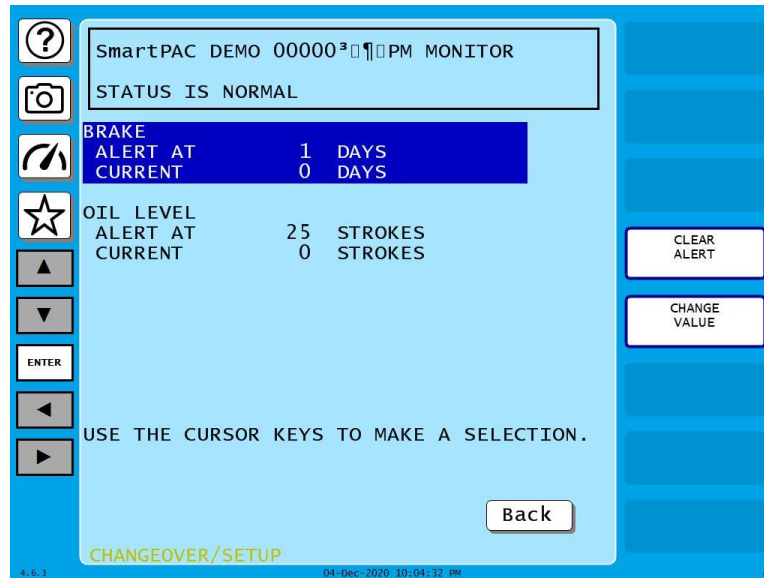


Figure A- 15. Run Mode Screen Showing PM Monitor in “Normal” Status Mode

NOTICE

You may notice that some of the current values do not update on every stroke while the press is running. SmartPAC is keeping track of these items, but does not refresh the display until the press actually stops.

3. The next display shows that one of the items, “Slide Adjust Motor,” is now in “alert” status mode. It flashes on the screen. Also, the number of items in alert status mode appears at the top of the screen.

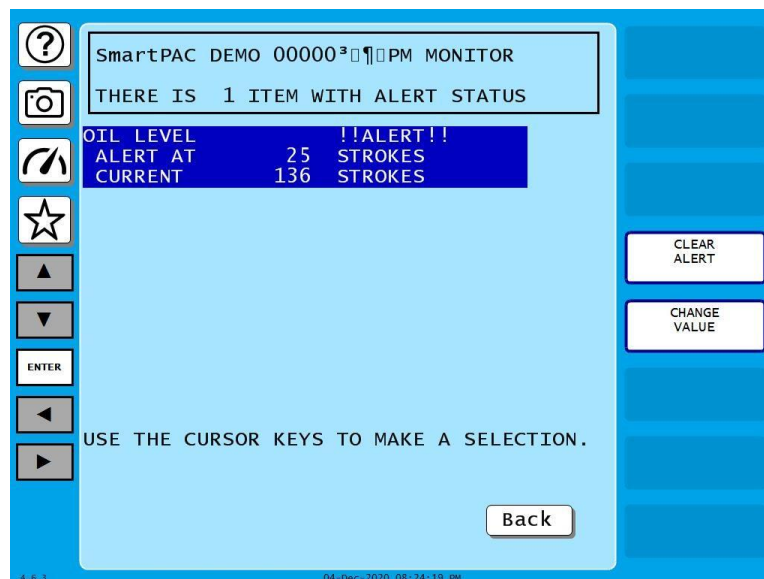


Figure A- 16. Run Mode Screen Showing “Slide Adjust Motor” in “Alert” Mode

4. To view other items in the schedule that may or may not be in “alert” status, use the cursor keys. If more than three PM items were set in Initialization, they will not all appear on the screen. To view them, simply use the cursor keys to scroll down the list.

5. To clear the alert, first highlight that item, press CLEAR ALERT OR CHANGE VALUE and enter the PM password.

NOTICE

When you clear the alert condition for a certain item, you automatically reset its current value to zero. You cannot recall the previous value.

6. If you want to change the frequency value on a given PM item, first highlight that item and press CHANGE VALUE. The number display will be superimposed over the screen (similar to Figure A- 12). Use the number keys or cursor keys to modify the tracking frequency for that PM item.
7. Once you are done viewing or modifying this screen, press RESET to return to the main Run menu.

Appendix B – Updating SmartPAC PRO Firmware


This appendix shows you how to update SmartPAC PRO firmware using a link you receive by email from Wintriss Support. Follow the instructions below to complete the update.

NOTICE

FIRMWARE ORDER MUST INCLUDE SMARTPAC PRO SERIAL NUMBER

When you order new firmware, make sure to include the serial number of your SmartPAC PRO unit. Wintriss needs the serial number to create the correct firmware for your unit.

You can find the serial number on

- the Installed Options screen (see *INSTALLED OPTIONS*, page 93).
- the Info screen (In Run mode, press the dashboard button. When the dashboard displays, press the  button.)
- the SD card installed on the HMI board (see Figure 2-10, page 63).

To order new SmartPAC PRO firmware, you must fill out a “SmartPAC PRO Firmware Upgrade” form, available from your Wintriss representative or Wintriss Tech. Support. Make sure to specify on the form the serial number on your SmartPAC PRO. The firmware upgrade file you receive from Wintriss includes this serial number in its file name (i.e., SPPnnnnnnnn, where SP2 stands for SmartPAC PRO and nnnnnnnn is the eight-digit SmartPAC PRO serial number).

1. Obtain a link from Wintriss Tech Support. The format is similar to:
http://smartpacpro.com/updates/sppxxxxxxx.zip, with *xxxxxxx* being your SmartPAC PRO’s serial number.
2. Save the .ZIP file to a USB drive. Do not unzip the file. SmartPAC PRO unzips it upon starting the update.
3. At the SmartPAC PRO unit in the Main Program menu, press **INITIALIZATION MENU**.
4. In the Main Initialization Menu, press **NEXT** one or more times to scroll down to **DIAGNOSTICS**.
5. Press **DIAGNOSTICS**. The Diagnostic Menu appears.
6. Press **UPDATE FIRMWARE**. The Update Firmware Utility page appears.
7. Insert the USB drive in the USB socket on the front of the SmartPAC PRO.
8. A window opens labeled **USB Disk Detected**. Press **Exit** to close this window.
9. When **USB Disk Present** appears on the display, press **Do Update**. A progress bar appears, showing **Load Time**. Then, the status changes to “**Downloading Firmware, Please Wait. . .**” The download and update takes approximately 3 minutes.
10. SmartPAC PRO restarts on its own and returns to the Program Menu when the update is finished. You can remove the USB disk while SmartPAC PRO is restarting.

If a tool is loaded and you are currently running a job, you must record the current tool number, tool

name or tool ID, and counter values before installing the new firmware. In Run mode, select COUNTERS, then enter the displayed counter values in the “COUNT” column in Table B-1, below.

Table B - 1. Record of Current Counts

Tool Number _____		
Tool Name or Tool ID _____		
COUNTER	COUNT	PRESET VALUE
Strokes		You do not have to record Preset Values. They are saved with the tool settings.
Good Parts		
Batch 1		
Batch 2		
Batch 3		
Total Hits		

Check the serial number of the new firmware to make sure it matches the serial number of your SmartPAC PRO. The firmware serial number begins with the prefix “SPP” (for SmartPAC PRO) followed by a numeric code (i.e., SPPnnnnnnn). The numeric code is the serial number of your SmartPAC PRO unit.

NOTICE

If you elect to download SmartPAC PRO firmware from Wintriss, you must have

- A PC with a USB port and one of the following Windows operating systems: Windows 10, Windows 2000, Windows XP, and Windows 7
- A USB disk with at least 4 MB of available space

Installing Updated Firmware from USB Disk to SmartPAC PRO

Follow these steps to load new firmware from a USB disk to your SmartPAC PRO.

NOTICE

If you downloaded your firmware from Wintriss, go to page 265 and follow the instructions in Downloading Updated Firmware from the Wintriss Server to load the firmware onto a USB disk. Then return to this page and install the firmware on your SmartPAC PRO.

1. If a tool is loaded and you are currently running a job, you must record the current tool number, tool name or tool ID, and counter values before installing the new firmware. In Run mode, select COUNTERS, then enter the displayed counter values in the “COUNT” column in Table B-2, below. Key in the number of good parts you want to add (1,000 parts maximum), and press ENTER

Table B - 2. Record of Current Counts

Tool Number _____		
Tool Name or Tool ID _____		
COUNTER	COUNT	PRESET VALUE
Strokes		You do not have to record Preset Values. They are saved with the tool settings.
Good Parts		
Batch 1		
Batch 2		
Batch 3		
Total Hits		

2. Check the serial number of the new firmware to make sure it matches the serial number of your SmartPAC PRO. The firmware serial number begins with the prefix “SPP” (for SmartPAC PRO) followed by a numeric code (i.e., SPPnnnnnnnn). The numeric code is the serial number of your SmartPAC PRO unit.

Appendix C – Reporting Downtime and Scrap to SFC

This appendix shows you how to report press downtime from your SmartPAC PRO control to Wintriss's ShopFloorConnect Asset Utilization Software (SFC). The appendix discusses the six machine states to which SFC logs press time, explains the downtime reporting features of SmartPAC PRO, shows you how to set up SmartPAC PRO to report downtime to SFC, and provides instructions for reporting downtime.

The appendix also shows you how to use the scrap counter on the SmartPAC PRO Counters screen in Run mode to report scrap to SFC and how to adjust the Good Parts count that is reported to SFC.

SmartPAC's downtime- and scrap-reporting features are available if SFC firmware option is installed.

Machine States to Which SFC Logs Press Time

SFC logs all elapsed time at each press to one of six categories called machine states. The sum of all the times assigned to these machine states for an individual press is the number of hours in a production day (e.g., 12 hours, 24 hours, etc.). SFC selects the machine state to which to log press time on the basis of downtime reporting and other information it receives from SmartPAC PRO. Machine states are differentiated as follows:

- Running Time – Press is running and making parts
- Idle Time – Press is stopped, no SmartPAC error has occurred, and the reason the press is stopped has not been documented in SmartPAC PRO
- Unplanned Downtime – Press is stopped due to a SmartPAC PRO error, or if the press is stopped for another reason, that reason has been assigned to the Unplanned Downtime state in SFC
- Planned Downtime – Press is stopped, and the reason has been assigned to the Planned Downtime state in SFC
- Changeover Time – Press is stopped, and the reason has been assigned to the Changeover state in SFC
- Offline Time – Press is stopped because there is no power to the press or the network is down

All time during which the press is stopped for any reason other than a power interruption or network failure is logged by SFC to Idle Time unless a downtime reason is reported from the SmartPAC PRO. Idle Time is treated in ShopFloorConnect as downtime with no documented reason. Since corrective action cannot be taken until a cause is identified, SmartPAC PRO has been designed to allow very precise reporting of downtime to SFC and may be programmed to require the operator to select a specific downtime reason each time the press enters an Idle state. When operator intervention is required, periods of press inactivity are more likely to be assigned to a specific downtime reason than to be logged as Idle Time.

SmartPAC PRO Downtime Reporting Features

Downtime reasons in SmartPAC PRO may be reported to SFC either automatically by the system or manually by the operator. When the press is stopped because of an error generated by SmartPAC PRO or an installed SmartPAC PRO module, the specific fault (e.g., “Sensor 1 Part Ejection Missed”) is reported automatically as a downtime reason to SFC.

When the press is stopped by the operator or by a piece of auxiliary equipment not connected to the SmartPAC PRO, a downtime reason must be reported manually by the operator since SmartPAC PRO is unable to detect the reason for the interruption (see *Forced Idle Dialog Mode*, below).

Downtime reasons may also be assigned manually to provide additional detail for periods documented automatically with specific error conditions (see *Forced Error Dialog Mode*, page 273).

Forced Idle Dialog Mode

If the SmartPAC PRO is set to Forced Idle Dialog mode (see *Making Downtime Reporting Settings*, page 276), a downtime reason must be entered whenever the press is stopped by the operator or by auxiliary equipment. When the press stops (see Figure C - 1, page 271, for a schematic time line), a message displays at the SmartPAC PRO stating that the operator must enter a downtime reason before the press can be restarted. When the operator closes the message window, the Dialog Menu automatically displays. The Dialog Menu, a selection on the SmartPAC PRO Main Run Menu, displays a list of downtime reasons from which the operator must select to report downtime to SFC. Refer to *Programming Downtime Reasons*, page 280, for instructions on how to set up the Dialog Menu.

The Forced Dialog message can be programmed to display a specified number of minutes after the press stops (see Figure C - 1). This Idle Dialog Time setting enables the press to be stopped briefly without requiring entry of a downtime reason.

Backfilling vs. Forward Filling

SFC initially logs the time after the press is stopped by the operator or by auxiliary equipment to Idle Time. When the operator selects an item on the Dialog Menu, the period of time previously documented as Idle is assigned that downtime reason. Downtime can be assigned manually or automatically, depending on how your SmartPAC PRO is programmed (see *Making Downtime Reporting Settings*, page 276).

If SmartPAC PRO is set up for manual downtime reporting, the operator selects how the downtime is to be assigned in an option window that displays following selection of the downtime reason (see Figure C - 11, page 286). One option, which is called “backfilling,” is to assign the downtime reason to all time that has elapsed since the press was stopped (see Figure C - 1, page 271,). The other option is to “forward fill” the downtime reason, assigning it to the period from reporting of the downtime reason until the press is restarted (see Figure C - 2, page 272). When this option is selected, all elapsed time before entry of the downtime reason is assigned to the previous downtime reason, if one was reported, or to Idle Time.

If SmartPAC PRO is set up for automatic downtime reporting, the option window does not display following selection of the downtime reason, and downtime is automatically backfilled.

Putting the Press “Back on Line”

A period of Idle Time or Planned or Unplanned downtime comes to an end either a programmed number of strokes after the operator restarts the press (see *Reset Strokes Counters*, page 274) or when they select “Back on Line” from the Dialog Menu. If the press is restarted at the same time as “Back on Line” is selected, SFC begins documenting the machine state as “Running time” (see Figure C - 1). When the operator selects “Back on Line” without restarting the press, the subsequent period until the press is restarted is logged to Idle Time (see Figure C - 2).

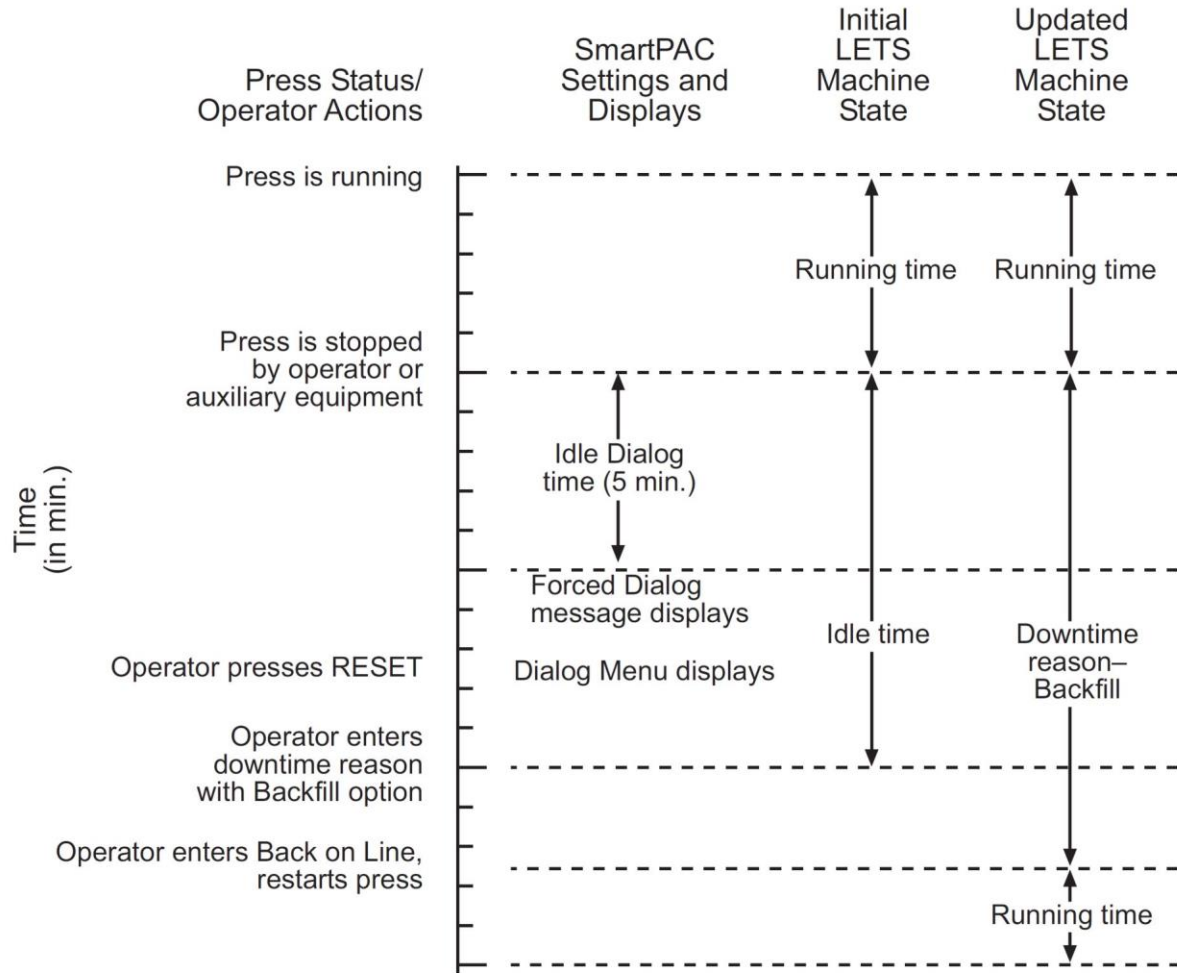


Figure C - 1. Forced Idle Dialog Mode Time Line (Downtime Reason Backfilled)

