Sure Coat® Modular Gun Control System

Part G: Application Controller

Customer Product Manual
Part 334666B
Issued 4/03

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Section G 1
Description

Introduction

The Sure Coat application controller fully automates the Sure Coat modular gun control system. The application controller allows the operator to monitor and control photoeye settings, as well as trigger and spray characteristics. All setup and control menus are accessed through a six-inch color touch-screen interface.

The application controller enclosure mounts to the central control unit of the Sure Coat modular gun control system. The application controller enclosure houses a touch-screen interface, computer module, power supply, and terminal strips.

Three photoeye junction box (PEJB) configurations are available for the application controller.

- **8 input:** Allows the system to accommodate up to 3 photoeyes
- **8 input:** Allows the system to accommodate up to 7 photoeyes
- **16 input:** Allows the system to accommodate up to 14 photoeyes

See Figure G 1-1. The application controller receives ac power from the central control unit. Two lengths of network interface cable connect the application controller to other system hardware. The first cable connects the application controller to the interface card in the main control cabinet. The second cable connects the interface card to the PEJB.

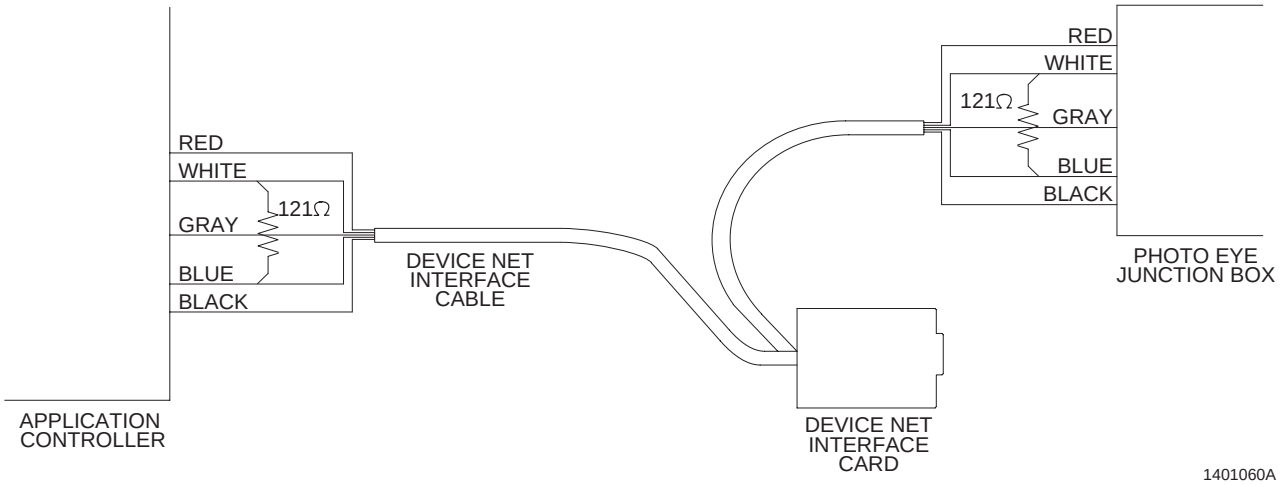


Figure G 1-1 Application Controller Communication

Startup Menu

See Screen G 1-1. The Startup Menu is the first screen that appears when the system is powered up during normal operation. The Startup Menu shows the current date, time, and current user access level.

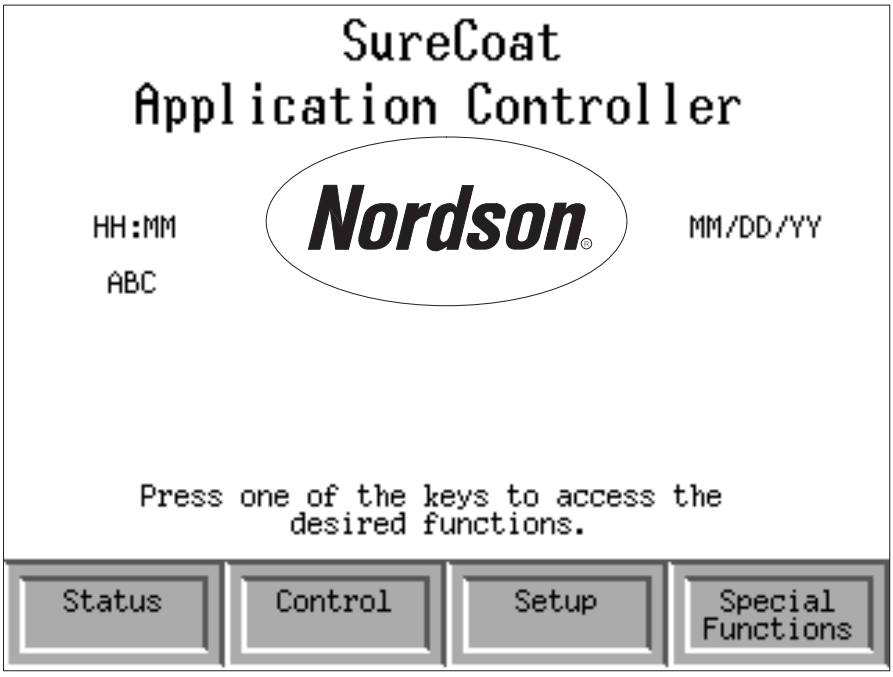
NOTE: Not all users have the authorization to make adjustments to all of the system parameters. Refer to *Changing User Level* in the *Configuration* section for procedures for changing user authorization levels.

The Startup Menu has four primary menu selector buttons which allow the operator to access the functional screens of the application controller. When each of the four primary buttons is touched, secondary buttons appear above the primary buttons.

Refer to Table G 1-1 for a description of the primary and secondary buttons and their functions.

The primary and secondary menu selector buttons are arranged in the order in which they are typically used. Functions that are used most often are furthest to the left, while functions that are rarely used are furthest to the right.

NOTE: Nordson service personnel have access to all functions in the system.



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Screen G 1-1 Startup Menu

Table G 1-1 Menu Selector Buttons

Primary Buttons	Secondary Buttons	Function	Users with Change Access	Users with View Access
Status	**Monitor Guns**	Shows current gun output, including current status of trigger, F1/F2, and AFC.	Operator Lead Operator Supervisor	Operator Lead Operator Supervisor
	Monitor Part ID	Displays the on/off status of the encoder and all zone and flag photoeyes.	Operator Lead Operator Supervisor	Operator Lead Operator Supervisor
	Alarm Log	Displays a list of system faults and allows the operator to acknowledge, hide, or clear active alarms.	Operator Lead Operator Supervisor	Operator Lead Operator Supervisor
Control	**Auto/Man Control**	Allows the user to switch between automatic and manual control of the guns. In manual mode, allows user to activate AFC, switch flow rate air settings, and trigger individual guns.	Operator Lead Operator Supervisor	Operator Lead Operator Supervisor
	Style Control	Allows the user to change the current style either manually or automatically using style flags.	Operator Lead Operator Supervisor	Operator Lead Operator Supervisor
	Purge Control	Allows the user to adjust the purge settings (including number of cycles; length of delay and duration; and gap length for bank purge) and assign the guns to slots.	Operator Lead Operator Supervisor	Operator Lead Operator Supervisor
Setup	**Style Adjustment**	Allows the user to edit style settings, including gun and spray length settings.	Lead Operator Supervisor	Operator Lead Operator Supervisor
	Trigger Adjustment	Allows the user to adjust the guns' pickoff points.	Lead Operator Supervisor	Operator Lead Operator Supervisor
	Configure System	Displays a map of the configuration steps, allowing the user to directly access any of the steps without performing the entire configuration procedure.	Lead Operator Supervisor	Operator Lead Operator Supervisor
Special Functions	**Program Control**	Allows an authorized user to stop and restart the PCLC; and view system status, error messages, and error codes.	Lead Operator Supervisor	Operator Lead Operator Supervisor
	Change User	Allows an authorized user to change to a higher authorization level.	Lead Operator Supervisor	Lead Operator Supervisor
	DevNet Status	Shows communication status of the network components and network error messages.	Lead Operator Supervisor	Operator Lead Operator Supervisor
	Diagnostic Settings	Shows current communication status between the application controller and interface card.	Lead Operator Supervisor	Operator Lead Operator Supervisor
	Load Panel	Shows a menu of all screens. Allows direct access to all screens in the system.	Supervisor	Operator Lead Operator Supervisor

Zone Photoeye Operation

Zone inputs are used for automatic triggering. Up to eight photoeyes connected to the zone inputs can be mounted in front of the entrance to the booth to detect parts as they enter the booth, the zones the parts occupy, and the length of the part.

See Figure G 1-2. In the first example, four zone photoeyes are mounted so that they create four vertical zones within the booth. The spray guns could then be assigned to the zones as follows:

Part ID 1		Part ID 2	
Guns	**Zones**	**Guns**	**Zones**
1, 5	1	1, 5	1
2, 6	2	2, 6	2
-	-	3, 7	3
-	-	4, 8	4

When part 1 is sent through the booth, only guns 1, 2, 5, and 6 are triggered since only zone 1 and 2 photoeyes detect the part. When part 2 is sent through the booth, all spray guns are triggered since all four zone photoeyes detect the part.

In the second example, if you had only two zone photoeyes, you could assign guns 1, 2, 5, and 6 to zone 1 and guns 3, 4, 7 and 8 to zone 2.

Zone assignments are part of the preset settings. This allows you to change a gun's zone assignment depending on the part being sprayed, if necessary. If you set a zone assignment to zero, the gun will not be triggered. This allows you to shut off a gun for a particular part.

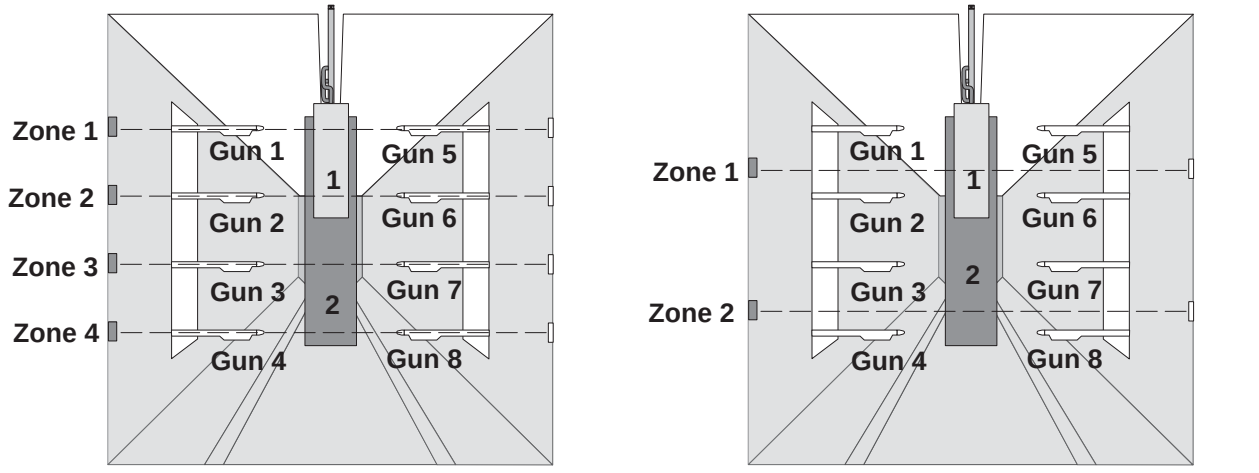


Figure G 1-2 Zone Photoeye Operation

The zone photoeye signal is combined with the encoder signal to track the part location and trigger the spray guns according to the zone and the lead and lag trigger settings in the the preset for the part.

Zone Photoeye Filter

The zone filter is a positive or negative length that adds or subtracts from the photoeye signal. A positive length extends the zone photoeye signal to prevent narrow part skipping and signal chattering; a negative length shortens the zone photoeye signal to prevent hanger detection.

Flag Photoeye Operation

The application controller can use up to eight flag photoeyes to identify different types of parts that are coming into the booth and change part style set points automatically.

Gun presets have a one-to-one relationship with part IDs. For example, when part 2 is identified, all guns are set to preset 2.

The system continues to spray parts with a preset until

- a new part ID is received by the flag inputs or
- the operator manually selects a new preset.

The flag inputs can be configured for straight or encoded flagging.

Straight Flagging

If you configure the flag inputs for straight flagging, the number of inputs receiving a signal determine the part ID. This configuration limits you to 8 part IDs.

Figure G 1-3 provides two examples of straight flagging:

The first uses 6 photoeyes to detect parts (or racks of parts) of different heights. When photoeye 1 detects part 1, style 1 is loaded; when photoeyes 1 and 2 detect part 2, style 2 is loaded; and so on.

In the second example, two photoeyes are positioned to detect enclosures with different depths. When photoeye 1 detects part 1, style 1 is loaded, which coats the inside of a shallow cavity. When photoeyes 1 and 2 detect part 2, style 2 is loaded, which coats the inside of a deep cavity.

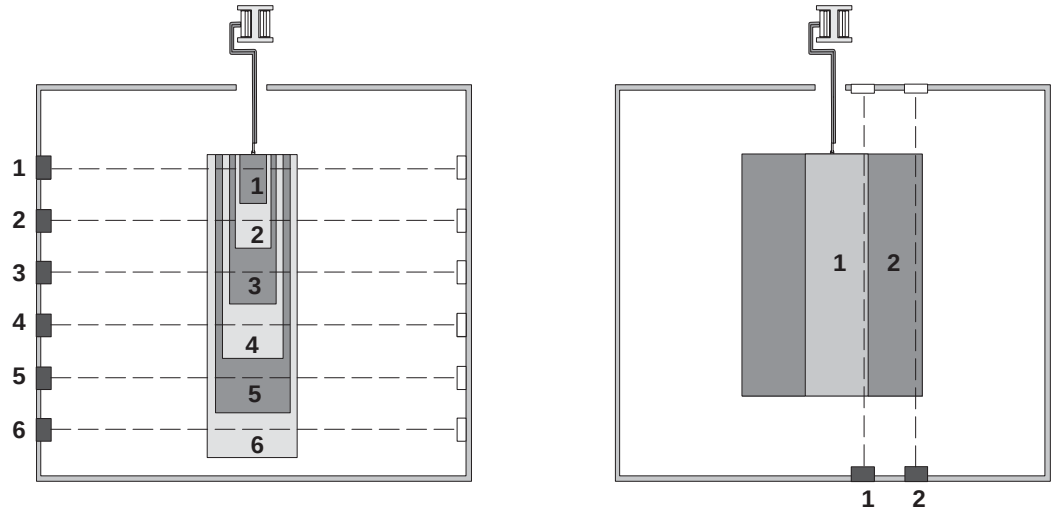


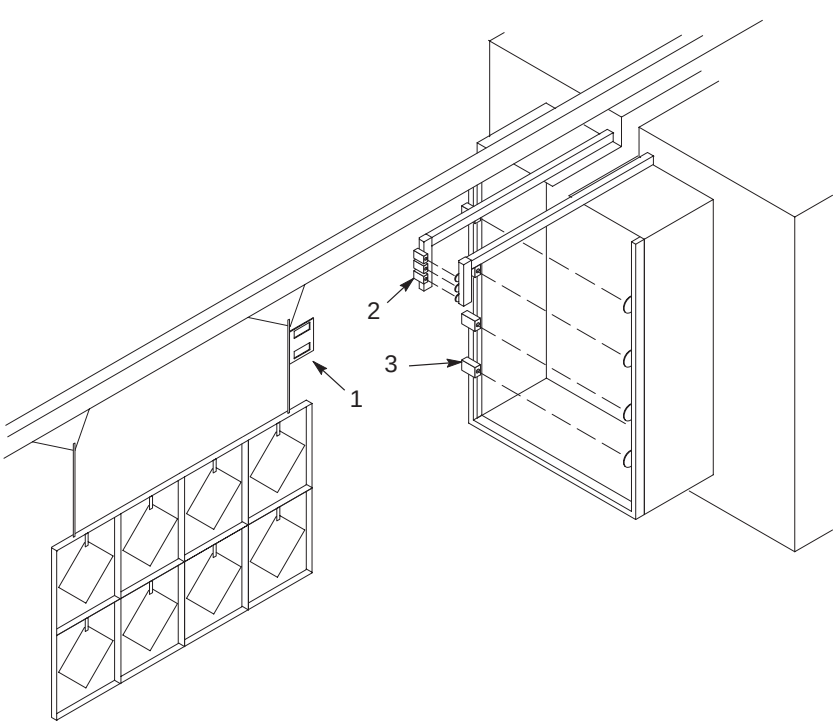
Figure G 1-3 Straight Flagging Example

Encoded Flagging

In a typical system that uses photoeyes for encoded flagging, the flag photoeyes read coded flags attached to the conveyor or part carrier. The flags are usually pieces of metal with rectangular slots cut in them.

NOTE: The flag photoeyes must be positioned far enough ahead of the zone photoeyes so that the flag inputs receive the part ID signal before the leading edge of the part is detected by the zone photoeyes.

Figure G 1-4 provides an example of encoded flagging using three flag photoeyes. This allows you to identify 7 different parts.



Flag	Blocked Photoeye	Binary # (Part ID #)
	1	00000001 (1)
	2	00000010 (2)
	1 2	00000011 (3)
	3	00000100 (4)
	1 3	00000101 (5)
	2 3	00000110 (6)
	1 2 3	00000111 (7)

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Figure G 1-4 Example of Encoded Flagging Using Three Flag Photoeyes

1. Flag
2. Flag photoeyes
3. Zone photoeyes

Flag Filter Delay

The flag filter delay is the distance the conveyor moves after the flag photoeyes detect the flag before the application controller reads the signal from the photoeyes. The delay must always be positive. The delay prevents reading a false part ID from the solid edge of the flag before the slots.

Section G 2
Configuration

WARNING: Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.

Introduction

CAUTION: This section contains password-protected configuration procedures. Supervisors and Nordson service representatives are the only personnel that should have access to this information. Do not allow unauthorized personnel to have access to this section.

More Information

Section	Information
Description	descriptions of the Startup Menu, buttons, and screen functions
Operation	daily operation; manual control screens and functions; and status screens
Troubleshooting	using the application controller to diagnose and correct system problems
Description section in Part C: *Interface Card*	using the LEDs on the interface card to diagnose and correct network problems

When and Why Configuration is Necessary

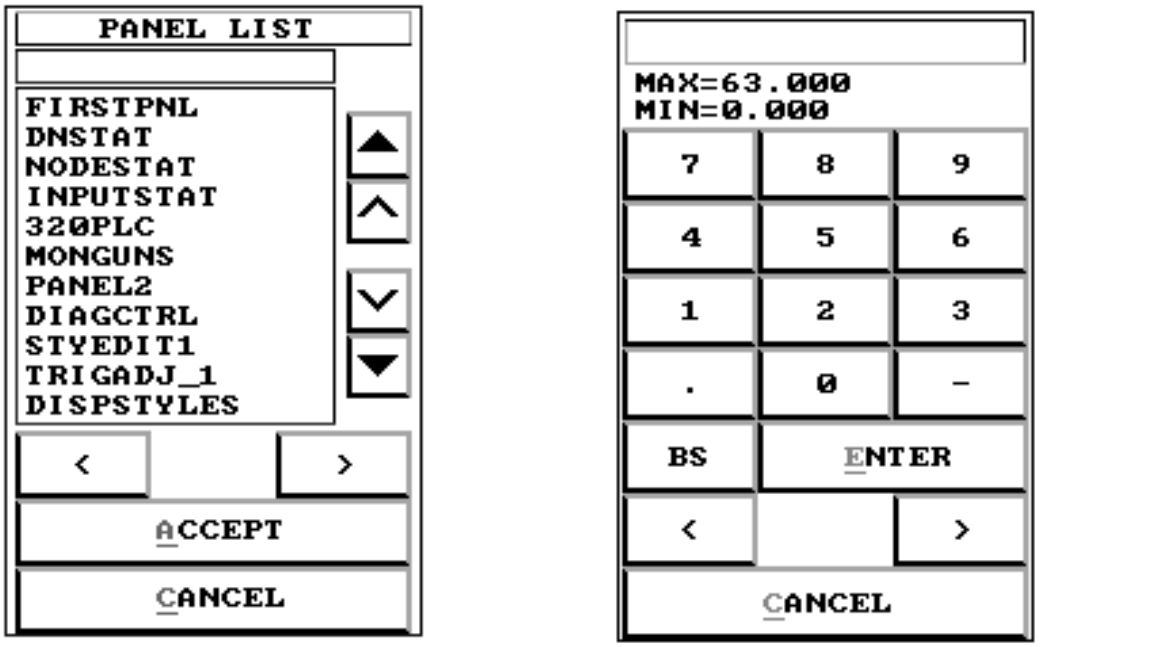
The Sure Coat modular gun control system cannot operate using the application controller until the configuration process has been completed. The configuration procedures set up system parameters for triggering, purging, and set point adjustments.

When to Configure	Why to Configure
Initial Installation	When you first install the application controller, complete all of the applicable configuration procedures. The adjustments made during the configuration process affect the system's ability to accurately and automatically operate your system.
Reconfigure an Existing System	When application requirements change, it is also necessary to change the operating parameters of the system. Perform as many of the configuration procedures as necessary to adjust your system to meet changing application needs.

Common Tasks

Table G 2-2 Common Tasks and Procedures

Task	Procedure
Access a screen from the Startup Menu	Touch the appropriate button on the menu.
Access a screen from a screen	Touch the appropriate button on the screen.
Return to a previous screen	Touch the **BACK** or **Previous Panel** button.
Return to the Startup Menu from a screen	Touch the **Startup Menu** button.
Enter or change a numeric value	1. Touch the ◀ button next to the value you want to enter or change. The numeric keypad appears. 2. See Figure G 2-1. Touch the appropriate buttons on the keypad to enter the desired value. 3. Touch the **ENTER** button at the bottom of the keypad. The value that you entered will be applied to the field.
Enter or change a value from a list of selections	1. Touch the ◀ button next to the value you want to enter or change. The selection menu will appear. 2. See Figure G 2-1. Highlight the desired value by touching either • the desired selection on the list, or • the arrow buttons to scroll up or down the list. 3. Touch the **ACCEPT** button to make the selection.
Save new or changed values to memory	Touch the **Accept** button on the screen. **NOTE:** Changes will not become effective until the **Accept** button is touched.
Display settings for a different gun, style, or range of guns or styles	Most screens use arrow buttons to allow forward and backward navigation. • Touch either the ▲ or ▶ button to select the next gun. • Touch either the ▼ or ◀ button to select the previous gun.
Make a selection on a screen	Touch the desired selection. Most gun triggering and selection screens highlight selections to show selection status. Green means a selection is active, red means a selection is not active.
Copy set points or spray length settings for one gun or style (or range) to a second gun or style (or range)	Refer to the *Copy Style Settings* procedure in this section.



SELECTION MENU NUMERIC KEYPAD

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Figure G 2-1 Selection Menu and Numeric Keypad

User Levels

Not all users have access to adjust all of the functions of the application controller. Four user levels are available:

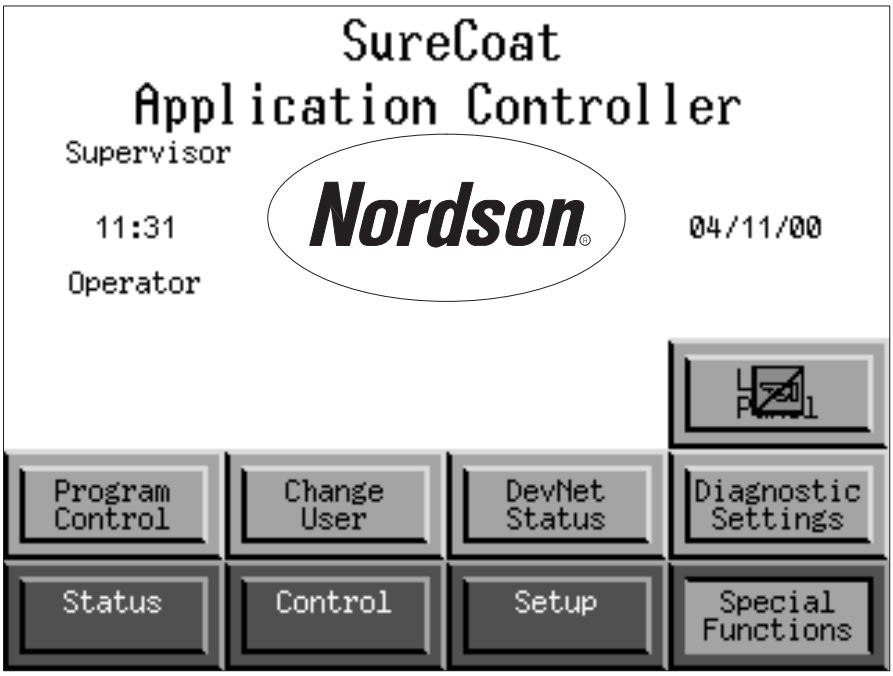
NOTE: The application controller ships from the factory in Supervisor mode.

