Instruction Sheet:

SmartPAC 2 Enhanced Third Party Communications Firmware

The SmartPAC Third Party Communications Firmware option enables SmartPAC 2 to transmit real-time status information to external software systems. It includes the following features:

- SmartPAC Dialog mode, which allows operators to assign reasons to downtime events from a SmartPAC Run mode menu (refer to Page 8).
- MODBUS protocol (MODBUS TCP) to transfer data to external systems. SmartPAC 2 communicates via its built-in Ethernet port.
- Fourteen (14) standard tags and 61 expanded data tags to transport the data over the Ethernet via MODBUS TCP (see Tables 1 and 2). Each data tag represents a production parameter. The information stored in each tag is continuously overwritten during production and must be polled at regular intervals to make this data available to the remote system.

A MODBUS "master" installed on the remote server oversees the polling process. The MODBUS master transmits queries over the Ethernet to SmartPAC 2, and the MODBUS protocol on that machine, referred to as the MODBUS "slave," responds by transmitting all tags with their current data.

Wintriss recommends that Kepware ServerEX by Kepware Technologies be used as the MODBUS master (get info at www.kepware.com). A file containing a MODBUS Tag Assignment List - which provides all of the tags used by the SmartPAC to transfer data - is available for download at www.wintriss.com/comms/. The file can be imported directly into Kepware as an .OPF document.

NOTICE

To ensure that the .OPF document imports correctly into Kepware, do not make changes to the file. The file contains a number of empty columns.

Download the file at www.wintriss.com/comms/

Changing from the System Default DHCP to Static IP Address

The SmartPAC 2 comes from the factory set up for a Dynamic Host Configuration Protocol (DHCP) network, which automatically assigns IP addresses. We strongly recommend that you reconfigure your SmartPAC 2 to use a static (fixed) IP address when using the Enhanced 3rd-Party Communications Firmware. You will need to connect a standard USB mouse to the SmartPAC 2 in order complete this conversion.

The method for reconfiguring your SmartPAC 2 depends on the operating system (XPE) version installed in your system. For XPE versions less than 3.4 follow the steps below. For XPE versions 4.0 and greater follow the steps in the next section.

To determine which XPE version you have, go to the Installed Options Menu by turning the PROG/RUN key to Program, then press the 1 and Clear keys simultaneously and select INSTALLED OPTIONS.

For XPE < 3.04 follow these steps:

1. Power down the SmartPAC 2.
2. Open the enclosure. Access the USB (J117) connector on the SmartPAC 2, and plug in your mouse.
3. Power up the SmartPAC 2. Once the unit has finished booting up, you should see a mouse pointer on your display and be able to move it around.
4. Turn the PROG/RUN key switch to PROG.
5. Access the Main Initialization Menu by holding down the “1” and “CLEAR” keys simultaneously, and select SETUP NETWORK.
6. On the Network Setup Utility screen, select CHANGE NETWORK SETTINGS.
7. When the red warning window displays, indicating that you are about to be taken to the Control Panel and that you need to connect a mouse (which you have done in step 2), press the 5 key.
8. When the Control Panel displays, double-left-click with your mouse on the Network Connections folder.
9. Single-right-click on the Local Area Connection icon.
10. Single-left-click on Properties in the drop-down box that displays. A Window should appear labelled Local Area Connection Properties.
11. In the Local Area Connection Properties window, select Internet Protocol (TCP/IP) and single-left-click on the Properties button. The Internet Protocol (TCP/IP) Properties window displays with two radio buttons already selected: “Obtain an IP address automatically” and “Obtain DNS server address automatically.” These are the default settings to make your SmartPAC 2 DHCP-enabled.
12. Single-left-click once to select “Use the following IP address,” and single-left click again to select “Use the following DNS server address.”
13. Using the on-screen keyboard, enter the appropriate IP addresses. Consult your IT department if you need help.
14. Single-left-click on the *OK* button.

15. Close the On-Screen Keyboard, Local Area Connection Properties, and Network Connections windows. You should see a blank blue screen with a small window labeled Control Panel Entered with the words Re-Start System and Save Changes. Single-left click on the *OK* button to restart the SmartPAC 2 and save your new network settings.

For XPE > 3.04 follow these steps:

1. Power down the SmartPAC 2 and connect a USB mouse to the USB (J117) connector.
2. Power up the SmartPAC 2. Once the unit has finished booting up, you should see a mouse pointer on your display and be able to move it around.
3. Turn the PROG/RUN key switch to PROG, then access the Main Initialization Menu by holding down the "1" and "CLEAR" keys simultaneously, and select SETUP NETWORK.
4. On the Network Setup Utility screen, select CHANGE NETWORK SETTINGS.
5. When the red warning window displays, indicating that you are about to be taken to the Control Panel and that you need to connect a mouse (which you have done in step 2), press the 5 key.
6. When the Control Panel "**Pick a category**" screen appears, single-left-click on "Network and Internet Connections".
7. Single-right-click on "Network Connections" under "**or pick a Control Panel icon**".
8. Single-right-click on the Local Area Connection icon.
9. Single-left-click on Properties in the drop-down box that displays. A Window should appear labelled "Local Area Connection Properties".
10. In the Local Area Connection Properties window, select Internet Protocol (TCP/IP) and single-left-click on the Properties button. The Internet Protocol (TCP/IP) Properties window displays with two radio buttons already selected: "Obtain an IP address automatically" and "Obtain DNS server address automatically." These are the default settings to make your SmartPAC 2 DHCP-enabled.
11. Single-left-click once to select "Use the following IP address," and single-left click again to select "Use the following DNS server address."
12. Using the on-screen keyboard, enter the appropriate IP addresses. Consult your IT department if you need help.
13. Single-left-click on the *OK* button.
14. Close the On-Screen Keyboard, Local Area Connection Properties, and Network Connections windows. You should see a blank blue screen with a small window labeled Control Panel Entered with the words Re-Start System and Save Changes. Single-left click on the *OK* button to restart the SmartPAC 2 and save your new network settings.

Table 1 – Standard Data Tag List

Tag Name/Description	MODBUS Register Number	Tag Length	Value Range
Production_Good_Parts_Preset Reports the SmartPAC Good Parts Counter Preset value entered by the operator.	401001	DWord (32-bit)	1-9,999,999
Production_Tool_Number* Reports the tool number currently loaded in the SmartPAC.	401003	DWord (32-bit)	1-9,999,999
Production_Job_Number* Reports the operator-entered job number currently loaded in the SmartPAC.	401005	DWord (32-bit)	1-9,999,999
Production_Part_Number* Reports the operator-entered part number currently loaded in the SmartPAC.	401007	DWord (32-bit)	1-9,999,999
Counter_Strokes_No_Reset Reports the total number of strokes made by the press. Increments when the SmartPAC Strokes Counter increments until it reaches a limit of 2^24, or 16,777,216; then, it starts counting again from 0. The counter cannot be reset at the SmartPAC.	401009	DWord (32-bit)	0-16,777,216
Counter_Good_Parts_No_Reset Reports the total number of good parts made by the press. Increments when the SmartPAC Good Parts Counter increments until it reaches a limit of 2^24, or 16,777,216; then, it starts counting again from 0. The counter cannot be reset at the SmartPAC.	401011	DWord (32-bit)	0-16,777,216
Press_Stop_Time_Actual Reports the most recent stopping time of the press (in milliseconds) measured by the SmartPAC.	401013	Word (16-bit)	0-9,999
Press_Stop_Time_Limit Reports the stop time limit (in milliseconds) set in SmartPAC Initialization. Refer to the SmartPAC User Manual for	401014	Word (16-bit)	0-9,999
Press_Total_Tonnage Reports the total forward peak load on the press for SmartPAC systems equipped with AutoSetPAC or WaveFormPAC. This value is calculated by adding the peak tonnage on all tonnage monitor inputs. If no tonnage monitor is present, the value is set to 0.	401015	Word (16-bit)	0.0-999

Press_Shaft_Speed Reports the current speed of the press if Single-stroke mode is disabled in SmartPAC Initialization; reports the calculated production rate if Single- stroke mode is enabled. Refer to document #1137900 for an explanation of this setting.	401016	Word (16-bit)	0-9,999
Press_Operator_1 Reports the Operator Number, entered at the SmartPAC, of the current operator.	401019	DWord (32-bit)	0-9,999,999
Counter_Scrap_No_Reset Reports the total number of scrap items entered at the SmartPAC. Increments until it reaches a limit of 2^15, or 32,767; then, it starts counting again from 0. The counter cannot be reset at the SmartPAC.	401021	Word (16-bit)	0-32,767
Press_State_Code Reports the current machine state of the SmartPAC (refer to page 6 for an explanation of machine states). Values are: 1 Running 2 Not used 3 Not used 4 Unplanned downtime 5 Changeover 6 Idle 7 Planned downtime	401022	Word (16-bit)	1-7
Press_Error_Reason_Code Reports the error code representing the current error displayed at the SmartPAC or the current downtime reason entered by the operator (see document #1137900). Error codes and corresponding errors are shown in Tables 3 (page 9) and 5 (page 25). The following codes represent Press_State_Code values (i.e., machine states): 0 Press_State_Code = 1 or 6 (Running or Idle) 222 Press_State_Code = 5 (Changeover) 238 Press_State_Code = 7 (Planned downtime)	401023	Word (16-bit)	0-9,999

* When a new tool is loaded at the SmartPAC, this value will reset to zero and remain at zero for five seconds, then increment to its new, correct value.