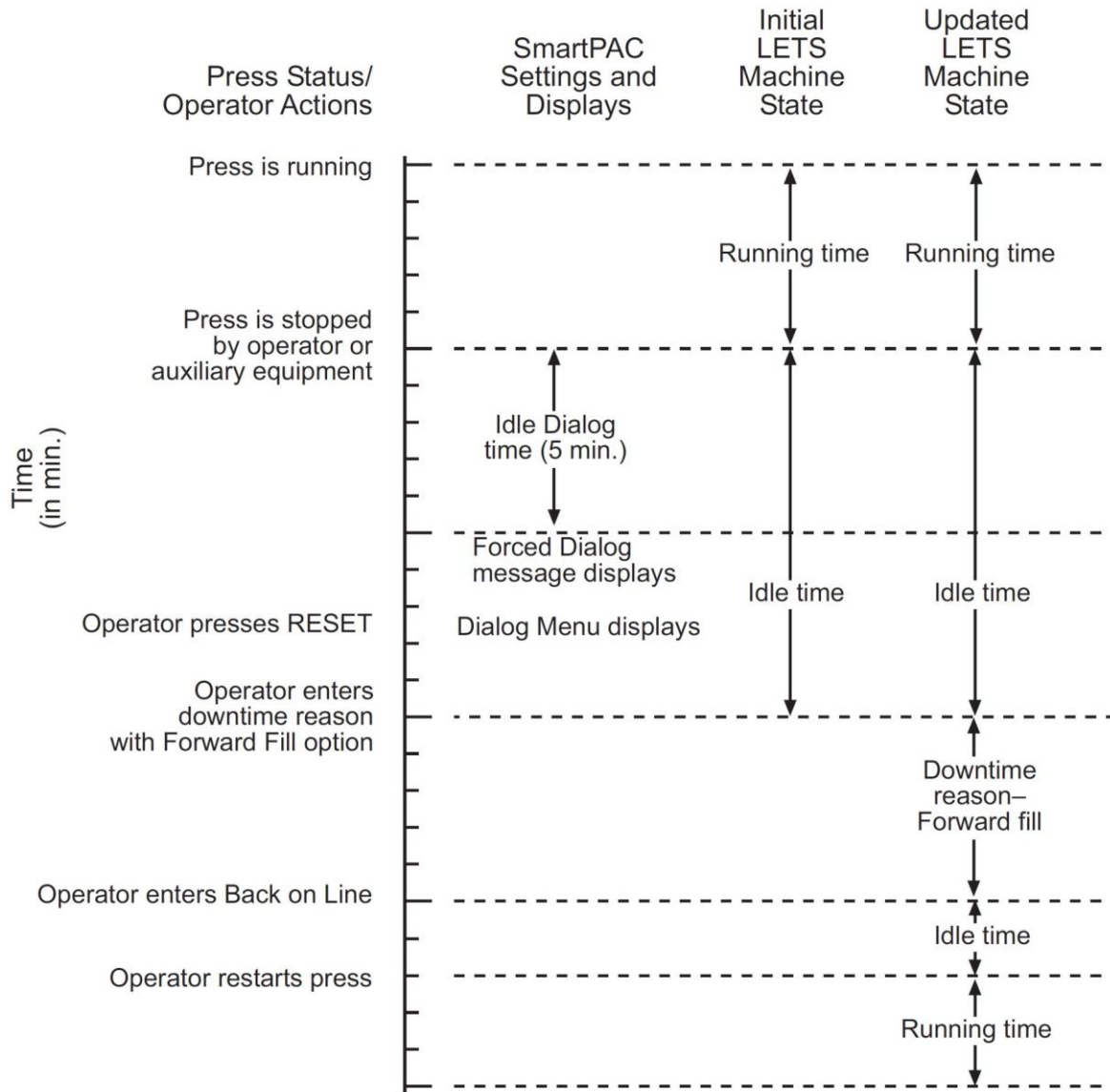


Figure C - 2. Forced Idle Dialog Mode Time Line (Downtime Reason Forward Filled)

Forced Error Dialog Mode

The Dialog Menu can also be programmed to display whenever the press is stopped due to a SmartPAC PRO-generated fault. This feature, called Forced Error Dialog mode (see *Making Downtime Reporting Settings*, page 276), allows the operator to add detail to a period of downtime that is initially logged to a specific SmartPAC PRO error but may actually have a different cause.

For example, SmartPAC PRO may be set up to generate an “End of Stock” error whenever the press runs out of material. This downtime reason is applied to the period of time during which a new coil is located and brought to the press unless the operator selects a more appropriate downtime reason, such as “Waiting for Coil,” and, using the backfill option (see *Backfilling vs. Forward Filling*, page 270), applies it to the incompletely documented period. When the downtime reason is backfilled (see Figure C - 3 for a schematic time line), SmartPAC logs one second to the initial error (e.g., “Sensor 5 – End of Stock”), assuring that the fault is documented, and the remaining time to the new downtime reason (e.g., “Waiting for Coil”).

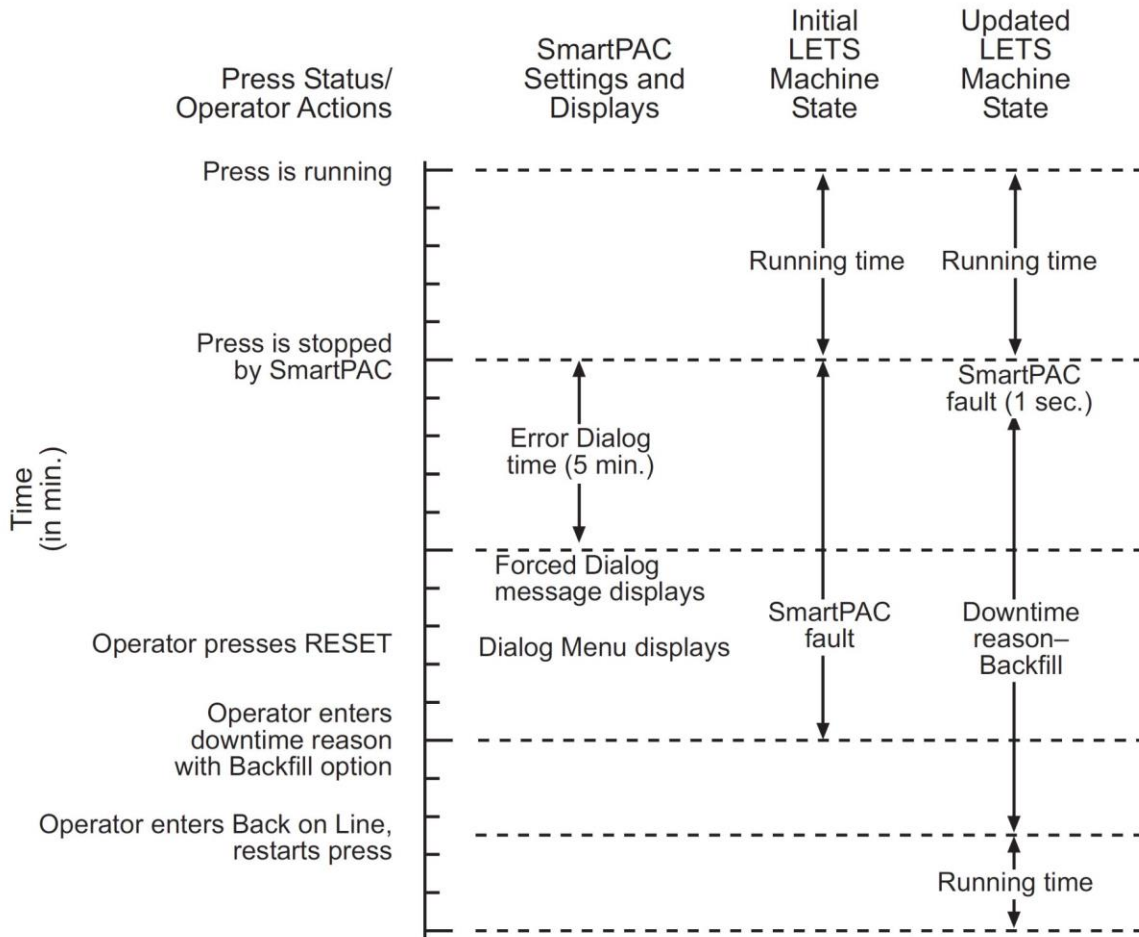


Figure C - 3. Forced Error Dialog Mode Time Line

Downtime reasons can also be “forward filled” in Forced Error Dialog mode.

As in Forced Idle Dialog mode, the Forced Dialog message can be programmed to display a specified number of minutes after the press stops (see Figure F-3). This Error Dialog Time setting prevents nuisance faults such as “Counter preset reached” from being reported as downtime.

Persist Dialog Mode

Periods during which the press is powered down are normally documented as Offline Time and the period following the next power-up assigned to Idle Time. Periods subsequent to machine power-ups are documented as Idle Time even when the period immediately preceding the shutdown has been assigned to an Unplanned Downtime reason. The only machine states that carry over from the period immediately preceding a shutdown to the period immediately succeeding a power-up are Changeover Time and Planned Downtime. In

these cases, the period during which the press is offline and the time immediately following press power-up are assigned to the machine state in effect when the press was powered down.

SmartPAC PRO can be programmed so that Unplanned Downtime reasons selected from the Dialog Menu also “persist” through press shutdowns (see *Making Downtime Reporting Settings*, page 276). When this setting is enabled, both the interval during which the press was powered down and the time following resumption of power to the press are assigned to the downtime reason in effect when the press was shut down. One second of the period during which the press was offline is assigned to Offline Time to document this event.

Single-stroke Mode

For hand-fed applications, a special setting can be programmed at the SmartPAC PRO (see *Making Downtime Reporting Settings*, page 276) that allows the state of the press to be continuously reported as “Running” as long as the operator maintains a pre-determined cycle time. Normally, Single-stroke operation produces an alternating series of “Running” and “Idle” events as the press cycles and then stops to allow the operator to remove one part and load another. Since the state of the press is reported as “Running” only a fraction of the time even when the operator is maintaining an acceptable production rate, this data stream does not accurately reflect press productivity, skewing OEE ratings unfairly downward.

When you make this cycle time setting, SmartPAC PRO no longer looks for a change of state to determine whether the press is running but rather expects to see the press stroke at least once during the pre-programmed interval. If a stroke is detected, the press is reported as “Running”; if not, the press is considered to be stopped and reported as “Idle.”

Reset Strokes Counters

Normally, a period of Idle Time, Planned or Unplanned Downtime, or Changeover Time is ended when the operator selects “Back on Line” from the Dialog Menu and restarts the press (see *Putting the Press “Back on Line”*, page 271). However, since the operator may forget to select the “Back on Line” item, an alternative way of terminating a period of downtime is available.

SmartPAC PRO can be programmed to begin logging time following a downtime period to Running Time after a specified number of press strokes. A Reset Strokes counter (see *Making Downtime Reporting Settings*, page 276) begins incrementing when the press is restarted, and after the counter reaches its preset, SFC changes the machine state to which it logs press time from the downtime reason to Running Time. Three different Reset Strokes counters can be programmed, allowing you to set different restart intervals following periods of Planned Downtime, Unplanned Downtime, and Changeover time.

Setting up SmartPAC PRO to Report Downtime

To set up SmartPAC PRO to report downtime to SFC, you make downtime reporting settings on the Set Communications Menu. You program downtime reasons in one of two ways, depending on the setting you select in the DIALOG SCREEN MODE field on the Set Communications Menu (see Table C - 1, page 277).

When the default setting “16 / 16” is selected, you create downtime reasons on the Dialog Special Choice Name and Dialog Fixed Name Choice menus, which you access via the SET SPECIAL NAMES and SET CANNED NAMES items on the Set Communications Menu.

When you select the DIALOG SCREEN MODE setting of “32 CUSTOM,” you create downtime reasons in SFC and download them to the SmartPAC PRO. The SET SPECIAL NAMES and SET CANNED NAMES items do not display when the “32 CUSTOM” option is selected.

NOTICE

Wintriss recommends that you select the “32 CUSTOM” setting if your shop floor uses only SmartPAC PRO controls. The “16 / 16” setting should be selected only if you have a mix of SmartPAC PROs and SmartPAC 2s and/or original SmartPACs and want to maintain consistency in your downtime reporting method.

The “32 CUSTOM” setting provides two advantages. All downtime reasons can be customized to meet the specific needs of your shop floor setup (up to 32 custom names can be created in SFC Administrator), and you can include all reasons in the Downtime by Reason report, which allows you to track occurrences of a specific downtime reason across multiple machines.

With the “16 / 16” setting you can create only 16 custom reasons (the other 16 are “canned”), and only the custom reasons can be included in the Downtime by Reason report. The report cannot be generated for “canned” reasons.

Making Downtime Reporting Settings

To enable and configure the SmartPAC PRO downtime reporting features described in the previous section, perform the following steps:

1. At the SmartPAC PRO, turn the Program/Run key to PROG. Then press INITIALIZATION MENU the Main Initialization Menu (see Figure C - 4) displays.

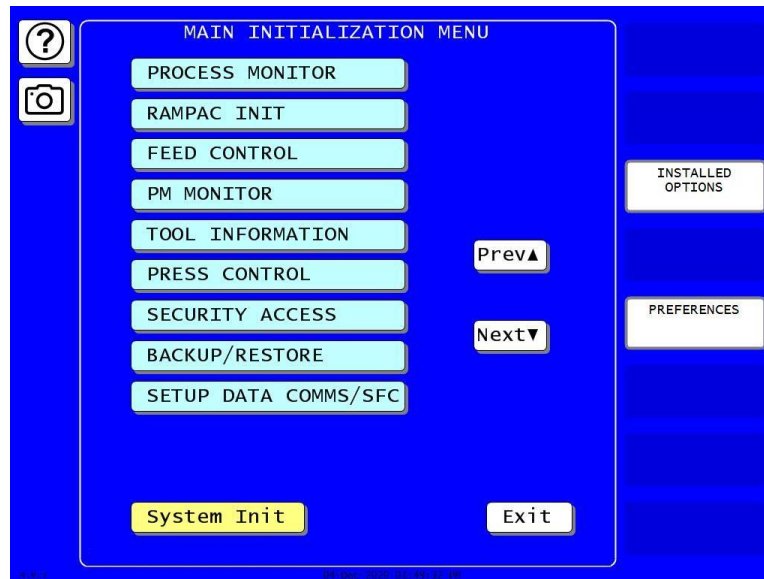


Figure C - 4. SmartPAC PRO Main Initialization Menu

2. Press SETUP DATA COMMS/SFC. The Set Communications Menu (Figure C - 5) displays:

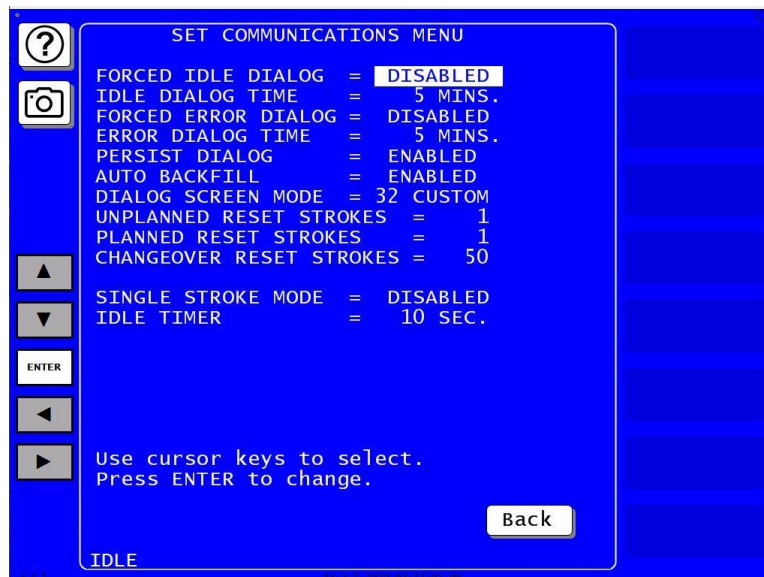


Figure C - 5. Set Communications Menu

NOTICE

Wintriss recommends that you take advantage of the additional features provided by the “32 Custom” dialog screen mode setting. The “16 / 16” setting should be selected only when you have both ORIGINAL SmartPACs and SmartPAC PROs and, even then, only if complete consistency is required.

3. See Table C - 1 for details about each menu item. Highlight each item you want to set, using the Up (▲) or Down (▼) cursor keys, then follow the appropriate steps:
 - To enable or disable a feature, press ENTER to toggle the setting until the desired setting shows.
 - To specify a value for an item (with the exception of IDLE TIMER), press ENTER to display the Numeric Entry window, key in your entry, and press ENTER to accept.
 - To select an option for DIALOG SCREEN MODE, press ENTER to toggle the setting until the desired setting is displayed. When DIALOG SCREEN MODE is set to “16 / 16,” the SET SPECIAL NAMES and SET CANNED NAMES items display at the bottom of the menu. When the setting is “32 CUSTOM,” these items do not appear.
 - To select a value for IDLE TIMER, press ENTER repeatedly until the desired value is displayed.
 - To display screens on which you can program Dialog Menu entries (the DIALOG SCREEN MODE setting must be “16 / 16”), highlight the SET SPECIAL NAMES or SET CANNED NAMES. Press ENTER.
 - To program downtime reasons when DIALOG SCREEN MODE is set to “32 CUSTOM,” use ShopFloorConnect Administrator.

Table C-1 explains each field on the Set Communications Menu and provides instructions on how to make settings.