Table G 2-3 User Levels

User Level	Password
Operator	0
Lead Operator	108
Supervisor	1597
Nordson Service	

User Levels *(contd)*

NOTE: See Screen G 2-1. Buttons that have a red box with a hand crossed through it indicate that the current user level does not have access to the corresponding function.



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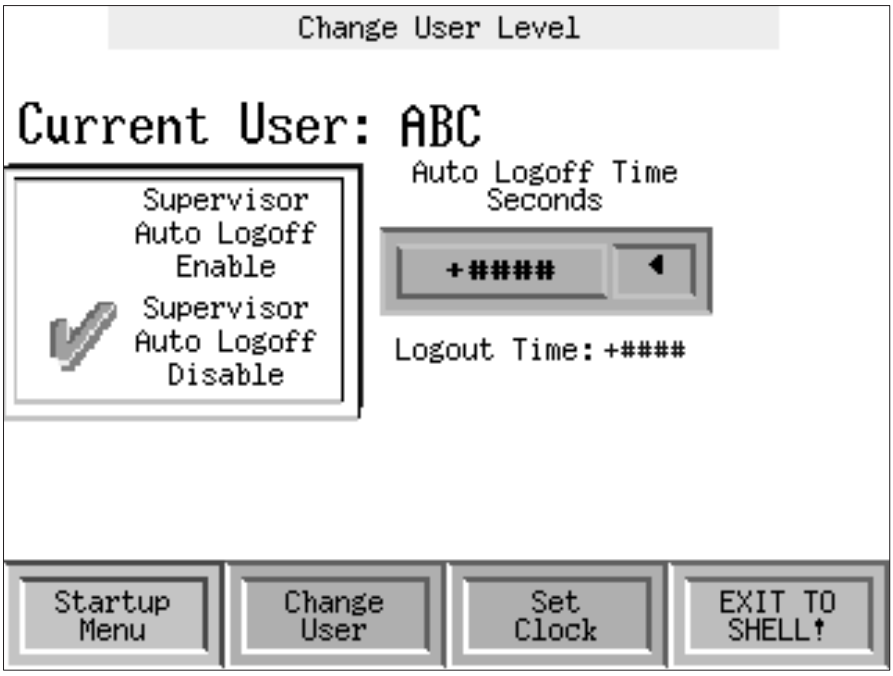
Screen G 2-1 Access Denied Icon

Changing User Level

1. From the Startup Menu, touch the **Special Functions** and **Change User** buttons. The **Change User Level** screen appears.
2. See Screen G 2-2. Touch the **Change User** button. The numeric keypad appears.
3. Enter the appropriate password and touch the **ENTER** button. The numeric keypad disappears.

   If you have logged into the Supervisor mode, the **Auto Logoff Timer** starts to count down. When this time has expired, the system will automatically return to operator mode.

   NOTE: Disable the auto logoff function by touching the **Supervisor Auto Logoff Disable** box. The green check mark will appear to the left, indicating that the auto logoff function is disabled. The system will stay in Supervisor mode until you follow steps 1-3 to change to another mode.



Screen G 2-2 Change User Level

Automatic Logoff Timer Duration Adjustment

NOTE: The automatic logoff timer may be set from between 30 and 9999 seconds.

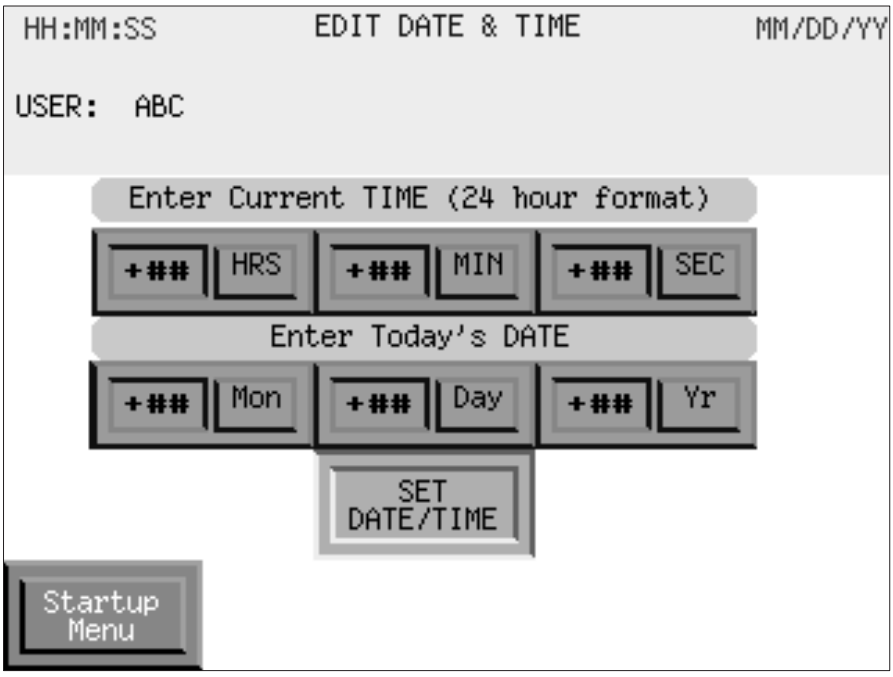
1. See Screen G 2-2. Touch the ◀ button next to the **Auto Logoff Time Seconds** field. The numeric keypad appears.
2. Enter the desired number of seconds and touch the **ENTER** button. The new duration is applied and the timer immediately begins to count down.

Clock Adjustment

1. See Screen G 2-2. Touch the **Set Clock** button. The **Edit Date & Time** screen appears.

NOTE: Time is based on a 24-hour format.

2. See Screen G 2-3. Enter all of the date and time values. The application controller will not register the date/time changes unless all values have been entered.
3. Touch the **SET DATE/TIME** button. The application controller recognizes the new date and time.



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Screen G 2-3 Edit Date & Time

Exit to Shell

See Screen G 2-2. The **EXIT TO SHELL!** button exits the application controller's operator interface program. Although touching this button does not stop the gun triggering, the operator may not control the triggering functions.

To return to the operator interface program from the shell menu, touch the **RUN** then **INTERACT** buttons. The application controller will restart the operator interface program.

Entering Configuration Mode

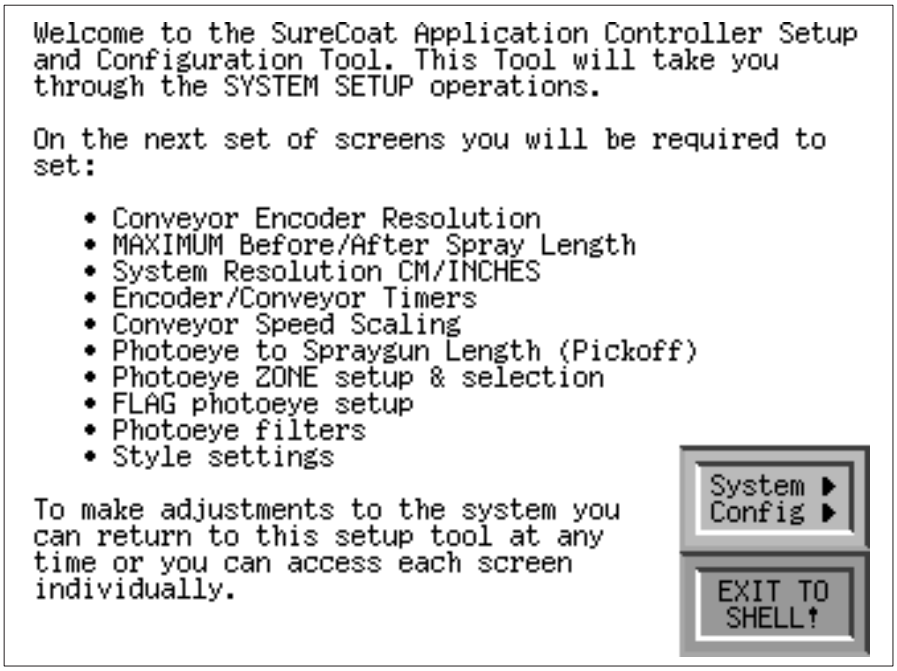
NOTE: The application controller must be connected to and communicating with the modular gun control system and photoeye junction box. If the application controller is not communicating, the configuration screens may not display the appropriate values or operate as they are supposed to.

The configuration mode can be accessed either:

- during initial startup or
- through the Startup Menu.

During Initial Startup

See Screen G 2-4. Follow the prompts when the system is first powered up and the configuration procedures have not been completed.



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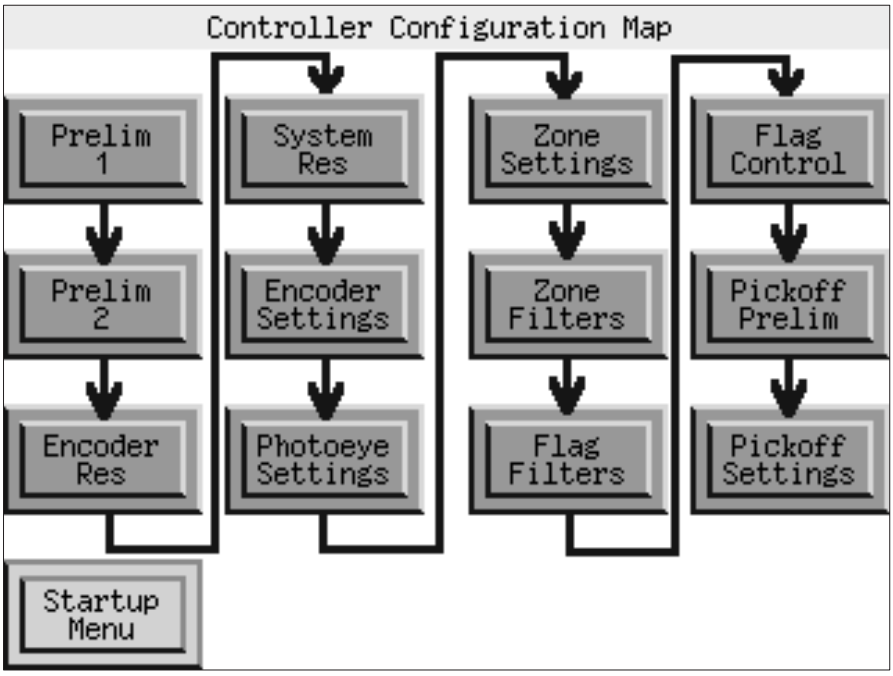
Screen G 2-4 Initial Setup

Through the Startup Menu

Return to the Startup Menu and touch the **Setup** and **Configure System** buttons. The **Controller Configuration Map** screen appears.

See Screen G 2-5. Touch the button that corresponds to the setting that you want to change.



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Screen G 2-5 Controller Configuration Map

Encoder and Photoeye Setup

The first procedure allows the application controller to confirm that it is properly connected to and communicating with the encoder and photoeyes.

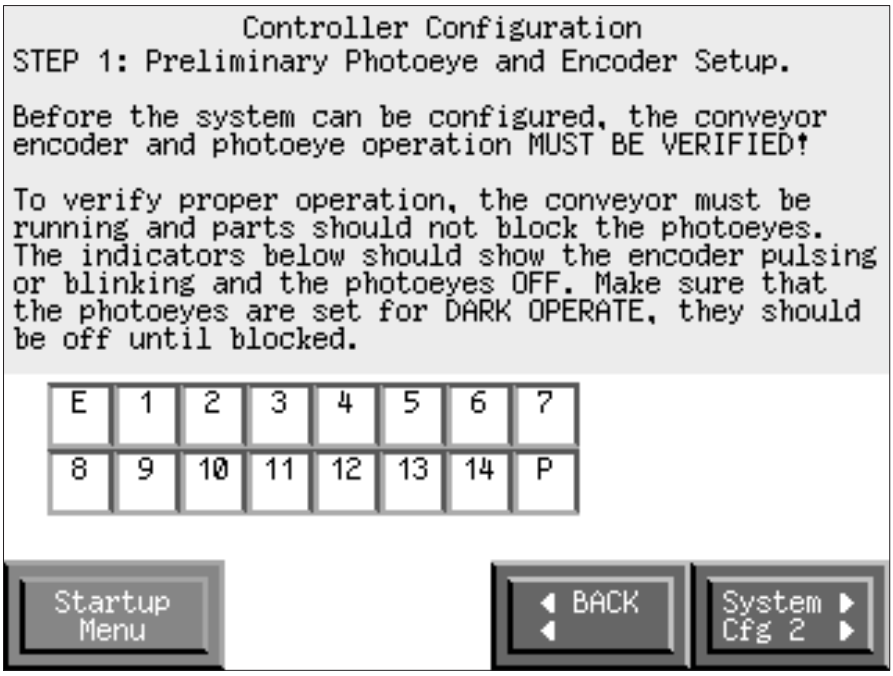
1. Proceed to the first screen in the configuration mode. The **Step 1** screen appears.

   NOTE: Screens G 2-6 and G 2-7 show a photoeye junction box (PEJB) with 16 inputs. A system with an 8-input PEJB displays all 16 indicators, but only the first row of indicators are active.

2. Make sure that no parts are on the conveyor.

NOTE: If you cannot eliminate moving parts from the conveyor, the **E** and **P** indicators will both blink.

3. See Screen G 2-6. Start the conveyor. The **E** box should blink, indicating that the encoder is operating.
4. Touch the **System Cfg 2** button to proceed to the next screen. The **Step 2** screen appears.



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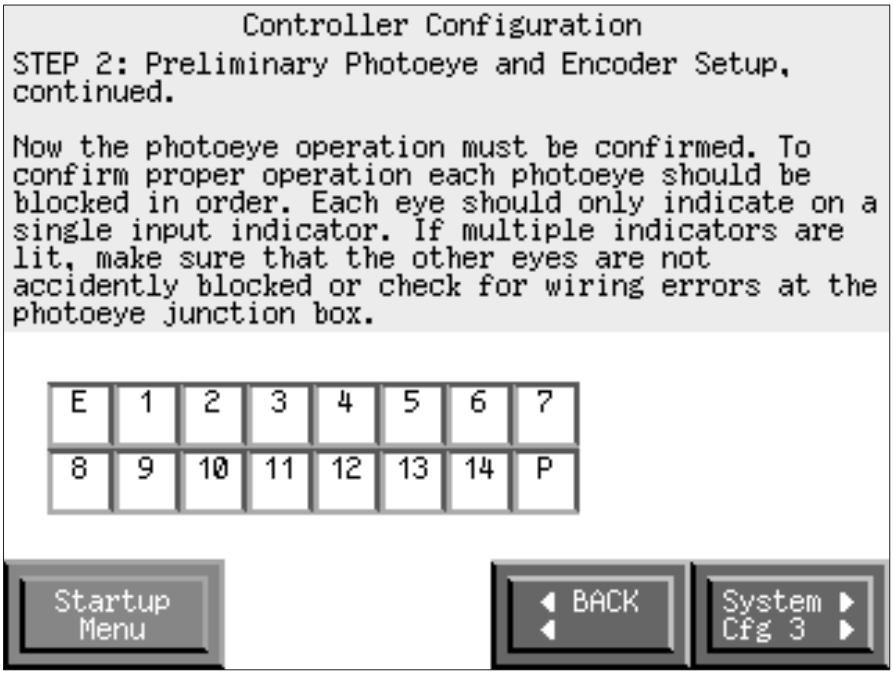
Screen G 2-6 Step 1: Encoder Setup

5. See Screen G 2-7. Have an assistant block each photoeye with their hand. Do this one photoeye at a time, following the numerical order which they are connected to the system. As each photoeye is blocked, the corresponding numerical block on the screen will light.
6. If any of the photoeye indicators do not light when the photoeyes are blocked, check the wiring connections at the PEJB.



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Screen G 2-7 Step 2: Photoeye Setup

Encoder Resolution

The application controller measures parts in encoder counts. Use the following procedure to set the system to convert encoder counts to real-world units (centimeters or inches).

CAUTION: Resetting the encoder resolution after the system has been configured will affect automatic triggering of the guns. All previously set values will be recognized in the new unit of measure.

NOTE: Accepting the **Scale Cts/RWU** default value of 1 in this step means that the application controller will recognize 1 encoder count as 1 inch or 1 centimeter. Complete this procedure so that you will always have an accurate reading at the application controller.

1. See Screen G 2-7. Touch the **System Cfg 3** button to proceed to the next screen. The **Step 3** screen appears.
2. Hang a large sheet of metal or cardboard on the conveyor. Make sure that the photoeye will detect the sheet.
3. Use a tape measure to measure the length of the sheet. Make sure that the measurement is as accurate as possible.
4. See Screen G 2-8. Touch the **Reset Count** button to clear any previously stored sizes.
5. Enter the length of the sheet in the **PART SIZE** field.

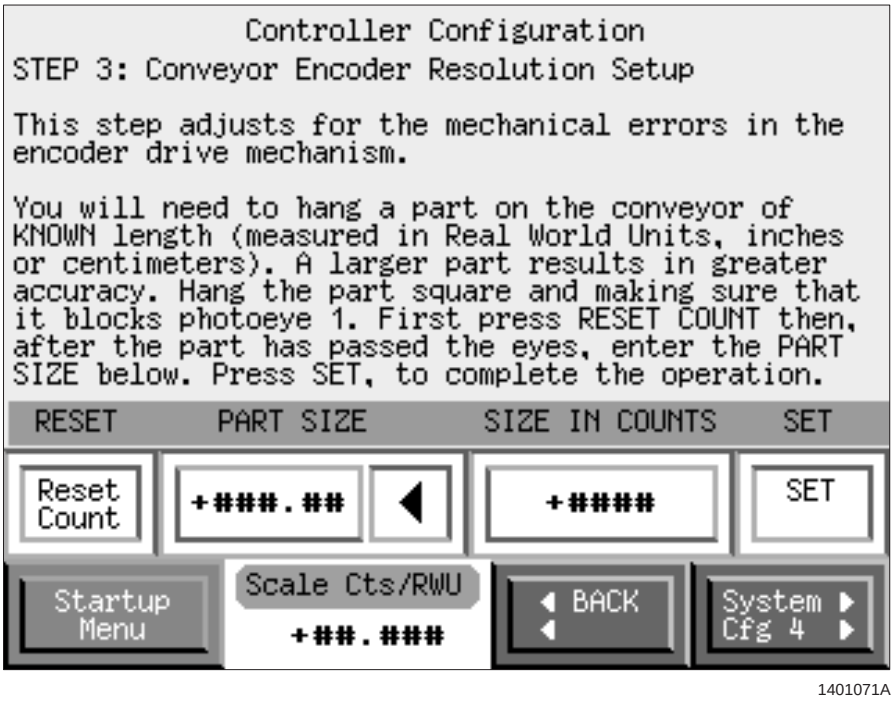
NOTE: You will get the most accurate results from the following step if two people are present. The first person should enter the information into the application controller. The second person should alert the first of when the sheet in the booth passes the photoeye.

NOTE: The **Scale** field displays the number of encoder counts per the selected unit of measure.

6. Start the conveyor. As the part passes the photoeye, the number in the **SIZE IN COUNTS** field will increase. As soon as the trailing edge of the sheet passes the photoeye, touch the **SET** button to store the **SIZE IN COUNTS** value. The calculation from encoder counts to part size centimeters or inches appears in the **Scale Cts/RWU** field.

   NOTE: Converting the system from encoder count to inch or centimeter recognition does not affect system operation. Setting the system to display real-world units displays familiar units of measure for data entry and display purposes.

NOTE: Before proceeding to the next step, record the encoder resolution settings in the *System Settings* chart at the end of this section.



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Screen G 2-8 Step 3: Conveyor Encoder Resolution Setup

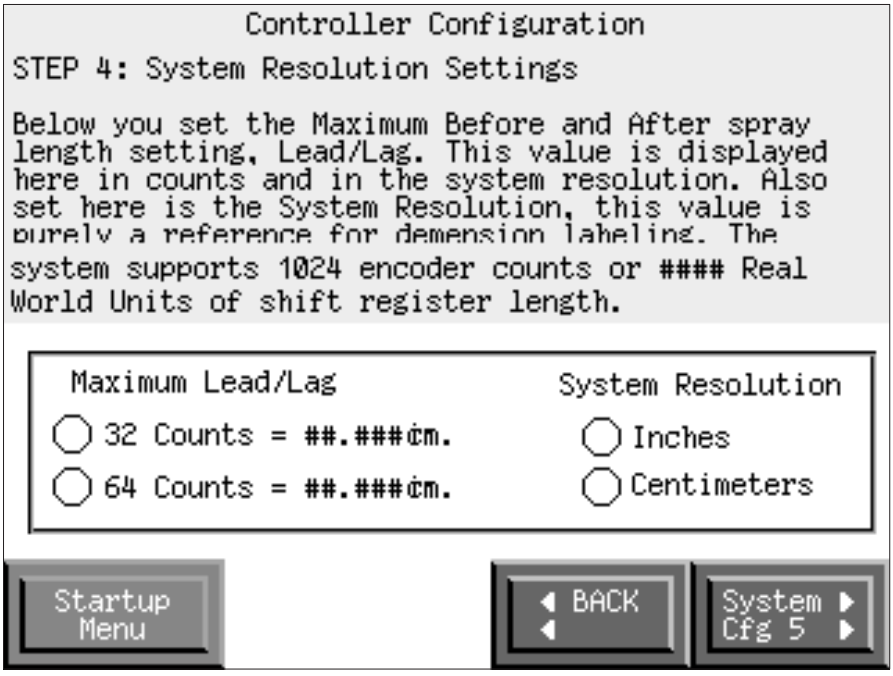
System Resolution

The application controller must have a maximum value of how long it will allow the guns to trigger before or after the actual length of the part. Use the following steps to set up the system resolution.

1. See Screen G 2-8. Touch the **System Cfg 4** button to proceed to the next screen. The **Step 4** screen appears.
2. See Screen G 2-9. Select one of the values under **Maximum Lead/Lag**:
   - **Lead:** The value in which the guns turn on before the parts reach the guns.
   - **Lag:** The value in which the guns turn off before the parts pass the guns.
3. Select one of the values under **System Resolution**.

NOTE: The values that you enter in the remaining configuration procedures will correspond to the unit of measure that you selected in the step 3. For example, if you selected **Inches** as the **System Resolution**, any measurements that you enter will be recognized in inches.

NOTE: Before proceeding to the next step, record the system resolution settings in the *System Settings* chart at the end of this section.



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Screen G 2-9 Step 4: System Resolution Settings

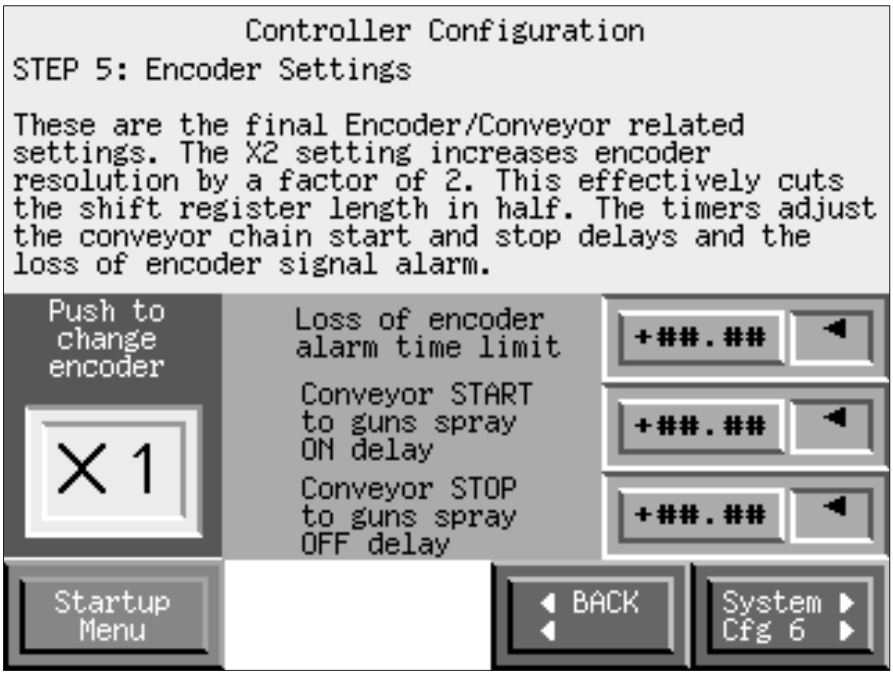
Encoder Settings

The application controller must be programmed to register an alarm when communication with the encoder fails and to compensate for slack in the conveyor during startup and shutdown. Use the following steps to set the encoder time delays.

1. See Screen G 2-9. Touch the **System Cfg 5** button to proceed to the next screen. The **Step 5** screen appears.
2. See Screen G 2-10. Touch the **Push to change encoder** button to set the encoder resolution.

   NOTE: Selecting **X2** allows the system to set up pick-off points and trigger guns with greater accuracy.

   - **X1:** encoder counts are read in 1-count resolution (1 encoder count=1 in. of conveyor travel)
   - **X2:** encoder counts are read in $^1/_2$-count resolution (1 encoder count=$^1/_2$ in. of conveyor travel)
3. Enter values in the three data entry fields using the guidelines given in Table G 2-4.