Table 2 – Expanded Data Tag List

EXPANDED - Counter Tags		
Good parts counter	400003	Dword
Stroke counter	400001	Dword
Stroke counter preset	400007	Dword
Batch 1 counter	400005	Dword
Batch 1 preset	400011	Dword
Batch 2 counter	400063	Dword
Batch 2 preset	400067	Dword
Batch 3 counter	400065	Dword
Batch 3 preset	400069	Dword
Total hits for tool	400031	Dword
Total hits preset	400443	Dword

EXPANDED - Scheduling Tags		
Alphanumeric Job String	401028	String (14 Char Max)
Alphanumeric Part String	401036	String (26 Char Max)
Production Write String (writeable tag)*	401050	String (240 Char Max)
* This is used to send the schedule or next job data down to the control. It is a semicolon delimited string and takes on the form: String ID;Next Tool Number;Next Preset;Next Job String;Next Part String1, Next Part String2…Next Part String 5 Here's an example of such a string: "1; 1234; 100000; J5678; P1000, P2000, P3000". If there is no schedule then this is indicated by the following string: "1;;;;"		

EXPANDED - Start Time amd Angle Tags		
Resolver angle*	400019	Word
* Due to the latency of the information, the Resolver Angle tag should not be used for control purposes.		
Start time	400022	Word
Start time limit	400042	Word

EXPANDED - I/O Status Tags		
DipPro Sensor Enable Status (0=Enabled, 1=Disabled)	400514	Word
Dipro input status (DiproPac req'd, up to 16 inputs only)	400072	Word
The DiPro input status tag's 16 bits indicates which sensors (1-16) are actuated (0=off, 1=actuated).		
Procam output status (ProCamPAC Req'd)	400073	Word
The ProCam ouput status tag's 16 bits indicates which ProCam channels (1-16) are on (0=off, 1=on).		
WPC input status (WPC req'd)	400074	Word
Bit 0=Off Mode, Bit 1 = Inch Mode, Bit 2 = Single Stroke Mode, Bit 3 = Continuous Mode, Bit 4 = Operator Station 1 Input On, Bit 5 = Operator Station 2 Input On, Bit 6 = WPC Lockout Input On, Bit 7 = Remote Reset On		
Input check input status (0-Off, 1-On)	400075	Word
Actual Flywheel Speed (*Requires WPC 2000 with flywheel sensor)*	400055	Word
Motor Slowdown Percentage (*Requires WaveFormPAC Module)*	400059	Word
Current Command Speed (**Requires WPC 2000 w/option 2)*	400056	Word

EXPANDED - RamPAC Tags	RamPAC Module Req'd	
RamPAC Counterbalance actual	400045	Word
RamPAC Counterbalance setpoint	400046	Word
RamPAC Cushion actual	400047	Word
RamPAC Cushion setpoint	400048	Word
RamPAC units	400049	Word
RamPAC shutheight actual	400453	Dword
RamPAC shutheight setpoint	400455	Dword

EXPANDED - AutoSetPAC Tags	AutoSetPAC or WaveformPAC Module Req'd	
Input 1 forward tonnage	400257	Word
Input 2 forward tonnage	400258	Word
Input 3 forward tonnage	400259	Word
Input 4 forward tonnage	400260	Word
Input 1 reverse tonnage	400269	Word
Input 2 reverse tonnage	400270	Word
Input 3 reverse tonnage	400271	Word
Input 4 reverse tonnage	400272	Word
Input 1 high setpoint	400273	Word
Input 2 high setpoint	400274	Word
Input 3 high setpoint	400275	Word
Input 4 high setpoint	400276	Word
Input 1 low setpoint	400277	Word
Input 2 low setpoint	400278	Word
Input 3 low setpoint	400279	Word
Input 4 low setpoint	400280	Word
Input 1 rep setpoint	400281	Word
Input 2 rep setpoint	400282	Word
Input 3 rep setpoint	400283	Word
Input 4 rep setpoint	400284	Word
High setpoint %	400310	Word
Low setpoint %	400311	Word
Rep setpoint %	400313	Word
Startup counter	400319	Word
Sample period	400320	Word
Inputs 1 - 4 total forward load	400321	Word
Inputs 1 - 4 total high setpoints	400341	Word
Inputs 1 - 4 total low setpoints	400346	Word
Inputs 1 - 4 total rep setpoints	400351	Word

Reporting Downtime and Scrap from SmartPAC

This section explains how to create and assign downtime reason codes at your SmartPAC, and describes how to use the SmartPAC Dialog Menu to send the downtime reasons back to your software. The document also explains how to adjust the Good Parts and Scrap parts counts that SmartPAC reports back to your software.

SmartPAC's downtime and scrap reporting features are available only on SmartPAC 2 versions 4.59 or higher; in addition, the Enhanced 3rd-Party Communications firmware option must be installed.

SmartPAC Machine States (Modbus Register 401022)

Every time the SmartPAC is polled, it reports the machine status as 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.). SmartPAC selects the machine state based on the whether or not the machine is running and the currently selected downtime reason (if any). Machine states are 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 (in other words, the operator has not yet selected a downtime reason from the Dialog Menu).
- Unplanned Downtime - Press is stopped due to a SmartPAC error, or if the press is stopped for another reason, the press operator has selected a downtime reason other than Planned Downtime or Tool Change
- Planned Downtime - Press is stopped, and the press operator has selected Planned Downtime from the Dialog Menu as the reason.
- Changeover Time - Press is stopped, and the press operator has selected Tool Change from the Dialog Menu as the reason.
- Offline Time - Press is stopped because there is no power to the press or the network is down.

Whenever the press is stopped for any reason other than a power interruption or network failure, the machine state will be Idle Time - unless the SmartPAC is displaying an error, or a downtime reason was selected from the SmartPAC Dialog Menu by the press operator.

While it is helpful to know *that* a press was stopped, it is infinitely more valuable to know *why* it was stopped. To help you to collect the actual reasons for downtime, the SmartPAC may be programmed so that it requires the operator to select a specific downtime reason any time the press persists in the Idle state for longer than a preset time period.

SmartPAC Downtime Reporting Features

Downtime reasons in SmartPAC may be reported either automatically by the system or manually by the operator. When the press is stopped because of an error generated by SmartPAC or an installed SmartPAC module, the specific fault (e.g., "Sensor 1 Part Ejection Missed") is reported automatically as an unplanned downtime reason.

When the press is stopped by the operator or by a piece of auxiliary equipment not connected to the SmartPAC, a downtime reason must be reported manually by the operator since SmartPAC is unable to detect the reason for the interruption. Downtime reasons may also be assigned manually in order for the operator to provide additional detail for periods documented automatically with specific error conditions (see *Forced Error Dialog Mode*, page 11).

State and Reason Tag behavior

If the SmartPAC stops the press, it will set the State Tag (Modbus Register 401022) to a value of "4" (Unplanned Downtime), and the Reason Tag (Modbus Register 404023) to the value in the Error Lookup Table (*see Table 5 on Pages 25-38*) that corresponds to the specific error generated by the SmartPAC.

If the press is stopped by the operator or by a piece of auxiliary equipment, the SmartPAC immediately sets the State Tag (Modbus Register 401022) to a value of "6" (Idle), and the Reason Tag (Modbus Register 404023) to the value of "0".

Any time after the machine is stopped, the operator may specify the reason for the stoppage by selecting "DIALOG MENU" from the SmartPAC's main run menu. The Dialog Menu is the list of downtime reasons configured for the machine (see page 13). The state and reason code will change immediately when the operator selects the downtime reason (*see the Table 3 on Page 10*).

If the press is restarted while in the Idle state before the operator specifies a downtime reason, the true reason for the stoppage will not be reported. However, the SmartPAC has a feature called the "Forced Idle Dialog Mode" that, when enabled, gives you the opportunity to capture the "real" reason for downtime during an "Idle" event.

Forced Idle Dialog Mode

If the SmartPAC's Forced Idle Dialog mode is enabled (see *Setting up SmartPAC to Report Downtime* on page 12), the SmartPAC will inhibit further machine operation until the operator specifies a downtime reason after a significant period of Idle time. In other words, a downtime reason must be entered when the press is stopped for longer than a preset period of time for any reason other than a SmartPAC error. The preset time period is called the "Idle Dialog Time". The Idle Dialog Time allows the press to be stopped briefly and restarted without requiring entry of a downtime reason.