Table C - 1. Set Communications Menu Settings

Field	Settings
FORCED IDLE DIALOG	<p>Indicates whether SmartPAC PRO displays the Forced Dialog message and Dialog Menu after the press has been stopped by the operator or by auxiliary equipment not connected to SmartPAC PRO. The number of minutes after the press has stopped before the Forced Dialog message appears is specified in the IDLE DIALOG TIME field (see next entry). At the appearance of the Forced Dialog message, the operator must select a downtime reason on the Dialog Menu in order to restart the press. This setting allows time that elapses after the press is stopped by the operator or by equipment not connected to SmartPAC PRO to be documented with a downtime reason rather than as Idle Time. There are two settings:</p> <p style="text-align: center;"> ENABLED Forced Idle Dialog mode enabled DISABLED Forced Idle Dialog mode disabled </p>

Field	Settings
IDLE DIALOG TIME	Specifies the number of minutes (1-60) after the press has stopped in Forced Idle Dialog mode before the Forced Dialog message displays. This setting allows you to prevent Forced Idle Dialog from being triggered by brief stops. Suggested initial value: 5 minutes.
FORCED ERROR DIALOG	<p>Indicates whether SmartPAC PRO displays the Forced Dialog message and Dialog Menu after the press has been stopped by a SmartPAC PRO fault. The number of minutes after the press has stopped before the Forced Dialog message appears is specified in the ERROR DIALOG TIME field (see next entry). At the appearance of the Forced Dialog message, the operator must select a downtime reason on the Dialog Menu in order to restart the press. This setting allows time that elapses after the press is stopped due to a SmartPAC PRO fault to be assigned a different downtime reason. There are two settings:</p> <p style="text-align: center;"> ENABLED Forced Error Dialog mode enabled DISABLED Forced Error Dialog mode disabled </p>
ERROR DIALOG TIME	Specifies the number of minutes (1-60) after the press has stopped in Forced Error Dialog mode before the Forced Dialog message displays. This setting allows you to prevent reporting of SmartPAC PRO nuisance faults such as "Counter preset reached." Suggested initial value: 5 minutes.
PERSIST DIALOG	<p>Indicates whether an Unplanned Downtime reason from the Dialog Menu that is assigned before a press shutdown continues to be applied to the period during which the press is down and to the time after the press is powered up again.</p> <p>Normally, the interval during a press shutdown is assigned to "Offline Time" and the period after the press is powered up to "Idle Time." There are two settings:</p> <p style="text-align: center;"> ENABLED Persist Dialog mode enabled DISABLED Persist Dialog mode disabled </p>
AUTO BACKFILL	<p>Indicates whether time occurring after the press has been stopped up to the point when the operator selects a downtime reason is automatically documented with that reason. When this item is disabled, the operator is given the option of backfilling or forward filling downtime following selection of a downtime reason. When this item is enabled, the downtime reason selected by the operator is automatically backfilled.</p> <p>There are two settings:</p> <p style="text-align: center;"> ENABLED Auto Backfill enabled DISABLED Auto Backfill disabled </p>

Field	Settings
DIALOG SCREEN MODE	<p>Indicates whether downtime reasons are created on the screens accessible from the SET SPECIAL NAMES and SET CANNED NAMES menu items (see below) or in ShopFloorConnect Administrator. There are two settings:</p> <p style="padding-left: 40px;">16 / 16 Downtime reasons are created in SmartPAC 32 CUSTOM Downtime reasons are created in SFC</p> <p>When the "16 / 16" setting is selected, you can create only 16 custom downtime reasons, and only those reasons can be included in the Downtime by Reason Report. The "32 CUSTOM" setting enables you to create up to 32 custom reasons, all of which can appear in the Downtime by Reason Report. When the "32 CUSTOM" setting is selected, the SET SPECIAL NAMES and SET CANNED NAMES items do not display.</p>
UNPLANNED RESET STROKES PLANNED RESET STROKES CHANGEOVER RESET STROKES	<p>Specifies the number of strokes that must occur after the press is restarted following a period of Unplanned Downtime, Planned Downtime, or Changeover Time before SFC begins documenting the machine state as "Running Time." This setting prevents additional press time from being attributed to a downtime reason when the operator forgets to select the "BACK ON LINE" item from the Dialog Menu. The number of strokes you specify should be the maximum number of press cycles that are likely to be needed to return the press to production. Valid entries: 1-9999.</p> <p>Suggested settings:</p> <p style="padding-left: 40px;">Set the Unplanned Reset Strokes counter to two strokes more than the maximum number of strokes required to fill an empty die. This setting should give the operator sufficient time to complete a response to the downtime cause (such as Coil Change) that requires the longest time to address.</p> <p style="padding-left: 40px;">Set the Planned Reset Strokes counter to the lowest number of strokes required to return the press to production following a lunch or other break.</p> <p style="padding-left: 40px;">Set the Changeover Reset Strokes counter to the maximum number of strokes required to complete a die setup.</p>
SINGLE STROKE MODE	<p>This setting, which is used for hand-fed applications when the press is being run in Single-stroke mode, indicates whether SFC counts press cycles (or parts made) within the period specified in the IDLE TIMER field (see next entry) to determine whether the press is "running." When this field is set to "ENABLED," SFC only documents the press as "Idle" when no cycles occur (i.e., no parts are made) during an Idle Timer period.</p> <p>There are two settings:</p> <p style="padding-left: 40px;">ENABLED Single-stroke Mode enabled DISABLED Single-stroke Mode disabled</p>

Field	Settings
IDLE TIMER	Specifies the number of seconds during which SmartPAC PRO counts the number of press strokes in Single-stroke mode to determine a production rate for hand-fed applications. This value should be twice the cycle time for the slowest hand-fed job run on a press. For example, if the slowest job produces an average of 6 parts per minute, the Idle Timer should be set to 20 seconds (6 parts per minute = 10-second cycle time; 2 x 10 seconds = 20 seconds). Available selections: 5, 10, 15, 20, 30, and 60.
SET SPECIAL NAMES	Displays the Dialog Special Choice Name Menu, on which you can create up to 16 custom downtime reasons for display on the Dialog Menu and specify the order in which they will appear (see <i>Creating Special Names on the Dialog Special Choice Name Menu</i> , page 282). This item does not display when the setting for DIALOG SCREEN MODE is “32 CUSTOM.”
SET CANNED NAMES	Displays the Dialog Fixed Name Choice Menu, on which you can select up to 14 pre-programmed, or “canned,” downtime reasons for display on the Dialog Menu and specify the order in which they will appear (see <i>Selecting Canned Names on the Dialog Fixed Name Choice Menu</i> , page 281). This item does not display when the setting for DIALOG SCREEN MODE is “32 CUSTOM.”

Programming Downtime Reasons

If you set the DIALOG SCREEN MODE item on the Set Communications Menu to “16 / 16,” the default, the SET SPECIAL NAMES and SET CANNED NAMES items are displayed on the menu, allowing you to specify the downtime reasons that appear on the Dialog Menu and the order in which they appear. The items you program on these two menus will be the menu selections available to the operator when the Dialog Menu displays in Forced Idle Dialog or Forced Error Dialog mode, or when the operator accesses the menu at other times.

If the DIALOG SCREEN MODE setting is “32 CUSTOM,” the SET SPECIAL NAMES and SET CANNED NAMES items do not display, and you create downtime reasons in SFC.

“Canned” names are downtime reasons whose text has been pre-programmed into the SmartPAC PRO. “Special” names are downtime reasons whose text you assign. You can select up to 14 “canned” names and create up to 16 “special” names. The Dialog Menu can include both “canned” and “special” entries, displaying up to 30 items.

NOTICE

It is recommended that you create a standardized list of downtime reasons for all your presses. Having the Dialog Menu display the same downtime reasons in the same order on all SmartPAC PROs will help to minimize reporting errors.

When planning the order in which to display Dialog Menu items, you should attempt to predetermine the downtime causes that are likely to occur most frequently and place these at the beginning of the downtime reason sequence.

Selecting Canned Names on the Dialog Fixed Name Choice Menu

When you select the SET CANNED NAMES item on the Set Communications Menu, the Dialog Fixed Name Choice Menu displays, Figure C - 6. This menu allows you to select the “Canned” names that will appear on the Dialog Menu. “Canned” names are downtime reasons whose text has already been programmed into the SmartPAC PRO. You can select up to 14 of these pre-programmed entries for inclusion in the Dialog Menu.

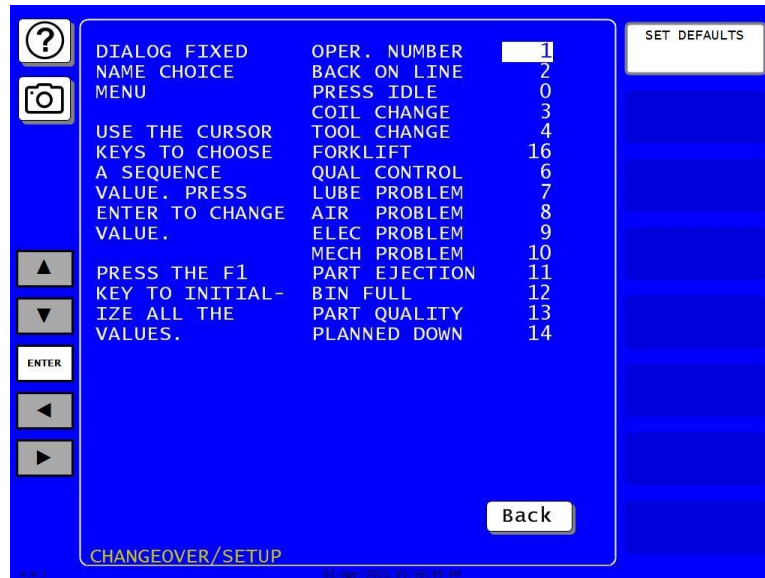


Figure C - 6. Dialog Fixed Name Choice Menu

You select a “canned” name by entering a sequence number to the right of the name’s text entry. The sequence number specifies the position in which that item will appear on the Dialog Menu. For example, in the screen shown in Figure C - 6 the item LUBE PROBLEM has a sequence number of 7 and, so, will appear seventh on the Dialog Menu. Since “special” downtime reasons may also appear on the Dialog Menu, be sure to maintain the necessary intervals in your “canned” name numbering scheme to accommodate these items.

To prevent a “canned” name from appearing on the Dialog Menu, set its sequence number to 0.

It is recommended that you include the following “canned” items in the Dialog Menu:

- **TOOL CHANGE** – This downtime reason is logged to the Changeover Time machine state, enabling SFC to track time for tool changes separately from other unplanned downtime and create special Changeover reports. “Tool Change” is the only Unplanned Downtime reason that is assigned to time when power to the press is off. Powering down the press is often necessary during tool changeover.
- **BACK ON LINE** – This selection enables the operator to end a downtime event. When BACK ON LINE is selected, the machine state will change from “Unplanned Downtime,” “Planned Downtime,” or “Changeover Time” to “Running Time” if the press is running or from one of these “downtime” states to “Idle Time” if the press is stopped.
- **OPER. NUMBER** – This “canned” name allows the operator to enter an operator number, enabling SFC to assign a period of press time such as a shift to a particular operator.

To select the pre-programmed downtime reasons that will appear on the Dialog Menu and the order in which they will appear, do the following:

1. On the Set Communications Menu, highlight the SET CANNED NAMES item, using the Up (▲) or Down (▼) cursor key, and press ENTER. The Dialog Fixed Name Choice Menu (see Figure C - 6) displays with the cursor resting in the OPER. NUMBER field.
2. Press ENTER, and when the Numeric Entry window appears, type the numeric position in which you want that item to appear on the Dialog Menu, or type “0” if you want to prevent the item from displaying on the Dialog Menu. Press ENTER to save your entry and return to the Dialog Fixed Name Choice Menu.
3. Move the cursor to the BACK ON LINE field, using the Down (▼) cursor key, and repeat step 2. Do the same for the remaining menu items.

NOTICE

Remember to leave intervals between sequence numbers to allow room for “special” downtime reasons. See *Creating Special Names on the Dialog Special Choice Name Menu*, below.

If the same sequence number is assigned to both a “canned” and a “special” name, both entries will display in that position on the Dialog Menu with the “special” name shown first.

4. When you are finished setting the sequence of “canned” names, press RESET to save your entries and return to the Set Communications Menu.

Creating Special Names on the Dialog Special Choice Name Menu

When you select the SET SPECIAL NAMES item on the Set Communications Menu, the Dialog Special Choice Name Menu (see Figure C - 7) displays. This menu allows you to select the “special” names that will appear on the Dialog Menu. “Special” names are downtime reasons created by the user. Each name can be up to 12 characters in length, and you can include up to 16 of them in the Dialog Menu.

You specify the order in which “special” names appear on the Dialog Menu by entering a sequence number to the right of each text entry. The sequence number specifies the position in which that item will appear on the Dialog Menu. Since “canned” downtime reasons may also appear on the Dialog Menu, be sure to maintain the necessary intervals in your “special” name numbering scheme to accommodate these items.

To prevent a “special” name from appearing on the Dialog Menu, set its sequence number to 0.

To program “special” downtime reasons for inclusion in the Dialog Menu, perform the following steps:

1. On the Set Communications Menu, highlight the SET SPECIAL NAMES item, using the Up (▲) or Down (▼) keys, and press ENTER. The Dialog Special Choice Name Menu displays with the SPEC. 1 field highlighted.



Figure C - 7. Dialog Special Choice Name Menu

2. Press ENTER. The onscreen keyboard displays. Type the text (12 characters maximum, including spaces) of the downtime reason that you want to appear on the Dialog Menu; then, press Enter to save your entry and close the onscreen keyboard.
3. Press the Right (►) key to highlight this downtime reason's sequence number.
4. Press ENTER. The onscreen numeric keypad. Key in the sequence number in which you want this downtime reason to appear on the Dialog Menu; then, press ENTER to save your entry and close the keypad.

NOTICE

Remember to leave intervals between sequence numbers to allow room for "canned" downtime reasons. See *Selecting Canned Names on the Dialog Fixed Name Choice Menu*, page 281. If the same sequence number is assigned to both a "canned" and a "special" name, both entries will display in that position on the Dialog Menu with the "special" name shown first.

5. Move the cursor to the SPEC. 2 field, using the Down (▼) key, and repeat steps 2 through 4. Do the same for the remaining items.
6. When you have finished programming "special" downtime reasons, press RESET to save your entries and return to the Set Communications Menu.

Documenting Downtime on the Dialog Menu

A downtime reason can be selected on the Dialog Menu either in response to the Forced Dialog message or when the operator wants to change a previous downtime entry or add detail to reported downtime.

Documenting Downtime in Response to the Forced Dialog Message

With Forced Idle Dialog mode or Forced Error Dialog mode enabled (see *Making Downtime Reporting Settings*, page 276), the operator is prompted to enter a downtime reason on the Dialog Menu whenever SmartPAC PRO detects that the press has stopped under the appropriate circumstances. This message is shown in Figure C - 8.

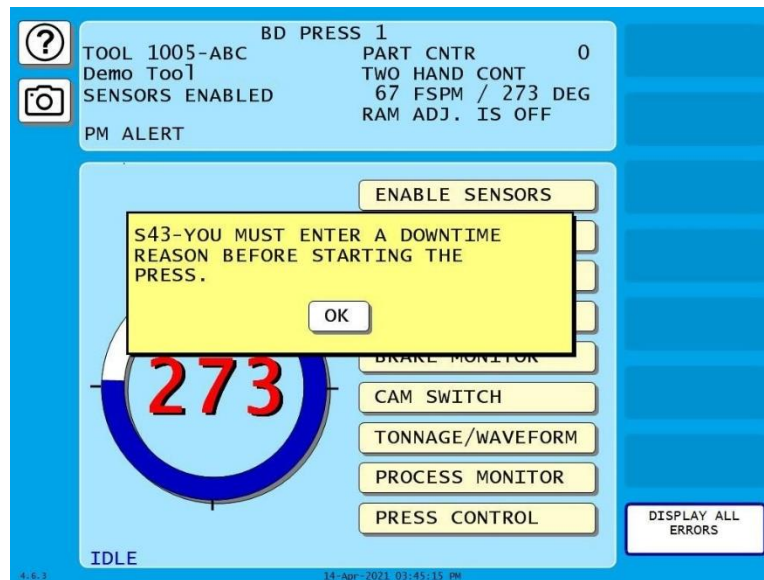


Figure C - 8. SmartPAC PRO Run Mode Main Menu with Forced Dialog Message Displayed

To respond to this prompt, perform the following steps:

1. Press OK to clear the message. The Dialog Menu displays.
 - If dialog screen mode is set to “16/16” (see *Setting up SmartPAC PRO to Report Downtime*, page 275), the Dialog Menu looks like the example shown in Figure C - 9.
 - If “32 CUSTOM” is the dialog screen mode setting, the Dialog Menu looks like the example shown in Figure C - 10. Note that the “32 CUSTOM” Dialog Menu has buttons for Operator Number, Back on Line, and Changeover, as well as the End Job function (see *Ending a Job*, page 288).

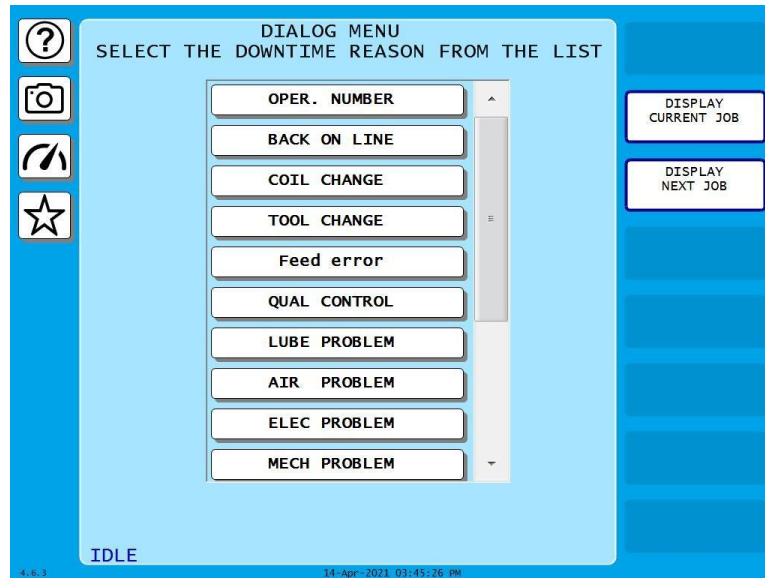


Figure C - 9. Dialog Menu (“16/16” Dialog Screen Mode)

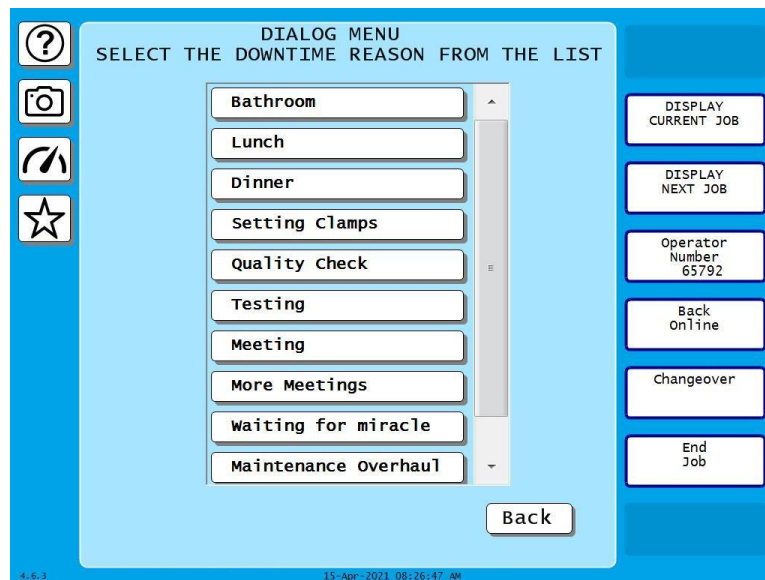


Figure C - 10. Dialog Menu (“32 CUSTOM” Dialog Screen Mode)

2. Press the downtime reason you want or Press Operator Number, Back on Line, or Changeover (“32 CUSTOM” dialog screen mode only; see Figure C - 10).
3. If Auto Backfill has been enabled on the Set Communications Menu (see Table C - 1, page 277), the downtime reason you selected is automatically “backfilled” (i.e., assigned to the period from the time that the press was stopped up to entry of the next downtime reason or the BACK ON LINE selection). If a SmartPAC PRO fault has already been assigned to this period of press inactivity, that fault will be documented as having consumed 1 second and the remainder of the period filled with the downtime reason you selected. If the period has been documented as Idle Time, your downtime reason will replace that entry. The SmartPAC PRO will display a message stating that the downtime reason has been sent to the host computer.