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Screen G 2-10 Step 5: Encoder Settings

Encoder Settings *(contd)*

Table G 2-4 Encoder Setting Fields

Field	Meaning	Example
Loss of encoder alarm time limit	Number of seconds before an alarm occurs after communication with the encoder fails	If you enter `10` in this field, the system alarm will activate if the application controller does not receive an encoder signal for 10 seconds.
Conveyor START to guns spray ON delay	Number of seconds the application controller gives the conveyor to start up before triggering the guns **NOTE:** This value extends or restricts the conveyor interlock signal.	If you enter `10` in this field, the application controller will keep the guns off until the encoder has been operating for 10 seconds. This allows the application controller to compensate for conveyor slack before normal operation.
Conveyor STOP to guns spray OFF delay	Number of seconds the application controller gives the conveyor to come to a stop before turning off the guns	If you enter `10` in this field, the application controller will keep the guns on for 10 seconds after the encoder has stopped. This allows the application controller to compensate for the conveyor coasting to a stop.

NOTE: Before proceeding to the next step, record the encoder settings in the *System Settings* chart at the end of this section.

Photoeye and Zone Assignment

Use the following procedure to assign which photoeyes trigger the zones of guns.

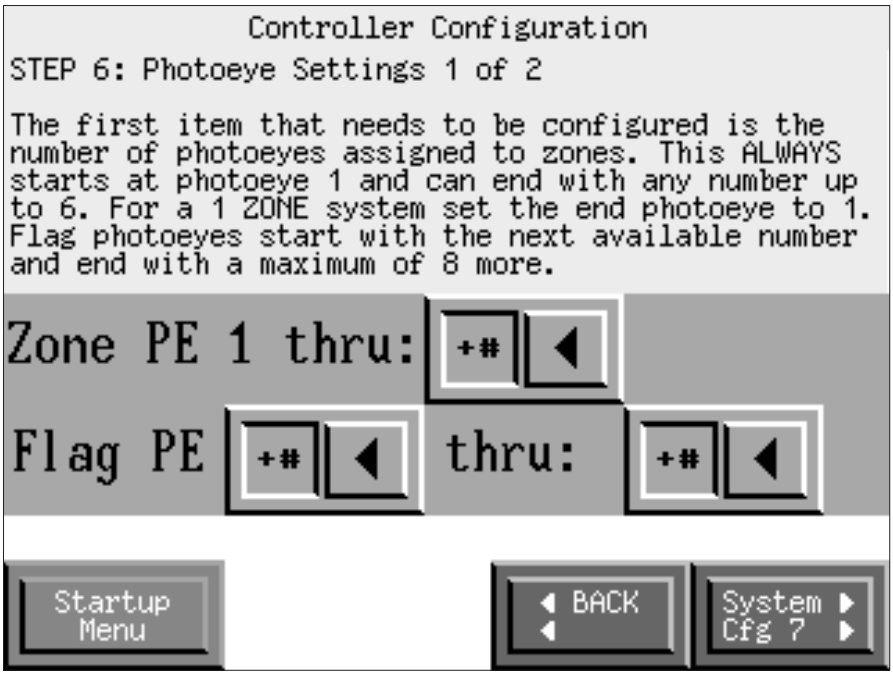
NOTE: Guns are assigned to different zones on the **Style Editor—Gun Settings** screen. Refer to the *Spray Length Settings* and *Gun Settings* procedures in this section for more information.

1. See Screen G 2-10. Touch the **System Cfg 6** button to proceed to the next screen. The **Step 6** screen appears.
2. See Screen G 2-11. Set the number of photoeyes you want to have available for zone operation in the **Zone PE 1 thru:** field.

   NOTE: The maximum number in the **Zone PE 1 thru:** field is 6. If your system consists of a single zone, enter `1` in the **Zone PE 1 thru:** field.
3. Enter the number of flag photoeyes in your system in the **Flag PE** fields. The range of flags must start with the next available photoeye number and end with the final photoeye number.

   For example, to set up a system that has 5 zone photoeyes and 2 flag photoeyes, enter `5` in the **Zone PE 1 thru:** field and `6` **thru:** `7` in the **Flag PE** fields.

   NOTE: The system automatically sets a single flag photoeye. If you will not be using flag photoeyes, leave the default value and disregard the other procedures in this section regarding flag photoeyes. For example, if your system has 3 zone photoeyes, the numeral 4 will automatically appear in the **Flag PE** field.
4. Touch the **System Cfg 7** button to proceed to the next screen. The **Step 7** screen appears.



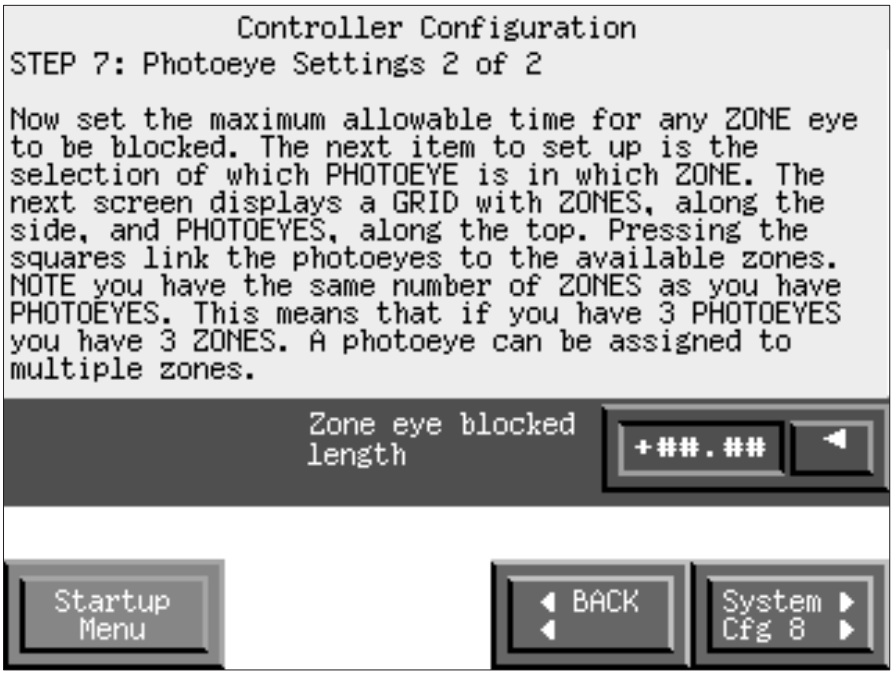
1401074A

Screen G 2-11 Step 6: Photoeye Settings (1 of 2)

Photoeye and Zone Assignment *(contd)*

NOTE: The **Zone eye blocked length** is the maximum length of a part (between 0.1 and 999.9) that will be detected by the photoeyes. If a photoeye does not detect a part after reaching this value, a photoeye fault occurs. This value is typically set slightly longer than the longest part that the system coats.

5. See Screen G 2-12. Enter a value between 0.1 and 999.9 in the **Zone eye blocked length** field.
6. Touch the **System Cfg 8** button to proceed to the photoeye zone assignment screen.

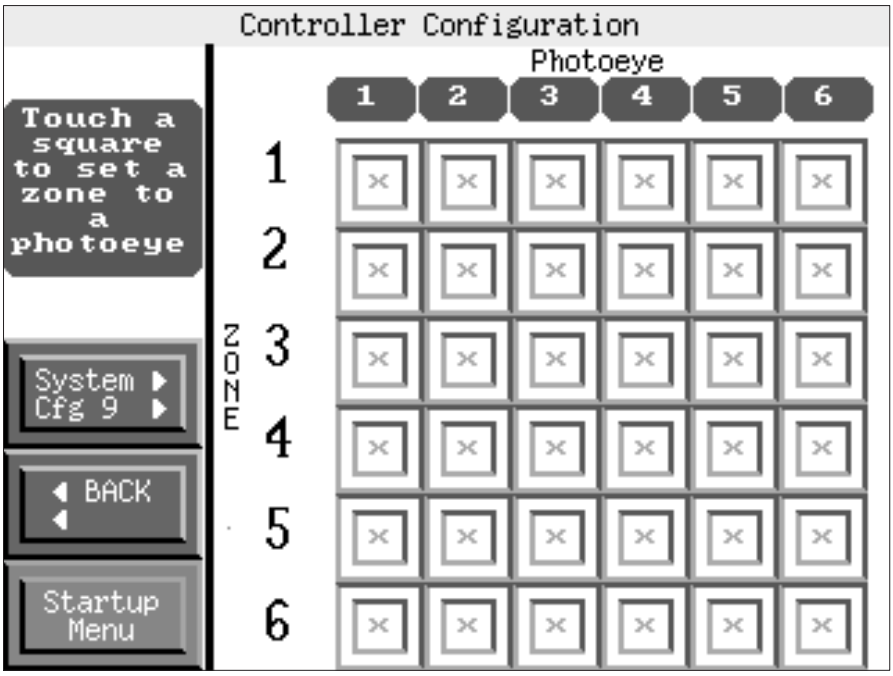


1401075A

Screen G 2-12 Step 7: Photoeye Settings (2 of 2)

Screen G 2-13 appears, showing the number of photoeyes and zones available. The system default sets up the photoeyes in a diagonal pattern on the screen (photoeye 1 in zone 1, photoeye 2 in zone 2, and so on). This screen allows you to control how the system detects parts and controls gun triggering.

For example, you may be required to coat parts that are consistently in zone 2, yet require reenforcement from guns in zone 1. By setting zone 2's photoeye to activate guns in zone 1, the guns in both zones 1 and 2 will trigger whenever the zone 2 photoeye detects a part.



1401076A

Screen G 2-13 Photoeye to Zone Setup

Refer to Table G 2-5 and see Screen G 2-14 for an example of how several zones can be set to a single photoeye.

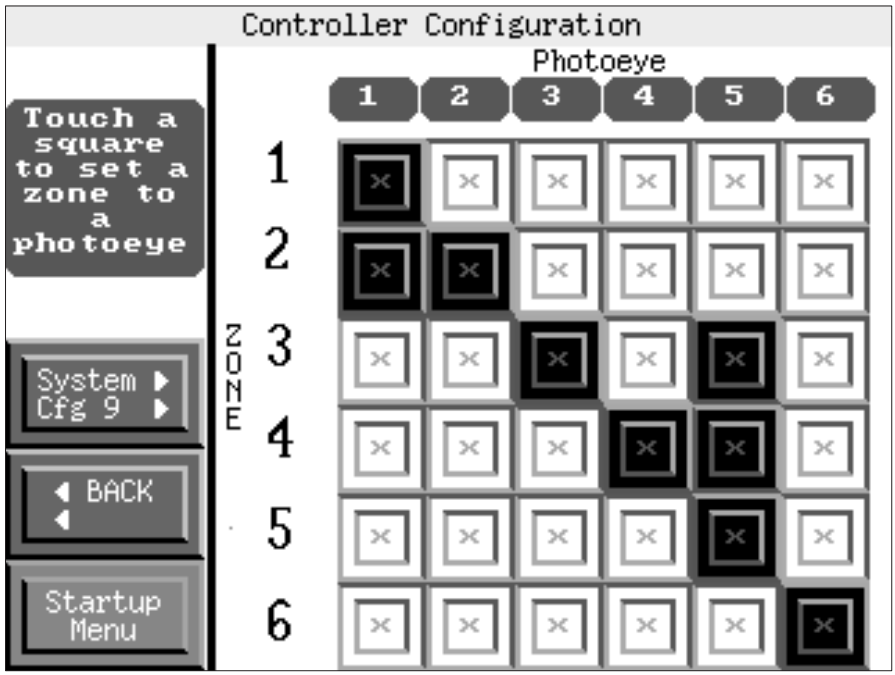
7. Touch a square to set a photoeye to a zone. The squares will light as you touch them. To remove a photoeye from a zone, touch the square again.

Table G 2-5 Zone Photoeye Setup Example

Zone Photoeye Activated	Zone Triggered
1	1 and 2
2	2
3	3
4	4
5	3, 4, and 5
6	6

Photoeye and Zone Assignment *(contd)*

NOTE: Before proceeding to the next step, record the zone photoeye locations in the *System Settings—Zone Photoeye Assignment* chart at the end of this section.



1401077A

Screen G 2-14 Photoeye to Zone Setup Example

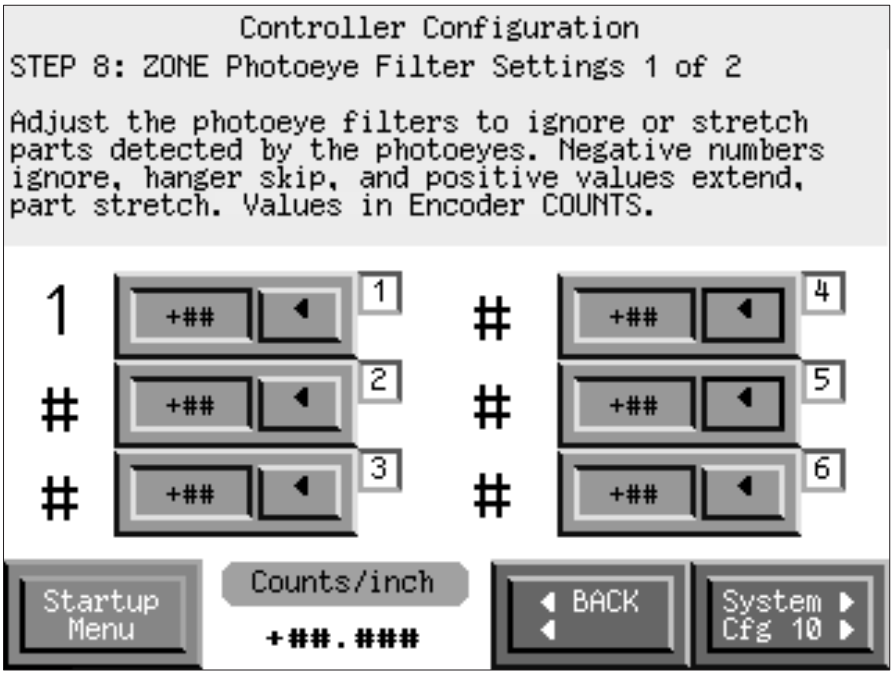
Zone Photoeye Filter Settings

The application controller may be programmed to not trigger the guns for parts that are under a specified length yet still recognize parts that have large gaps in them, such as grid patterns. This prevents the system from spraying empty hangers.

1. See Screen G 2-14. Touch the **System Cfg 9** button to proceed to the next screen. The **Step 8** screen appears, showing a data entry field for each registered zone photoeye.

NOTE: The values that you enter in the following step will represent encoder counts. These values do not correspond to units of measure selected in the *System Resolution* procedure.

2. See Screen G 2-15. Enter a value into each of the fields using the guidelines given in Table G 2-6.



1401078A

Screen G 2-15 Step 8: Zone Photoeye Filter Settings

Table G 2-6 Zone Photoeye Filter Values

Value	Meaning	Example
Zero (0)	No filter (part is measured as its actual length)	If the photoeyes detect a 10-count long part, the application controller recognizes it as being 10-counts long
Positive (+)	Extends the length of a part by the entered value	If `+2` is entered, the application controller recognizes a 10-count long part as being 12-counts long.
Negative (-)	Restricts the length of a part by the entered value (ignores parts shorter than the value entered)	If `-5` is entered, the application controller will not recognize parts less than 6-counts long. **NOTE:** You must increase the before part spray length setting to compensate for a negative value entered. Refer to *Spray Length Settings* for more information.

NOTE: Before proceeding to the next step, record the zone photoeye filter settings in the *System Settings* chart at the end of this section.

Flag Photoeye Filter Settings

The application controller may be programmed to not trigger the guns for flags that are under a specified length yet still recognize flags that have large gaps in them. This prevents the system from spraying when the flag photoeyes detect either empty part hangers or the leading edge of cut-out sections of encoded flags.

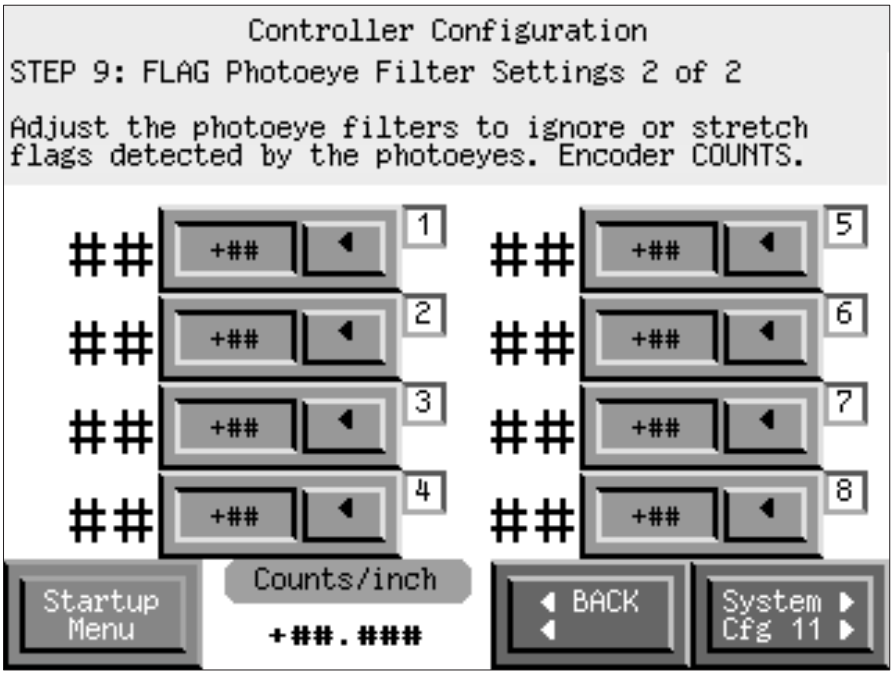
The values entered in this procedure affect the minimum flag length settings. The values extend the length of the flags so that the application controller does not switch styles back and forth when the flag photoeyes detect flags or parts with multiple gaps in them.

NOTE: Disregard this procedure if you will not be using flag photoeyes.

1. See Screen G 2-15. Touch the **System Cfg 10** button to proceed to the next screen. The **Step 9** screen appears, showing a data entry field for each registered flag photoeye.

NOTE: The values that you enter in the following step will represent encoder counts. These values do not correspond to units of measure selected in the *System Resolution* procedure.

2. See Screen G 2-16. Enter values into the each of the fields using the guidelines given in Table G 2-7.



1401079A

Screen G 2-16 Step 9: Flag Photoeye Filter Settings

Table G 2-7 Flag Photoeye Filter Values

Value	Meaning	Example
Zero (0)	No filter (flag is measured as its actual length)	If the photoeyes detect a narrow section of a flag followed by a cut-out section, the application controller recognizes it as being a full, valid flag.
Positive (+)	Extends the length of a flag by the entered value	If **+2** is entered, the application controller recognizes a 6-count long section of a flag as being 8-counts long.
Negative (-)	Restricts the length of a flag by the entered value (ignores parts shorter than the value entered)	If **-2** is entered, the application controller will not recognize flags that are less than 3-counts long.

NOTE: Before proceeding to the next step, record the flag photoeye filter settings in the *System Settings* chart at the end of this section.

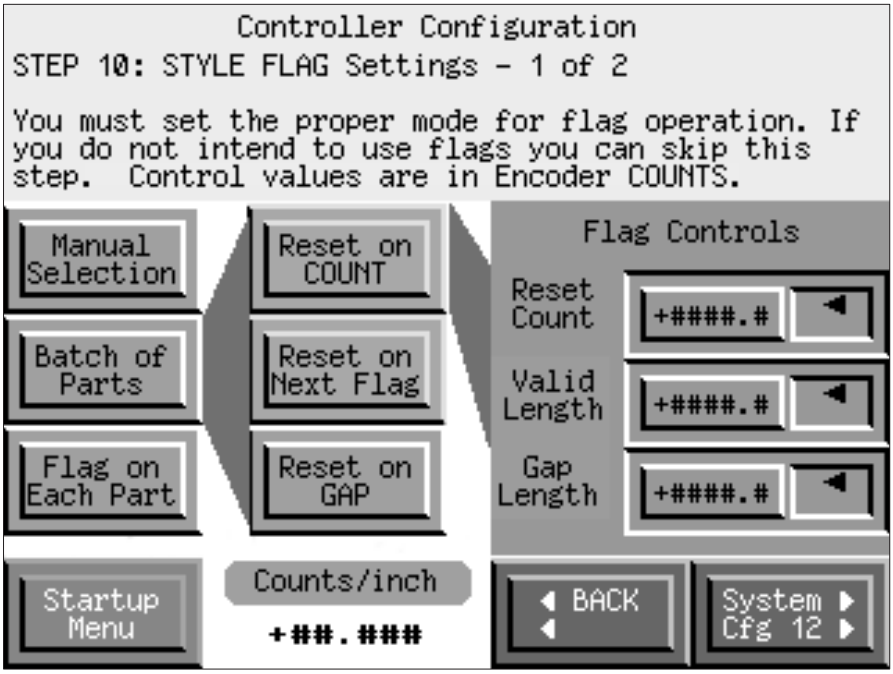
Style Flag Settings

If you program the application controller to operate using flags, you must set the appropriate flag style mode.

Selecting a Style Flag Setting

NOTE: Flag and part style settings affect parts as they are detected at the photoeyes. If changes are made to the parts between the photoeyes and the guns, the parts will be coated using the settings applied by the photoeyes.

1. See Screen G 2-16. Touch the **System Cfg 11** button to proceed to the next screen. The **Step 10** screen appears.
2. See Screen G 2-17. Touch the appropriate button using the guidelines given in Table G 2-8.



1401080A

Screen G 2-17 Step 10: Style Flag Settings (1 of 2)

Selecting a Style Flag Setting (contd)

NOTE: If you touch the **Batch of Parts** button, you must also touch either the **Reset on COUNT, Reset on Next Flag**, or **Reset on GAP** button.

Table G 2-8 Flag Control Buttons

Button	Meaning	Example
Manual Selection	System is set to default style; operator must select other styles as appropriate	Flag photoeyes are disabled. The operator must watch the conveyor for new part styles and select styles as appropriate. The system will operate under the selected style until the operator selects a new style using the **Manual Style** field.
Batch of Parts	Each batch of parts has its own flag	When the flag photoeyes detect a flag, the system operates using the corresponding style parameters until one of the following events occurs (depending on which batch button has been selected): • **Reset on COUNT:** The system operates under a flag's style parameters until the number of encoder counts specified in the **Reset Count** field passes. When the specific value has been reached, the system resets to style 0. • **Reset on Next Flag:** The system operates under a flag's style parameters until the flag photoeyes detect two consecutive occurrences of the same flag. When the same flag is detected, the system resets to the style 0. • **Reset on GAP:** The system operates under a flag's style parameters until it senses a gap between parts of the length specified in the **Gap Length** field. When the specified gap count has been reached, the system resets to the style 0.
Flag on Each Part	Each part has its own flag or acts as a flag	Each part that is on the conveyor requires its own flag. If no flag is detected on a part, the system uses style 0.

NOTE: The values that you enter in the following step will represent encoder counts. These values do not correspond to units of measure selected in the *System Resolution* procedure.

3. Enter the appropriate values into the **Flag Controls** fields. Refer to Table G 2-9 for a description of the fields.

Table G 2-9 Flag Control Fields

Field	Meaning	Example
Reset Count	Length of gap between parts before system resets to style 0	If you set the **Reset Count** value to `120`, the system will reset to style 0 if the zone photoeyes do not detect a part for 120 encoder counts since the last part that passed.
Valid Length	Minimum length of flag	If you set the **Valid Length** value to `5`, the system will ignore any part hangers or flag sections that are under 5 encoder counts long. **NOTE:** See Figure G 2-2. When using encoded flags, set the valid length at 1 encoder count greater than the length of the leading edge of the flag before the gap. In the example given in Figure G 2-2, the valid length must be set to 5.
Gap Length	Normal length of a gap between parts	If parts on the conveyor are usually 120 encoder counts apart, enter `120` in this field. **NOTE:** The style automatically resets to style 0 if no parts are seen in this period of time.