When the press is stopped for a period of time long enough to allow the Forced Dialog Timer to time out, the SmartPAC opens its e-stop relays and a message displays on the SmartPAC stating that the operator must select a downtime reason before the press can be restarted. When the operator closes the message window, a menu called the Dialog Menu automatically displays.

The Dialog Menu is the list of downtime reasons available on the press (Refer to *Programming Downtime Reasons*, page 15 for instructions on how to create the Dialog Menu.). In order to close the e-stop relays and allow the press to run, the operator must select a reason from this list which will insert a 3-digit downtime code into Modbus Register 401023.

Reason Description	State Tag Value Modbus Register **401023**	Reason Tag Value Modbus Register **401023**
Coil change	4	221
Tool change	5	222
Bin full	4	223
Forklift	4	224
Quality control	4	225
User-definable reason #1	4	227
User-definable reason #2	4	228
User-definable reason #3	4	229
User-definable reason #4	4	230
Lube problem	4	232
Air problem	4	233
Electrical problem	4	234
Mechanical problem	4	235
Part ejection	4	237
Planned downtime	7	238
Part quality	4	239
User-definable reason #5	4	241
User-definable reason #6	4	242
User-definable reason #7	4	243
User-definable reason #8	4	244
User-definable reason #9	4	245
User-definable reason #10	4	246
User-definable reason #11	4	247
User-definable reason #12	4	248
User-definable reason #13	4	249
User-definable reason #14	4	250
User-definable reason #15	4	251
User-definable reason #16	4	252

Table 3 - Downtime State and Reason Code Table

In order to take advantage of the Forced Dialog Mode and capture the real downtime reason for significant Idle events, you will need to configure your software to detect when the State and Reason values (Modbus Registers 401022 and 401023) switch from 6 and 0 to either 4, 5, or 7, and a 3-digit downtime code; then "backfill" the preceding period of Idle time with the new state and reason.

Putting the Press "Back on Line"

A period of Idle Time or downtime (either "Planned" or "Unplanned") comes to an end when the operator either restarts the machine (*see Error Reset Strokes Counter on page 11*), or selects "Back on Line" from the Dialog Menu. When the press is restarted, a State Code of 1 (Running) will be reported in Modbus Register 401022. If the operator selects "Back on Line" without restarting the press, a State Code of 6 (Idle) will be reported in Modbus Register 401022 until the press is restarted.

Forced Error Dialog Mode

You can also configure SmartPAC to require the operator to manually select a downtime reason when a SmartPAC error message persists for an extended period of time. This feature, called Forced Error Dialog mode (see *Making Downtime Reporting Settings*, page 9), allows the operator to add detail to a period of downtime that is initially logged to a specific SmartPAC error but may actually have a different cause.

For example, say a SmartPAC has a die protection sensor that generates an "End of Stock" error whenever the press runs out of material, and that one day this sensor stops the press while the operator is otherwise occupied, and the machine sits with that error on the screen for 45 minutes before the operator is able attend to the machine and restart it. This event would result in 45 minutes of downtime being attributed to "End of Stock", while the real reason for downtime might be more accurately described as "Operator Busy".

As with the Forced Idle Dialog mode, the Forced Error Dialog message can be programmed to appear a specified number of minutes after the press stops. This time period is specified by the Error Dialog Time setting.

Persist Dialog Mode

When enabled, the Persist Dialog Mode causes the SmartPAC to remember the downtime reason while it is powered off, and reinstate the reason when the power comes back on again. If the Persist Dialog Mode is disabled, the press will power up in the Idle state regardless of which state the machine was in when it powered off.

Single-Stroke Mode and Idle Timer

Normally, the SmartPAC updates the state, (401022), reason (401022), and speed (401016) tags immediately, in real time. This is effective when running the press in the continuous mode, but is troublesome if you run hand-fed operations in the single stroke mode.

When single-stroking the machine, the state (404022) value will be constantly alternating between "Running"(1) and "Idle"(6) because of the brief stoppages while the part is being placed in the die.

Also, rather than getting an indication of the actual production rate, the speed will be reported as either "0" if the Modbus tag is updated between strokes, or as the actual resolver speed if it is updated while the ram is moving – neither is really accurate.

The SmartPAC has a setting called the Single Stroke Mode, that when enabled works in conjunction with another setting called the "IDLE TIMER" to decide when to switch the machine state from running (Modbus register 401022 value of "1") to Idle (Modbus register 401022 value of "6"). When the machine stops, the SmartPAC will hold the Running state for the time period specified by the IDLE TIMER. If the machine is cycled again during that time, the state will remain as Running. If the machine does not cycle by the end of the IDLE TIMER, SmartPAC will change the machine state to Idle.

In addition, the SmartPAC will calculate a production rate in strokes per minute rather than reporting the instantaneous resolver speed on Modbus Register 401016.

Error Reset Strokes Counters

There are two ways for a press operator to take a SmartPAC out of the Planned Downtime, Unplanned Downtime, or Changeover state:

1. Select "Back on Line" from the Dialog menu, which changes the state to Idle.
2. Start the machine, which will automatically change the state to Running.

If the machine state is Idle or Planned Downtime, it is desirable to switch the machine state to Running immediately when the press is restarted. However, this is not the case when the machine is in Unplanned Downtime state or Changeover because it might be necessary to cycle the machine while loading a new coil or changing dies, and it is preferable for the SmartPAC to "hold" the state long enough for the coil change or changeover to be completed.

The Reset Strokes Counters in SmartPAC enable the SmartPAC to hold each state for the specified number of strokes after the machine has been started. There are separate counters that control this behavior when the SmartPAC is coming out of the Planned Downtime, Unplanned Downtime, and Changeover states.

For example, if your operators normally cycle the press 10 times during a coil change, you would set the Unplanned Downtime Reset Strokes Counter to 10. Then whenever an operator selects "Coil Change" (or any other unplanned downtime reason) the SmartPAC will hold that state and reason for 10 strokes after the machine starts up. On the 11th stroke, it will switch the state from Unplanned Downtime to Running.

Setting up SmartPAC to Report Downtime

To set up SmartPAC to report downtime, you first configure the reporting settings on the Set Communications Menu, and then program the downtime reasons on the Dialog Fixed Name Choice Menu and the Dialog Special Choice Name Menu.

Making Downtime Reporting Settings

To enable and configure the SmartPAC downtime reporting features described in the previous section, perform the following steps:

1. Turn the SmartPAC's Program/Run key to "PROG," then press the "1" and "CLEAR" keys simultaneously for a second or two until the Main Initialization Menu appears.
2. Highlight the "SETUP DATA COMMS" menu item, using the Up or Down cursor key, and press ENTER. The Set Communications Menu (see Figure 1) displays.

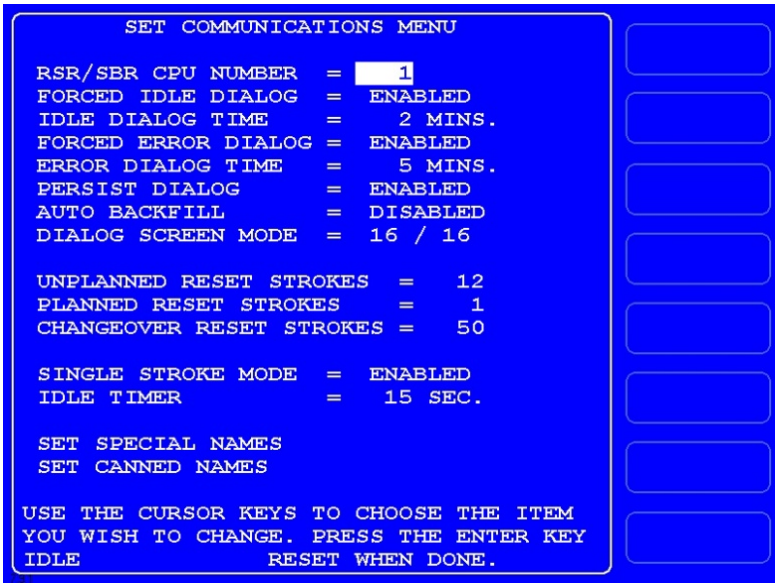

Figure 1 - Set Communications Menu

3. Highlight each menu item you want to set, using the Up or Down cursor key, then do the following:
   - To enable or disable a feature, press ENTER until the desired setting is displayed.
   - To specify a value for an item (except IDLE TIMER), press ENTER to display the Numeric Entry window, key in your entry then press ENTER again.
   - To select a value for IDLE TIMER, press ENTER until the desired value is displayed.
   - To display screens on which you can program Dialog Menu entries, press ENTER with the cursor resting in the SET SPECIAL NAMES or SET CANNED NAMES field.