If Auto Backfill has been disabled, the window shown in Figure C - 11 displays.

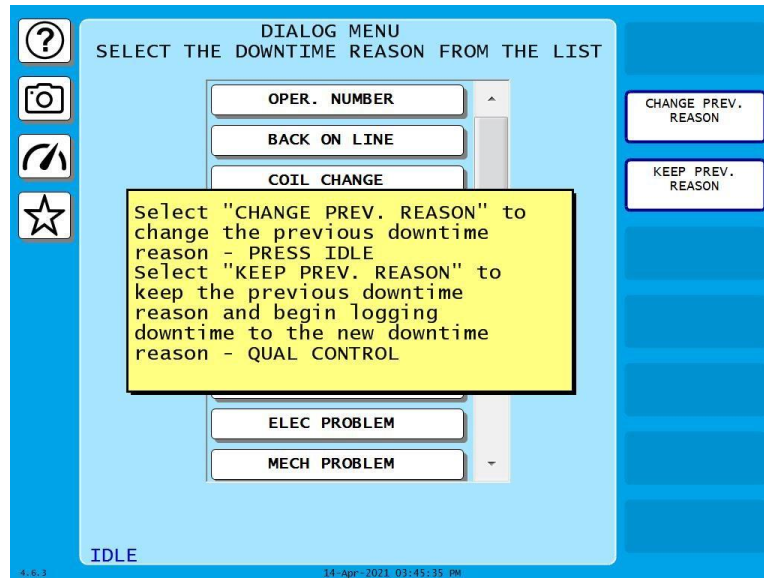


Figure C - 11. Dialog Menu Window Displayed

PRESS CHANGE PREV. REASON to “backfill” the selected downtime reason, in other words, to assign it to the period from the time that the press was stopped up to entry of the next downtime reason or the BACK ON LINE selection. If a SmartPAC PRO fault has already been assigned to this period of press inactivity, that fault will be documented as having consumed 1 second and the remainder of the period filled with the downtime reason you selected. If the period has been documented as Idle Time, your downtime reason will replace that entry.

or

Press KEEP PREV. REASON to leave documentation of the period up to the present unchanged and “forward fill” the selected downtime reason, in other words, assign it to the period from the present up to entry of the next downtime reason or the BACK ON LINE selection.

The SmartPAC PRO will display a message stating that the downtime reason has been sent to the host computer.

Documenting Downtime in Other Situations

You can report downtime reasons to SFC at any time without being prompted by the Forced Dialog message.

EXAMPLE: UPDATING A DOWNTIME REASON

The operator stops the press for what he assumes is a feed problem and selects the downtime reason “FEED PROBLEM” from the Dialog Menu. After further investigation, he finds that the feed is working properly but the air supply to the feed is intermittent. The operator accesses the Dialog Menu, selects “AIR PROBLEM” from the list of downtime reasons, and presses CHANGE PREV. REASON. SFC changes the reason for the downtime period from “FEED PROBLEM” to “AIR PROBLEM.”

To report downtime without being prompted, perform the following steps:

1. On the Main Run Menu (see Figure C - 12), select the DIALOG MENU item.

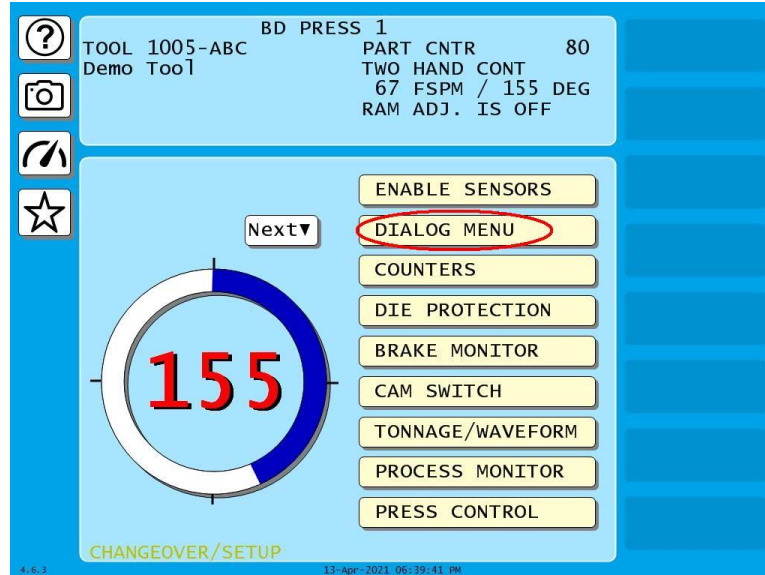


Figure C - 12. SmartPAC PRO Run Mode Main Menu Showing DIALOG MENU Item

2. On the Dialog Menu, highlight the downtime reason you want, using the Up (▲) or Down (▼) cursor key, and press ENTER.

or

Press OPERATOR NUMBER, BACK ON LINE, or CHANGEOVER (“32 CUSTOM” dialog screen mode only).

3. If Auto Backfill has been enabled on the Set Communications Menu (see Figure C - 1, page 271), the downtime reason you selected is automatically “backfilled” (i.e., assigned to the period from the time that the press was stopped up to entry of the next downtime reason or the BACK ON LINE selection). If a SmartPAC PRO fault has already been assigned to this period of press inactivity, that fault will be documented as having consumed 1 second and the remainder of the period filled with the downtime reason you selected. If the period has been documented as Idle Time, your downtime reason will replace that entry. The SmartPAC PRO will display a message stating that the downtime reason has been sent to the host computer.
4. If Auto Backfill has been disabled, the window shown in Figure C - 11 displays. Press CHANGE PREV. REASON to “backfill” the selected downtime reason, in other words, to assign it to the period of Idle Time or downtime up to entry of the next downtime reason or the BACK ON LINE selection. If a downtime reason other than a SmartPAC PRO fault has been assigned to this period, the downtime reason you selected will replace it. If a SmartPAC PRO fault has been assigned to this period, that fault will be documented as having consumed 1 second and the remainder of the period filled with the downtime reason you selected. If the period has been documented as Idle Time, your downtime reason will replace that entry.

or

Press KEEP PREV. REASON to leave documentation of the period up to the present unchanged and “forward fill” the selected downtime reason, in other words, assign it to the period from the present up to entry of the next downtime reason or the BACK ON LINE selection.

The SmartPAC PRO displays a message stating that the downtime reason has been sent to the host computer.

Ending a Job

If you are using the “32 CUSTOM” dialog screen mode setting, the Dialog Menu allows you to “close out” the previous job when no subsequent job is immediately available, thereby preventing any non-job-related downtime to be charged against it. Close out the previous job by pressing END JOB (see Figure C - 10, page 285).

Normally, in ShopFloorConnect one job ends and a new one begins when a new tool number is loaded, at which point all data stops accruing for the previous tool and begins accruing for the new tool.

When an End Job function is executed, the SmartPAC PRO will report the tool number to SFC as Tool Number “0” to indicate that the machine is in a “No Job” condition. All time logged during the No Job condition can be assigned machine states (Planned Downtime, Unplanned Downtime, or Changeover) and downtime reasons just as if a tool were actually loaded.

Please note that if the End Job button is used, the current job will end, but the machine can still be run. Any production run after the job has ended will be attributed to a new job.

NOTICE

DO NOT press END JOB unless you are absolutely certain that you want to close out the previous job. A job cannot be “reopened” once it has ended. If you attempt to reopen a job, any production that is run after the end of the job will be attributed to a new job using the same tool number.

Reporting Scrap and Good Parts to SFC

If you are running SFC-compatible firmware, SmartPAC PRO enables you to document scrap so that scrap counts can be reported to SFC. The scrap counter, which appears on the Counters screen in Run mode, maintains a cumulative total of all user scrap entries for the currently running job, resetting to zero when the job is complete.

The cumulative scrap count reduces by that amount the number of good parts reported to SFC. The good parts count is maintained in the Good Parts Count field on the Counters screen (see Figure C - 14, page 289). If you wish to adjust the Good Parts counter upward, you can do so in up to 1,000-part increments in Run mode and in larger increments in Program mode.

To enable scrap entries and Good Parts counter adjustments to be made in Run mode, you must set the CHANGE COUNT and CHG GOOD PRPTS CNT items on the Security Access Menu in Initialization mode to “PROGRAM AND RUN MODES,” as shown in Figure C - 13. (To display the Security Access Menu, select SECURITY ACCESS from the Main Initialization Menu – see Figure C - 1, page 271).

If you want to allow scrap entries to be made in Run mode but prevent Good Parts counter adjustments, you must set the CHG GOOD PRPTS CNT item on the Security Access Menu to “NO CHANGES ALLOWED” while leaving the CHANGE COUNT item set to “PROGRAM AND RUN MODES.”

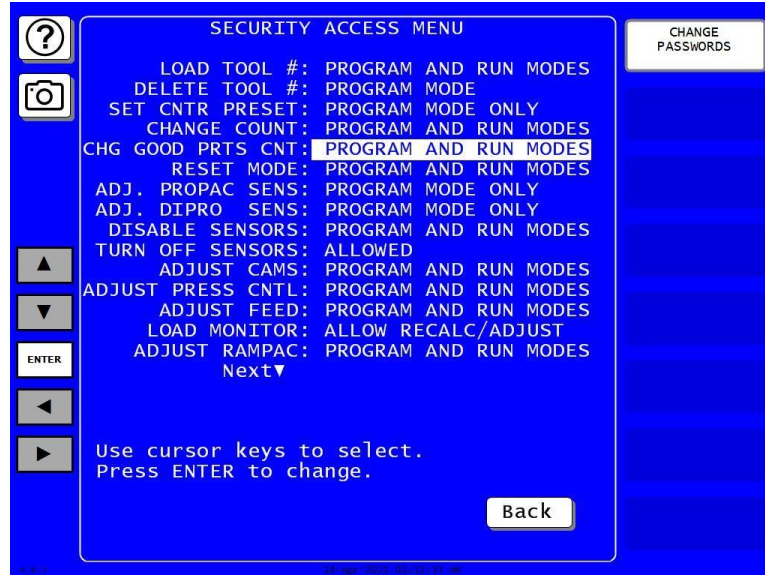


Figure C - 13. Security Access Menu with CHANGE COUNT and CHG GOOD PRTS CNT Items Set to “PROGRAM AND RUN MODES”

By default, the Good Parts counter does not increment during a fault condition. If you wish the counter to increment even when there is a fault, set the COUNTER INCREMENT MODE item on the Position Sensor screen to “INC ALWAYS” (see page 92).

Making Scrap Entries

To document scrap for a currently running job, do the following:

1. With the tool loaded and running, select “COUNTERS” on the Main Run Menu (see Figure C - 12, page 287) to display the Counters screen (see Figure C - 14).

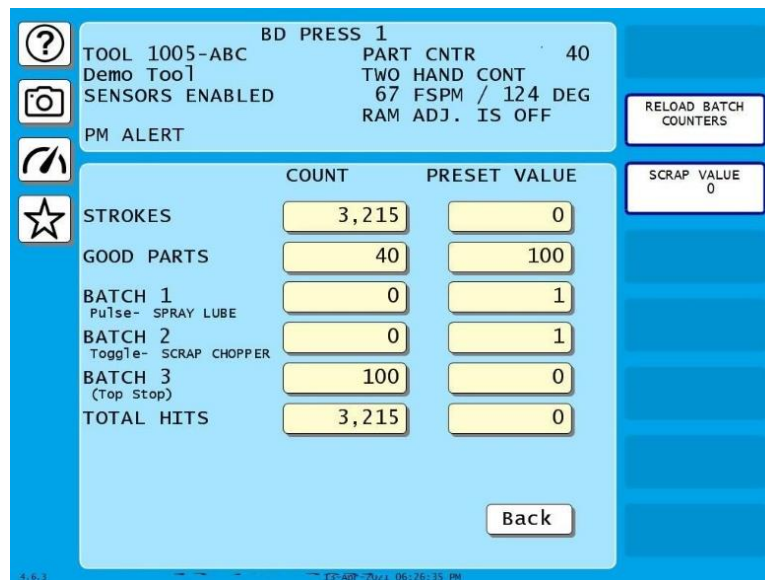


Figure C - 14. Counters Screen; Note SCRAP VALUE button

2. Press SCRAP VALUE. The Scrap Value Entry window displays (Figure C - 15).

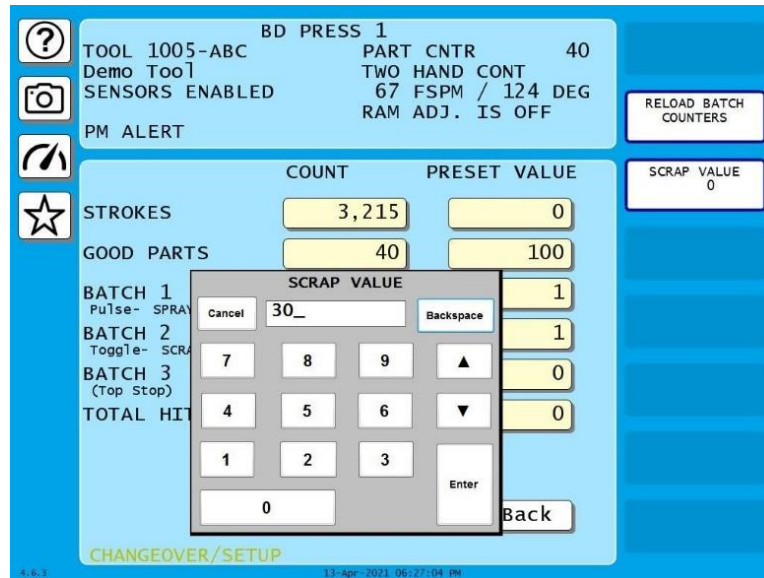


Figure C - 15. Counters Screen with Scrap Value Entry Window Displayed (30 Items Shown)

3. Key in the number of scrap items you wish to document and press ENTER. (Figure C - 15 shows a scrap value entry of “30” as an example.)
4. Press ENTER. A confirmation window appears, .

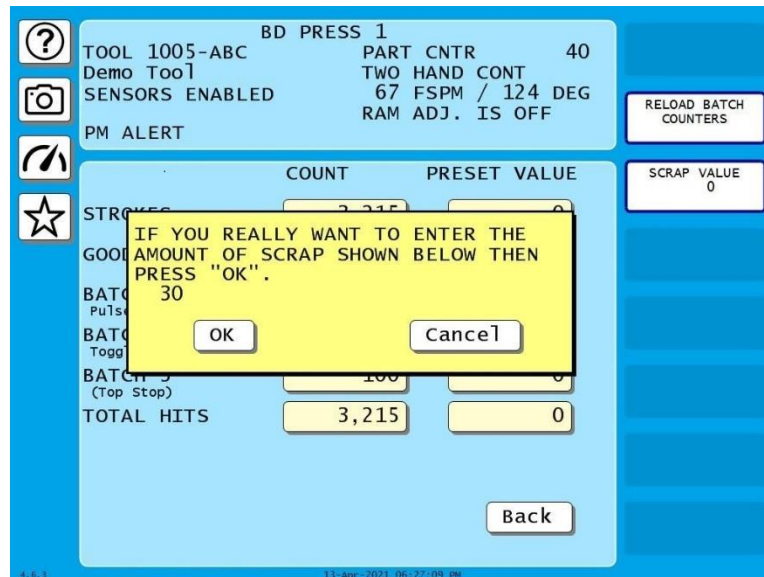


Figure C - 16. Change Scrap Value Confirmation

5. Press OK to confirm the new scrap value. You return to the Counters screen with the new scrap value displayed under SCRAP VALUE. At the right of the display, Figure C - 17, below. The Good Parts counter is reduced by the number of scrap items (e.g., $40-30=10$ in Figure C - 17).

	COUNT	PRESET VALUE
STROKES	3,215	0
GOOD PARTS	10	100
BATCH 1 Pulse- SPRAY LUBE	0	1
BATCH 2 Toggle- SCRAP CHOPPER	0	1
BATCH 3 (Top Stop)	100	0
TOTAL HITS	3,215	0

RELOAD BATCH COUNTERS

SCRAP VALUE 30

Back

4.6.3 13-Apr-2021 06:27:14 PM

Figure C - 17. Counters Screen with Scrap Value Updated to 30 Items

NOTICE

INDIVIDUAL SCRAP ENTRIES ARE ADDED TO THE CURRENT SCRAP TOTAL

The Scrap Value counter maintains a cumulative total of the scrap items documented for each job. The value you enter in the Scrap Value Entry window (see Figure C - 15) is automatically added to the total.

For example, if the count in the Scrap Value field is “30,” and you want to include an additional 10 parts in the count, you would enter “10” in the Scrap Value Entry window (Figure C - 15). When you are returned to the Counters screen, the Scrap Value counter would display 40 parts (the 30 parts in the current total plus the 10 parts you entered; the Good Parts counter would be reduced by 10 parts (Figure C - 17).

- Repeat step 2 for the remaining scrap entries associated with the current job until the job is completed.

Adjusting the Good Parts Counter

NOTICE

You can only increase the value maintained by the Good Parts counter. You cannot decrease the Good Parts counter except by entering scrap values.

NOTICE

You cannot adjust the Good Parts counter if the CHG GOOD PRTS CNT item on the Security Access Menu has been set to “NO CHANGES ALLOWED.”