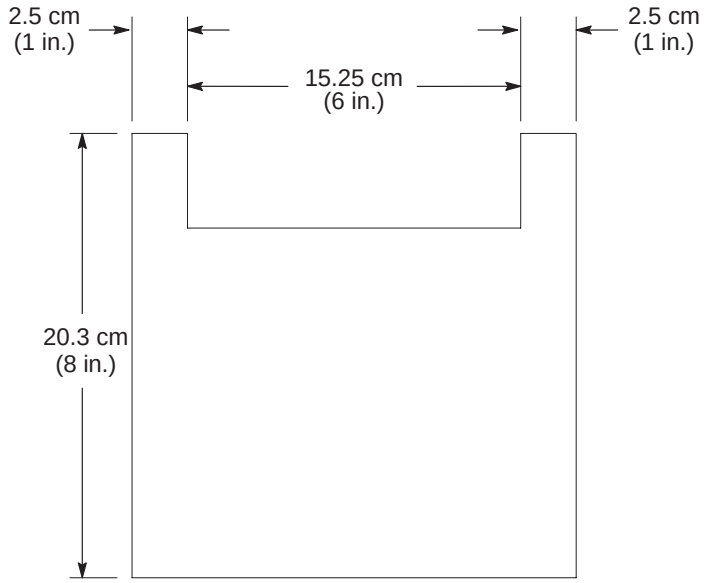


Figure G 2-2 Style Flag Valid Length Settings

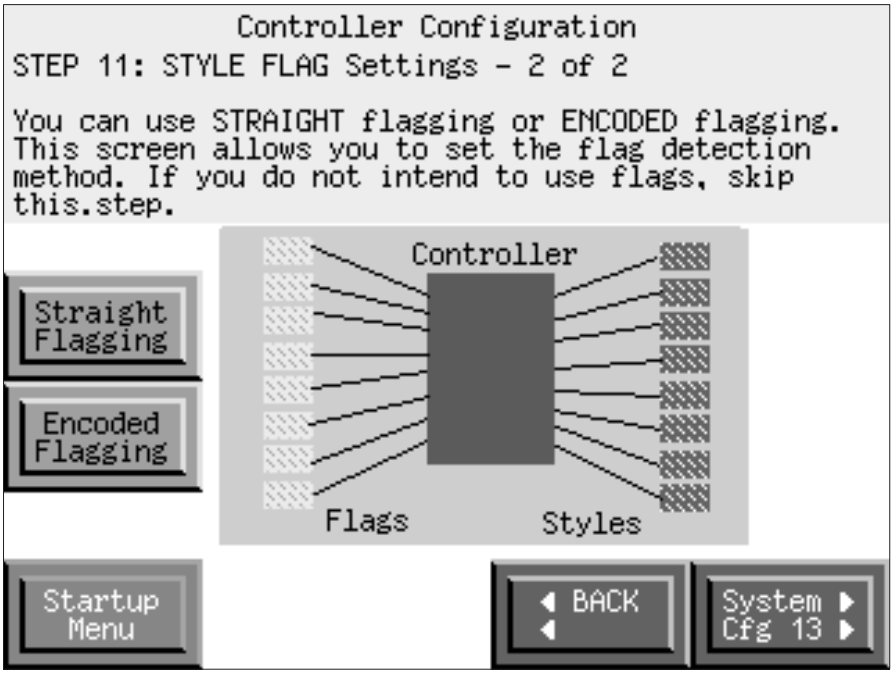
4. Touch the **System Cfg 12** button to proceed to the next screen. The **Step 11** screen appears.
5. See Screen G 2-18. Touch either the **Straight Flagging** or **Encoded Flagging** button.

   See Screen G 2-19. Touching the **Encoded Flagging** button changes the appearance of the screen to indicate encoded flagging.

Selecting a Style Flag Setting *(contd)*

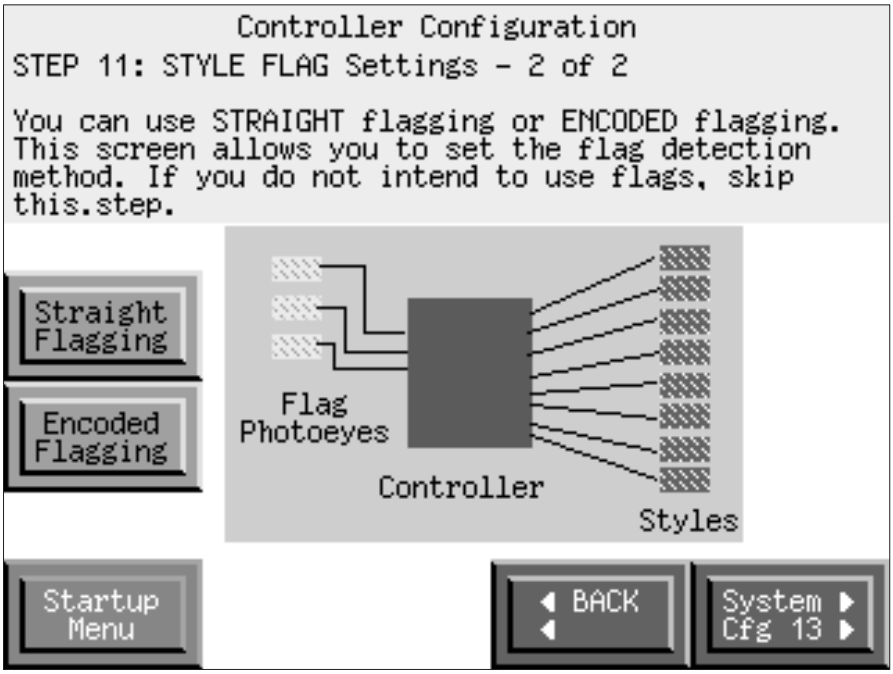
NOTE: Refer to the *Description* section for more information about flagging.

NOTE: Before proceeding to the next step, record the style flag settings in the *System Settings* chart at the end of this section.



1401081A

Screen G 2-18 Step 11: Style Flag Settings (2 of 2)—Straight Flagging



1401082A

Screen G 2-19 Step 11: Style Flag Settings (2 of 2)—Encoded Flagging

Example

The following example explains a typical reset on next flag batch operation.

NOTE: The following example uses styles 1 and 2. A batch of parts can consist of any styles.

1. The application controller sprays parts entering the booth using style 0.
2. When a style 1 flag is detected, the application controller switches to style 1. The style 1 flag indicates the beginning of the batch.
3. If a style 2 flag is detected in the batch, the application controller switches to style 2, even though it is still in the same batch. The system sprays using style 2 settings until another flag is detected.
4. When two style 3 flags are detected, the application controller recognizes the second consecutive flag as the end of the batch and switches back to style 0. The system sprays using style 0 settings until another flag is detected, which begins another batch.

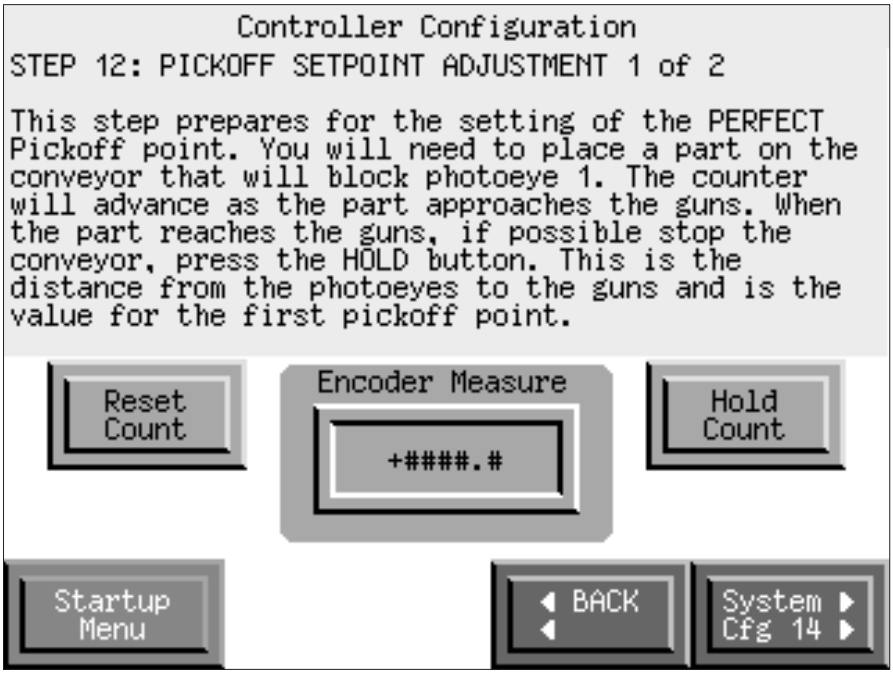
Pickoff Point Settings

A pickoff point is the distance from a zone photoeye to a gun. Measuring the pickoff points gives you a starting point to set spray length settings.

NOTE: You will get the best results from the following procedure if two people are present. The first person should enter the information into the application controller. The second person should alert the first of when the part reaches the gun.

1. See Screen G 2-19. Touch the **System Cfg 13** button. The **Step 12** screen appears.
2. Hang a part on the conveyor. Make sure that the leading edge of the part is not blocking the zone photoeyes, but will block photoeye 1 when the conveyor starts.
3. See Screen G 2-20. Touch the **Reset Count** button and start the conveyor. When photoeye 1 becomes blocked, the **Encoder Measure** value will increment as the part passes.
4. When the leading edge of the part reaches the gun, touch the **Hold Count** button. Record the value that appears in the **Encoder Measure** field.

Pickoff Point Settings *(contd)*



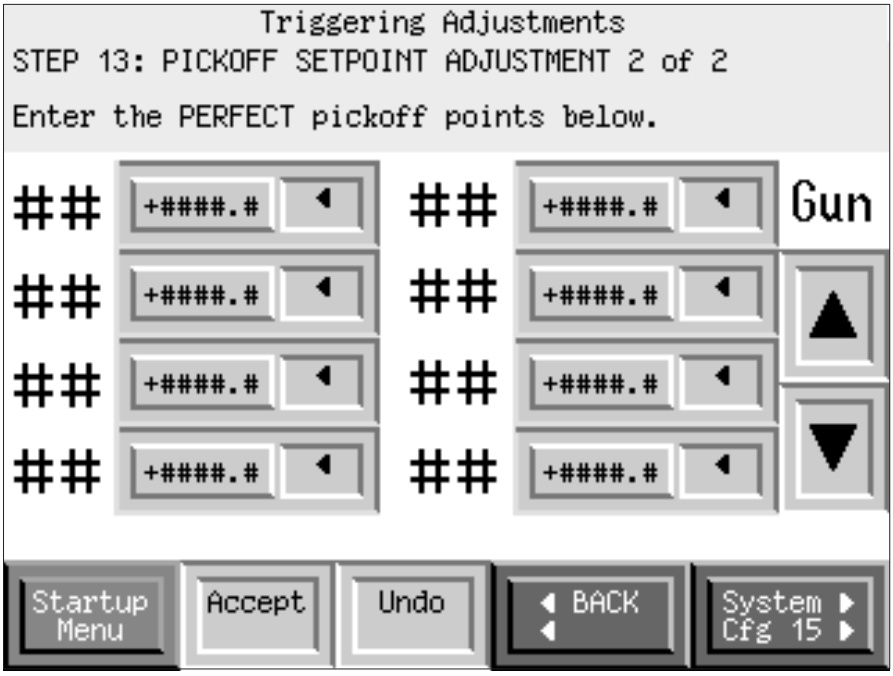
1401084A

Screen G 2-20 Step 12: Pickoff Setpoint Adjustment (1 of 2)

5. Touch the **System Cfg 14** button. The **Step 13** screen appears.
6. See Screen G 2-21. Enter the value from the **Encoder Measure** field on Screen G 2-20 into the appropriate gun's field.

   NOTE: All guns in the same slot have the same pickoff point setting. Enter the same pickoff point setting for all guns in the same slot so that you only have to repeat this procedure for each slot.

7. After you have entered the perfect pickoff setting for every gun, touch the **BACK** button to return to Screen G 2-20. Repeat steps 1-5 for each slot in the booth.



1401085A

Screen G 2-21 Step 13: Pickoff Setpoint Adjustment (2 of 2)

8. Touch the **Accept** or **Undo** button as appropriate for each value that you enter. You may also touch the **Accept** or **Undo** buttons to apply or reject all settings on the screen at the same time.

   - Touch the **Accept** button to apply the new before or after setting. The new value will replace any previously entered values.
   - Touch the **Undo** button to return to the previously entered value. For example, if a value of `5` was entered and you changed the setting to `8`, touching Undo will return the value to `5`.

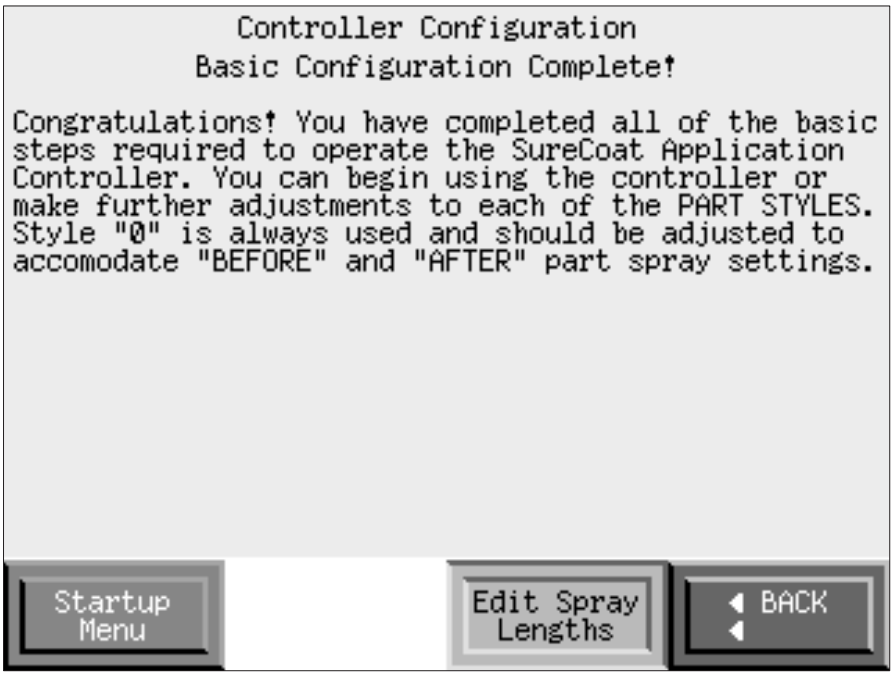
   NOTE: The **Undo** button only allows 1 undo operation. Touching the **Undo** button repeatedly will not affect a value after it has been accepted.

9. Touch the **System Cfg 15** button. Screen G 2-22 appears, indicating that you have completed all of the basic configuration procedures.

   However, you must assign each gun to a photoeye zone in order to operate using automated triggering. Refer to the *Spray Length Settings* and *Gun Settings* procedures in order to create and use part styles. Touch the **Edit Spray Lengths** button to proceed to the *Spray Length Settings* procedure.

Pickoff Point Settings *(contd)*

NOTE: Before proceeding to the *Spray Length Settings* and *Gun Settings* procedures, record the perfect pickoff point settings in the *System Settings* chart at the end of this section.



1401086A

Screen G 2-22 Basic Configuration Complete

Spray Length Settings

The following procedure allows you to set the distance before (lead) and after (lag) the part that the guns will turn on and off. This operation is known as extending or restricting the spray pattern. The following procedure also allows you to assign guns to zones and spray length attributes to styles.

NOTE: If you entered a negative value in the zone photoeye filter settings, you must extend the spray length settings in this procedure to compensate for values that you set the zone photoeyes to ignore. Refer to *Zone Photoeye Filter Settings* for more information.

Setting Spray Lengths

NOTE: You must assign the guns to zones before the guns will respond to parts entering the booth.

1. Refer to Table G 2-10. Access the **Style Editor—Spray Length Settings** screen by touching the appropriate button.

Table G 2-10 Spray Length Settings Screen Access

Source Screen	Button
Basic Configuration Complete	**Edit Spray Lengths**
Startup Menu—Setup	**Trigger Adjustment**
Style Editor—Gun Settings	**Edit Spray Lengths**

2. See Screen G 2-23. Select the gun and style that you want to adjust.
   - Touch the arrow buttons to select the appropriate gun.
   - Touch the **Style** selection box to select the appropriate style.
3. Assign the gun to a zone using the **Photoeye Zone** selection box.

   NOTE: A gun may be assigned to a different zone for each style. For example, gun 1 could be assigned to zone 1 for style 0, but it could be assigned to zone 4 for style 1.

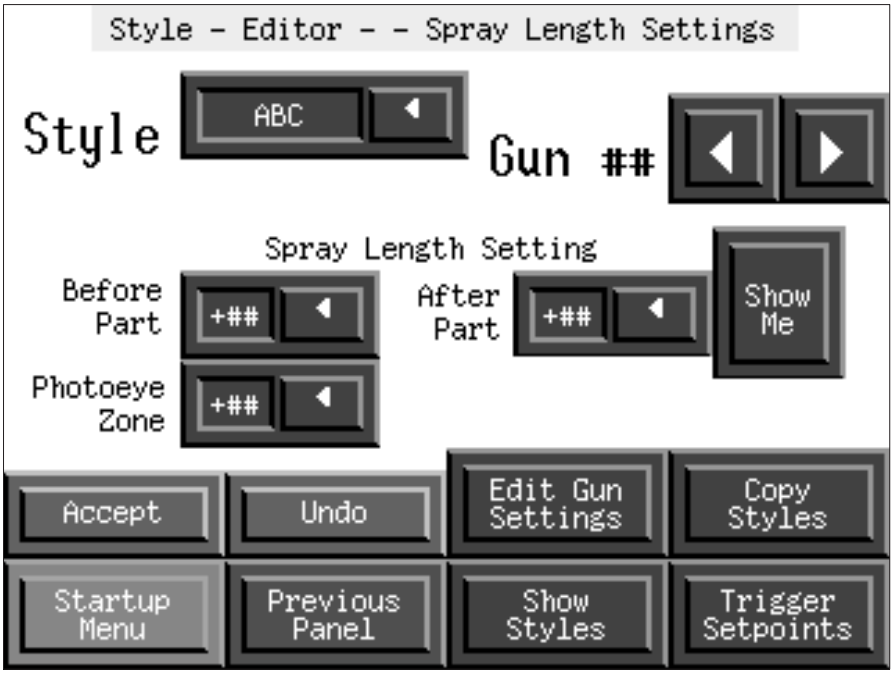
4. Enter the appropriate spray length settings. Refer to *Application Examples* for typical applications of spray lengths.
   - Enter positive values to extend the spray pattern (turning on the gun before the part reaches the gun or turning off the gun after the part passes the gun).
   - Enter negative values to restrict the spray pattern (turning on the gun after the part reaches the gun or turning off the gun before the part passes the gun).

Setting Spray Lengths *(contd)*

NOTE: Changes made will not take effect unless the **Accept** button is pressed. If the active screen is is changed or the selected gun or style is changed before touching the **Accept** button, changes will be lost.

5. Touch the **Accept** or **Undo** button as appropriate for each value that you enter. You may also touch the **Accept** or **Undo** buttons to apply or reject all settings on the screen at the same time.
   - Touch the **Accept** button to apply the new before or after setting. The new value will replace any previously entered values.
   - Touch the **Undo** button to return to the previously entered value. For example, if a value of `5` was entered and you changed the setting to `8`, touching Undo will return the value to `5`.

   NOTE: The **Undo** button only allows 1 undo operation. Touching the **Undo** button repeatedly will not affect a value after it has been accepted.



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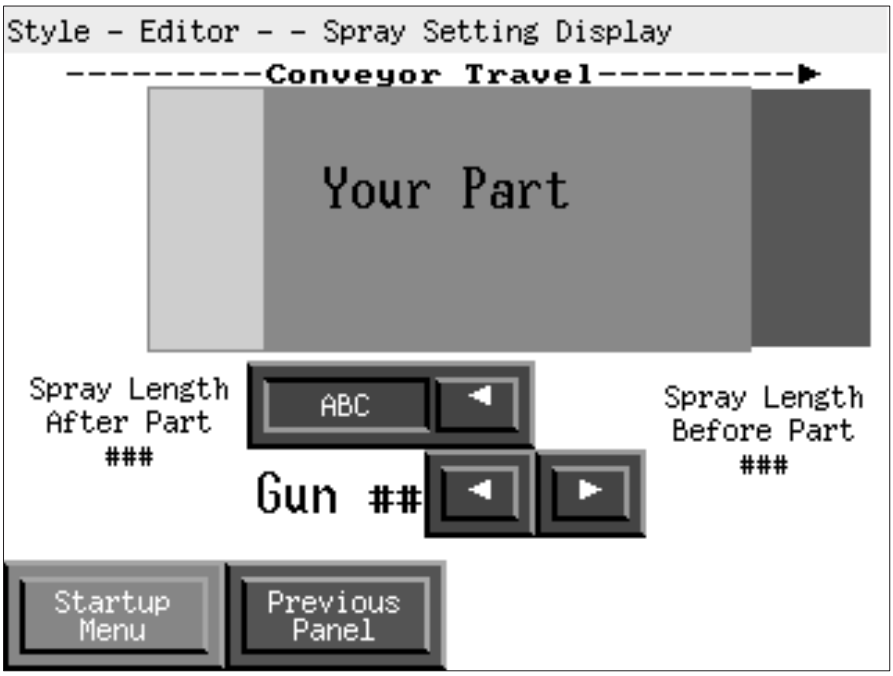
Screen G 2-23 Style Editor—Spray Length Settings

6. Touch the **Show Me** button. Screen G 2-24 appears, showing a visual representation of the currently selected spray length setting. Touch the **Previous Panel** button to return to Screen G 2-23.
7. Repeat steps 1-5 to adjust the spray length settings for other guns and styles.

   NOTE: Refer to *Copy Style Settings* to apply a gun's or style's parameters to other guns or styles.

8. Touch the **Show Styles** button to see a list of all of the spray length and gun settings that you have programmed. See Screen G 2-25.

   NOTE: Newly changed settings that have not been accepted will not be displayed.



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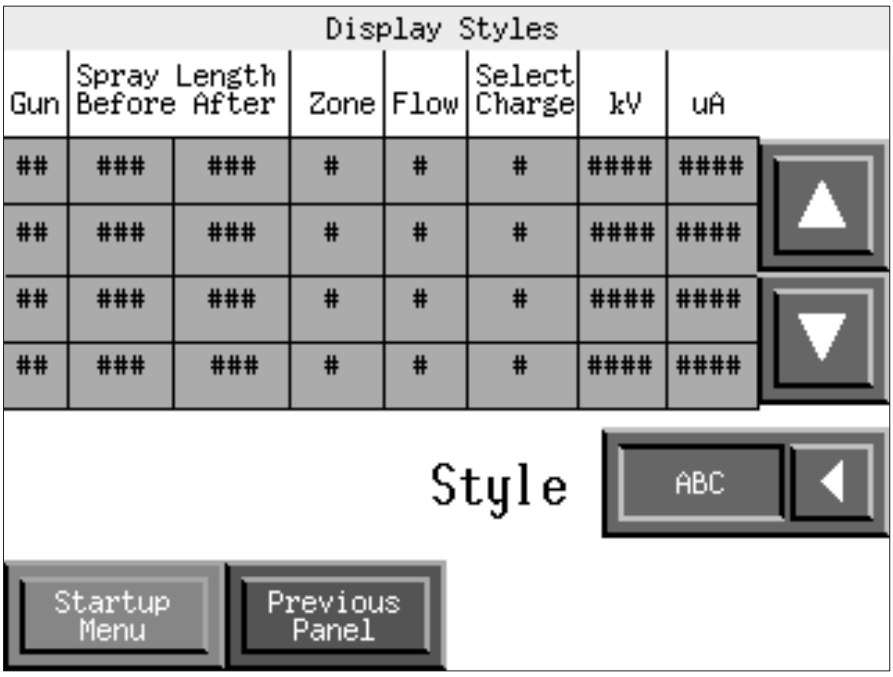
Screen G 2-24 Spray Setting Display



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Screen G 2-25 Display Styles

9. Touch the **Edit Gun Settings** button on Screen G 2-23 to proceed to the *Gun Settings* procedure.

Application Examples

NOTE: Any of the spray settings described in the examples may be combined to achieve desired results. Refer to *Extended Leading Edge, Restricted Trailing Edge* for an example of a spray pattern combining both extended and restricted patterns.

Perfect Pickoff Example

See Figure G 2-3. A perfect pickoff spray pattern occurs when the guns start spraying just as the leading edge of the part reaches the gun, and stops just as the trailing edge of the part passes the gun. Because the conveyor is moving forward while the guns turn on and off, the leading and trailing edges are not coated as well as the middle.

Before Part Spray Length: 0
After Part Spray Length: 0

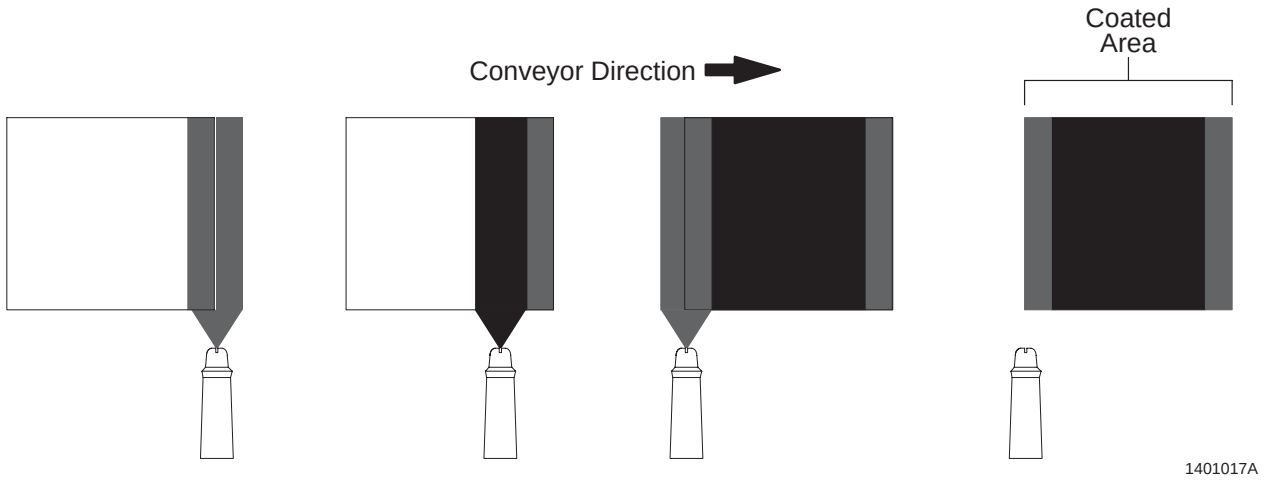


Figure G 2-3 Perfect Pickoff Spray Pattern

Extended Spray Example

See Figure G 2-4. An extended spray pattern occurs when the guns start spraying 5 units before the leading edge of the part reaches the guns, and stop spraying 5 units after the trailing edge of the part passes the gun. An extended spray pattern allows for the entire part to be coated consistently.