The table below explains each field on the Set Communications Menu and provides instructions on how to make settings.

Table 4 – SET DATA COMMS Settings

Field	Settings
RSR/SBR CPU NUMBER	This field must be set to "1."
FORCED IDLE DIALOG	Indicates whether SmartPAC 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. 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. There are two settings: ENABLED Forced Idle Dialog mode enabled DISABLED Forced Idle Dialog mode disabled
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.
FORCED ERROR DIALOG	Indicates whether SmartPAC displays the Forced Dialog message and Dialog Menu after the press has been stopped by a SmartPAC 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. ENABLED Forced Error Dialog mode enabled DISABLED Forced Error Dialog mode disabled
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 nuisance faults such as "Counter preset reached." Suggested initial value: 5 minutes.
PERSIST DIALOG	Indicates whether an Unplanned Downtime reason from the Dialog Menu that is assigned before a press shutdown continues to be applied after the press is powered up again. There are two settings: ENABLED Persist Dialog mode enabled DISABLED Persist Dialog mode disabled
AUTO BACKFILL	This MUST be Set to DISABLED
DIALOG SCREEN MODE	This MUST be set to 16/16.

Table 4 - Set Communications Menu Settings (Cont)

Field	Settings
UNPLANNED RESET STROKES PLANNED RESET STROKES CHANGEOVER RESET STROKES	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 SmartPAC changes the machine state to "Running."
SINGLE STROKE MODE	Used when the press is being run in Single-stroke mode, it determines whether the SmartPAC changes the state from Running to Idle immediately upon stoppage, or if it waits for the IDLE TIMER to time out. When enabled, the SmartPAC will report a calculated speed value rather than the instantaneous value. ENABLED Single-stroke Mode enabled DISABLED Single-stroke Mode disabled
IDLE TIMER	The IDLE TIMER set the amount of time after a stoppage is detected that that the SMARTPAC will hold the Running state before switching to Idle. It also specifies the number of seconds during which SmartPAC counts the number of press strokes in Single-stroke mode to determine a production rate for hand-fed applications. 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 *Creating Special Names on the Dialog Special Choice Name Menu*, page 18). If you do not see this menu choice, verify that the DIALOG SCREEN MODE is set to 16/16.
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 *Selecting Canned Names on the Dialog Fixed Name Choice Menu*, page 15). If you do not see this menu choice, verify that the DIALOG SCREEN MODE is set to 16/16.

Programming Downtime Reasons

The SET SPECIAL NAMES and SET CANNED NAMES items on the Set Communications Menu allow you to specify the downtime reasons that appear on the Dialog Menu and the order in which they are presented. 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.

"Canned" names are downtime reasons whose text has been pre-programmed into the SmartPAC. "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 SmartPACs will help to minimize reporting errors.

When planning the order in which you want Dialog Menu items to display, you should attempt to predetermine the downtime causes that are likely to occur most frequently and place these at the top of the Dialog Menu.

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 (see Figure 2) appears. 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. You can select up to 14 of these pre-programmed entries for inclusion in the Dialog Menu.

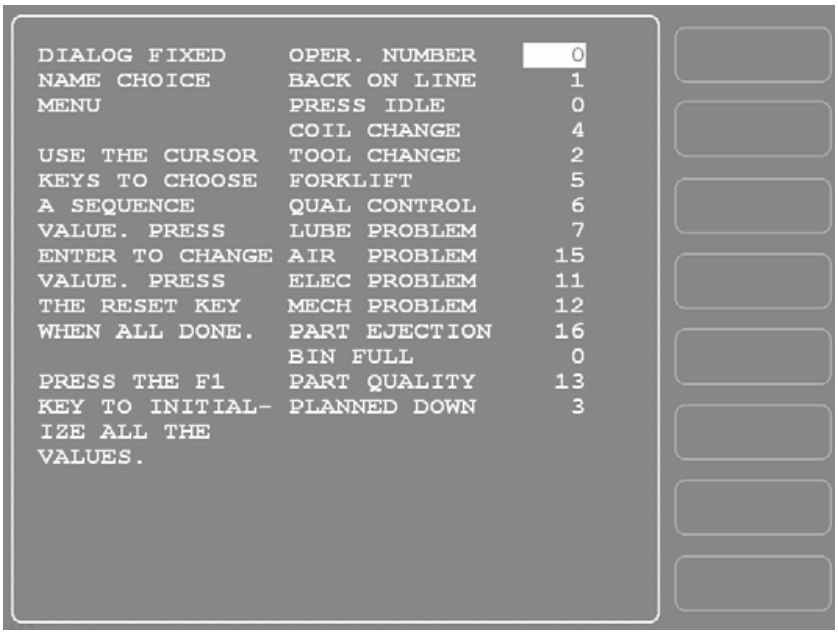

Figure 2 - Dialog Fixed Name Choice Menu

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 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 gaps in your "canned" name numbering scheme to accommodate these items.

To prevent an item from showing 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 LETS 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.
- PLANNED DOWN–This entry is logged to the Planned Downtime machine state, which includes time for planned lunch or coffee breaks, meetings, training, etc. Planned Downtime is not used in calculating Overall Equipment Effectiveness (OEE) and, therefore, does not reduce the OEE value.
- BACK ON LINE–This selection enables the operator to end a downtime event. When 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 LETS 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 cursor keys, and press ENTER. The Dialog Fixed Name Choice Menu (see Figure 2) appears 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
>
> 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 3) appears. 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.

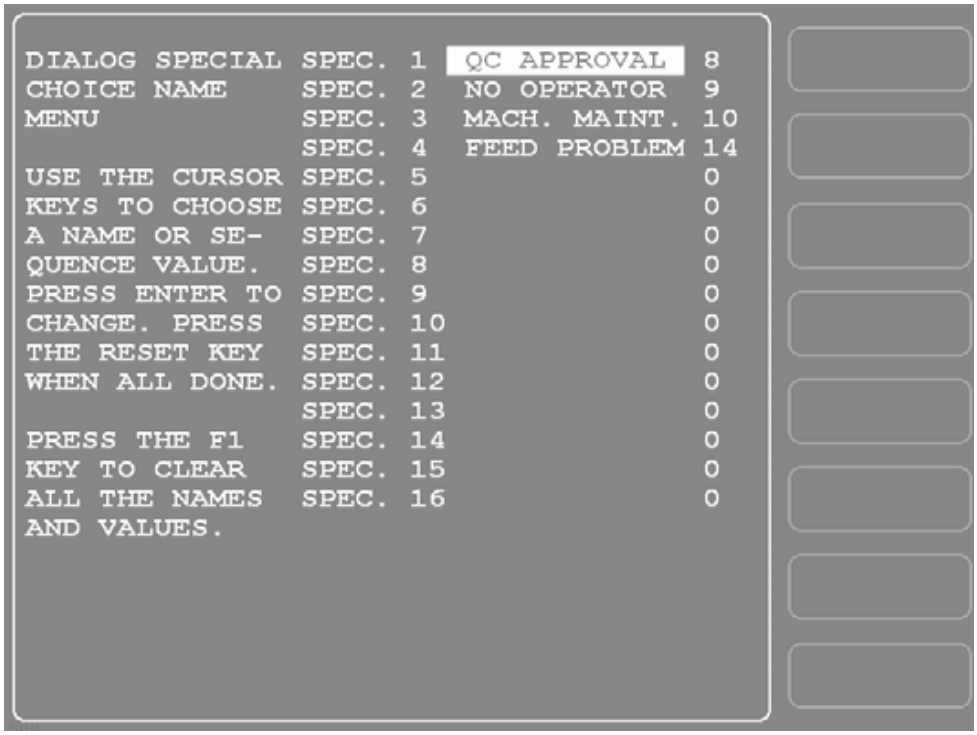

Figure 3 - Dialog Special Choice Name Menu

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 and press ENTER. The Dialog Special Choice Name Menu (see Figure 7) displays with the cursor resting in the SPEC. 1 field.
2. Press ENTER, and when the Alphabetic Entry window displays, type the text (12 characters maximum, including spaces) of the downtime reason that you want to

appear on the Dialog Menu; then, press **F6** to save your entry and return to the Dialog Special Choice Name Menu.

3. Press the Right cursor key to move the cursor to the column for the SPEC. 1 sequence number.
4. Press ENTER, and when the Numeric Entry window displays, type the numeric position in which you want that downtime reason to appear on the Dialog Menu; then, press ENTER to save your entry and return to the Dialog Special Choice Name Menu.

> NOTICE
>
> 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 cursor key, and repeat steps 2 through 4. Do the same for the remaining menu 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 *SmartPAC Downtime Reporting Features*, page 9), the operator is prompted to enter a downtime reason on the Dialog Menu whenever SmartPAC detects that the press has stopped under the appropriate circumstances. This message is shown in Figure 4.