The Run mode Counters screen enables you to increase the Good Parts count to adjust for count inaccuracies, such as when good parts may be produced but not counted in Setup mode or during Fault conditions. The count can be increased by up to 1,000 parts at a time.

The Counters screen in Program mode allows you to increase Good Parts by larger amounts (see Adjusting the Good Parts Counter in Program Mode, below). This capability is useful if new firmware is installed in the middle of a job, causing the Good Parts counter to reset to zero.

Adjusting the Good Parts Counter in Run Mode

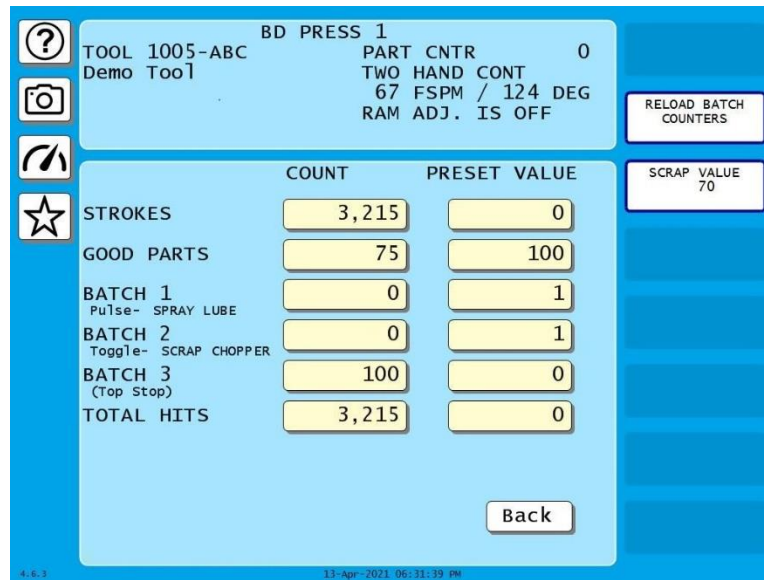


Figure C - 18. Counters Screen

To increase the Good Parts count in Run mode, do the following on the Counters screen:

1. Press GOOD PARTS COUNT field. The Good Parts entry window displays.

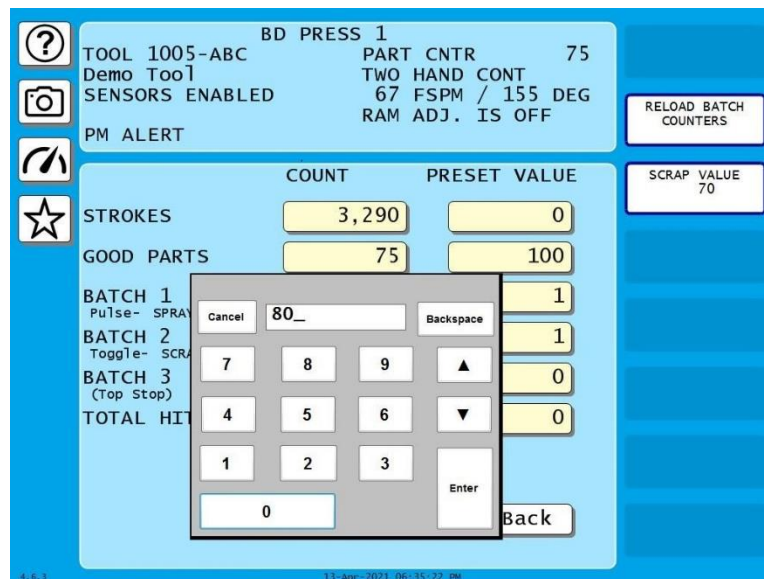


Figure C - 19. Good Parts Entry Window

2. Key in the number of good parts you want to add (1,000 parts maximum), and press ENTER. A warning window displays, similar to the one shown in Figure C - 20.



Figure C - 20. Good Parts Counter Adjustment Confirmation Window

3. Press OK to confirm that you want to change the Good Parts counter value. You are returned to the Counters screen with the change reflected in the GOOD PARTS COUNT field.

NOTICE

If you attempt to enter a value greater than 1,000 or one that reduces (rather than increases) the Good Parts count, an error message will display briefly.

Adjusting the Good Parts Counter in Program Mode

NOTICE

In Program mode, you can increase the Good Parts count in increments greater than 1,000.

To increase the Good Parts count in Program mode, do the following:

4. On the Counters screen in Run mode, press RESET to return to the Main Run Menu.
5. Turn the Program/Run key to "PROG" to display the Main Program Menu.
6. Select "GO TO THE TOOL MANAGER" to display the Tool Manager screen.
7. Press EDIT TOOL with the loaded tool selected to display the Tool Program Menu.
8. Select COUNTERS to display the Counters screen.
9. Perform steps 1 through 3 of the procedure for adjusting the Good Parts counter in Run mode, above.

Glossary

NOTICE

Cross-references to other glossary entries are shown in *italics*.

actuation block	A graphical indicator on the Sensor Status screen in Run mode, showing whether a sensor is actuated.
actuation	A change in the state or condition of a sensor.
actuation angle	See <i>dwell</i> .
ANSI	Stands for American National Standards Institute, a U.S. clearinghouse and coordinating body for voluntary standards activity on the national level.
auto advance	A ProCamPAC feature that allows cam channels to be programmed for speed-sensitive functions (e.g., feed advance, pilot release, etc.) on variable speed presses. A channel programmed as Auto Advance automatically advances cam timing as the speed of the press increases and delays timing as speed decreases. The rate of advance or delay is controlled by an advance constant, a specified number of degrees of advance for each 100 SPM increase in press speed.
Auto-compensated Top-stop (ACTS)	A WPC 1000/2000 feature, designed specifically for variable speed presses that adjusts the top-stop angle automatically as press speed changes or the brake wears.
auto enable by sensor	A die protection mode in which an individual sensor is automatically actuated after a specified number of strokes.
auto enable by tool	A die protection mode in which all sensors in a tool are automatically actuated after a specified number of strokes.
batch counter	One of three counters that can be set to increment when either the good parts or strokes counter increments and to either top-stop the press or signal programmable limit switch (PLS) outputs when its preset is reached. See <i>counter</i> .
brake monitor	A SmartPAC PRO feature that checks for brake wear.
cam channels	Relays that open and close on signals from the programmable cam switch to turn auxiliary equipment on and off at specified crankshaft angles.
CAN bus	CAN (Controller Area Network) bus data communication IN and OUT of the RTS is provided as a more rugged replacement for USB communication.
checksum	A numeric value calculated when a tool is stored in memory and when it is loaded. The two values must match or SmartPAC PRO displays a fault message.

crank angle clock	A graphical indicator on the SmartPAC PRO display that shows the angle of rotation of the press's crankshaft.
communications	Data sent by SmartPAC PRO to one of its installed options (e.g., WPC, SFI, etc.) or received from an installed option.
counter	A SmartPAC PRO feature that maintains a count of the number of strokes made by the press, the number of good parts produced, or the number of strokes that must occur before a programmed output is actuated. See <i>batch counter</i> .
control reliability	A regulation defined in ANSI B11.1-2009 and OSHA 1910.217 requiring that a single component failure in a clutch/brake control circuit not prevent the normal stopping action of the press, not create an unintended stroke, and not allow initiation of a subsequent stroke until the failure has been corrected.
critical angle	The point in the crankshaft rotation after which a stop signal to the press cannot prevent the die from closing.
depth penetration factor	A value used in the ANSI formula for calculating the safety distance. The depth penetration factor is a measure of how far an object, like an operator's hand, can move through the light curtain before the light curtain reacts.
diode	A component that reduces or eliminates electrical noise.
dwelt	The range of angles during which a sensor or cam is actuated, or "on." Also called actuation angle.
emergency stop	A signal sent to the press in response to a malfunction that stops the press immediately.
error message	A message appearing on the SmartPAC PRO LCD that indicates a fault condition, identifies the problem, and may suggest how to correct it.
hand-speed constant	A value used in the ANSI formula for calculating the safety distance. The hand-speed constant is the distance one can theoretically move one's hand and arm in one second. OSHA recommends a hand-speed constant of 63 inches-per-second.
manual enable	A die protection mode in which sensors are manually enabled or disabled by the operator.
messaging	A SmartPAC PRO feature that allows e-mails to be sent from SmartPAC PRO to networked computers, pagers, text-enabled cell phones and other devices. This feature is set up in SmartView.
NEMA 12	A rating that certifies that an electrical device is protected against dust, water, and oil.

ninety degree (90°) stop-time test	A test required to set the proper safety distance for personnel-guarding devices, including light curtains, two-hand controls, and type-B movable barriers. This test checks the stopping time of the press at its most critical stopping point, normally the midpoint of the downstroke (i.e., 90°), while the press is running in Continuous mode (or Single-stroke if the press does not have a selector setting for Continuous). Stopping time is a value required in the ANSI formula for calculating the safety distance.
object sensitivity	A value required in deriving the depth penetration factor for a light curtain. Object sensitivity specifies the smallest diameter object that a light curtain can detect anywhere in its field.
on-off setting	Stroke angle settings at which the cam channel is to turn “on” and “off.”
OSHA	Stands for Occupational Safety and Health Administration, a government agency that has established regulations for mechanical power presses including presence-sensing devices for point-of-operation guarding.
pinch point	The hazardous area between the upper and lower die from which OSHA mandates that the operator should be protected by installation of safety equipment such as light curtains, two-hand controls, and other barriers.
position sensor	A magnetic proximity switch used to check the crankshaft angle reading provided by the resolver. This device consists of a magnet which can be mounted on the crankshaft (or other shaft) and a stationary sensor. Whenever the resolver reading at the point in the stroke at which the sensor is mounted changes relative to the signal created by the magnet, SmartPAC PRO generates a fault.
reset	A command issued by the operator that allows the press to resume operation after it has been stopped due to a malfunction. The “reset” command clears the fault message from the SmartPAC PRO display. The command is issued by pressing RESET.
response time	The length of time it takes SmartPAC PRO to activate the machine’s brake.
safety distance	The distance from the pinch point that OSHA requires safety equipment such as light curtains, two-hand controls, and type-B movable barriers to be mounted to assure the safety of the operator. The safety distance is calculated using a precise formula set by OSHA regulations and/or ANSI standards. The formula uses the results of the ninety degree (90°) stop-time test.
security access	Settings made in Initialization that control the amount of access SmartPAC PRO users are given to SmartPAC PRO functions.
slow RPM	A setting used with the auto advance feature that indicates the slowest speed at which the press will be operated.

smart stop	A type of stop programmed for a die protection sensor that sends an emergency stop to the press when a sensor fault occurs before the critical angle or a top stop if the fault occurs after the critical angle. See <i>critical angle</i> , <i>emergency stop</i> , and <i>top stop</i> .
stopping angle	The number of degrees of crankshaft rotation required for the press to stop after a “stop” command is issued. The stopping angle is calculated by subtracting the crankshaft position when the dual safety valve (DSV) is closed from the press’s position when it actually stops. The stopping angle is useful in determining where to set Top Stop and in die-protection settings.
stopping time	The length of time it takes the crankshaft to stop moving after the Dual Safety Valve (DSV) deenergizes.
suppressor	A component that reduces or eliminates electrical noise.
top stop	A signal sent to the press in response to a malfunction that stops the press at the top of its current stroke (0°).
Tool Template	A tool on the Tool Manager screen that you can program with settings shared by multiple tools, then use as a “template” to copy the common settings to those tools.
total hits counter	A counter that maintains a count of the total number of hits made by a tool, used in determining when a tool needs regrinding. See <i>counter</i> .

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SmartPAC PRO Setup Sheet

Tool Name and Number: _____

Counter Presets

	Batch 1 (Ch. 6)	Batch 2 (Ch. 7)	Batch 3 (Ch. 8)
Preset Value			
Output mode (circle one)	Top Stop Toggle Pulse for _____mS	Top Stop Toggle Pulse for _____mS	Top Stop Toggle Pulse for _____mS
Increment mode (circle one)	Strokes Good Parts	Strokes Good Parts	Strokes Good Parts
Increment angle (degrees)			

This tool should be serviced when the TOTAL HITS count reaches _____

Strokes / Part: _____ - OR - Parts / Stroke: _____

Tool Information

Item	Value	Units

Tool Memo box text
(30 characters, total)

<p>-----</p> <p>-----</p>

ProCamPAC Cam Switch – SmartPAC PRO Setup Sheet Channels 1-8

Tool Name and Number: _____

Ch #	Cam Name (function) same for all tools	Global cam? (✓) Not Ch. 6, 7 or 8	Auto Adv.? (✓) 2 max. Program ON/OFF angles	TIMED 4 max. ON angle + ON Time in mS	DSV-ON Time to shut-off after press stops, in seconds	ON/OFF Multiple arcs for ON/OFF only 6 extras, total		
						Arc # Normally 1 arc per channel, can be up to 4	ON angle	OFF angle
1				____ ° ____ mS	____ sec	Arc 1		
						Arc 2		
						Arc 3		
						Arc 4		
2				____ ° ____ mS	____ sec	Arc 1		
						Arc 2		
						Arc 3		
						Arc 4		
3				____ ° ____ mS	____ sec	Arc 1		
						Arc 2		
						Arc 3		
						Arc 4		
4				____ ° ____ mS	____ sec	Arc 1		
						Arc 2		
						Arc 3		
						Arc 4		
5				____ ° ____ mS	____ sec	Arc 1		
						Arc 2		
						Arc 3		
						Arc 4		
6				____ ° ____ mS	____ sec	Arc 1		
						Arc 2		
						Arc 3		
						Arc 4		
7				____ ° ____ mS	____ sec	Arc 1		
						Arc 2		
						Arc 3		
						Arc 4		
8				____ ° ____ mS	____ sec	Arc 1		
						Arc 2		
						Arc 3		
						Arc 4		

ProCamPAC Cam Switch – SmartPAC PRO Setup Sheet Channels 9-16

Tool Name and Number: _____

Ch #	Cam Name (function) same for all tools	Global cam? (✓) Not Ch. 6, 7 or 8	Auto Adv.? (✓) 2 max. Program ON/OFF angles	TIMED 4 max. ON angle + ON Time in mS	DSV-ON Time to shut-off after press stops, in seconds	ON/OFF Multiple arcs for ON/OFF only 6 extras, total		
						Arc # Normally 1 arc per channel, can be up to 4	ON angle	OFF angle
9				____ ° ____ mS	____ sec	Arc 1		
						Arc 2		
						Arc 3		
						Arc 4		
10				____ ° ____ mS	____ sec	Arc 1		
						Arc 2		
						Arc 3		
						Arc 4		
11				____ ° ____ mS	____ sec	Arc 1		
						Arc 2		
						Arc 3		
						Arc 4		
12				____ ° ____ mS	____ sec	Arc 1		
						Arc 2		
						Arc 3		
						Arc 4		
13				____ ° ____ mS	____ sec	Arc 1		
						Arc 2		
						Arc 3		
						Arc 4		
14				____ ° ____ mS	____ sec	Arc 1		
						Arc 2		
						Arc 3		
						Arc 4		
15				____ ° ____ mS	____ sec	Arc 1		
						Arc 2		
						Arc 3		
						Arc 4		
16				____ ° ____ mS	____ sec	Arc 1		
						Arc 2		
						Arc 3		
						Arc 4		

DiProPAC Die Protection – SmartPAC PRO Setup Form Sensors 1-16

Tool Name and Number: _____

Sensor Number	Sensor Name (function)	Sensor Type (circle one)	Stop Type (circle one)	Ready Signal Timing
1		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
				OFF
2		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
				OFF
3		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
				OFF
4		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
				OFF
5		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
				OFF
6		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
				OFF
7		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
				OFF
8		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
				OFF
9		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
				OFF
10		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
				OFF
11		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
				OFF
12		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
				OFF
13		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
				OFF
14		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
				OFF
15		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
				OFF
16		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
				OFF

Auto Enable Counter Critical Angle (for Smart Stop)

R=RED; Y=YELLOW; G=GREEN STD; GC=GREEN CONSTANT;
GQ=GREEN QUICK CHECK; GS=GREEN SPECIAL; GF=GREEN FLEX

DiProPAC Die Protection – SmartPAC PRO Setup Form Sensors 17-32

Tool Name and Number: _____

Sensor Number	Sensor Name (function)	Sensor Type (circle one)	Stop Type (circle one)	Ready Signal Timing
17		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
		OFF		
18		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
		OFF		
19		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
		OFF		
20		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
		OFF		
21		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
		OFF		
22		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
		OFF		
23		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
		OFF		
24		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
		OFF		
25		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
		OFF		
26		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
		OFF		
27		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
		OFF		
28		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
		OFF		
29		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
		OFF		
30		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
		OFF		
31		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
		OFF		
32		R Y G GC GQ GS ___strokes GF	E-STOP TOP STOP SMART STOP	ON
		OFF		