Before Part Spray Length: 5
After Part Spray Length: 5

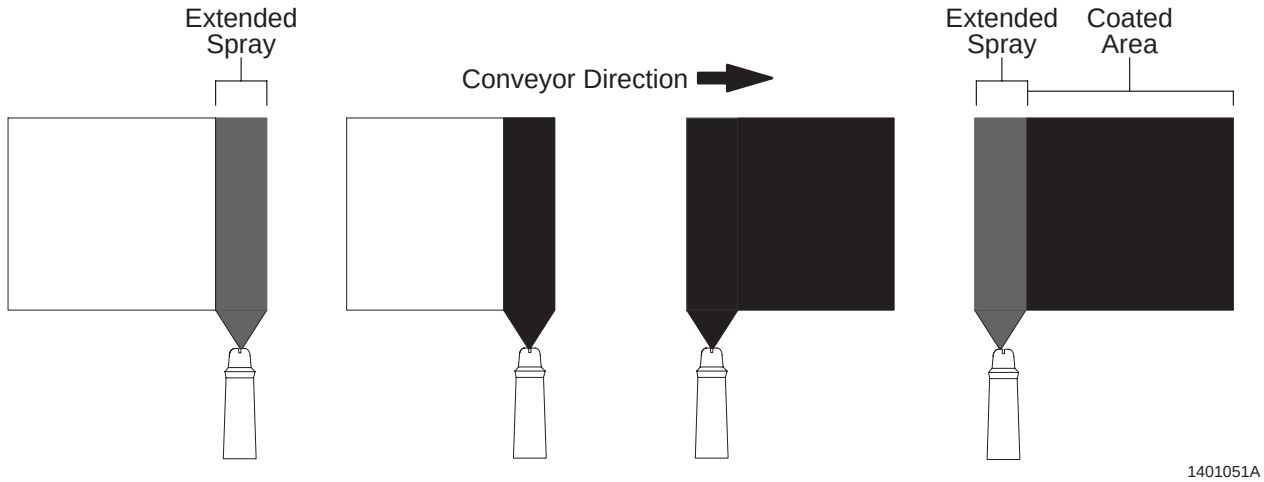


Figure G 2-4 Extended Spray Pattern

Restricted Spray Example

See Figure G 2-5. A restricted spray pattern occurs when the guns start spraying 3 units after the leading edge of the part reaches the guns, and stop spraying 3 units before the trailing edge of the part reaches the gun. A restricted spray pattern allows critical edges of parts to remain powder-free, while thoroughly coating the middle of the part.

Before Part Spray Length: -3
After Part Spray Length: -3

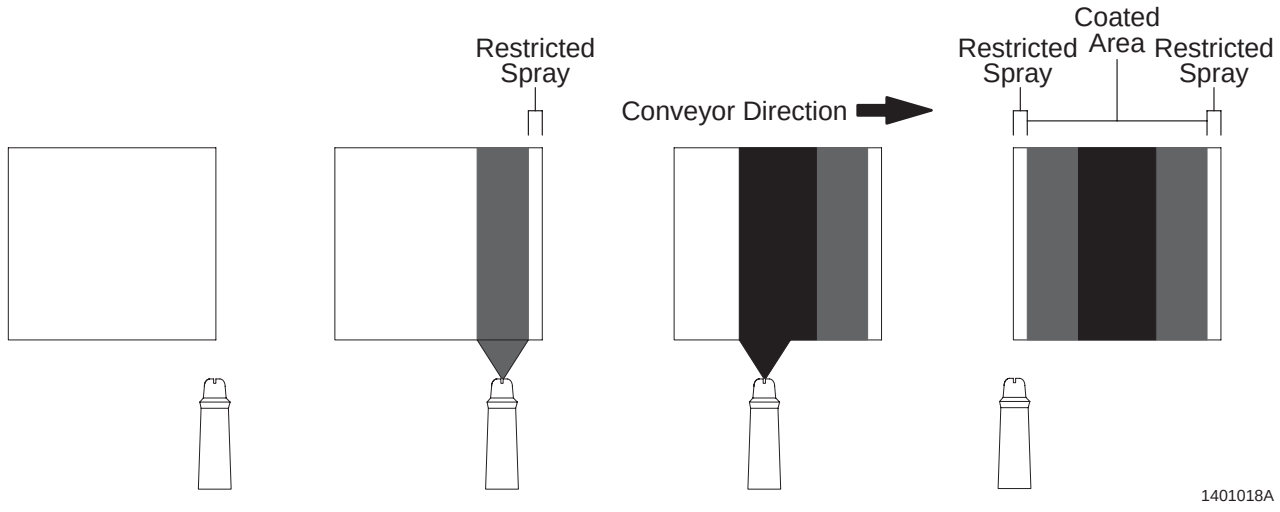


Figure G 2-5 Restricted Spray Pattern

Extended Leading Edge, Restricted Trailing Edge Example

See Figure G 2-6. This spray pattern causes the guns to start spraying 5 units before the leading edge of the part reaches the guns, and stop spraying 3 units before the trailing edge of the part reaches the guns. This combination allows the trailing edge to remain powder-free, while the leading edge and middle are thoroughly coated.

Before Part Spray Length: 5
After Part Spray Length: -3

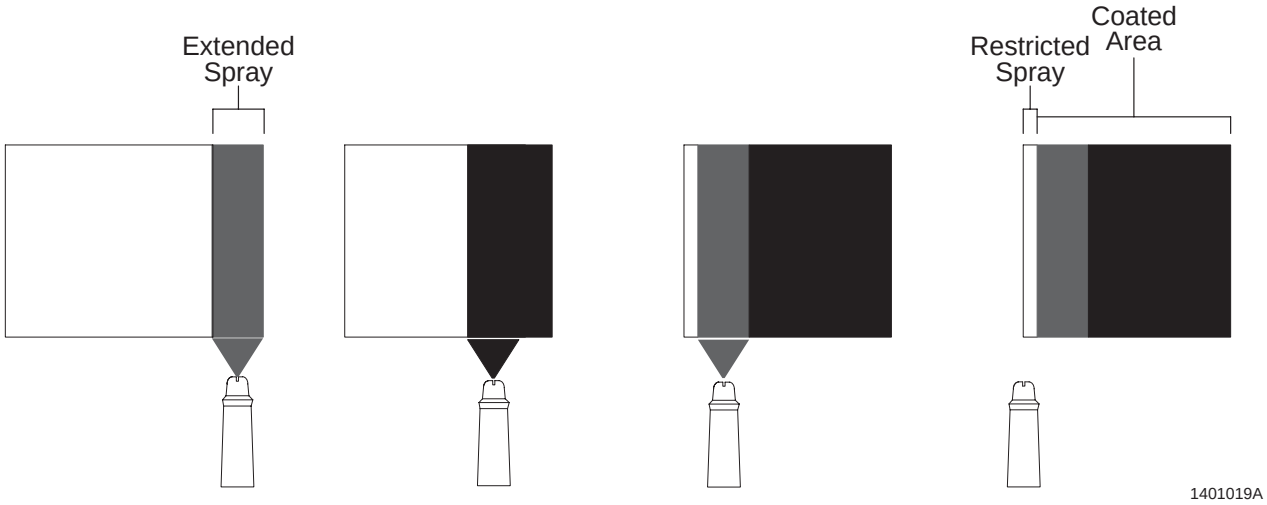


Figure G 2-6 Extended Leading Edge, Restricted Trailing Edge Spray Pattern

Gun Settings

The following procedure allows you to adjust the spray characteristics of each gun for each style. This procedure allows you to set a gun's electrostatic set points, Select Charge mode, AFC, and flow selection (if applicable) for each style.

1. Refer to Table G 2-11. Access the **Style Editor—Gun Settings** screen by touching one of the following buttons.

Table G 2-11 Gun Settings Screen Access

Source Screen	Button
Startup Menu—Setup	**Style Adjustment**
Style Editor—Spray Length Settings	**Edit Gun Settings**

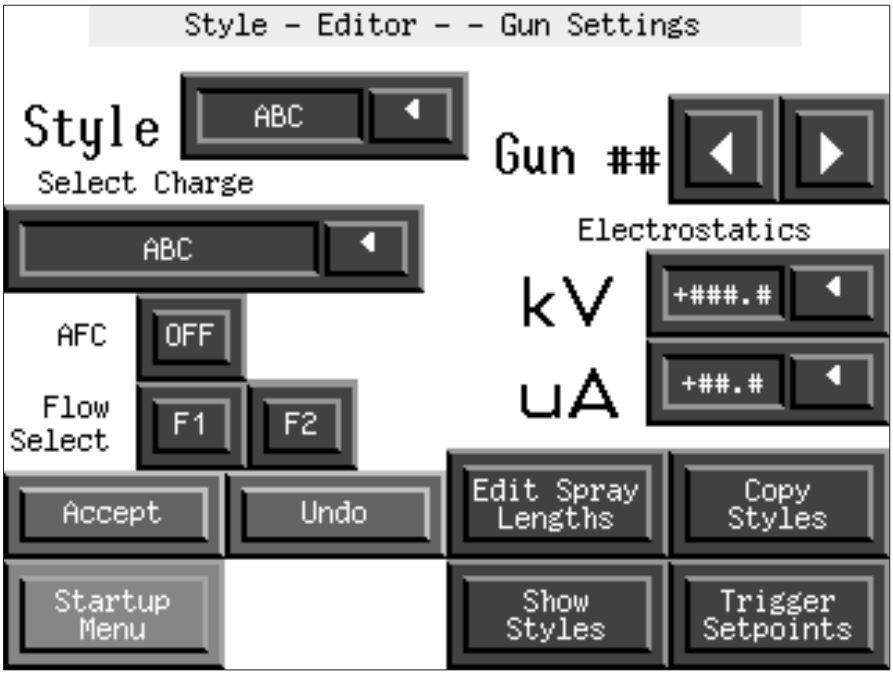
2. See Screen G 2-26. Select the gun and style that you want to adjust.
   - Touch the arrow buttons to select the appropriate gun.
   - Touch the **Style** selection box to select the appropriate style.

NOTE: Touch the **Accept** button to apply the **Electrostatics** and **Select Charge** values. The system will not apply these values until you touch the **Accept** button.

3. Select the appropriate **Select Charge** mode. Refer to the *Description* section in Part A: *System Overview*, for more information about Select Charge modes.
4. Touch the **AFC** button to turn AFC on or off as appropriate.
5. If your system has flow 1/flow 2 pneumatic modules, touch the appropriate **Flow Select** button.
6. Enter the appropriate electrostatic set points in the **kV** and **uA** fields.
7. Repeat steps 1-5 to adjust the gun settings for other guns and styles.

   NOTE: Refer to *Copy Styles Settings* to apply a gun's or style's parameters to other guns or styles.

NOTE: Record the spray length and style settings in the *System Settings* chart at the end of this section. Touch the **Show Styles** button to view a list of the style settings that you have entered.



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Screen G 2-26 Style Editor—Gun Settings

Copy Style Settings

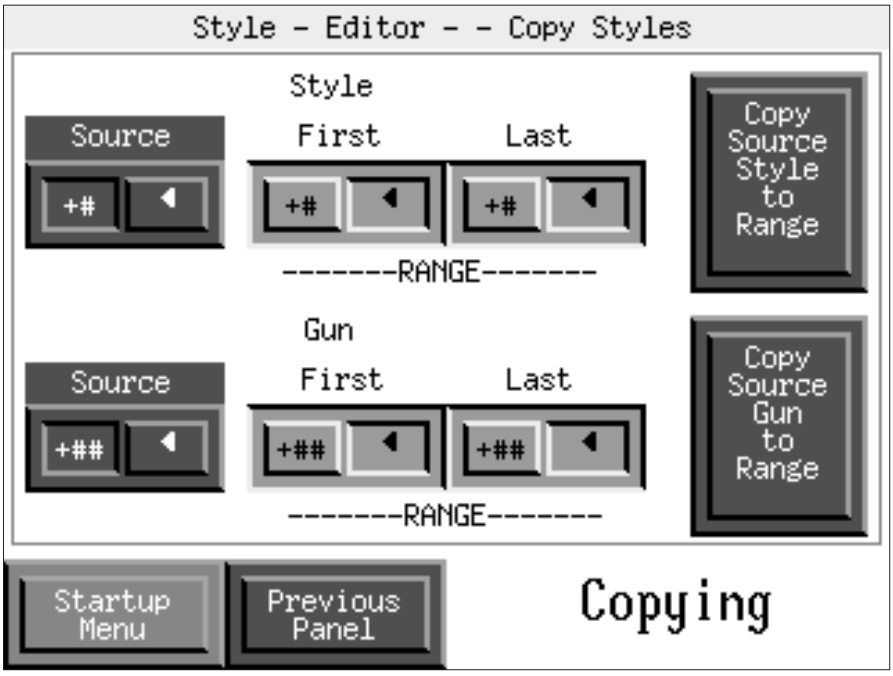
When entering spray length and gun settings, use the copy styles function to copy one set of gun or style settings to other guns or styles. This allows you to enter redundant information in only one place and copy it to as many guns or styles as necessary, instead of entering the same information several times.

NOTE: When you copy a style, all style settings, including F1/F2, electrostatic, and spray length settings, are copied at the same time.

1. Access the **Style Editor—Spray Length Settings** or **Gun Settings** screen for the properties that you want to copy.
2. Touch the **Copy Styles** button. The **Copy Styles** screen appears.

NOTE: All fields on the **Copy Styles** screen are initially set to default settings to prevent accidental copy operations.

3. See Screen G 2-27. You may copy style settings to either a range of styles or a range of guns. Select the style or gun that you want to copy the settings.
   - If you are copying style settings, enter the style number that you want to copy in the **Style Source** field.
   - If you are copying gun settings, enter the gun number that you want to copy in the **Gun Source** field.



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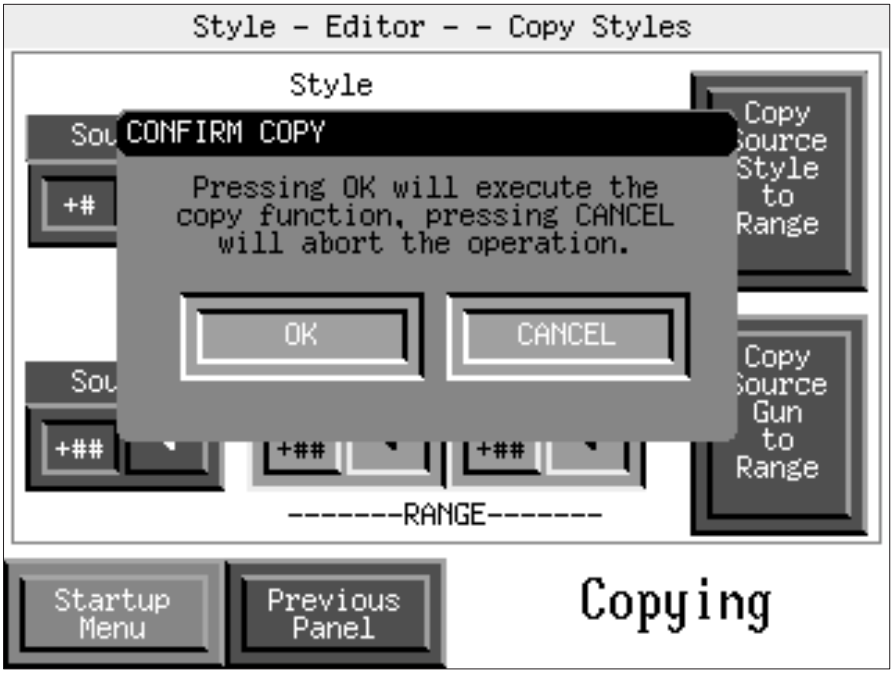
Screen G 2-27 Copy Styles

4. Enter the range of styles and/or guns to which you want to apply the source style or gun settings. Refer to *Examples* for sample copy operations.
5. Touch the appropriate **Copy Source to Range** button. The **CONFIRM COPY** window appears.
6. See Screen G 2-28. Touch the **OK** or **CANCEL** button as appropriate to apply or cancel the copy operation.
   - Touching **OK** will apply the source settings to the range of guns or styles that you specified.
   - Touching **CANCEL** will return you to the **Copy Styles** screen. You can then either adjust the values as appropriate and resume the copy operation or resume normal operation with the current settings.



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Screen G 2-28 Confirm Copy

Copy Style Examples

NOTE: The value in the **Last** field must be equal to or greater than the value in the **First** field.

Copying One Gun's Settings to a Range of Guns

Refer to Table G 2-12 to copy the style settings for gun 1, style 0 to guns 2-14.

NOTE: You must set the source style (0-8) and the source gun (1-number of guns in the system).

Table G 2-12 Copying One Gun's Settings to a Range of Guns

Style		
Source	**First**	**Last**
0	#	#
Gun		
Source	**First**	**Last**
1	2	14
Touch the **Copy Source Gun to Range** button to apply the copy operation.		

Copying One Gun's Settings to a Range of Styles

Refer to Table G 2-13 to copy the style settings for gun 1, style 0 to styles 1-8.

NOTE: You must set the source style (0-8) and the source gun range (first and last are the same gun if copying a single gun's settings).

Table G 2-13 Copying One Gun's Settings to a Range of Styles

Style		
Source	**First**	**Last**
0	1	8
Gun		
Source	**First**	**Last**
#	1	1
Touch the **Copy Source Style to Range** button to apply the copy operation.		

Copying a Range of Gun Settings to a Range of Styles

Refer to Table G 2-14 to copy the style settings for all guns (in a 10-gun system), style 0 to styles 3-5.

NOTE: You must set the source style (0-8) and the source gun range (1-number of guns in the system).

Table G 2-14 Copying a Range of Gun Settings to a Range of Styles

Style		
Source	**First**	**Last**
0	3	5
Gun		
Source	**First**	**Last**
#	1	10
Touch the **Copy Source Style to Range** button to apply the copy operation.		

Configuration Charts

Use the following charts to record the settings that you have entered during the configuration process. Use these charts as a reference when reestablishing settings if the system software is updated.

NOTE: Remember to update these charts if you change your configuration settings.

System Settings

NOTE: The system settings were set during the initial configuration process. Update this chart if you adjust any of the system parameters through the configuration map.

Step	Setting	Field	Value
3	Conveyor Encoder Resolution	Part Size	
		Size in Counts	
4	System Resolution	Maximum Lead/Lag	
		System Resolution (in./cm)	
5	Encoder Settings	Encoder resolution (X1 or X2)	
		Loss of encoder alarm time limit	
		Conveyor START to guns spray ON delay	
		Conveyor STOP to guns spray OFF delay	
6	Photoeye Settings	Zone PE 1 thru: ____	
		Flag PE ____ thru ____	
7	Photoeye Zone Settings	Refer to *Photoeye Zone Assignment* for a chart	
8	Zone Photoeye Filter Settings	1	
		2	
		3	
		4	
		5	
		6	
9	Flag Photoeye Filter Settings	1	
		2	
		3	
		4	
		5	
		6	
		7	
		8	

Continued...

Step	Setting	Field	Value
10	Style Flag Settings	Operation (Batch or Flag)	
		Reset (Count or Next Flag)	
		Reset Count	
		Gap Length	
		Valid Length	
11	Flag Type	Straight or Encoded	
13	Perfect Pickoff Points (Guns)	1	
		2	
		3	
		4	
		5	
		6	
		7	
		8	
		9	
		10	
		11	
		12	
		13	
		14	
		15	
		16	

Photoeye Zone Assignment

Use the following chart to record which photoeyes have been assigned to which zones.

Zone	Photoeye					
	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						

Style Settings

Copy this information from the **Display Styles** screen for each style.

Gun	Style 0							
	Spray Length		Photoeye Zone	Flow Select (F1/F2)	Select Charge	kV	uA	AFC (on/off)
	Before	After						
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								

Gun	Style 1							
	Spray Length		Photoeye Zone	Flow Select (F1/F2)	Select Charge	kV	uA	AFC (on/off)
	Before	After						
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								

Gun	Style 2							
	Spray Length		Photoeye Zone	Flow Select (F1/F2)	Select Charge	kV	uA	AFC (on/off)
	Before	After						
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								

Gun	Style 3							
	Spray Length		Photoeye Zone	Flow Select (F1/F2)	Select Charge	kV	uA	AFC (on/off)
	Before	After						
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								

Style Settings *(contd)*

Gun	Style 4							
	Spray Length		Photoeye Zone	Flow Select (F1/F2)	Select Charge	kV	uA	AFC (on/off)
	Before	After						
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								

Gun	Style 5							
	Spray Length		Photoeye Zone	Flow Select (F1/F2)	Select Charge	kV	uA	AFC (on/off)
	Before	After						
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								

Gun	Style 6							
	Spray Length		Photoeye Zone	Flow Select (F1/F2)	Select Charge	kV	uA	AFC (on/off)
	Before	After						
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								

Gun	Style 7							
	Spray Length		Photoeye Zone	Flow Select (F1/F2)	Select Charge	kV	uA	AFC (on/off)
	Before	After						
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								

Style Settings *(contd)*

Gun	Style 8							
	Spray Length		Photoeye Zone	Flow Select (F1/F2)	Select Charge	kV	uA	AFC (on/off)
	Before	After						
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								

Resetting the System

The application controller may be reset in one of two ways:

- Installing new software (cold start is automatically initiated)
- Performing the *Cold Start* procedure

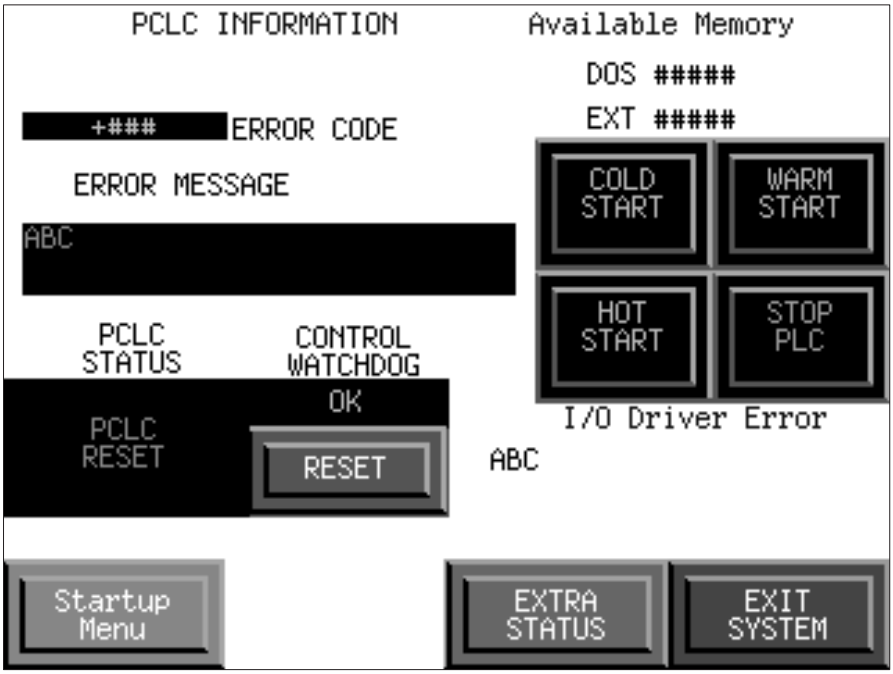
CAUTION: Performing a cold start erases all system parameters. Complete the *Configuration Charts* to make sure that you have a record of your system operating parameters before performing the following procedure.

Cold Start

If you cold start the system, you must reset the time and date and run the system tests to make sure that the system is functioning properly. You must complete these procedures before proceeding with the rest of the configuration process.

NOTE: This procedure may only be performed by Supervisors or Nordson Service personnel. Operators and Lead Operators do not have sufficient access rights to perform a cold start.

1. Touch the **Special Functions** and **Program Control** buttons on the Startup Menu. The **PCLC INFORMATION** screen appears.
2. See Screen G 2-29. Touch the **STOP PLC** button and then touch the **COLD START** button. The application controller completely shuts down and starts up again.