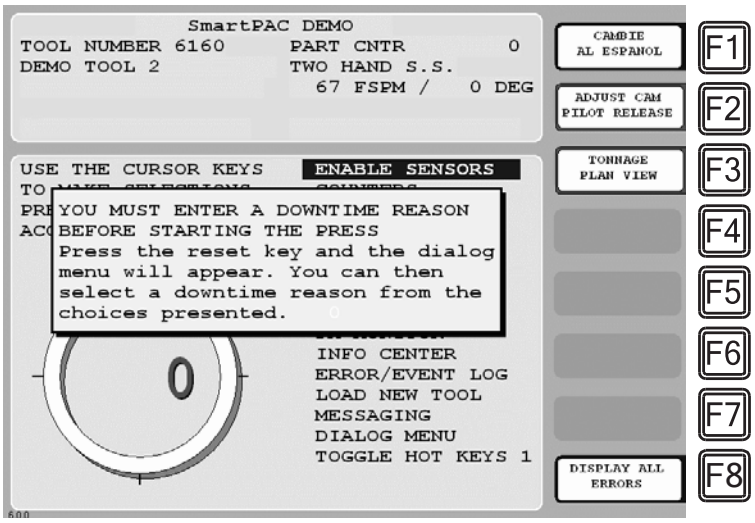

Figure 4 - SmartPAC Run Mode Main Menu with Forced Dialog Message Displayed

To respond to this prompt, perform the following steps:

1. Press RESET to clear the message. The Dialog Menu (see Figure 5) displays.

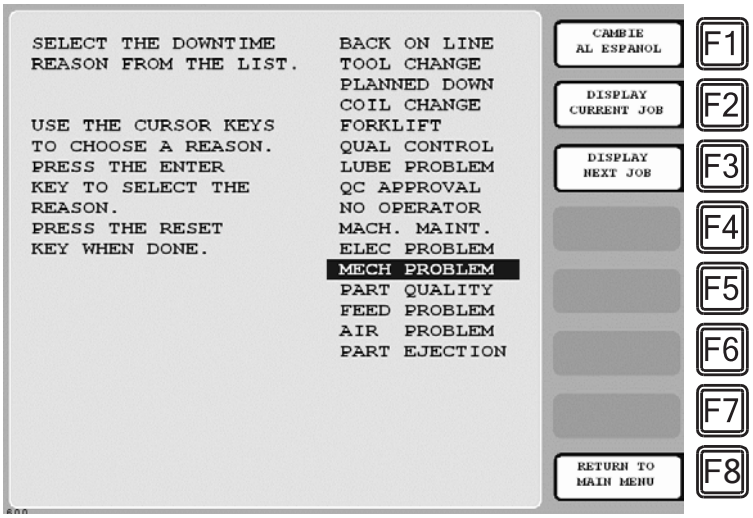

Figure 5 - Dialog Menu

2. Highlight the downtime reason you want (in Figure 9, MECH PROBLEM is selected as an example) using the cursor keys, and press ENTER. The SmartPAC 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 LETS 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 chooses the **F2** (Change Prev. Reason) option. LETS 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, select the DIALOG MENU item.
2. On the Dialog Menu, highlight the downtime reason you want and press ENTER. A window appears with instructions for keeping or changing the downtime reason. This functionality is included in the 3rd Party Communications firmware to maintain compatibility with existing legacy products, and is no longer used.
3. To continue, press either F2 or F3 to change the downtime reason, as both choices produce the same result.

How SmartPAC Reports the Strokes, Good Parts, and Scrap Parts Counters

There are three data tag values that you can use to track various counts from the SmartPAC:

MODBUS Register 401009 contains a non-resettable "free-running" Stroke counter that increments by 1 every time the press makes a cycle. The range of values is from 0 to 16,777,216. When the maximum value is reached, the counter rolls over, resets to zero, and begins counting up again. There is no way to manually reduce this counter. It will only increment.

MODBUS Register 40101 contains a non-resettable "free-running" Good Parts counter. The range of values is from 0 to 16,777,216. When the maximum value is reached, the counter rolls over, resets to zero, and begins counting up again. The Good Parts counter increments when the following three conditions are met:

1. The SmartPAC is NOT in the Setup Mode.
2. The machine makes a complete cycle.
3. The SmartPAC does not go into any kind of fault condition (such as a die protection or tonnage monitor fault) during the cycle.

Like the Non-Resettable Stroke Counter, there is no way to manually reduce this counter. It can only be incremented.

MODBUS Register 401021 contains a non-resettable "free-running" Scrap Part counter that increments when the operator manually adds to the SmartPAC scrap counter (see description on page 22). Like the other two counters, the range of values is from 0 to 16,777,216. When the maximum value is reached, the counter rolls over, resets to zero, and begins counting up again. There is no way to manually reduce this counter. It will only increment.

Using the Counters in SmartPAC

To enable scrap entries and Good Parts counter adjustment in the Run mode, you must set the CHANGE COUNTS and CHG GOOD PRTS CNT items on the Security Access Menu in Initialization mode to "PROGRAM AND RUN MODES," as shown in Figure 6. (To display the Security Access Menu, select SECURITY ACCESS from the Main Initialization Menu.)

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 PRTS CNT item on the Security Access Menu to "NO CHANGES ALLOWED" while leaving the CHANGE COUNTS item set to "PROGRAM AND RUN MODES."

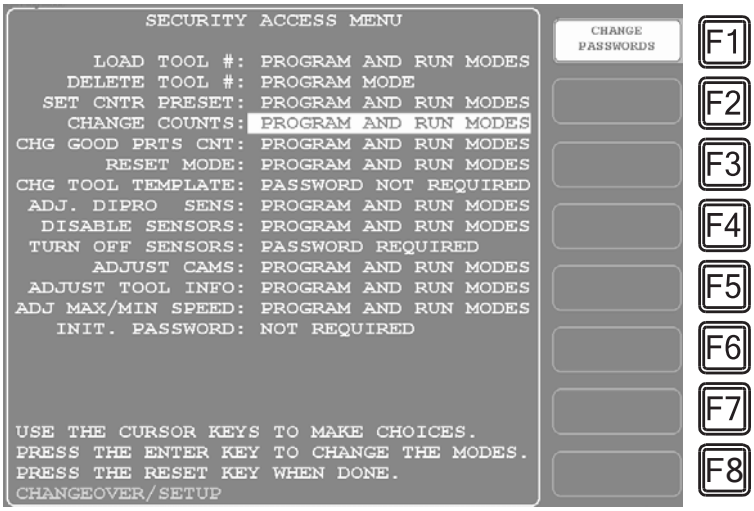

Figure 6 - Security Access Menu with CHANGE COUNTS and CHG GOOD PARTS CNT Items Set to "PROGRAM AND RUN MODES"

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 in SmartPAC Initialization to "INC ALWAYS."

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 to display the Counters screen
2. Press **F3** (Scrap Value). The Scrap Value Entry window displays (see Figure 7).

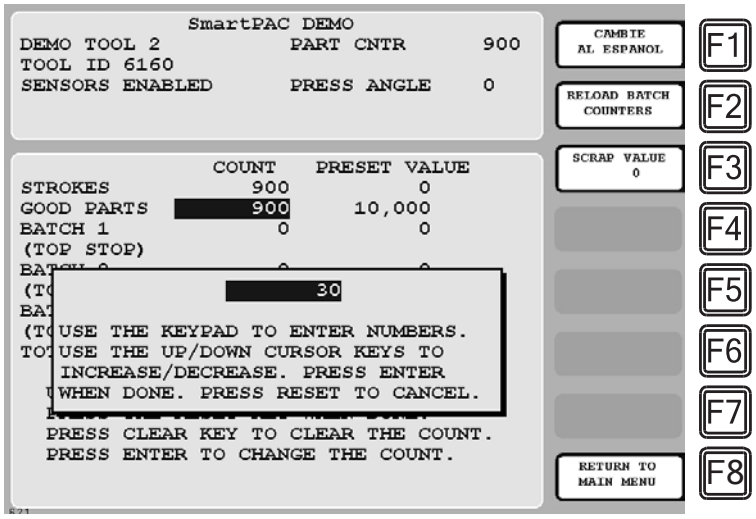

Figure 7 - Counters Screen with Scrap Value Entry Window Displayed (30 Items Shown)

3. Enter the number of scrap parts you wish to record, following the directions in the window, and press ENTER. (Figure 9 shows a scrap entry of "30" as an example.) When you press ENTER, the value in MODBUS Register 401021 will increment by the value you entered. In the example above, 30 counts will be added to the Non-Resettable Scrap Counter.

   When you press ENTER, the Scrap Value Entry window disappears, and the value you keyed in is displayed beneath the "Scrap Value" caption to the left of the **F3** function key, as shown in Figure 15, where a scrap value of "30" is used as an example.