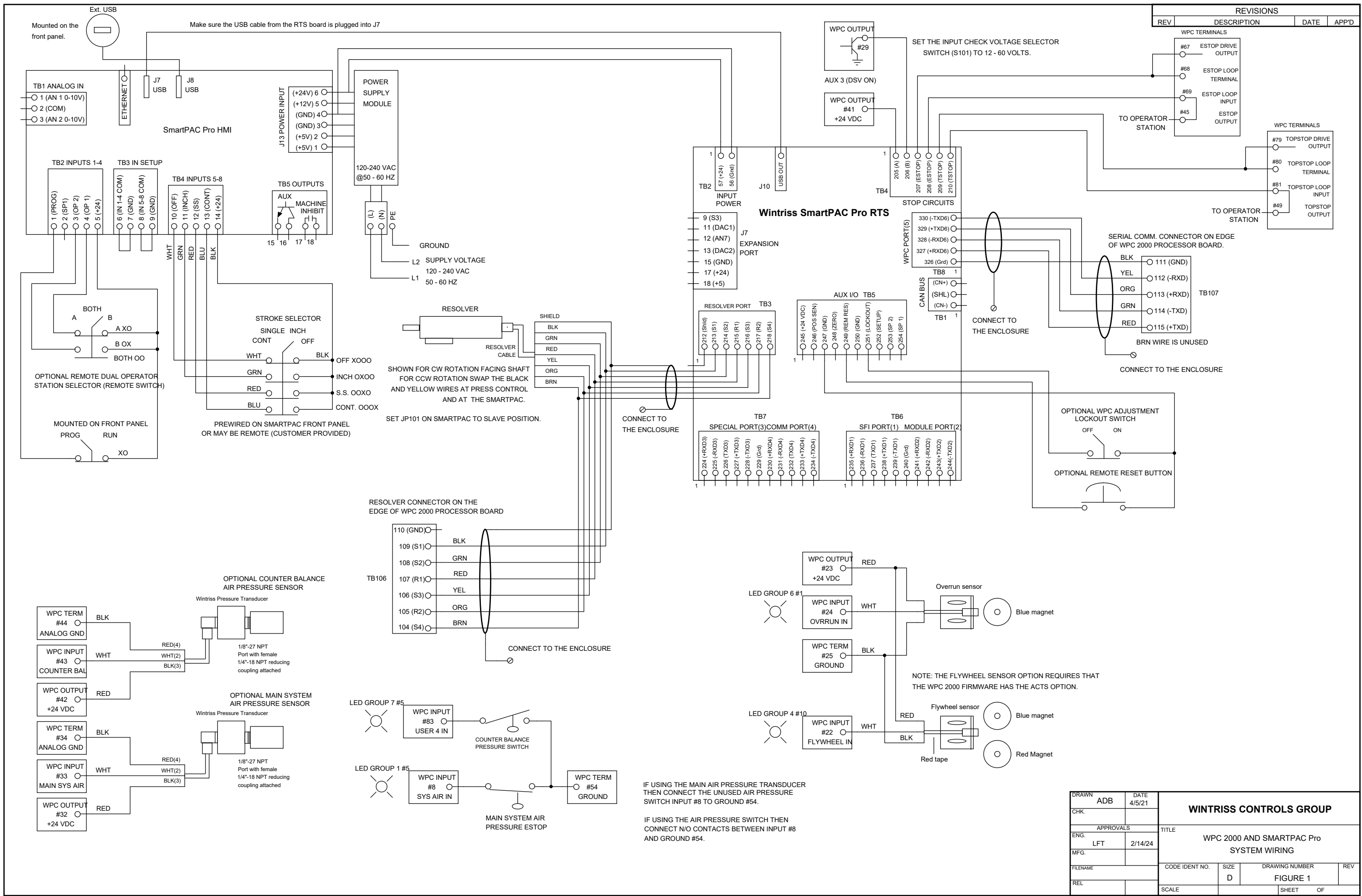
Auto Enable Counter

Critical

Angle (for Smart Stop)

R=RED; Y=YELLOW; G=GREEN STD; GC=GREEN CONSTANT;
 GQ=GREEN QUICK CHECK; GS=GREEN SPECIAL; GF=GREEN FLEX

REVISIONS			
REV	DESCRIPTION	DATE	APP'D

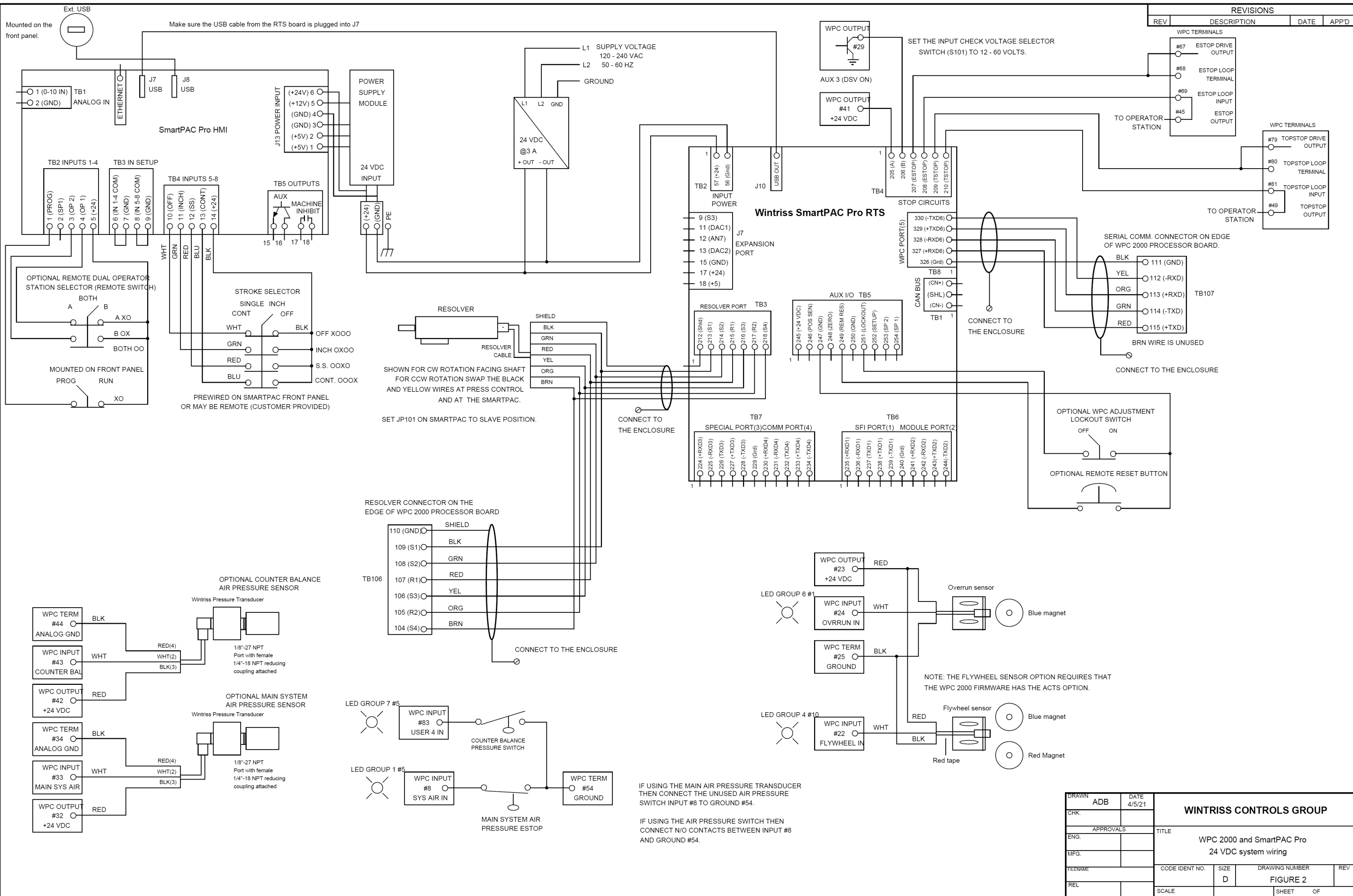


DRAWN	ADB	DATE	4/5/21	WINTRISS CONTROLS GROUP		
CHK.						
APPROVALS				TITLE		
ENG.	LFT	DATE	2/14/24	WPC 2000 AND SMARTPAC Pro SYSTEM WIRING		
MFG.				CODE IDENT NO.	SIZE	DRAWING NUMBER
FILENAME				REL	D	FIGURE 1
				SCALE		SHEET OF

IF USING THE MAIN AIR PRESSURE TRANSDUCER THEN CONNECT THE UNUSED AIR PRESSURE SWITCH INPUT #8 TO GROUND #54.

IF USING THE AIR PRESSURE SWITCH THEN CONNECT N/O CONTACTS BETWEEN INPUT #8 AND GROUND #54.

REVISIONS			
REV	DESCRIPTION	DATE	APP'D

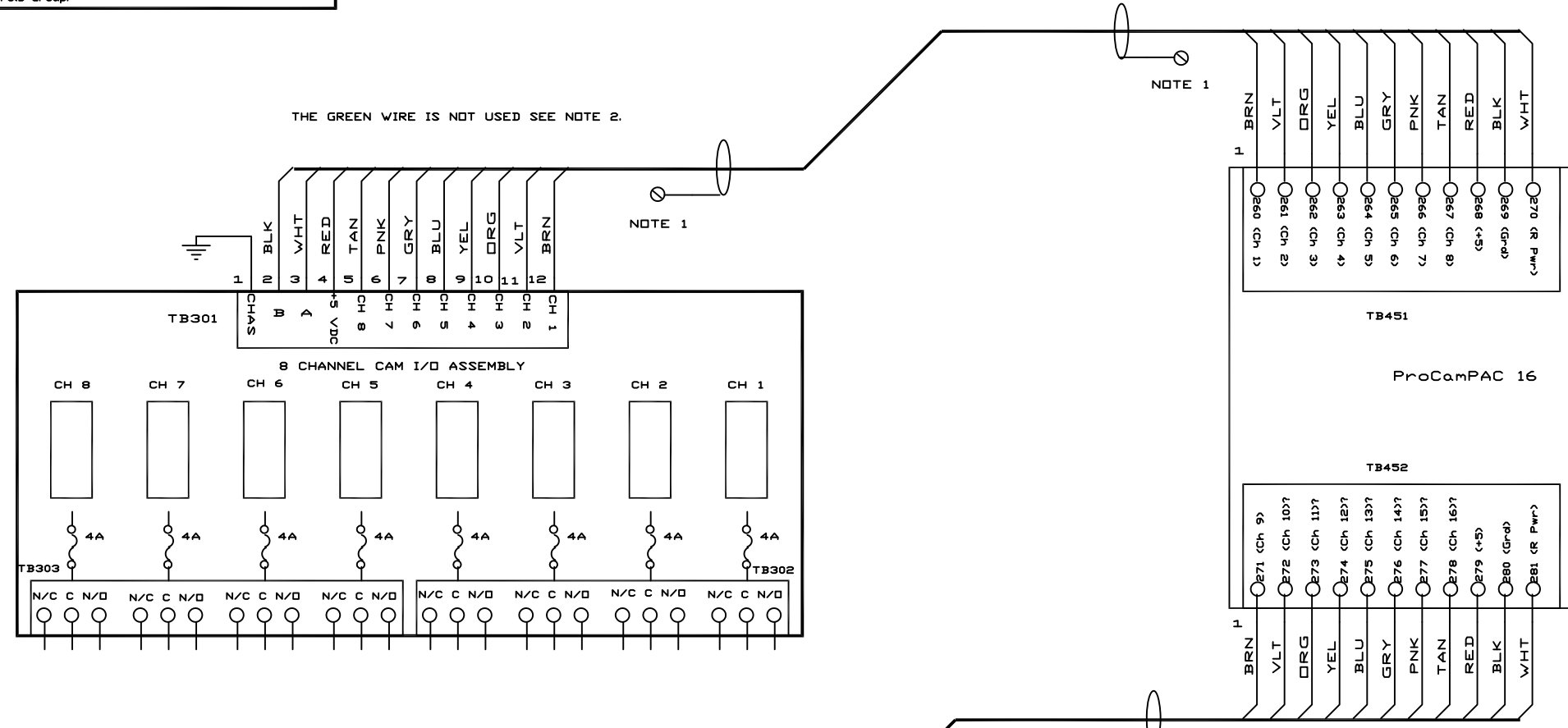


DRAWN	ADB	DATE	4/5/21	WINTRISS CONTROLS GROUP					
CHK.									
APPROVALS							TITLE WPC 2000 and SmartPAC Pro 24 VDC system wiring		
ENG.									
MFG.				CODE IDENT NO.	SIZE	DRAWING NUMBER	REV		
FILENAME					D	FIGURE 2			
REL				SCALE		SHEET	OF		

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REVISIONS			
REV	DESCRIPTION	DATE	APP'D

CAMS 1 - 8

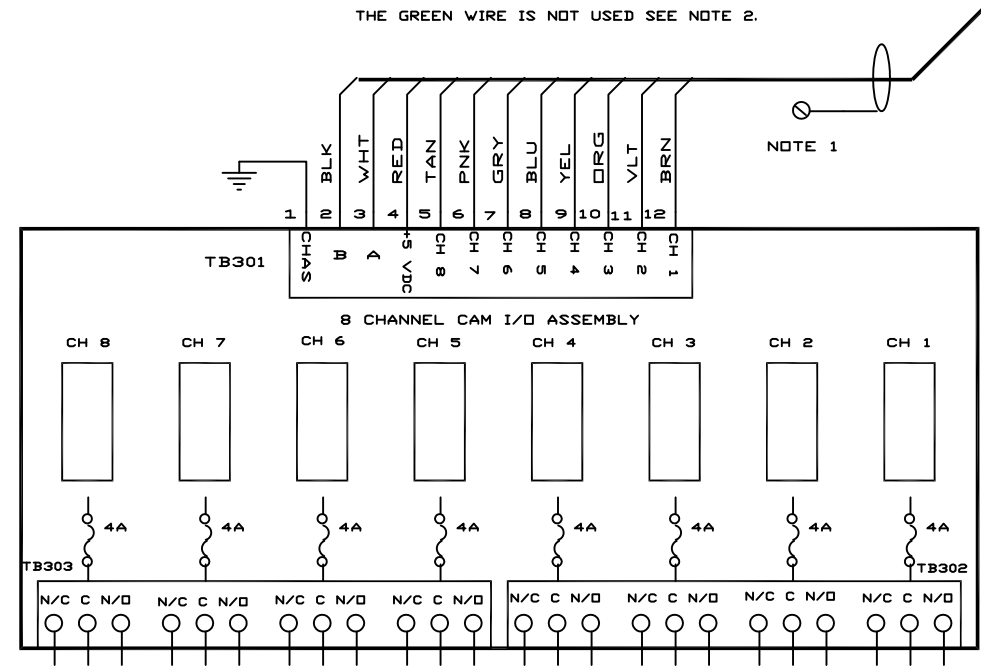


THE GREEN WIRE IS NOT USED SEE NOTE 2.

NOTE 1

NOTE 1

CAMS 9 - 16



THE GREEN WIRE IS NOT USED SEE NOTE 2.

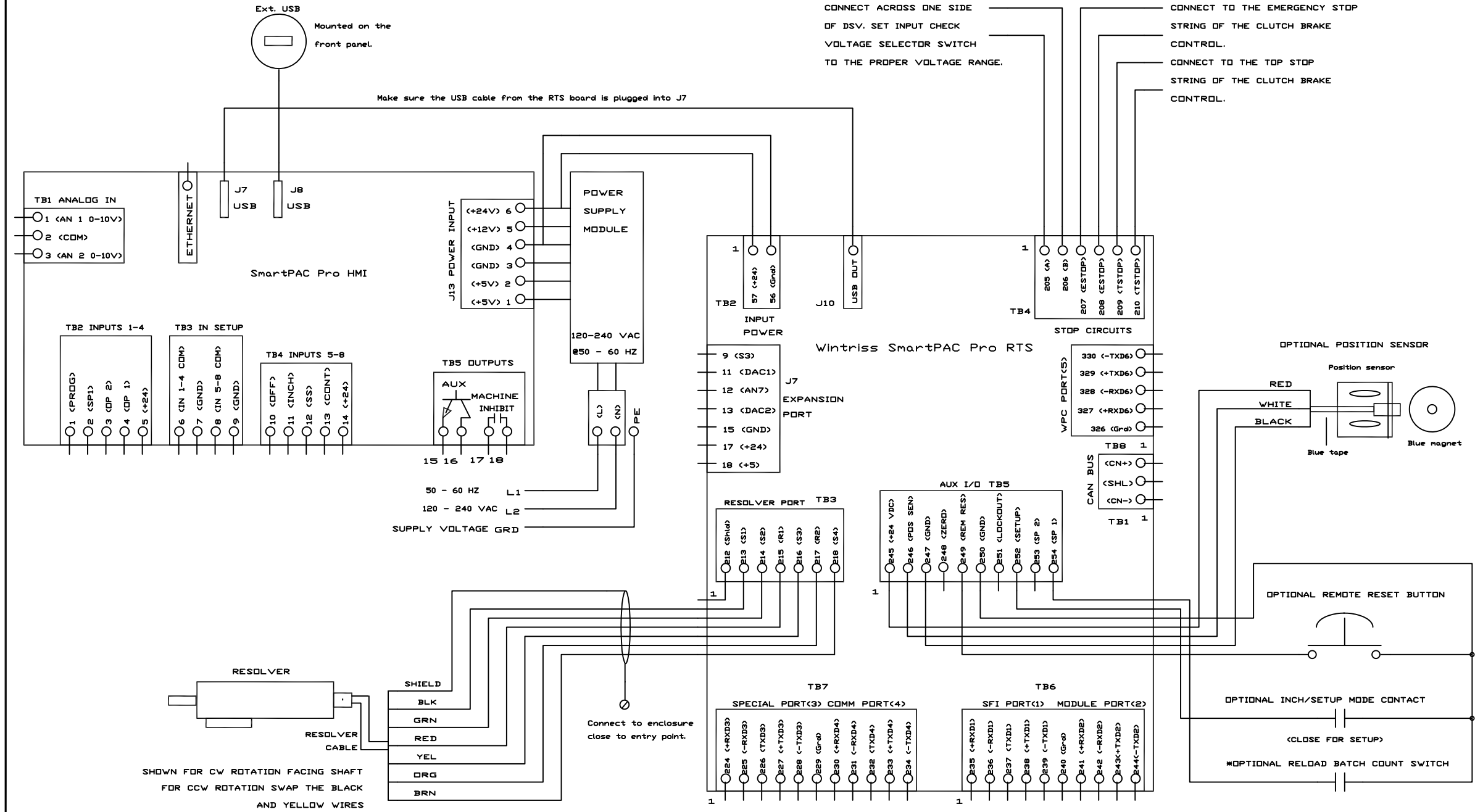
NOTE 1

NOTE 1: TERMINATE THE SHIELD TO THE ENCLOSURE CLOSE TO THE CONDUIT ENTRY POINT.

NOTE 2: CUT OFF THE GREEN WIRE FLUSH WITH THE END OF THE CABLE JACKET.