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Screen G 2-29 PCLC Information

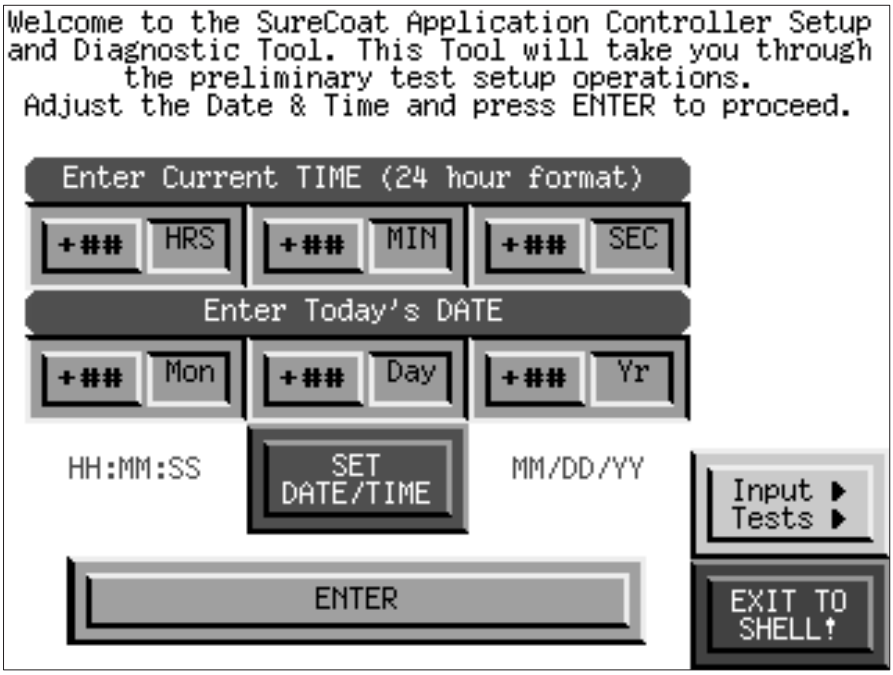
Cold Start *(contd)*

3. See Screen G 2-30. When the application controller starts up again, reset the time and date using the following steps.
   a. Enter the current time and date in the data entry fields.
   b. Touch the **SET DATE/TIME** button. The date and time appear on either side of the **SET DATE/TIME** button.

   NOTE: The time appears in a 24-hour format.

   If the time and date are incorrect, repeat steps a and b.

   c. When you are satisfied with the time and date settings, touch the **ENTER** button to save the time and date settings.



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Screen G 2-30 Time and Date

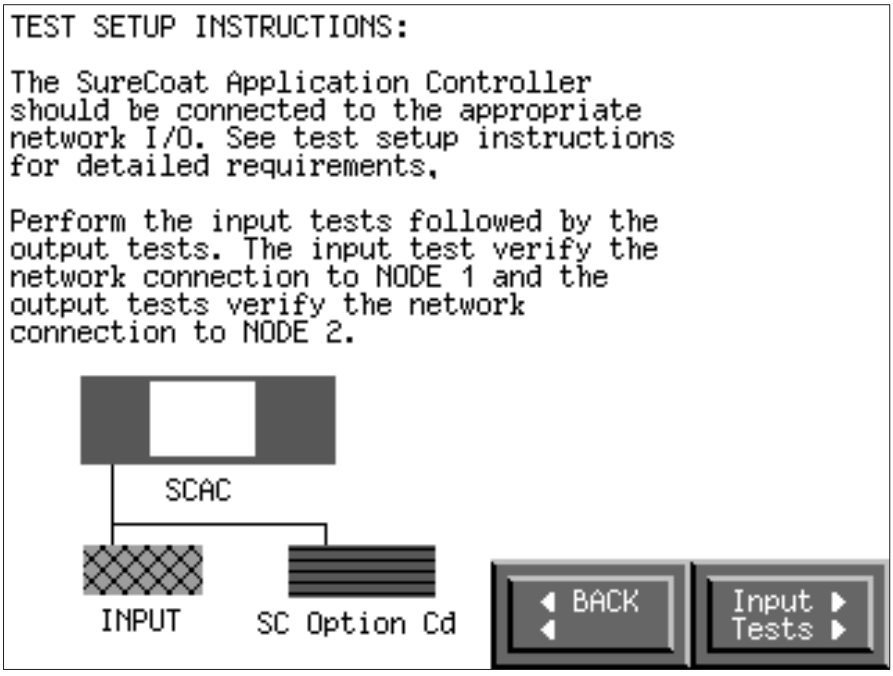
Input and Output Tests

After you have set the date and time, use the following procedure to perform the application controller's initial input and output tests.

NOTE: These are factory tests. If you have performed a cold start on an existing system, you may disregard this procedure.

1. Touch the **Input Tests** button.

   Screen G 2-31 appears, displaying information about the testing that must be done.



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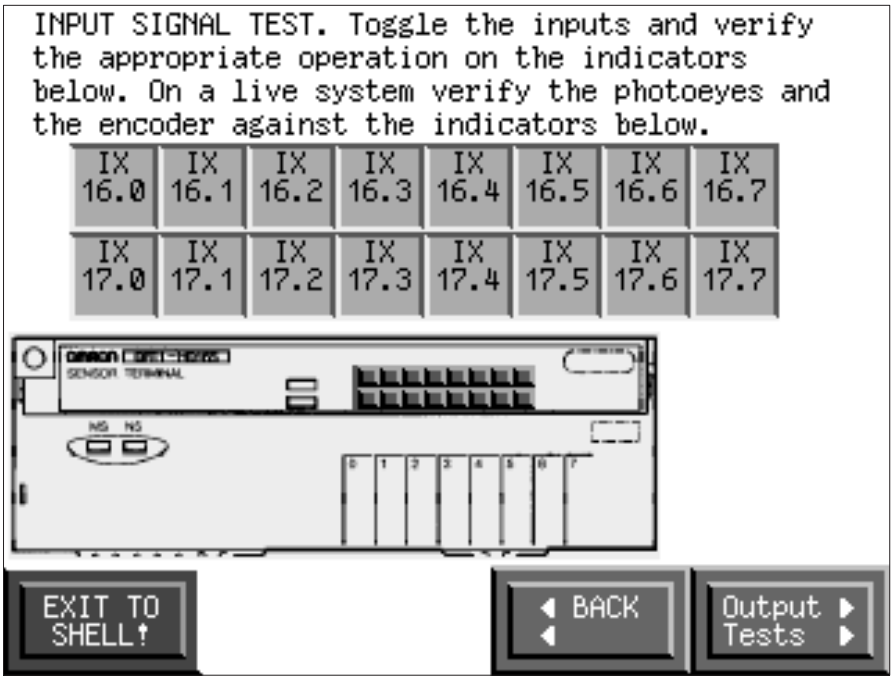
Screen G 2-31 Test Setup Instructions

2. Touch the **Input Tests** button.

   Screen G 2-32 appears, displaying the information necessary to perform an input signal test.

Input and Output Tests *(contd)*

The input test instructions tell you to toggle the inputs. To do this, run the conveyor and observe the **16.0** indicator. Block the photoeyes and observe indicators **16.1** through **17.6**.



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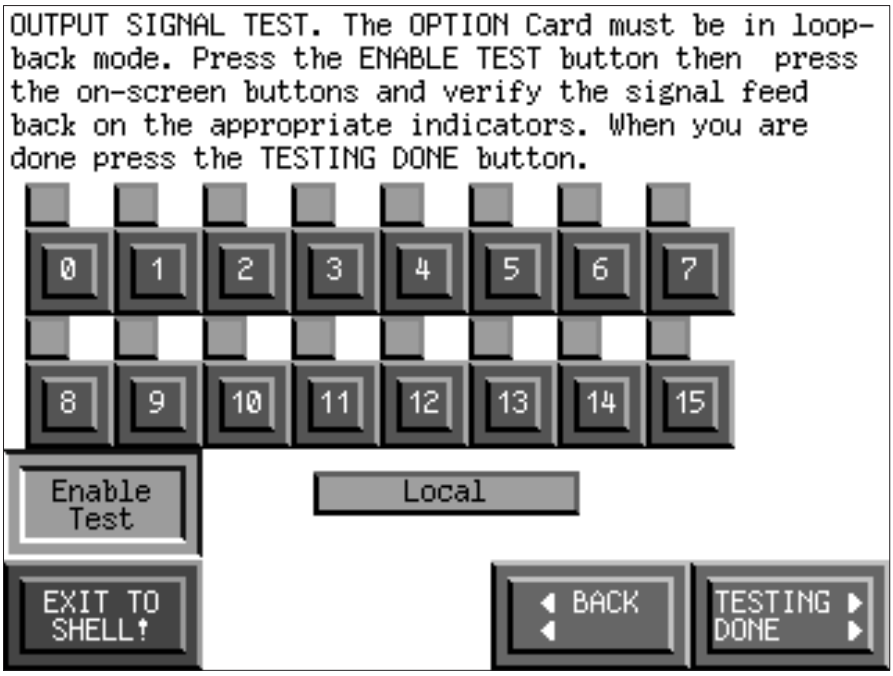
Screen G 2-32 Input Signal Test

3. Touch the **Output Tests** button.

   Screen G 2-33 appears, showing a graphical representation of the outputs. This screen allows the user to verify that the interface card is functioning properly.



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Screen G 2-33 Output Signal Test

4. Touch the **Enable Test** button to begin the output test.
5. Touch and hold the numbered buttons one at a time to make sure that the outputs are all functioning. Each red output indicator will change to green and the corresponding gun will trigger.
6. Touch the **Test Enabled** button to end the output test.
7. Touch the **TESTING DONE** button.

   Screen G 2-4 appears, allowing you to continue with system configuration. Refer to the procedures at the beginning of this section for instructions for completing the configuration process.

Section G 3
Operation

WARNING: Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.

This section explains basic startup, monitoring, adjustment, and shutdown procedures. Refer to your other powder application equipment manuals for additional startup procedures.

Common Procedures

Table G 3-1 lists common operating procedures. Procedures listed in the Refer to column are in this part of the manual.

Table G 3-1 Common Operating Procedures

Procedure	Refer to
Start up the application controller	*Startup*
Monitor gun operation and status	*Status Monitoring—Guns*
Monitor photoeye and encoder status	*Status Monitoring—Photoeyes and Encoder*
View faults	*Status Monitoring—Controller and Gun Faults*
Switch between automatic and manual control	*Control Functions—Changing Control Modes*
Trigger guns manually	*Control Functions—Manual Triggering*
Manually switch styles/style modes	*Control Functions—Changing Style Modes*
Change spray length settings	*Trigger Adjustment*
Change style settings	*Style Adjustment*
Adjust purge settings	*Purge Control*
Shut down the application controller	*Shutdown*

Startup

NOTE: The application controller should turn on when power is applied to the modular gun control system. If the application controller does not turn on, turn the power switch on the back of the application controller to the on position. It may take up to $1^1/_2$ minutes for the application controller to load its system software.

1. Start up the Sure Coat modular gun control system. Refer to the *Operation* section in Part A: *System Overview*, for instructions.
2. The white **Touch to Configure** screen appears, displaying a clock counting down from 10 seconds.
   - To operate the system using the existing parameters, let the time on the clock expire and proceed to step 3.
   - To enter the configuration mode, touch the screen before the clock reaches 0. Refer to Table G 3-2. Touch the appropriate button to select your system's input module.

Table G 3-2 Input Module Configuration

Button	Description
1. System uses 7 or less eyes DTR1-8	Systems with either three- or seven-eye photoeye junction box
2. System uses 8 or more eyes DTR1-16	Systems with a fifteen-eye photoeye junction box
EXIT WITHOUT CHANGE	No change—start system using current photoeye junction box configuration

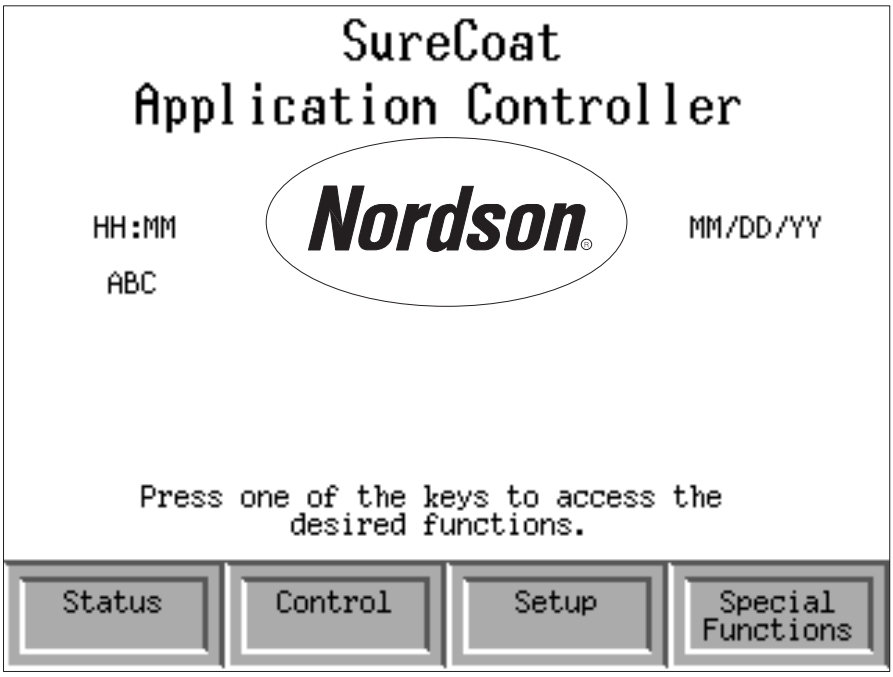
Refer to Table G 3-3. Touch the appropriate button to continue.

Table G 3-3 Accept or Reject Input Module Configuration

Button	Description
TOUCH TO ACCEPT CHANGE	Start the system using the new input module configuration
EXIT WITHOUT CHANGES	Restart the system

3. Screen G 3-1 appears when the self test is complete. Use the Startup Menu to locate the operation functions described in this section.

NOTE: To return to the Startup Menu from any screen, touch the green **Startup Menu** button.



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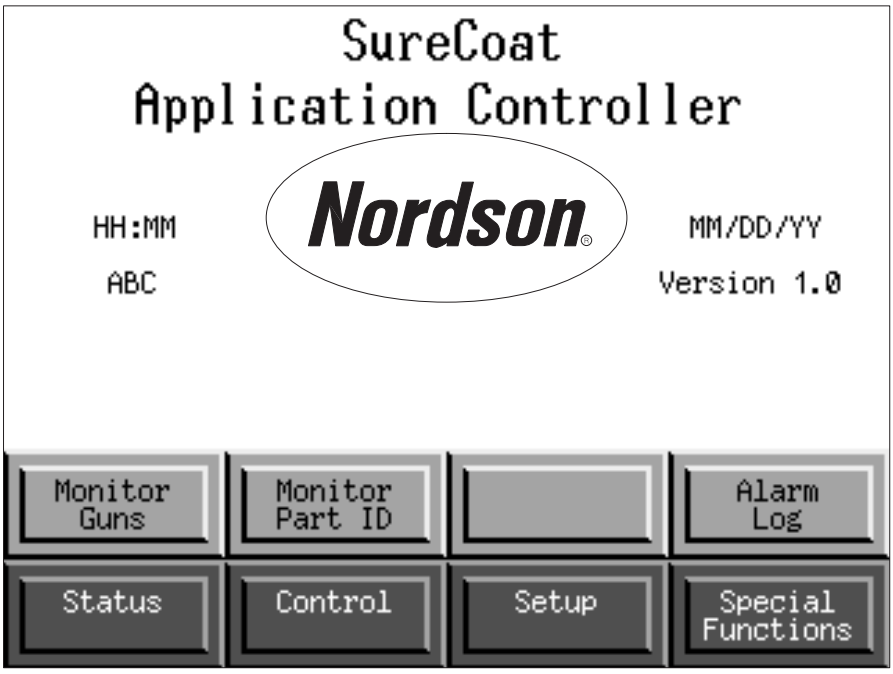
Screen G 3-1 Startup Menu

Status Monitoring

See Screen G 3-2. Touch the **Status** button on the Startup Menu to access the status monitoring functions. Use the following procedures to monitor the status of the guns, photoeyes, and encoder.



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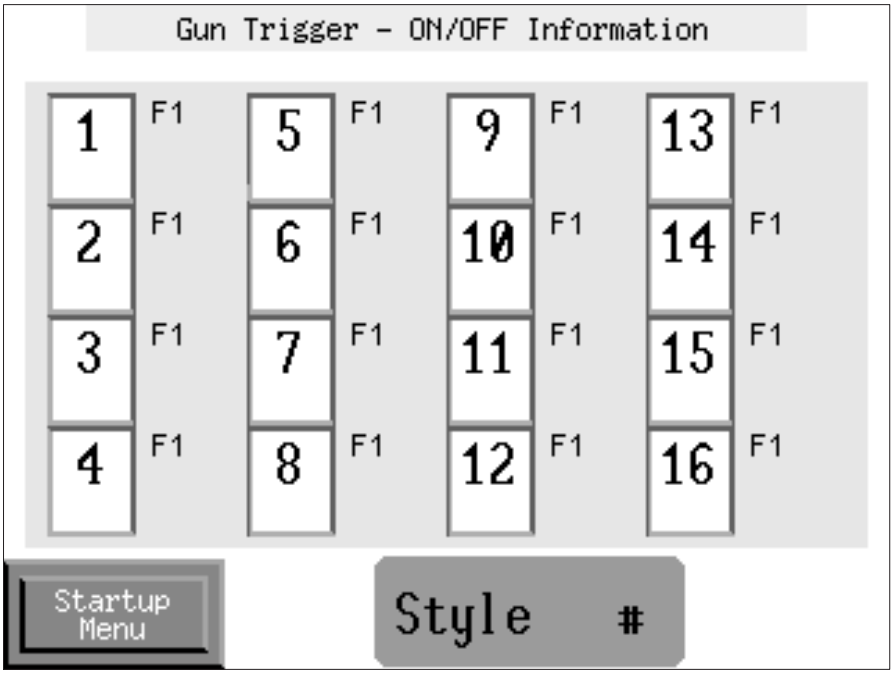
Screen G 3-2 Startup Menu—Status Functions

Monitor Guns

1. See Screen G 3-2. Touch the **Monitor Guns** button to view the status of the guns. The **Gun Trigger On/Off Information** screen appears.
2. Screen G 3-3 displays the current status of all guns in the system. Refer to Table G 3-4 for a description of the indicators on the gun monitoring screen.

Table G 3-4 Gun Monitoring Screen Indicators

Indicator	Status	Meaning
Gun (#)	Black	Gun is off
	Green	Gun is triggered
	Red	Gun is triggered; fault is detected
F1	Green	Flow rate 1 air pressure is active
F2	Green	Flow rate 2 air pressure is active
AFC	Green	AFC function is active
Style (#)	Number displayed	Current active style (for gun 1)
NOTE: Other guns may be operating using other styles, but the active style on this screen always represents gun 1.		



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Screen G 3-3 Monitor Guns

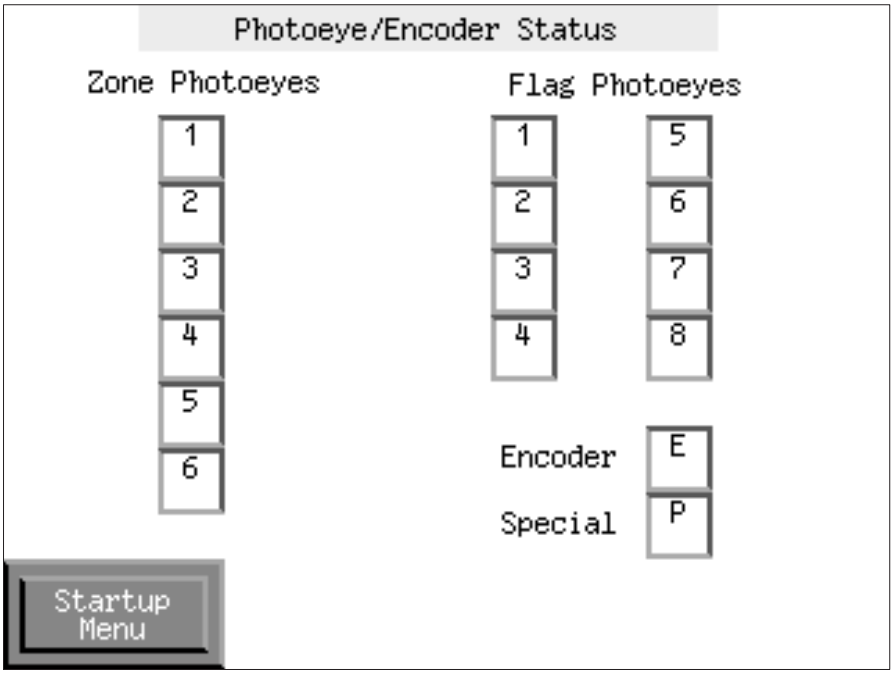
Monitor Part ID

1. See Screen G 3-2. Touch the **Monitor Part ID** button to view the status of the photoeyes and encoder. The photoeye/encoder status screen appears.
2. Screen G 3-4 displays the current status of the encoder and the zone and flag photoeyes.

   Refer to Table G 3-5 for a description of the indicators on the photoeye/encoder status screen.

Table G 3-5 Photoeye/Encoder Status Screen Indicators

Indicator	Status	Meaning
Zone photoeye (#)	Black	Zone photoeye does not detect a part
	Green	Zone photoeye detects a part
Flag photoeye (#)	Black	Flag photoeye does not detect a flag
	Green	Flag photoeye detects a flag
Encoder (**E**)	Green (blinking)	Encoder detects conveyor travel
Special (**P**)	Not used in this system	Not used in this system



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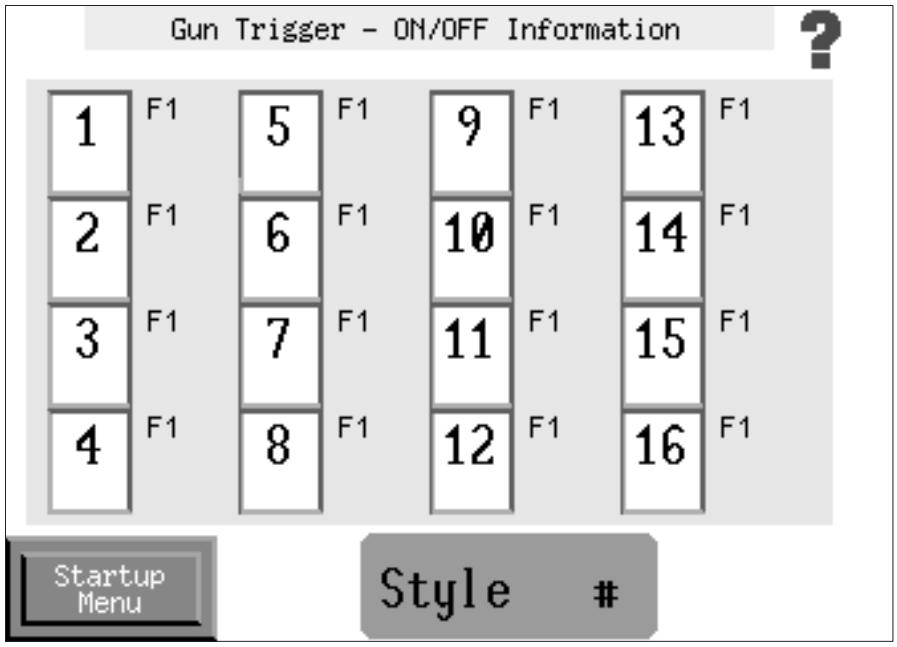
Screen G 3-4 Photoeye/Encoder Status

Alarm Log

Identifying Faults

See Screen G 3-5. The **?** icon in the upper right-hand corner of a screen indicates that a fault has occurred.



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Screen G 3-5 Typical Indication of a Fault

Touch the **?** icon to view controller faults.

See Screen G 3-6. The **ALARM SUMMARY** screen shows the system's active and inactive faults.

The top half of the **ALARM SUMMARY** screen lists the time that each fault occurred, a brief description of each fault, and the total number of current active and inactive faults. Alarms appear in either of the following two colors:

- **Green:** Active fault
- **Gray:** Inactive/acknowledged fault

Viewing Fault Descriptions

When the fault selector is active, the bottom, **Fault Description** half of the screen shows a detailed description of a single fault.

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Screen G 3-6 Alarm Summary

Clearing and Acknowledging Faults

Faults that do not critically affect system operation may be acknowledged. The system may still operate if several non-critical faults are present and have been acknowledged.

Critical faults may not be acknowledged. A critical fault requires immediate operator intervention before the fault is cleared and the system may properly operate.

Refer to the *Troubleshooting* section in this part of the manual for a list of faults and corrective actions.