   This value represents the running total of scrap parts counted so far for this job. It will reset to 0 when a new job is loaded.

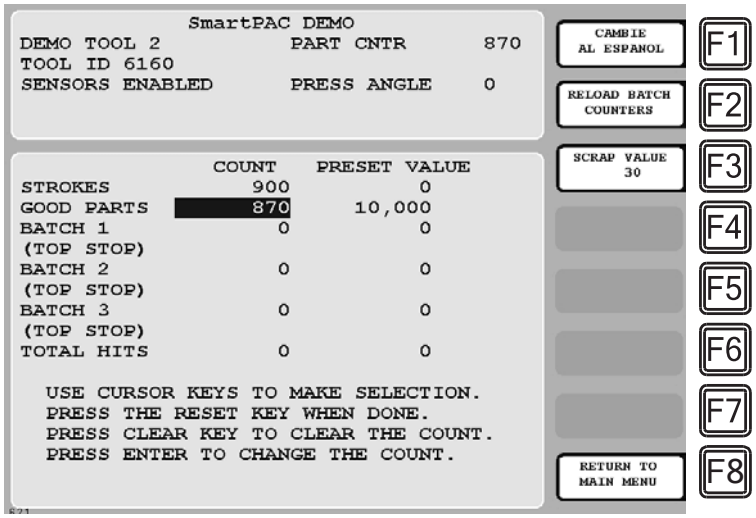

Figure 8 - Counters Screen with Scrap Value Updated to 30 Items

Even though the Good Parts counter displayed on the SmartPAC is reduced by the amount of your scrap entry (e.g., 900-30=870 in Figure 8), this entry has no effect on the non-resettable Good Parts Counter in MODBUS register 401011.

4. If you have made previous Scrap Value entries for this job, the value shown under the words SCRAP VALUE in the label for function key **F3** will display the running total of all of the scrap parts for the current job.

Adjusting the Good Parts Counter

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*, next page). This capability is useful if new firmware is installed in the middle of a job, causing the Good Parts counter to reset to zero.

Any adjustments made to the Good Parts Counter will be immediately added to the Non-

Resettable Good Parts Count held in MODBUS Register 401011.

Adjusting the Good Parts Counter in Run Mode at the SmartPAC

To increase the Good Parts count in Run mode, do the following:

1. Select the GOOD PARTS COUNT field on the Counters screen.
2. When the Good Parts Entry window (like the window shown in Figure 9) displays, enter the number of good parts you want to add (1,000 parts maximum), and press ENTER.

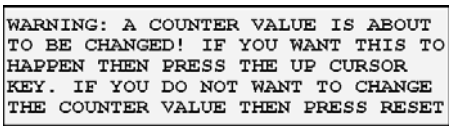

Figure 9 - Good Parts Counter Adjustment Confirmation Window

3. Press the Up Arrow cursor key to confirm that you want to change the Good Parts counter value. You are returned to the Counters screen with your adjustment reflected in the GOOD PARTS COUNT field.

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:

1. On the Counters screen in Run mode, press RESET to return to the Main Run Menu.
2. Turn the Program/Run key to “PROG” to display the Main Program Menu.
3. Select “GO TO THE TOOL MANAGER” to display the Tool Manager screen.
4. Press **F4** (Edit Tool) with the loaded tool selected to display the Tool Program Menu.
5. Select COUNTERS to display the Counters screen.
6. Perform steps 1 through 3 of the procedure for adjusting the Good Parts counter in Run mode, above.

Table 5 - Error Lookup Table

Error Code	Error Description
8	E-stop driver failure
12	Position sensor incorrect
13	System failure (program memory checksums incorrect)
14	Angle resolver problems (both drive and stator)
17	Input module failure
19	Module WPC, SFI, STI, or PLC communications error
23	Stop time exceeded (upstroke or down stroke)
24	Loss of rotation
25	Setup table checksum incorrect or no setup loaded
26	Maximum or minimum speed exceeded
31	Stroke counter preset reached
32	Good parts counter preset reached
33	Batch counter preset (1-3) reached
34	Host-computer-generated top-stop
35	MultiPAC fault
36	RamPAC fault
37	Lube fault
38	Hydraulic overload 1 fault
39	Hydraulic overload 2 fault
40	Lube switch 1 fault
41	Lube switch 2 fault
42	Sump return fault
43	Outer right-hand bearing fault
44	Inner right-hand bearing fault
45	Right-hand center bearing fault
46	Right-hand connection bearing fault
47	Left-hand connection bearing fault
48	Left-hand center bearing fault
49	Inner left-hand bearing fault
50	Outer left-hand bearing fault
51	High setpoint exceeded on channel 1
52	High setpoint exceeded on channel 2
53	High setpoint exceeded on channel 3
54	High setpoint exceeded on channel 4
55	High setpoint exceeded on channel 5
56	High setpoint exceeded on channel 6
57	High setpoint exceeded on channel 7
58	High setpoint exceeded on channel 8
59	Tool ID tool number mismatch

Table 5 - Error Lookup Table (cont.)

Error Code	Error Description
61	Low setpoint exceeded on channel 1
62	Low setpoint exceeded on channel 2
63	Low setpoint exceeded on channel 3
64	Low setpoint exceeded on channel 4
65	Low setpoint exceeded on channel 5
66	Low setpoint exceeded on channel 6
67	Low setpoint exceeded on channel 7
68	Low setpoint exceeded on channel 8
71	Repeatability setpoint exceeded on channel 1
72	Repeatability setpoint exceeded on channel 2
73	Repeatability setpoint exceeded on channel 3
74	Repeatability setpoint exceeded on channel 4
75	Repeatability setpoint exceeded on channel 5
76	Repeatability setpoint exceeded on channel 6
49	Inner left-hand bearing fault
50	Outer left-hand bearing fault
51	High setpoint exceeded on channel 1
52	High setpoint exceeded on channel 2
53	High setpoint exceeded on channel 3
54	High setpoint exceeded on channel 4
55	High setpoint exceeded on channel 5
56	High setpoint exceeded on channel 6
57	High setpoint exceeded on channel 7
58	High setpoint exceeded on channel 8
59	Tool ID tool number mismatch
61	Low setpoint exceeded on channel 1
62	Low setpoint exceeded on channel 2
63	Low setpoint exceeded on channel 3
64	Low setpoint exceeded on channel 4
65	Low setpoint exceeded on channel 5
66	Low setpoint exceeded on channel 6
67	Low setpoint exceeded on channel 7
68	Low setpoint exceeded on channel 8
71	Repeatability setpoint exceeded on channel 1
72	Repeatability setpoint exceeded on channel 2
73	Repeatability setpoint exceeded on channel 3
74	Repeatability setpoint exceeded on channel 4
75	Repeatability setpoint exceeded on channel 5
76	Repeatability setpoint exceeded on channel 6

Table 5 - Error Lookup Table (cont.)

Error Code	Error Description
77	Repeatability setpoint exceeded on channel 7
78	Repeatability setpoint exceeded on channel 8
81	Reverse setpoint exceeded on channel 1
82	Reverse setpoint exceeded on channel 2
83	Reverse setpoint exceeded on channel 3
84	Reverse setpoint exceeded on channel 4
85	Reverse setpoint exceeded on channel 5
86	Reverse setpoint exceeded on channel 6
87	Reverse setpoint exceeded on channel 7
88	Reverse setpoint exceeded on channel 8
91	120% press capacity exceeded on channel 1
92	120% press capacity exceeded on channel 2
93	120% press capacity exceeded on channel 3
94	120% press capacity exceeded on channel 4
95	120% press capacity exceeded on channel 5
96	120% press capacity exceeded on channel 6
97	120% press capacity exceeded on channel 7
98	120% press capacity exceeded on channel 8
101	Zero offset exceeded on channel 1
102	Zero offset exceeded on channel 2
103	Zero offset exceeded on channel 3
104	Zero offset exceeded on channel 4
105	Zero offset exceeded on channel 5
106	Zero offset exceeded on channel 6
107	Zero offset exceeded on channel 7
108	Zero offset exceeded on channel 8
114	Yellow sensor “on” sensor 1
115	Yellow sensor “on” sensor 2
116	Yellow sensor “on” sensor 3
117	Yellow sensor “on” sensor 4
118	Yellow sensor “on” sensor 5
119	Yellow sensor “on” sensor 6
120	Yellow sensor “on” sensor 7
121	Yellow sensor “on” sensor 8
122	Yellow sensor “on” sensor 9
123	Yellow sensor “on” sensor 10
124	Yellow sensor “on” sensor 11
125	Yellow sensor “on” sensor 12

Table 5 - Error Lookup Table (cont.)