DRAWN ADB	DATE 7/10/14	WINTRISS CONTROLS GROUP		
CHK.		TITLE ProCamPAC 16 to Cam Output Wiring Diagram		
APPROVALS		CODE IDENT NO.		
ENG.		SIZE C	DRAWING NUMBER FIGURE 3	REV
MFG.		SHEET OF		
FILENAME		SCALE		
REL		SHEET OF		

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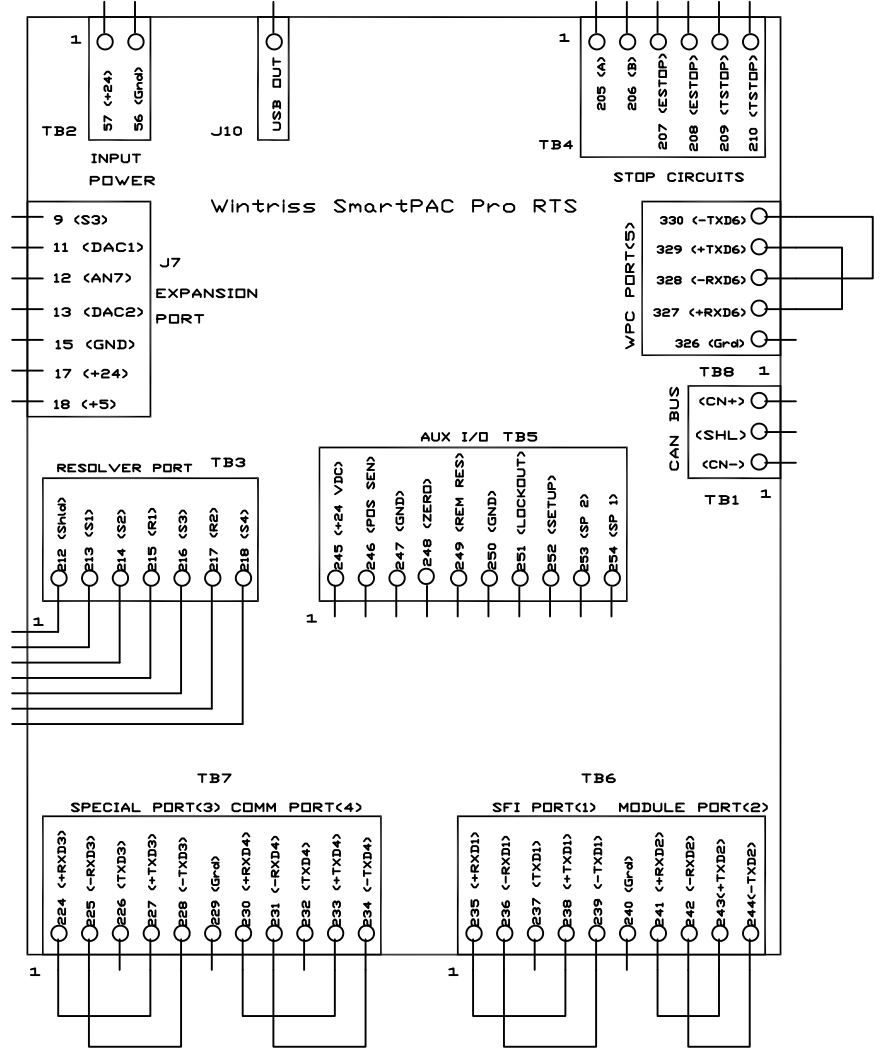


TITLE			
120 - 240 VAC SmartPAC Pro wiring configuration			
DRAWN	SIZE	DRAWING NUMBER	REV
ADB	C	FIGURE 4	
DATE	8/28/20	SHEET	OF

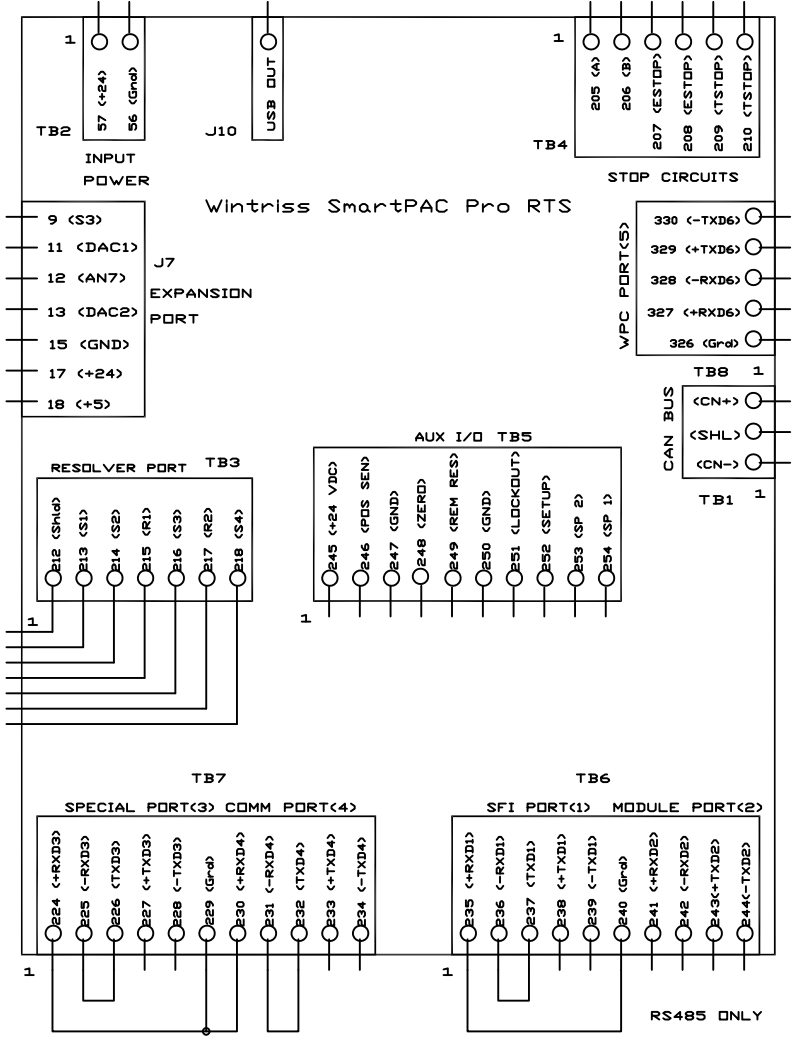
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REV	DESCRIPTION	DATE	APP'D

RS 485 CONNECTIONS



RS 232 CONNECTIONS

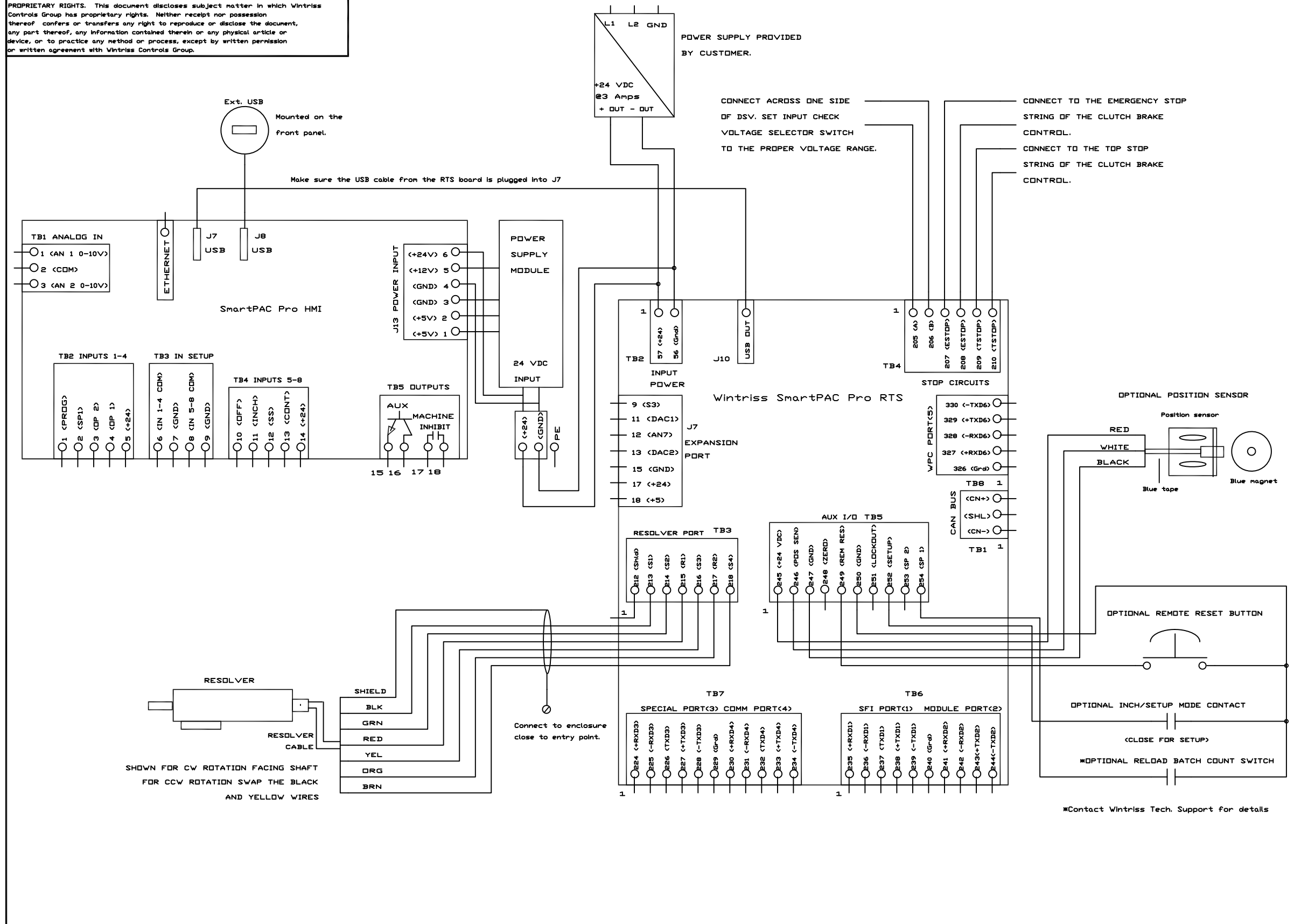


RS485 ONLY

RS485 ONLY

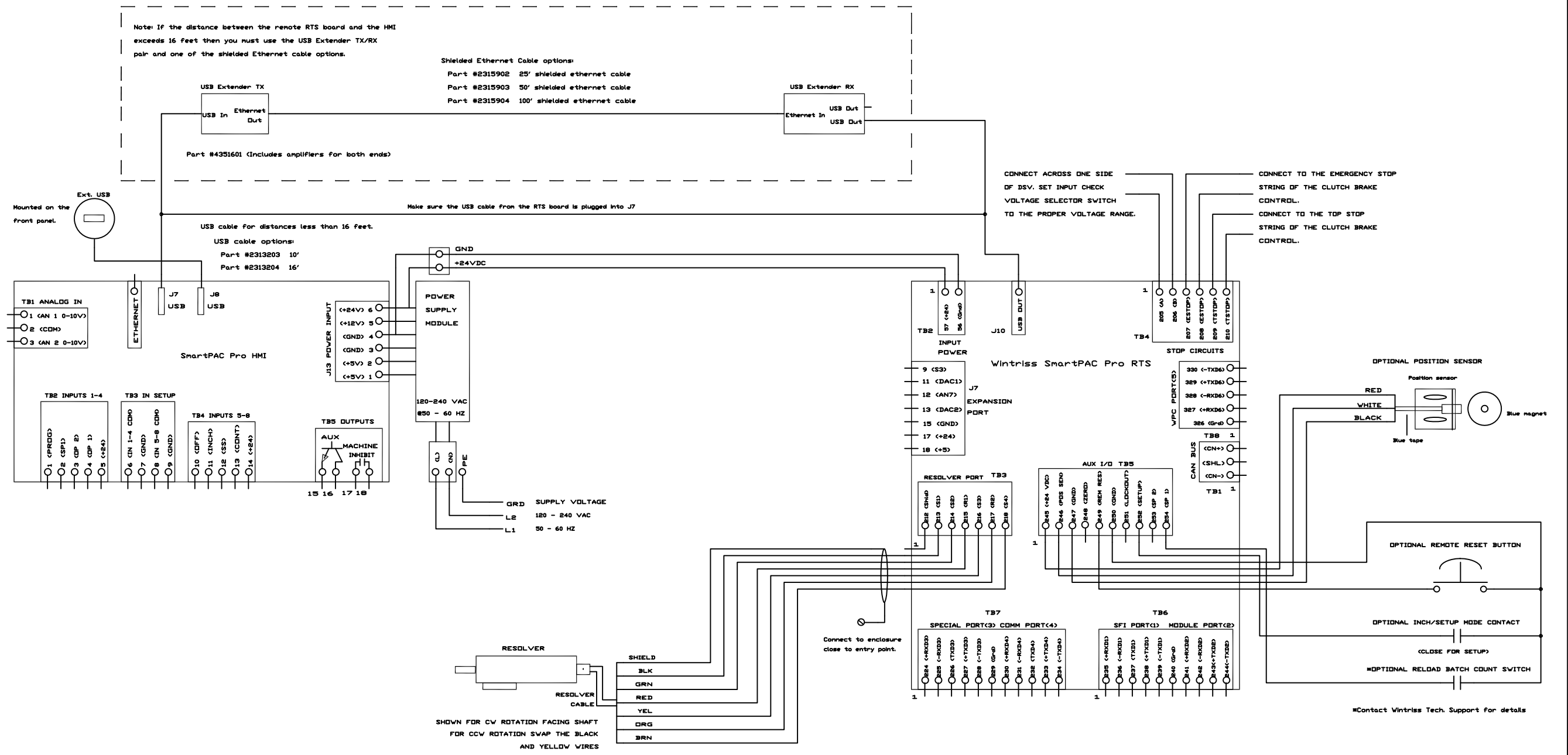
DRAWN ADB	DATE 2/26/19	WINTRISS CONTROLS GROUP		
CHK.		TITLE		
APPROVALS		SmartPAC Pro loopback test wiring		
ENG.		CODE IDENT NO.	SIZE C	DRAWING NUMBER FIGURE 5
MFG.		REL	SCALE	REV
				SHEET OF

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TITLE			
+24 VDC SmartPAC Pro wiring configuration			
DRAWN	SIZE	DRAWING NUMBER	REV
ADB	C	FIGURE 6	
DATE		SHEET	OF
8/28/20			01

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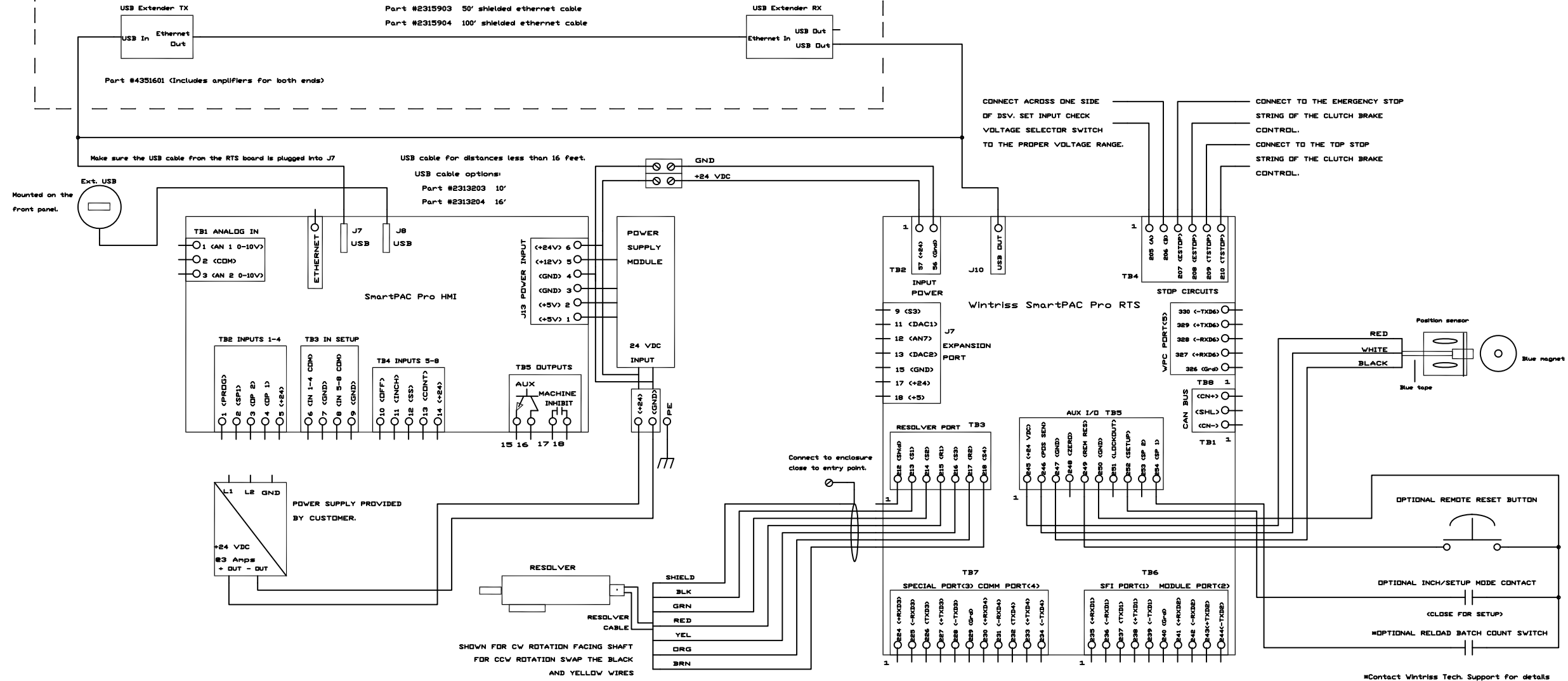


DRAWN	ADB	DATE	8/28/20		
CHK.			WINTRISS CONTROLS GROUP		
APPROVALS			TITLE		
ENG.			120 - 240 VAC SmartPAC Pro with		
MFG.			USB extended wiring configuration		
FILENAME		CODE IDENT NO.	SIZE	DRAWING NUMBER	REV
REL			ID	FIGURE 7	
		SCALE		SHEET	OF