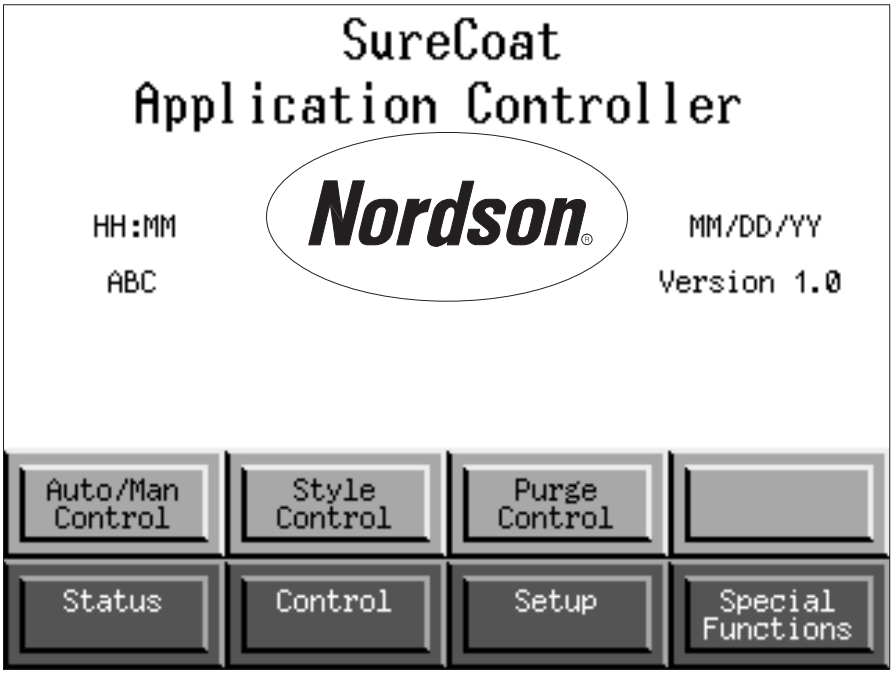
See Screen G 3-6 and refer to Table G 3-6 for a description of the buttons on the **ALARM SUMMARY** screen.

Table G 3-6 Alarm Summary Screen Buttons

Button	Function
▲	Scrolls up list of faults
▼	Scrolls down list of faults
◀	Shows detailed description of faults in list
▶	Hides detailed description of faults in list
Last Panel	Returns the user to the previous panel
ACK ALARMS	Acknowledges a new, non-critical alarm; fault remains on the **ALARM SUMMARY** screen
CLEAR ALARMS	Clears an acknowledged alarm; removes fault from the screen
PRINTER indicator	Displays current status of printer **NOTE:** A printer currently may not be connected to the application controller. Contact your Nordson representative about questions regarding a system printer.

Control Functions

See Screen G 3-7. Touch the **Control** button on the Startup Menu to access the system control functions.

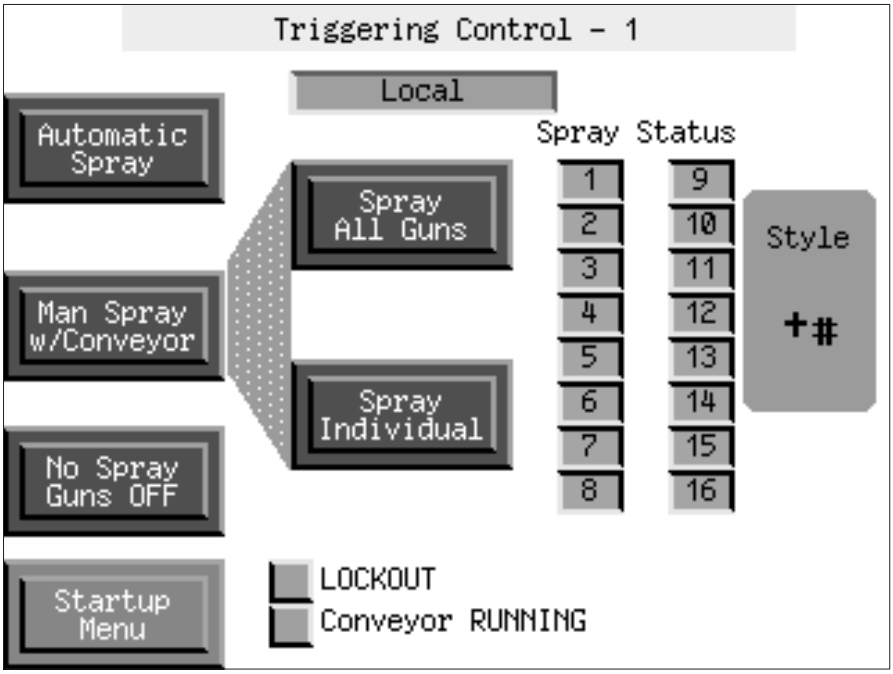


Screen G 3-7 Startup Menu—Control Functions

Automatic/Manual Control Modes

See Screen G 3-7. Touch the **Auto/Man Control** button on the Startup Menu. Screen G 3-8 appears.

Refer to Table G 3-7 for a description of the functions available on the triggering control screen.



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Screen G 3-8 Triggering Control - 1

Table G 3-7 Triggering Control - 1 Screen Buttons and Indicators

Item	Function
Automatic Spray	Puts system in automatic mode (guns trigger and styles are chosen based on photoeyes detecting parts)
Man Spray w/Conveyor Interlock	Allows the operator to trigger guns manually while the conveyor is active Zone and flag photoeyes are not active; if the conveyor stops, guns do not trigger (**Spray ALL Guns** and **Spray Individual** buttons appear)
Spray ALL Guns	Triggers all guns at once
Spray Individual	Allows operator to control individual guns manually (trigger, AFC, F1/F2 manually selected by operator) Refer to *Manual Triggering* for more information
No Spray Guns OFF	Stops all guns from triggering; guns will not trigger until new trigger mode is selected
Spray Status (#) **Indicators**	Grey: Gun is not triggered Green: Gun is triggered Red: Gun is triggered; fault is detected
Style Indicator	Indicates which style is currently active (for gun 1)
Local/Remote Indicator	Blue: System is in remote mode (controlled through the application controller) Red (flashing): System is in local mode (controlled through the central controller)

Manual Triggering with Conveyor Interlock

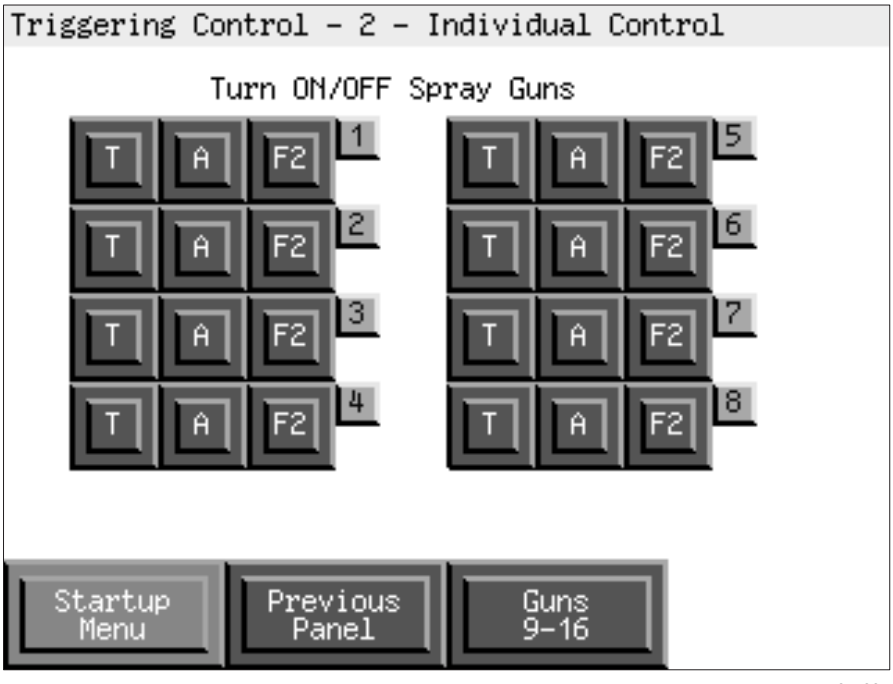
See Screen G 3-8. Touch the **Spray Individual** button to access the manual triggering controls. Screen G 3-9 appears, displaying the manual controls for the first eight guns.

Refer to Table G 3-8 for a description of the buttons and indicators on the manual triggering control screen.

Table G 3-8 Manual Triggering Control Screen Buttons and Indicators

Item	Description
T	Triggers corresponding gun (gun stays on until **T** button is touched again)
A	Turns on or off AFC of corresponding gun (pressed button indicates AFC is on)
F2	Switches corresponding gun to flow rate 2 air pressure (if applicable)
Gun Number Indicator	Blue: Gun is not triggered Green: Gun is triggered Red: Gun is triggered; fault is detected
Guns 9-16	Displays manual controls for guns 9-16

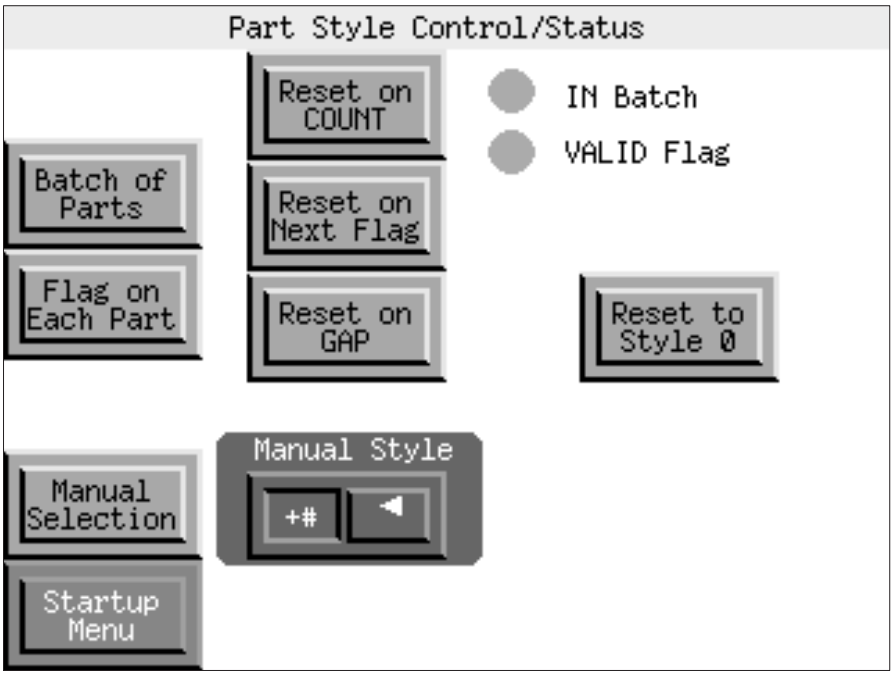
NOTE: If you touch the **Spray ALL Guns** button on Screen G 3-8, the **T** buttons on the manual triggering control screen will be illuminated but will not appear depressed.



Screen G 3-9 Triggering Control - 2 Individual Control

Style Control

See Screen G 3-7. Touch the **Style Control** button on the Startup Menu. Screen G 3-10 appears. Refer to Table G 3-9 for a description of the functions available on the part style control/status screen.



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Screen G 3-10 Part Style Control/Status

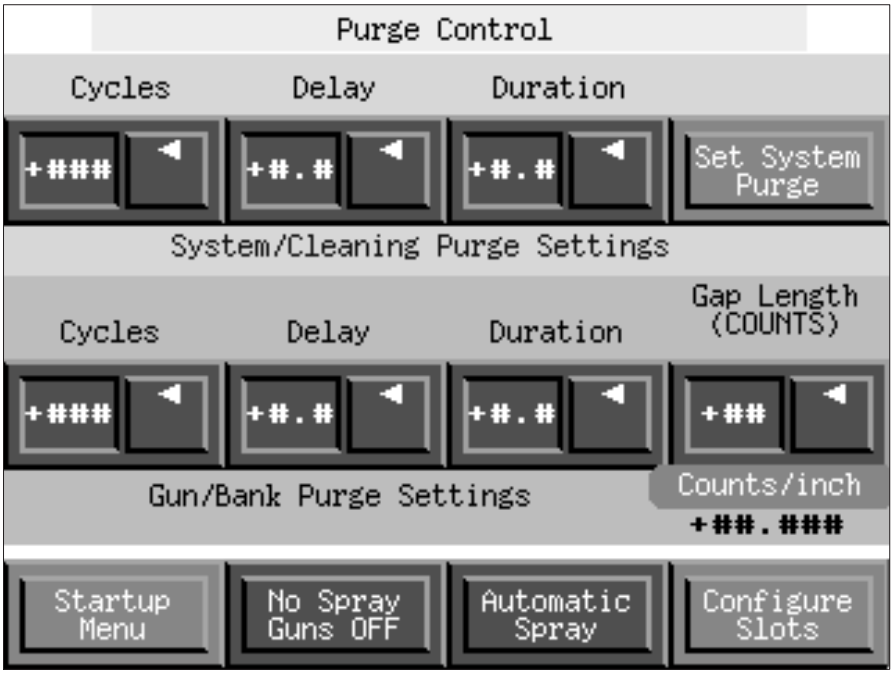
Table G 3-9 Part Style Control/Status Screen

Item	Function
Batch of Parts	Tells system that current group of parts is a batch; will coat parts using current style until one of the following events occurs: • Batch count expires • New style flag is detected • Gap between parts is detected • Operator manually resets style
Flag on Each Part	Tells system that each part on the conveyor has a style flag; controller resets to default style if no flag is detected
Manual Selection	Allows operator to manually select styles as appropriate
Reset on COUNT	Resets system to default style when encoder count reaches specified number
Reset on Next Flag	Resets system to default style when identical flag is detected
Reset on GAP	Resets system to default style when specified gap is detected
Reset to Style 0	Allows operator to manually reset the system to the default style
Manual Style	Allows operator to manually select a style **NOTE:** When you manually select a new style, the style change does not affect parts that have already been detected by the photoeyes. Parts that are between the photoeyes and the guns will be sprayed using the previous style.
IN Batch Indicator	Indicates that system is in batch mode
VALID Flag Indicator	Indicates that a valid style flag is being detected

Purge Control

NOTE: Your system may not have the gun purge option.

1. See Screen G 3-7. Touch the **Purge Control** button on the Startup Menu. The **Purge Control** screen appears.
2. Screen G 3-11. Refer to Table G 3-10 for a description of the buttons at the bottom of the **Purge Control** screen.



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Screen G 3-11 Purge Control

Table G 3-10 Purge Control Settings

System/Cleaning Purge Settings	
System/cleaning purge settings are not used on this system.	
Gun/Bank Purge Settings	
Cycles	Number of purge pulses that determine the overall gun purge cycle (0-255 cycles)
Delay	Number of seconds between pulses (0-1.5 seconds)
Duration	Number of seconds for each pulse (0-1.5 seconds)
Gap Length	Amount of space in between parts (1-32 encoder counts)
Buttons	
Startup Menu	Returns you to the Startup Menu
No Spray Guns OFF	Turns off all guns before beginning a manual system purge cycle
Automatic Spray	Allows the system to trigger the guns and purge the system automatically
Configure Slots	Accesses the **Purge Slot Configuration** screen (allows the user to assign individual guns to slots in the booth; all guns must be assigned to slot 1)

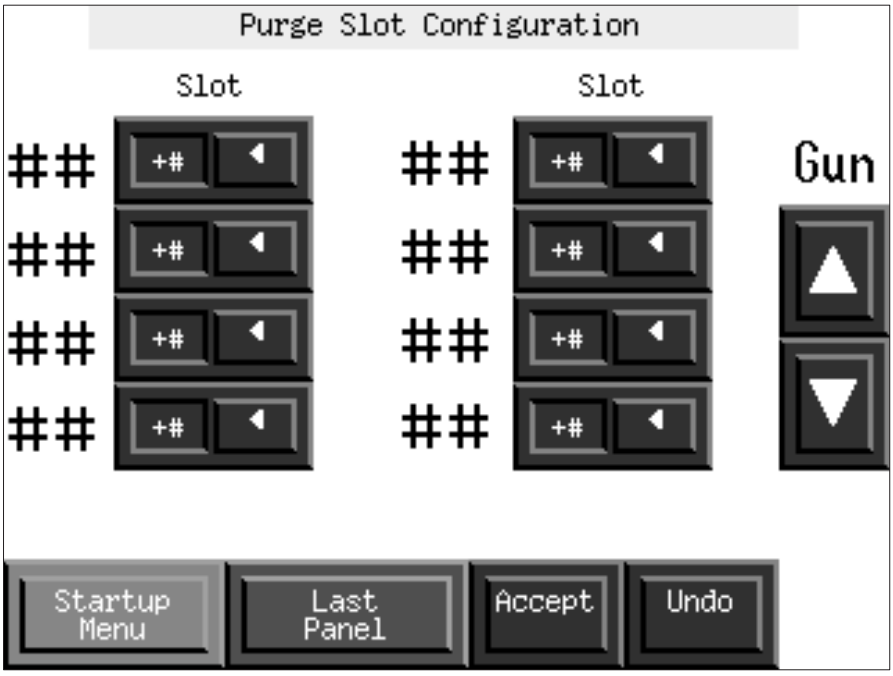
Purge Control *(contd)*

3. Touch the **Configure Slots** button to assign guns to banks in the booth. The **Purge Slot Configuration** screen appears.

   See Screen G 3-12. Assign all guns to slot 1.

NOTE: Touch the ▲ ▼ buttons to view the slot configuration for all guns in the system.

4. Touch either the **Accept** or **Undo** button as appropriate to apply or reject the settings.



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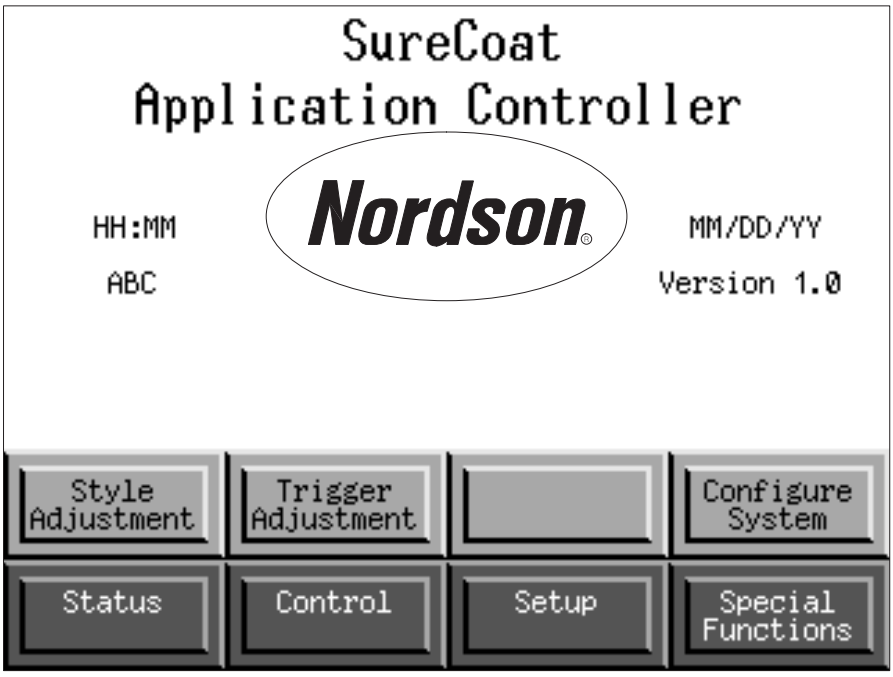
Screen G 3-12 Purge Slot Configuration

Setup Functions

See Screen G 3-13. Touch the **Setup** button on the Startup Menu to access the setup functions.

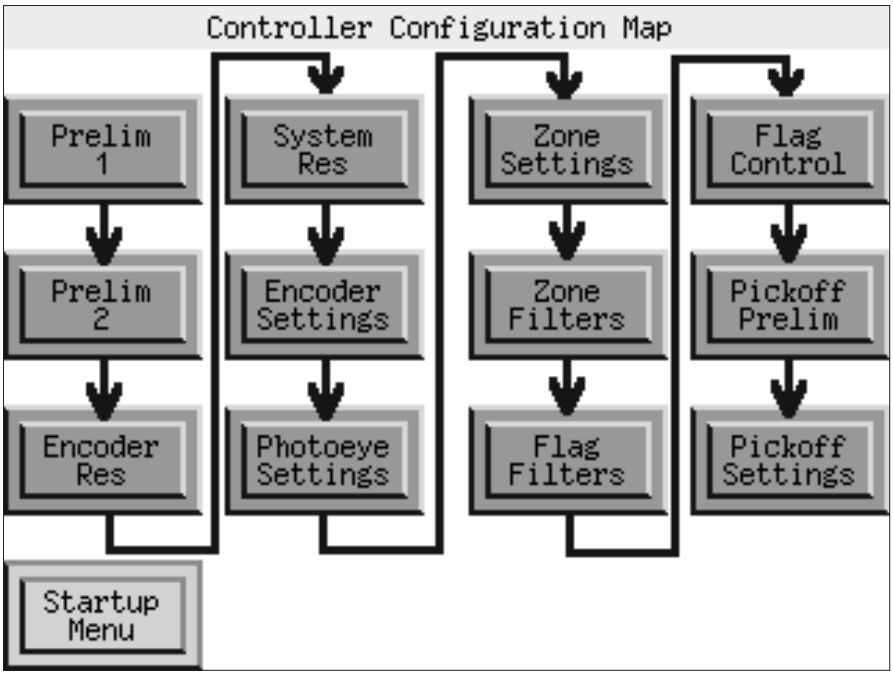
NOTE: Supervisors and Nordson Service are the only personnel with access rights to the setup functions.



Screen G 3-13 Startup Menu—Setup Functions

Button	Function
Style Adjustment	Touch the **Style Adjustment** button to quickly access the **Style Editor—Gun Settings** screen. Use this screen to adjust style settings as necessary after your system has been configured. Refer to *Gun Settings* in the *Configuration* section for more information about the **Style Editor—Gun Settings** screen.
Trigger Adjustment	**CAUTION:** Making changes to the trigger settings will affect the trigger timing of all styles for a gun.
	Touch the **Trigger Adjustment** button to quickly access the trigger adjustment (**Style Editor—Spray Length Settings**) screen. Use this screen to adjust pickoff point settings for each gun. Refer to *Spray Length Settings* and *Pickoff Point Settings* in the *Configuration* section for more information about trigger adjustments.
Configure System	Touch the **Configure System** button to access a map of the configuration procedures. See Screen G 3-14. Touch the button that corresponds to the system setting that you want to adjust. Refer to the *Configuration* section for information about adjusting each of the system settings.

Setup Functions *(contd)*



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Screen G 3-14 Controller Configuration Map

Section G 4
Troubleshooting

WARNING: Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.

This section explains procedures for using the application controller to identify faults in the modular gun control system. Refer to the manuals included with your other powder application equipment to troubleshoot the other components of your powder coating system.

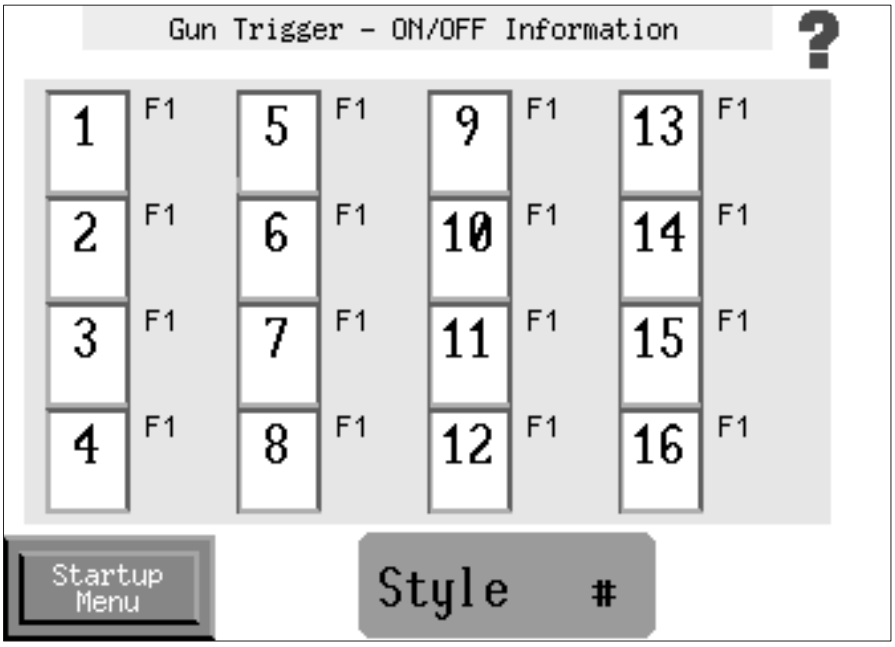
Viewing Faults

The following paragraphs describe how to identify and view detailed descriptions of faults using the **ALARM SUMMARY** screen.

Identifying Faults

See Screen G 4-1. The **?** icon in the upper right-hand corner of a screen indicates that a fault has occurred.

Touch the **?** icon to view controller faults.



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Screen G 4-1 Typical Indication of a Fault

Identifying Faults *(contd)*

See Screen G 4-2. The **ALARM SUMMARY** screen shows the system's active and inactive faults.