Error Code	Error Description
126	Yellow sensor “on” sensor 13
127	Yellow sensor “on” sensor 14
128	Yellow sensor “on” sensor 15
129	Yellow sensor “on” sensor 16
131	Red sensor “off” sensor 1
132	Red sensor “off” sensor 2
133	Red sensor “off” sensor 3
134	Red sensor “off” sensor 4
135	Red sensor “off” sensor 5
136	Red sensor “off” sensor 6
137	Red sensor “off” sensor 7
138	Red sensor “off” sensor 8
139	Red sensor “off” sensor 9
140	Red sensor “off” sensor 10
141	Red sensor “off” sensor 11
142	Red sensor “off” sensor 12
143	Red sensor “off” sensor 13
144	Red sensor “off” sensor 14
145	Red sensor “off” sensor 15
146	Red sensor “off” sensor 16
148	Green Quick Check sensor “on” outside Ready signal sensor 1
149	Green Quick Check sensor “on” outside Ready signal sensor 2
150	Green Quick Check sensor “on” outside Ready signal sensor 3
151	Green Quick Check sensor “on” outside Ready signal sensor 4
152	Green Quick Check sensor “on” outside Ready signal sensor 5
153	Green Quick Check sensor “on” outside Ready signal sensor 6
154	Green Quick Check sensor “on” outside Ready signal sensor 7
155	Green Quick Check sensor “on” outside Ready signal sensor 8
156	Green Quick Check sensor “on” outside Ready signal sensor 9
157	Green Quick Check sensor “on” outside Ready signal sensor 10
158	Green Quick Check sensor “on” outside Ready signal sensor 11
159	Green Quick Check sensor “on” outside Ready signal sensor 12
160	Green Quick Check sensor “on” outside Ready signal sensor 13
161	Green Quick Check sensor “on” outside Ready signal sensor 14
162	Green Quick Check sensor “on” outside Ready signal sensor 15
163	Green Quick Check sensor “on” outside Ready signal sensor 16
165	Green sensor missed sensor 1
166	Green sensor missed sensor 2

Table 5 - Error Lookup Table (cont.)

Error Code	Error Description
167	Green sensor missed sensor 3
168	Green sensor missed sensor 4
169	Green sensor missed sensor 5
170	Green sensor missed sensor 6
171	Green sensor missed sensor 7
172	Green sensor missed sensor 8
173	Green sensor missed sensor 9
174	Green sensor missed sensor 10
175	Green sensor missed sensor 11
176	Green sensor missed sensor 12
177	Green sensor missed sensor 13
178	Green sensor missed sensor 14
179	Green sensor missed sensor 15
180	Green sensor missed sensor 16
182	Green sensor failure sensor 1
183	Green sensor failure sensor 2
184	Green sensor failure sensor 3
185	Green sensor failure sensor 4
186	Green sensor failure sensor 5
187	Green sensor failure sensor 6
188	Green sensor failure sensor 7
189	Green sensor failure sensor 8
190	Green sensor failure sensor 9
191	Green sensor failure sensor 10
192	Green sensor failure sensor 11
193	Green sensor failure sensor 12
194	Green sensor failure sensor 13
195	Green sensor failure sensor 14
196	Green sensor failure sensor 15
197	Green sensor failure sensor 16
199	Green sensor late sensor 1
200	Green sensor late sensor 2
201	Green sensor late sensor 3
202	Green sensor late sensor 4
203	Green sensor late sensor 5
204	Green sensor late sensor 6
205	Green sensor late sensor 7
206	Green sensor late sensor 8

Table 5 - Error Lookup Table (cont.)

Error Code	Error Description
207	Green sensor late sensor 9
208	Green sensor late sensor 10
209	Green sensor late sensor 11
210	Green sensor late sensor 12
211	Green sensor late sensor 13
212	Green sensor late sensor 14
213	Green sensor late sensor 15
214	Green sensor late sensor 16
221	Coil change
222	Tool change
223	Bin full
224	Forklift
225	Quality control
227	User-definable downtime reason #1 (see document #1137900)
228	User-definable downtime reason #2 (see document #1137900)
229	User-definable downtime reason #3 (see document #1137900)
230	User-definable downtime reason #4 (see document #1137900)
232	Lube problem
233	Air problem
234	Electrical problem
235	Mechanical problem
237	Part ejection
238	Planned downtime
239	Part quality
241	User-definable downtime reason #5 (see document #1137900)
242	User-definable downtime reason #6 (see document #1137900)
243	User-definable downtime reason #7 (see document #1137900)
244	User-definable downtime reason #8 (see document #1137900)
245	User-definable downtime reason #9 (see document #1137900)
246	User-definable downtime reason #10 (see document #1137900)
247	User-definable downtime reason #11 (see document #1137900)
248	User-definable downtime reason #12 (see document #1137900)
249	User-definable downtime reason #13 (see document #1137900)
250	User-definable downtime reason #14 (see document #1137900)
251	User-definable downtime reason #15 (see document #1137900)
252	User-definable downtime reason #16 (see document #1137900)
253	Green Constant sensor “off” in Ready signal sensor 1
254	Green Constant sensor “off” in Ready signal sensor 2

Table 5 - Error Lookup Table (cont.)

Error Code	Error Description
255	Green Constant sensor “off” in Ready signal sensor 3
256	Green Constant sensor “off” in Ready signal sensor 4
257	Green Constant sensor “off” in Ready signal sensor 5
258	Green Constant sensor “off” in Ready signal sensor 6
259	Green Constant sensor “off” in Ready signal sensor 7
260	Green Constant sensor “off” in Ready signal sensor 8
261	Green Constant sensor “off” in Ready signal sensor 9
262	Green Constant sensor “off” in Ready signal sensor 10
263	Green Constant sensor “off” in Ready signal sensor 11
264	Green Constant sensor “off” in Ready signal sensor 12
265	Green Constant sensor “off” in Ready signal sensor 13
266	Green Constant sensor “off” in Ready signal sensor 14
267	Green Constant sensor “off” in Ready signal sensor 15
268	Green Constant sensor “off” in Ready signal sensor 16
269	Green Special sensor missed sensor 1
270	Green Special sensor missed sensor 2
271	Green Special sensor missed sensor 3
272	Green Special sensor missed sensor 4
273	Green Special sensor missed sensor 5
274	Green Special sensor missed sensor 6
275	Green Special sensor missed sensor 7
276	Green Special sensor missed sensor 8
277	Green Special sensor missed sensor 9
278	Green Special sensor missed sensor 10
279	Green Special sensor missed sensor 11
280	Green Special sensor missed sensor 12
281	Green Special sensor missed sensor 13
282	Green Special sensor missed sensor 14
283	Green Special sensor missed sensor 15
284	Green Special sensor missed sensor 16
302	F02 Press was started in Continuous mode with the Shadow bypass switch (mute limit switch input #26) “on”
303	F03 Bottom dwell loss of rotation input (mute limit switch input #26) closed at start of stroke
304	F04 Resolver drive signal level incorrect
305	F05 Sum of resolver stator signals incorrect
306	E06 Resolver was turning too fast, or the R/D converter system failed
307	E07 Resolver tried to zero outside of 330 to 30 degree range
310	F10 Main motor is off without Two-hand Inch operating mode selected

Table 5 - Error Lookup Table (cont.)

Error Code	Error Description
311	F11 Uncommanded motion occurred
313	F13 E-stop button pressed or E-stop circuit open
314	F14 Prior Act button pressed at start of stroke
315	F15 Counter preset reached
316	F16 Top-stop button pressed or Top-stop circuit open at start of stroke
317	F17 User input 8/9 pair disagree
318	F18 User input 10/11 pair disagree
319	F19 Auxiliary E-stop relay not open before being turned “on”
320	F20 Main motor is in reverse without Two-hand Inch operating mode selected
321	F21 Operator station logic incorrect
322	F22 Operating mode was changed while press was running
323	F23 Operating mode selected is not a valid mode
324	F24 Both palm buttons were pressed while in One-hand mode, or the N/O palm button inputs from an unselected operator station were closed
325	F25 Flywheel speed sensor not turning “on” and “off” properly when spin-down is enabled
326	F26 Ram was moved too fast in Bar mode
327	F27 Press speed exceeded the maximum press speed setpoint
328	F28 Main motor was reversed before spin-down timer ran out
329	F29 Flywheel speed sensor is turning “on” and “off” with spin-down disabled
330	F30 A and B processor resolver angles disagreed by more than 2 degrees
331	F31 No reply received from B processor to Check Start request
333	F33 Incorrect reply received from B processor to Mode Change message
334	F34 No reply received from B processor to Mode Change message
335	F35 Incorrect reply received from B processor to Power-up message
336	F36 No reply received from B processor to Reset Error message
337	F37 No reply received from B processor to Compare Input Buffers message
341	F41 Input buffer 1 check incorrect
342	F42 Input buffer 2 check incorrect
343	F43 Input buffer 3 check incorrect
344	F44 Input buffer 4 check incorrect
345	F45 Transducer-measured main system air pressure was below the setpoint
346	F46 Transducer-measured counterbalance air pressure was outside the pressure limits
347	F47 DSV monitor switch input open
348	F48 Main system air pressure switch input open
349	F49 User input 11 open
350	F50 User input 10 open
351	F51 User input 1 open

Table 5 - Error Lookup Table (cont.)