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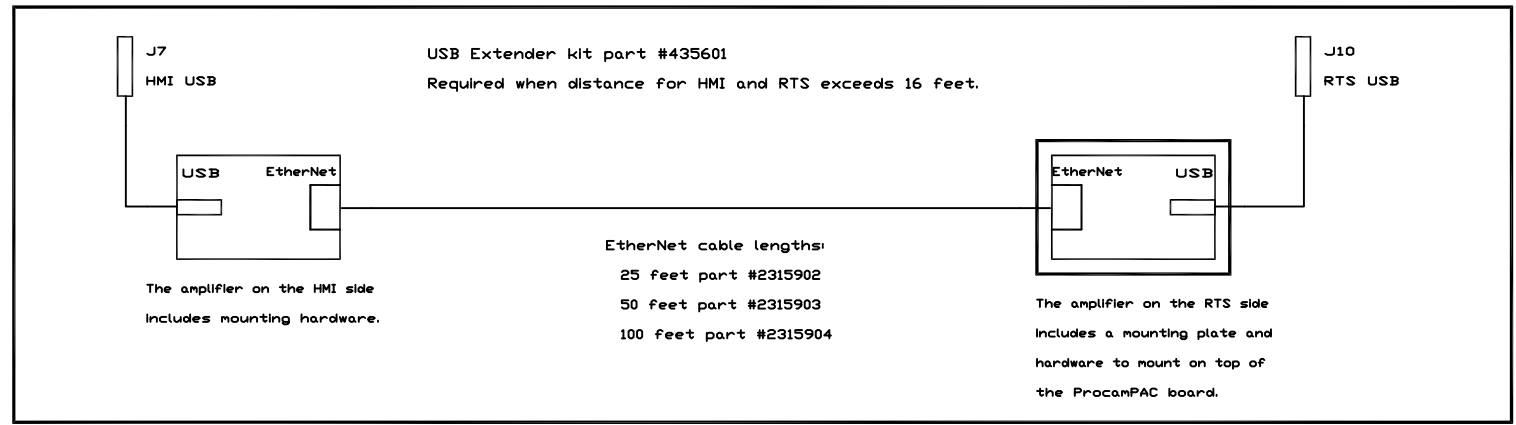
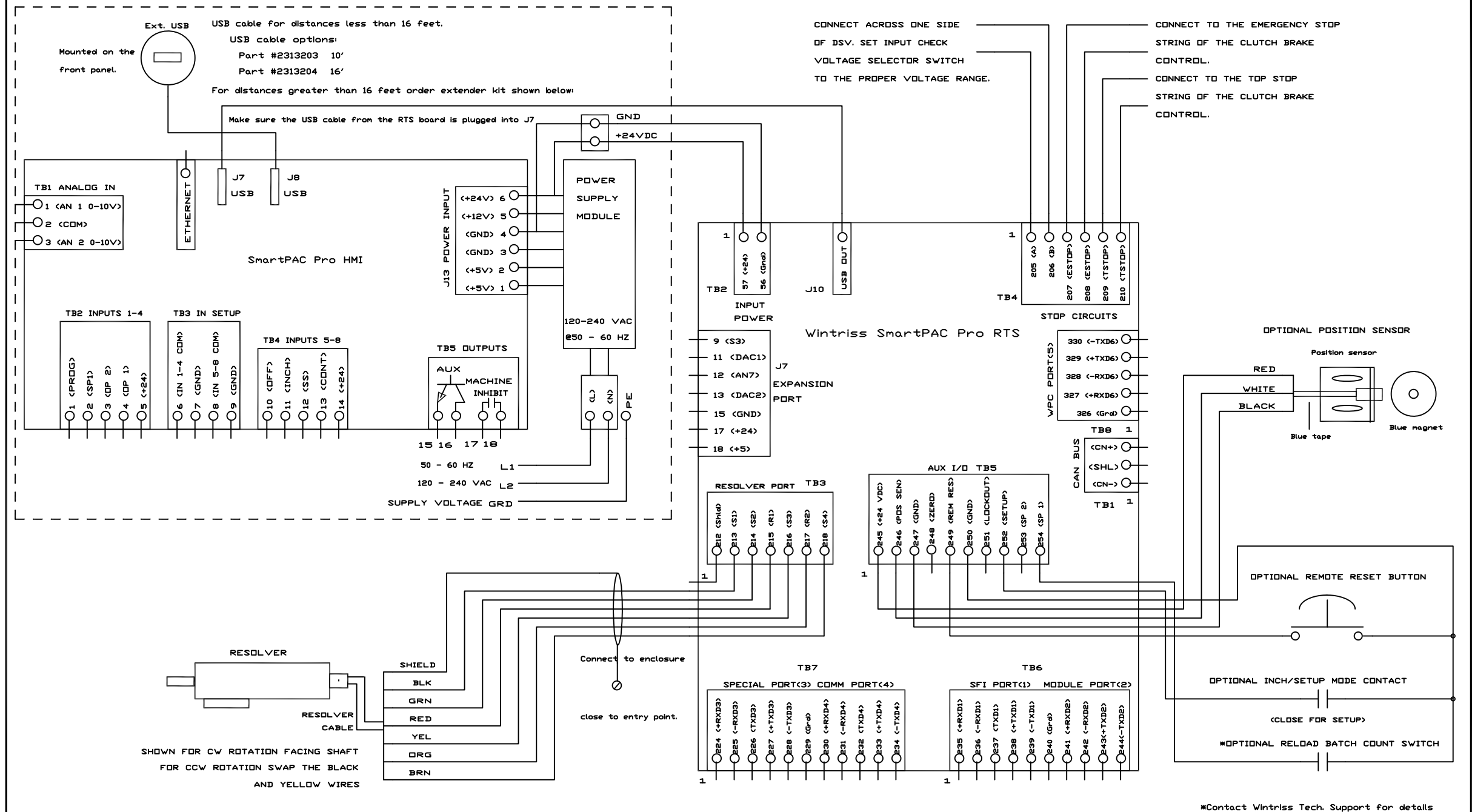
Note: If the distance between the remote RTS board and the HMI exceeds 16 feet then you must use the USB Extender TX/RX pair and one of the shielded Ethernet cable options.

Shielded Ethernet Cable options:
 Part #2315902 25' shielded ethernet cable
 Part #2315903 50' shielded ethernet cable
 Part #2315904 100' shielded ethernet cable



DRAWN ADB	DATE 8/28/20	WINTRISS CONTROLS GROUP			
CHK.		TITLE 24 VDC SmartPAC Pro with USB extended wiring configuration			
APPROVALS		CODE IDENT NO.	SIZE D	DRAWING NUMBER FIGURE 8	REV
ENG.					
MFG.					
FILENAME					
REL		SCALE		SHEET	OF

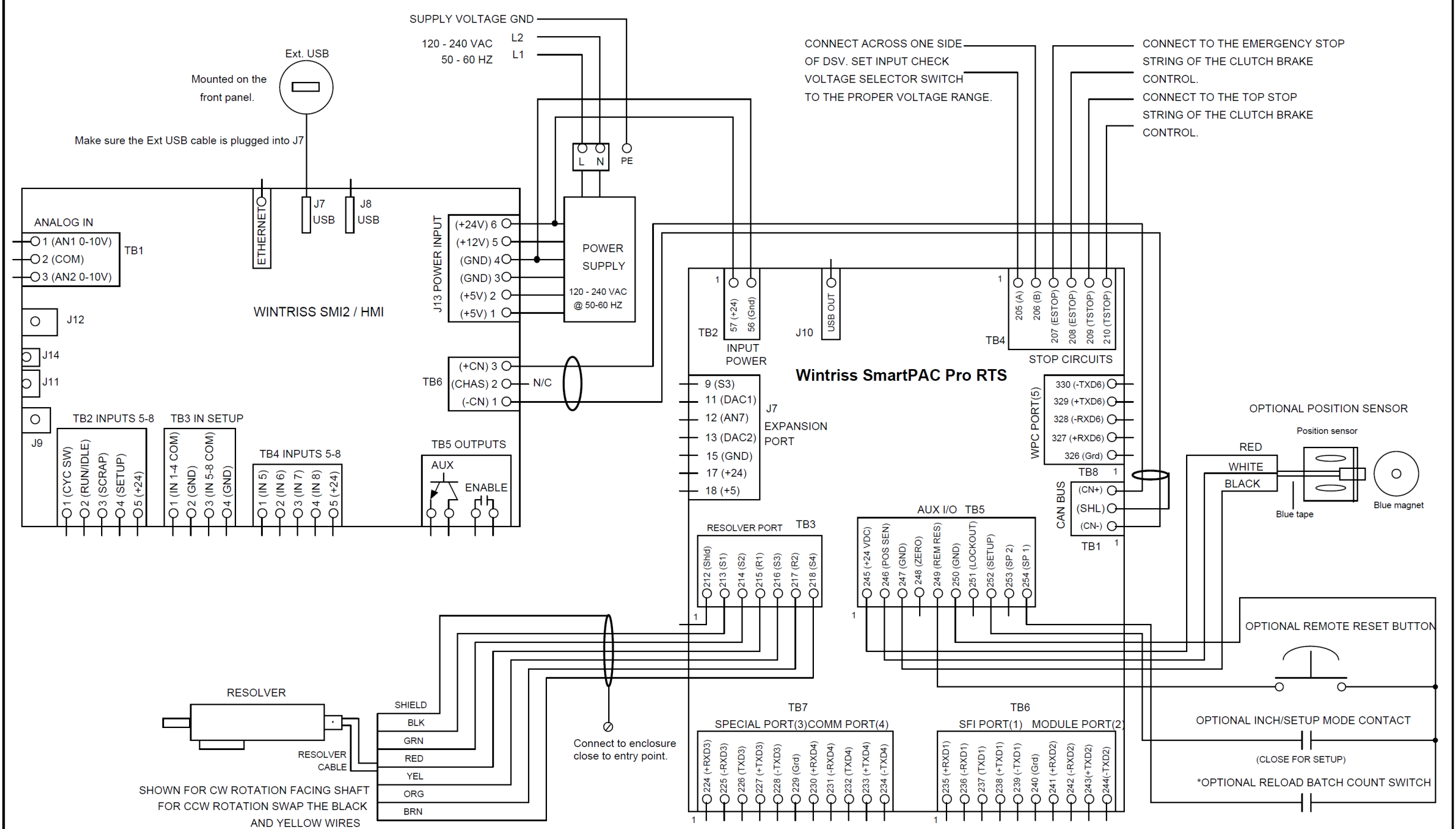
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TITLE 120 - 240 VAC SmartPAC Pro with remote RTS wiring configuration			
DRAWN ADB	SIZE C	DRAWING NUMBER FIGURE 9	REV
DATE 8/28/20	SHEET		OF

*Contact Wintriss Tech. Support for details

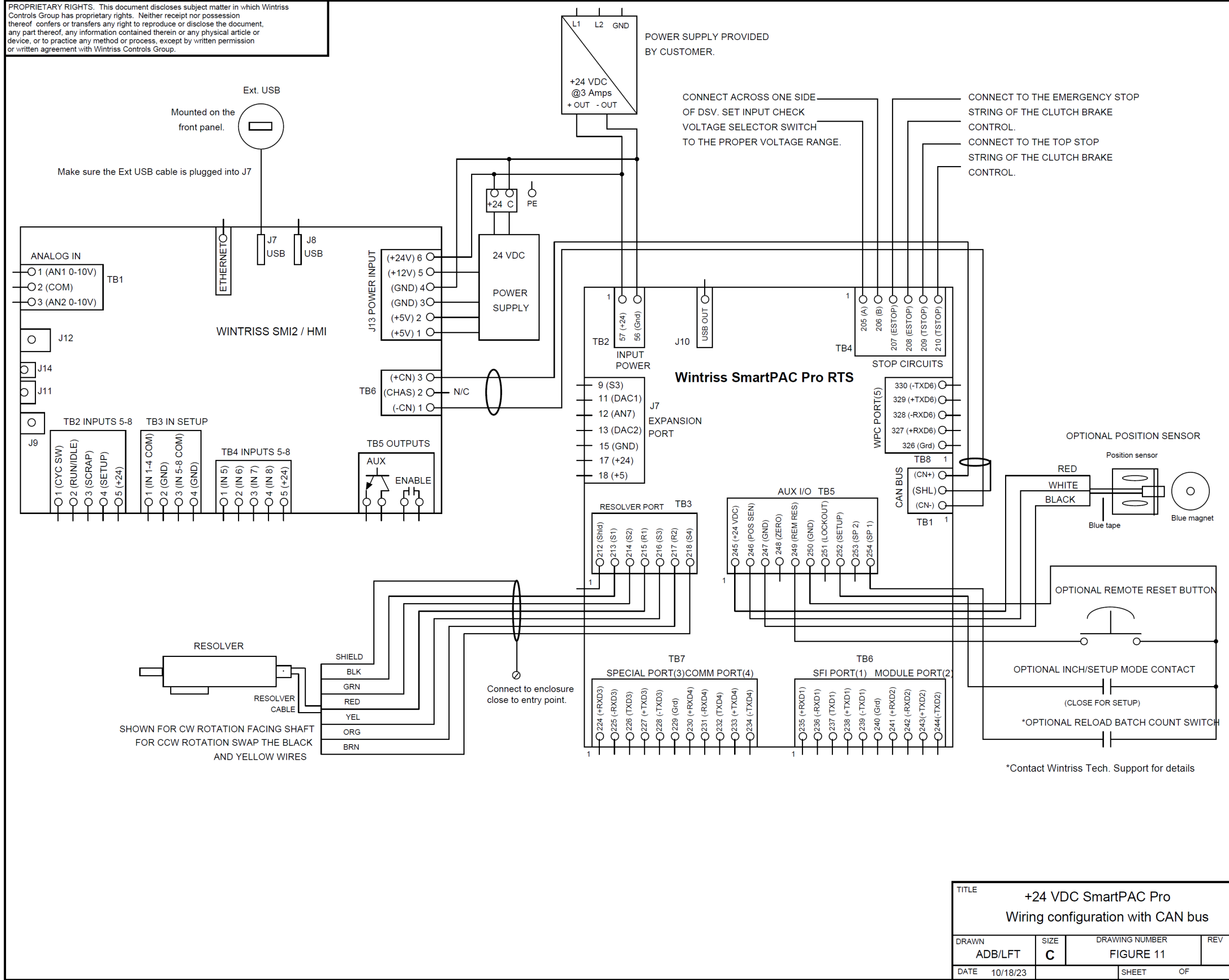
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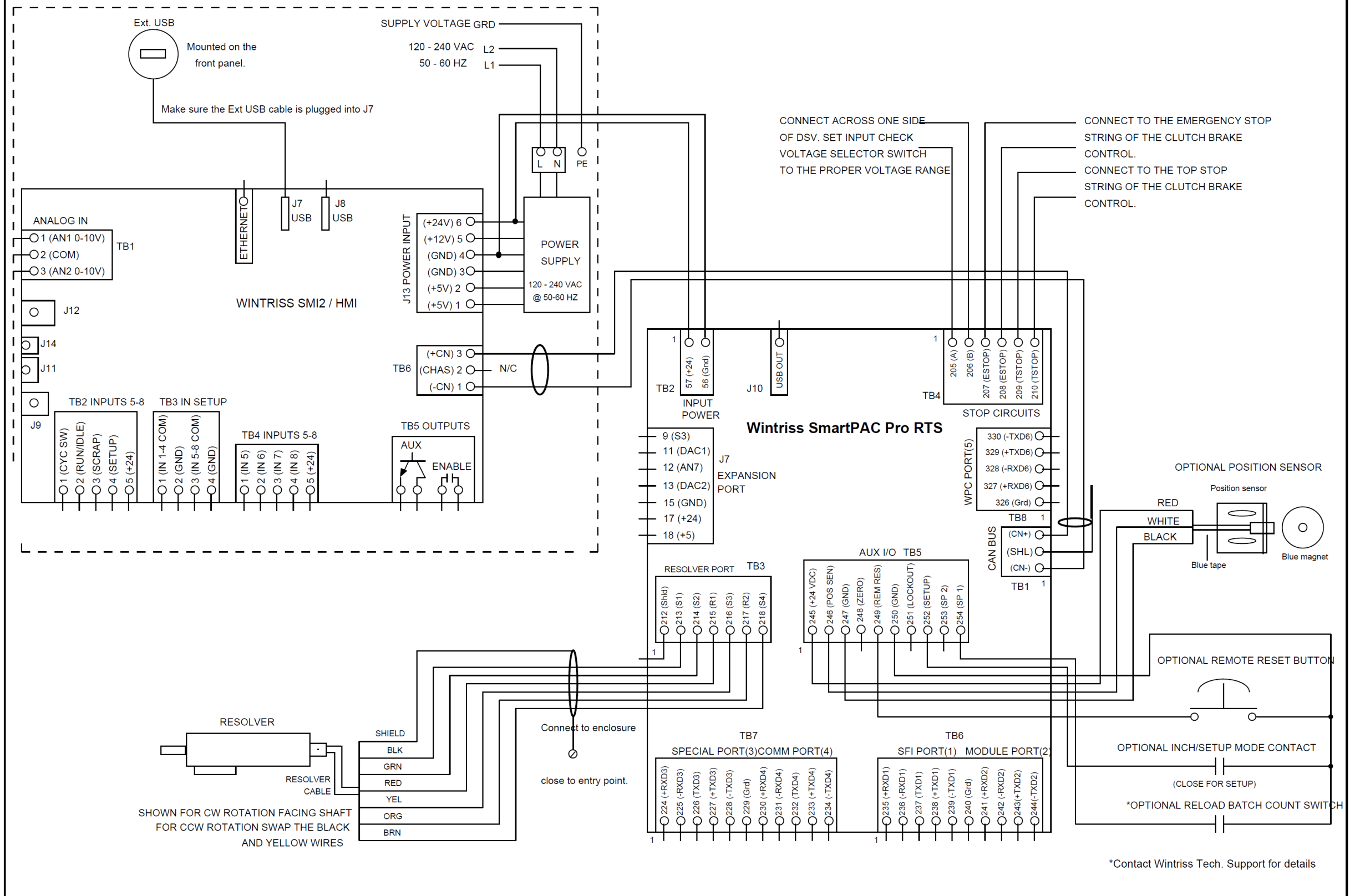
TITLE			
120 - 240 VAC SmartPAC Pro			
Wiring configuration w/CAN bus			
DRAWN	SIZE	DRAWING NUMBER	REV
ADB/LFT	C	FIGURE 10	
DATE	10/18/23	SHEET	OF

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TITLE			
+24 VDC SmartPAC Pro			
Wiring configuration with CAN bus			
DRAWN	SIZE	DRAWING NUMBER	REV
ADB/LFT	C	FIGURE 11	
DATE	10/18/23	SHEET	OF

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TITLE			
120 - 240 VAC SmartPAC Pro with CAN bus and remote RTS wiring configuration			
DRAWN	SIZE	DRAWING NUMBER	REV
ADB/LFT	C	FIGURE 12	
DATE	10/18/23	SHEET	OF

*Contact Wintriss Tech. Support for details