Error Code	Error Description
352	F52 User input 2 open
353	F53 User input 3 open
354	F54 User input 4 open
355	F55 User input 5 open
356	F56 User input 6 open
357	F57 User input 7 open
358	F58 User input 8 open
359	F59 User input 9 open
360	F60 Light curtain A inputs did not open during light curtain test
361	F61 Light curtain B inputs did not open during light curtain test
362	F62 Light curtain B inputs are closed with only light curtain A mode selected
363	F63 Light curtain A inputs are open at start of or during stroke
364	F64 Light curtain B inputs are open at start of or during stroke, or dual light curtains are selected with only one set connected
365	F65 Light curtains connected with Two-hand Only firmware installed
366	F66 E-stop circuit did not open during E-stop circuit test
367	F67 Top-stop circuit did not open during Top-stop circuit test
368	F68 Light curtain A inputs disagree
369	F69 Light curtain B inputs disagree
370	F70 DSV A relay not open at start of stroke
371	F71 DSV A driver did not turn “on” or DSV B was not “off” during pulse in 10 millisecond window test
372	F72 DSV A Control Flip-flop not functioning properly
373	F73 DSV A Missing Pulse Detector window not functioning properly
374	F74 DSV A relay did not close properly at start of stroke
375	F75 DSV A relay did not open properly at end of stroke
376	F76 Lockout relay driver did not turn “off” properly during test
377	F77 Lockout relay check contacts were not closed before the lockout relay was turned “on”
378	F78 Position of DSV poppets is incorrect (Minster version)
379	F79 Loss of rotation
380	F80 Press was still muted when Overrun switch closed
381	F81 More than one limit switch was closed at one time
382	F82 Press was still muted when Carry-up limit switch closed
383	F83 Mute limit switch did not close or was out of sequence
384	F84 Carry-up limit switch did not close or was out of sequence
385	F85 Overrun switch closed without seeing the other three limit switches (i.e., closed more than once)
386	F86 Too many limit switch set flags are set

Table 5 - Error Lookup Table (cont.)

Error Code	Error Description
387	F87 Top-stop limit switch did not close or was out of sequence
388	F88 Overrun limit switch did not close or was out of sequence
389	F89 Overrun limit switch was not closed at overrun test angle, or Overrun limit switch was not open at 180 degrees
390	F90 Program memory checksum 1 incorrect
391	F91 Program memory checksum 2 incorrect
395	F95 Angle table memory checksum incorrect
396	F96 RAM memory failed memory test
397	F97 No angle setup loaded
398	F98 Option switch image changed during operation
399	F99 + 24 Vdc failed or the fuse blew
400	F100 Stop time exceeded
401	F101 Interrupted Stroke mode
402	F102 Lockout mode
403	F103 Control Off mode
404	F104 Operating mode is not defined
405	F105 Motor Is Off mode
406	F106 Motor Is in Reverse mode
407	F107 Motor shut-down timer turned motor off
420	F120 User input 12 open
421	F121 User input 13 open
422	F122 User input 14 open
423	F123 User input 15 open
424	F124 User input 16 open
425	F125 User input 17 open
426	F126 User input 18 open
427	F127 User input 19 open
428	F128 User input 20 open
429	F129 User input 21 open
430	F130 User input 22 open
431	F131 User input 23 open
432	F132 User input 24 open
433	F133 User input 25 open
434	F134 User input 26 open
435	F135 User input 27 open
436	F136 User input 28 open
437	F137 User input 29 open
438	F138 User input 30 open

Table 5 - Error Lookup Table (cont.)

Error Code	Error Description
439	F139 User input 31 open
440	F140 User input 32 or 33 open
441	F141 User input 34 or 35 open
442	F142 User input 36 or 37 open
443	F143 User input 38 or 39 open
444	F144 User input 32 and 33 disagree
445	F145 User input 34 and 35 disagree
446	F146 User input 36 and 37 disagree
447	F147 User input 38 and 39 disagree
454	H04 Resolver drive signal level incorrect
455	H05 Sum of resolver stator signals incorrect
510	H60 Light curtain A inputs did not open during light curtain test
511	H61 Light curtain B inputs did not open during light curtain test
516	H66 E-stop circuit did not open during E-stop circuit test
517	H67 Top-stop circuit did not open during the Top-stop circuit test
522	H72 DSV A Control Flip-flop not functioning properly
523	H73 DSV A Missing Pulse Detector window not functioning properly
524	H74 DSV A relay did not close properly at start of stroke
525	H75 DSV A relay did not open properly at end of stroke
526	H76 Lockout relay driver did not turn “off” properly during test
529	H79 Loss of rotation
530	H80 Press was still muted when Overrun switch closed
531	H81 More that one limit switch was closed at one time
532	H82 Press was still muted when Carry-up limit switch closed
533	H83 Mute limit switch did not close or was out of sequence
534	H84 Carry-up limit switch did not close or was out of sequence
535	H85 Overrun switch closed without seeing other three limit switches (i.e., closed more than once)
536	H86 Too many limit switch set flags are set
537	H87 Top-stop limit switch did not close or was out of sequence
538	H88 Overrun limit switch did not close or was out of sequence
539	H89 Overrun limit switch was not closed at overrun test angle, or Overrun limit switch was not open at 180 degrees
540	H90 Program memory checksum 1 incorrect
541	H91 Program memory checksum 2 incorrect
545	H95 Angle table memory checksum incorrect
546	H96 RAM memory failed memory test
570	F150 Main lube fault cycle switch
571	F151 Lube cycle switch 1 fault

Table 5 - Error Lookup Table (cont.)

Error Code	Error Description
572	F152 Lube cycle switch 2 fault
573	F153 Hydraulic overload fault after BDC
574	F154 Hydraulic overload fault before BDC
575	F155 Hydraulic overload not pressurized at top
576	F156 Flywheel brake fault
577	F157 CAN communications failure
578	F158 4-20 mA speed input loop failure
579	F159 Processor A and B option board type disagreement
580	F160 Unsupported option board type was installed
581	F161 Hydraulic overload switch is closed with pump not “on”
582	F162 Lube motor “off” with main motor turned “on”
600	Undefined RamPAC error
601	Shut height not correct
602	Counterbalance parameters have been corrupted
603	Shut height parameters are not correct
604	Shut height outside upper/lower limit
605	Counterbalance pressure different from setpoint
606	Counterbalance pressure below minimum value
607	Position transducer did not indicate ram was moving
608	Shut height control in manual mode
609	Cushion pressure different from setpoint
610	RamPAC control has reset due to a noise disturbance
611	RamPAC did not receive a zero signal from SmartPAC
612	RamPAC did not receive an Input Check signal
613	Shut height cannot be adjusted at press angle
825 to 840	ProPAC1 High setpoint exceeded sensor 1 to 16
841 to 856	ProPAC1 Low setpoint exceeded sensor 1 to 16
857 to 872	ProPAC1 Yellow sensor closed sensor 1 to 16
873 to 888	ProPAC1 Red sensor open sensor 1 to 16
889 to 904	ProPAC1 Green Quick Check sensor “on” outside Ready signal sensor 1 to 16
905 to 920	ProPAC1 Green sensor missed sensor 1 to 16
921 to 936	ProPAC1 Green sensor failed sensor 1 to 16
937 to 952	ProPAC1 Green sensor late sensor 1 to 16
953 to 968	ProPAC1 Green Constant sensor “off” outside Ready signal sensor 1 to 16
969 to 984	ProPAC1 Green Special sensor missed sensor 1 to 16
1125 to 1140	ProPAC2 High setpoint exceeded sensor 1 to 16
1141 to 1156	ProPAC2 Low setpoint exceeded sensor 1 to 16

Table 5 - Error Lookup Table (cont.)

Error Code	Error Description
1157 to 1172	ProPAC2 Yellow sensor closed sensor 1 to 16
1173 to 1188	ProPAC2 Red sensor open sensor 1 to 16
1189 to 1204	ProPAC2 Green Quick Check sensor “on” outside Ready signal sensor 1 to 16
1205 to 1220	ProPAC2 Green sensor missed sensor 1 to 16
1221 to 1236	ProPAC2 Green sensor failed sensor 1 to 16
1237 to 1252	ProPAC2 Green sensor late sensor 1 to 16
1253 to 1268	ProPAC2 Green Constant sensor “off” outside Ready signal sensor 1 to 16
1269 to 1284	ProPAC2 Green Special sensor missed sensor 1 to16