The top half of the **ALARM SUMMARY** screen lists the time that each fault occurred, a brief description of each fault, and the total number of current active and inactive faults. Alarms appear in either of the following two colors:

- **Green:** Active fault
- **Gray:** Inactive/acknowledged fault

Viewing Fault Descriptions

When the fault selector is active, the bottom, **Fault Description** half of the screen shows a detailed description of a single fault.

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Screen G 4-2 Alarm Summary

Clearing and Acknowledging Faults

Faults that do not critically affect system operation may be acknowledged. The system may still operate if several non-critical faults are present and have been acknowledged.

Critical faults may not be acknowledged. A critical fault requires immediate operator intervention before the fault is cleared and the system may properly operate.

Refer to the *Troubleshooting* section in this part of the manual for a list of faults and corrective actions.

See Screen G 4-2 and refer to Table G 4-1 for a description of the buttons on the **ALARM SUMMARY** screen.

Table G 4-1 Alarm Summary Screen Buttons

Button	Function
▲	Scrolls up list of faults
▼	Scrolls down list of faults
◀	Shows detailed description of faults in list
▶	Hides detailed description of faults in list
Last Panel	Returns the user to the previous panel
ACK ALARMS	Acknowledges a new, non-critical alarm; fault remains on the **ALARM SUMMARY** screen
CLEAR ALARMS	Clears an acknowledged alarm; removes fault from the screen
PRINTER indicator	Not used

Corrective Actions

Table G 4-2 Fault Descriptions and Corrective Actions

Fault Message	Fault Description	Corrective Action
UCS interface fault	UCS DeviceNet interface card fault	Reset the DeviceNet interface card.
Neuron EEPROM fault	Problem writing to Neuron EEPROM	Reset the DeviceNet interface card.
No guns installed	No gun cards are connected to the system	Check the connections on the gun driver cards.
No PLC detected	PLC communication failure (lost heart beat)	Check the connections and terminating resistors on the DeviceNet interface cable.
Invalid node detected	Invalid node received or requested	Check if any gun or interface is not responding. Replace module as necessary.
Serial EEPROM read error	Error during read of serial EEPROM stored parameters	Reset the DeviceNet interface card.
Lockout fault	Gun trigger or purge attempted while in lockout mode	Correct the lockout condition and trigger the guns.
Trigger fault	Trigger attempted while purging or purge attempted while triggering gun	Do not trigger guns and initiate the purge sequence at the same time.
CCU heart beat lost	Central control unit heart beat lost; communication error	Check the connections and terminating resistors on the DeviceNet interface cable.
CCU comm error	Central control unit not capable of communication with interface card; incorrect versions	Contact your Nordson representative.
Gun card comm error	Gun controller not communicating with gun driver card; incorrect versions	Contact your Nordson representative.
Gun # RAM fault	Gun card RAM test failure	Turn off power and turn on power to reset the gun driver card.
Gun # kV fault	kV feedback does not match commanded setting	Check the gun current with no parts in front of the gun. If the current is 105 μA, check for a short circuit of the current feedback wires in the gun cable.
Option card RAM failure	Interface card RAM failure detected; Neuron fault	Turn off power and turn on power to reset the DeviceNet interface card.
Gun # Neuron fault	Neuron fault	Turn off power and turn on power to reset the gun driver card.

Continued...

Fault Message	Fault Description	Corrective Action
Gun # foldback	Over current protection circuit tripped	1. Turn off the system power. 2. Unplug the cable from the back of the gun. 3. Turn on the system power. 4. Trigger the gun for approximately 30 seconds. 5. Go to the ALARM SUMMARY screen. • If the error remains the same, replace the gun cable. • If the error changes to Gun # open, the cable is working correctly. Check the gun multiplier.
Gun # open	Gun cable or multiplier open circuit detected	With the gun triggered, check the µA. If the µA reading is 0, check the gun cable connection. If the connection is secure, check the multiplier.
Gun # short	Gun cable or multiplier short circuit detected	1. Turn off the system power. 2. Unplug the cable from the back of the gun. 3. Turn on the system power. 4. Trigger the gun for approximately 30 seconds. 5. Go to the ALARM SUMMARY screen. • If the error remains the same, replace the gun cable. • If the error changes to Gun # open, the cable is working correctly. Check the gun multiplier.
Gun # noise	Noise detected on digital inputs	Press the reset button on the gun driver card.

Continued...

Corrective Actions *(contd)*

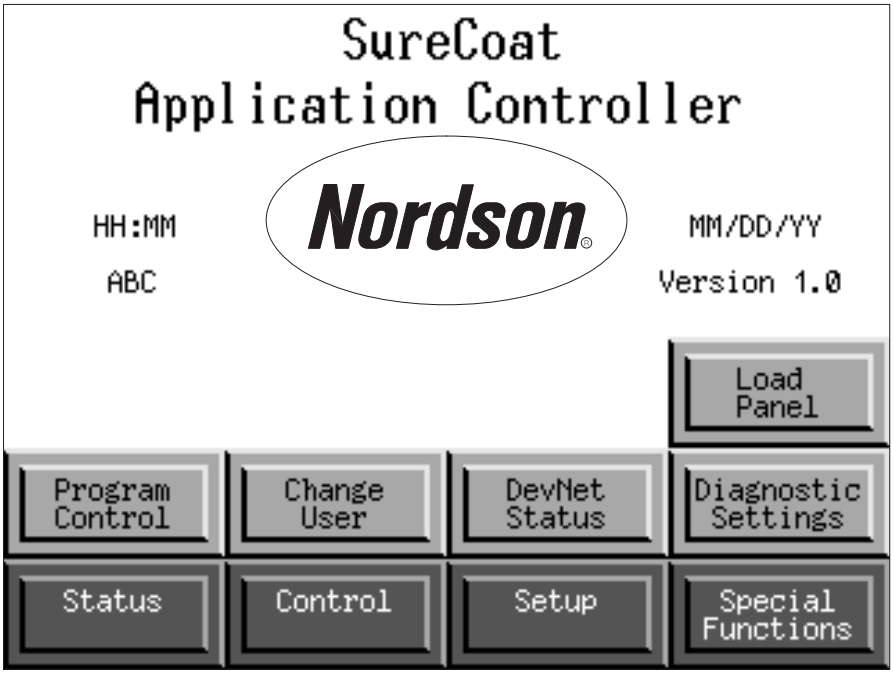
Table G 4-2 Fault Descriptions and Corrective Actions (contd)

Fault Message	Fault Description	Corrective Action
Gun # hardware	Gun driver hardware error	1. Turn off the system power. 2. Unplug the cable from the back of the gun. 3. Turn on the system power. • If the error remains the same, replace the gun driver card. • If the error changes to Gun # open, the board is working correctly. Check the gun multiplier.
Gun # comm fault	System communication failure	Check all internal connections.
Gun # ID fault	Gun identification fault	Make sure that the gun is a Versa-Spray II, Tribomatic, or Sure Coat automatic powder spray gun. Check the gun cable connection.
Gun # 24 Vdc	24 Volt power loss or not detected during power-up	Check the power supply located in the main control cabinet. Replace the power supply if it is not within 2 Volts of 24 Volts.
Gun # uA alarm	Tribomatic uA alarm; feedback current below set point	Check the powder flow for poor charging. Check for humidity in the compressed air.
Encoder error	Conveyor operating but no encoder pulses are detected	1. Check the encoder and its wiring. 2. Check the loss of encoder alarm time limit value. Refer to *Encoder Settings* in the *Configuration* section.
Zone photoeye blocked	One or more photoeyes are blocked for too long	1. Check the wiring and alignment of the zone photoeyes. 2. Check the zone photoeye blocked length value for correct value. Refer to *Photoeye and Zone Assignment* in the *Configuration* section for more information.

Advanced Troubleshooting

The following paragraphs explain advanced troubleshooting procedures. Do not perform any of these procedures without the guidance of a Nordson service representative.

See Screen G 4-3. Touch the **Special Functions** button on the Startup Menu to access the advanced troubleshooting functions.



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Screen G 4-3 Startup Menu—Special Functions

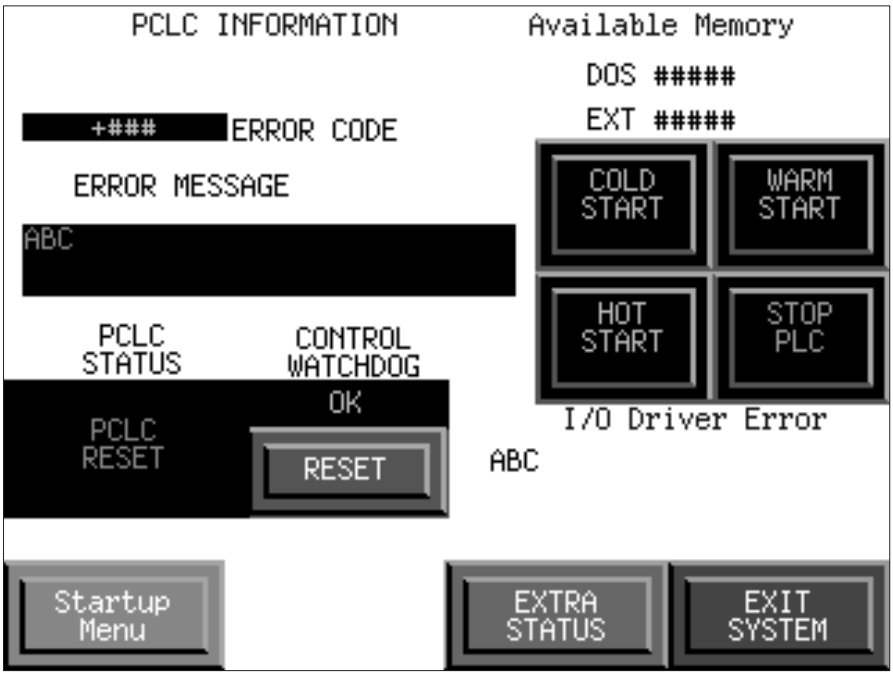
Program Control

See Screen G 4-3. Touch the **Program Control** button to access the **PCLC Information** screen.

See Screen G 4-4. The **PCLC Information** screen allows you to control the application controller's PCLC. It also shows the current status of the PCLC, including error messages and available memory.

Program Control *(contd)*

Refer to Table G 4-3 for a description of the buttons on the **PCLC Information** screen.



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Screen G 4-4 PCLC Information

Table G 4-3 Program Control Buttons

Button	Description
COLD START	Restarts a stopped PCLC; resets all settings to factory default; initiates the configuration mode Refer to *Resetting the System* in the *Configuration* section for more information
WARM START	Restarts a stopped PCLC; does not reset values; initializes memory
HOT START	Restarts a stopped PCLC; does not reset values or initialize any memory
STOP PLC	Stops a running PCLC
RESET	(Not Used) Resets a tripped watchdog timer
I/O Status	Takes the user to the **Diagnostic Interface** screen (See Screen G 4-8)
EXTRA STATUS	Takes the user to the **MachineLogic Status** screen (See Screen G 4-5)
EXIT SYSTEM	Exits the operator screens; returns to the machine shop shell screen used for loading software from another PC **NOTE:** Only use this function with the assistance of a Nordson service representative.

MachineLogic Status

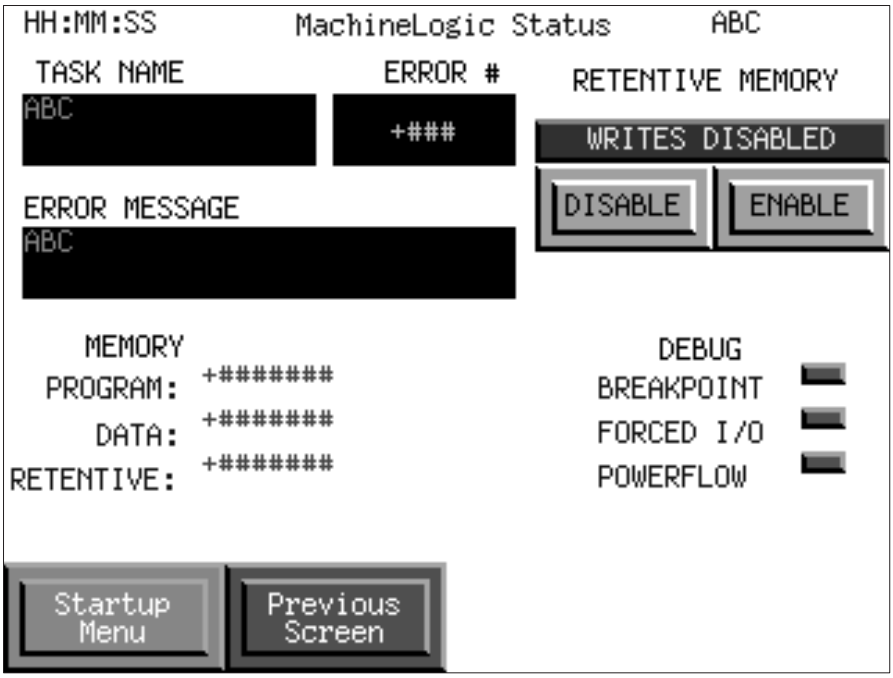
Touch the **Extra Status** button to access the **MachineLogic Status** screen.

See Screen G 4-5. The **MachineLogic Status** screen shows information useful when troubleshooting the memory. Most of the information on this screen is only helpful to Nordson service personnel.

Refer to Table G 4-4 for a description of the major fields and buttons on the **MachineLogic Status** screen.

Table G 4-4 MachineLogic Status Screen

Field/Button	Description
TASK NAME	Displays the task that was being performed when the PCLC was stopped
ERROR #	Displays the error code for the previous task
ERROR MESSAGE	Displays a description of the error for the previous task
DISABLE	Disables write capability to retentive memory
ENABLE	Enables write capability to retentive memory



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Screen G 4-5 MachineLogic Status

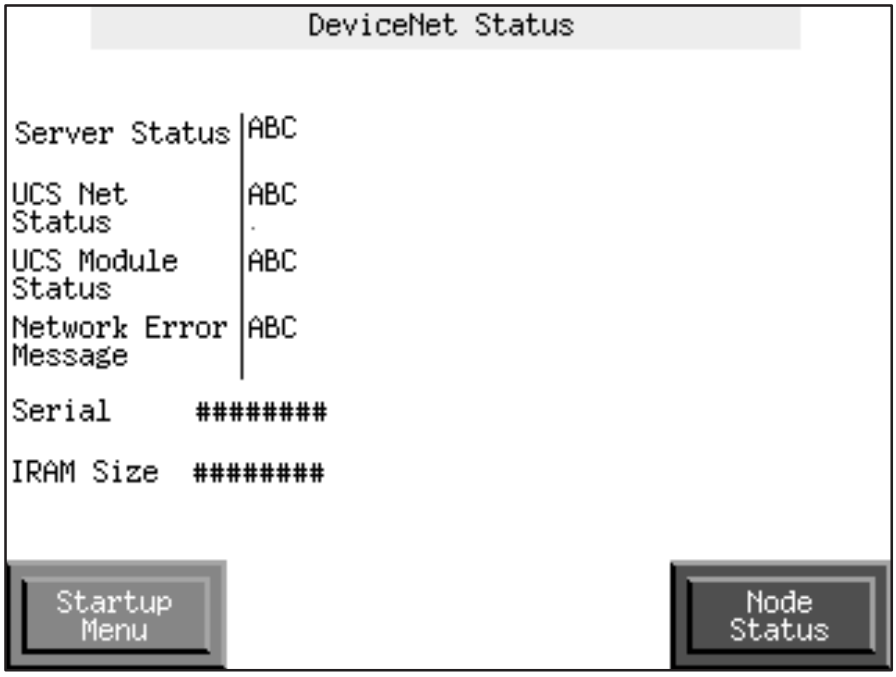
Change User

See Screen G 4-3. Touch the **Change User** button to change the user level. Refer to *Changing User Level* in the *Configuration* section for more information.

DevNet Status

See Screen G 4-3. Touch the **DevNet Status** button to access the **DeviceNet Status** screen.

See Screen G 4-6.



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Screen G 4-6 DeviceNet Status

Node Status

Touch the **Node Status** button to access the **Node Status** screen.

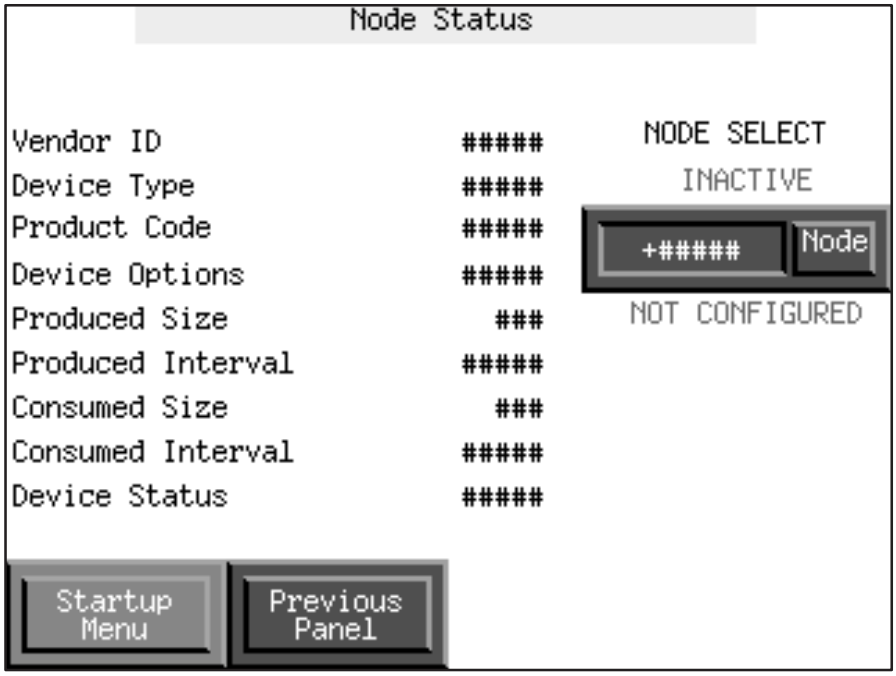
See Screen G 4-7. The two network nodes are

- **1:** DeviceNet interface card
- **2:** PCLC logic module

Touch the **Node** button and enter a node address to view the status of the desired node.

Valid, normally active nodes will display **INACTIVE** status if either the

- network connection between the application controller and the node is broken, or
- node is defective or powered off.



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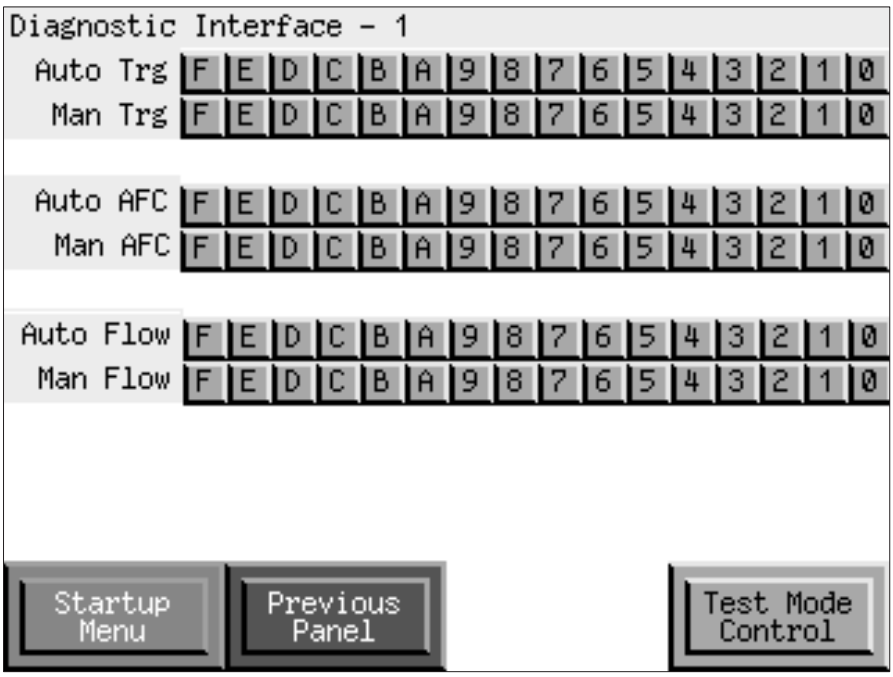
Screen G 4-7 Node Status

Diagnostic Settings

See Screen G 4-3. Touch the **Diagnostic Settings** button to access the **Diagnostic Interface** screen.

See Screen G 4-8. The **Diagnostic Interface** screen displays the communication status of the trigger, AFC, and flow rate settings for each gun. Communication out to the guns is indicated, but return signals from the guns are not displayed on the **Diagnostic Interface** screen.



Screen G 4-8 Diagnostic Interface

Test Mode Control

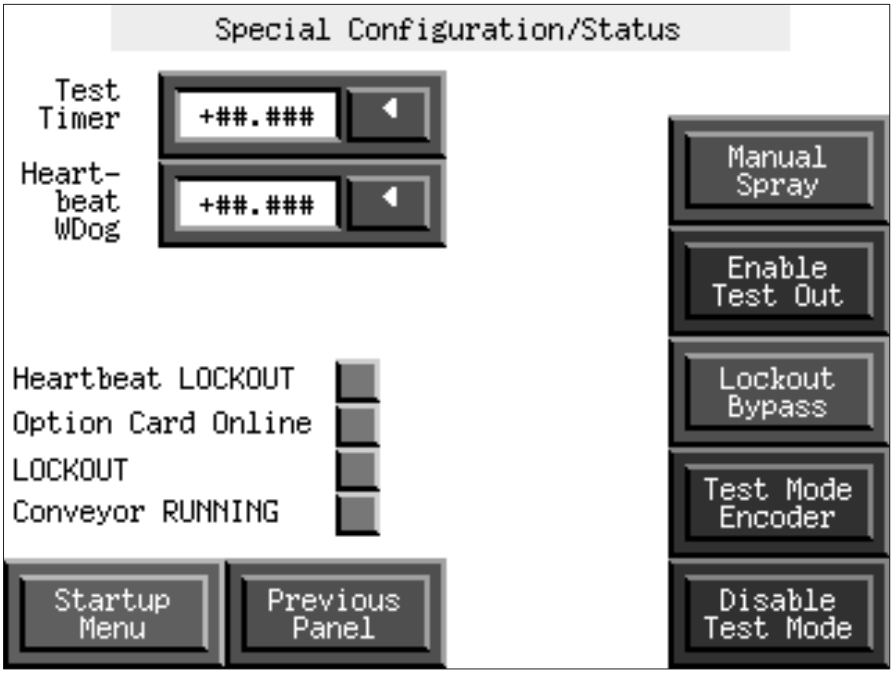
Touch the **Test Mode Control** button to access the **Special Configuration/Status** screen.

See Screen G 4-9. The **Special Configuration/Status** screen allows the user to simulate normal operations to test the operation of the application controller. These tests are internal to the application controller. The external photoeyes and encoder are bypassed while the application controller simulates normal operating conditions.

Refer to Table G 4-5 for a description of the fields and buttons on the **Special Configuration/Status** screen.

Table G 4-5 Special Configuration/Status Screen

Field/Button	Description
Test Timer	Displays the frequency of simulated encoder pulses (in seconds)
Heartbeat WDog	Displays the length of time (in seconds) between heartbeat pulses between the DeviceNet interface card and the application controller's PLC **NOTE:** A watchdog fault occurs if no pulses are detected within this time period. Refer to *Corrective Actions* in this section for more information.
Manual Spray	Bypasses the conveyor interlock to allow the guns to spray continuously
Enable Test Out	Starts the simulated test
Lockout Bypass	Overrides the lockout condition within the controller
Test Mode Encoder	Enables the simulated encoder
Disable Test Mode	Disables the simulated encoder



Screen G 4-9 Special Configuration/Status

Load Panel

NOTE: The Load Panel function allows access to screens that may not have relevant data. Touch the green **Startup Menu** button from any of these screens to return to the Startup Menu.

See Screen G 4-3. Touch the **Load Panel** button to access a selection menu of all of the application controller's screens.

See Figure G 4-1. Use the selection menu to locate the appropriate screen. Highlight the desired selection and touch the **ACCEPT** button to access the screen.

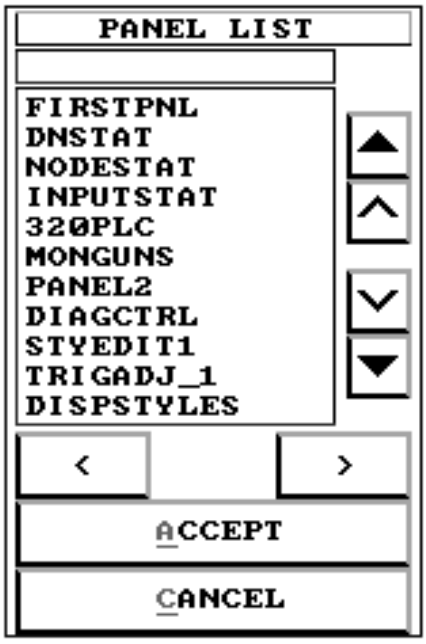


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Figure G 4-1 Load Panel Selection Menu

Wiring Diagrams

Application Controller

See Figure G 4-2.

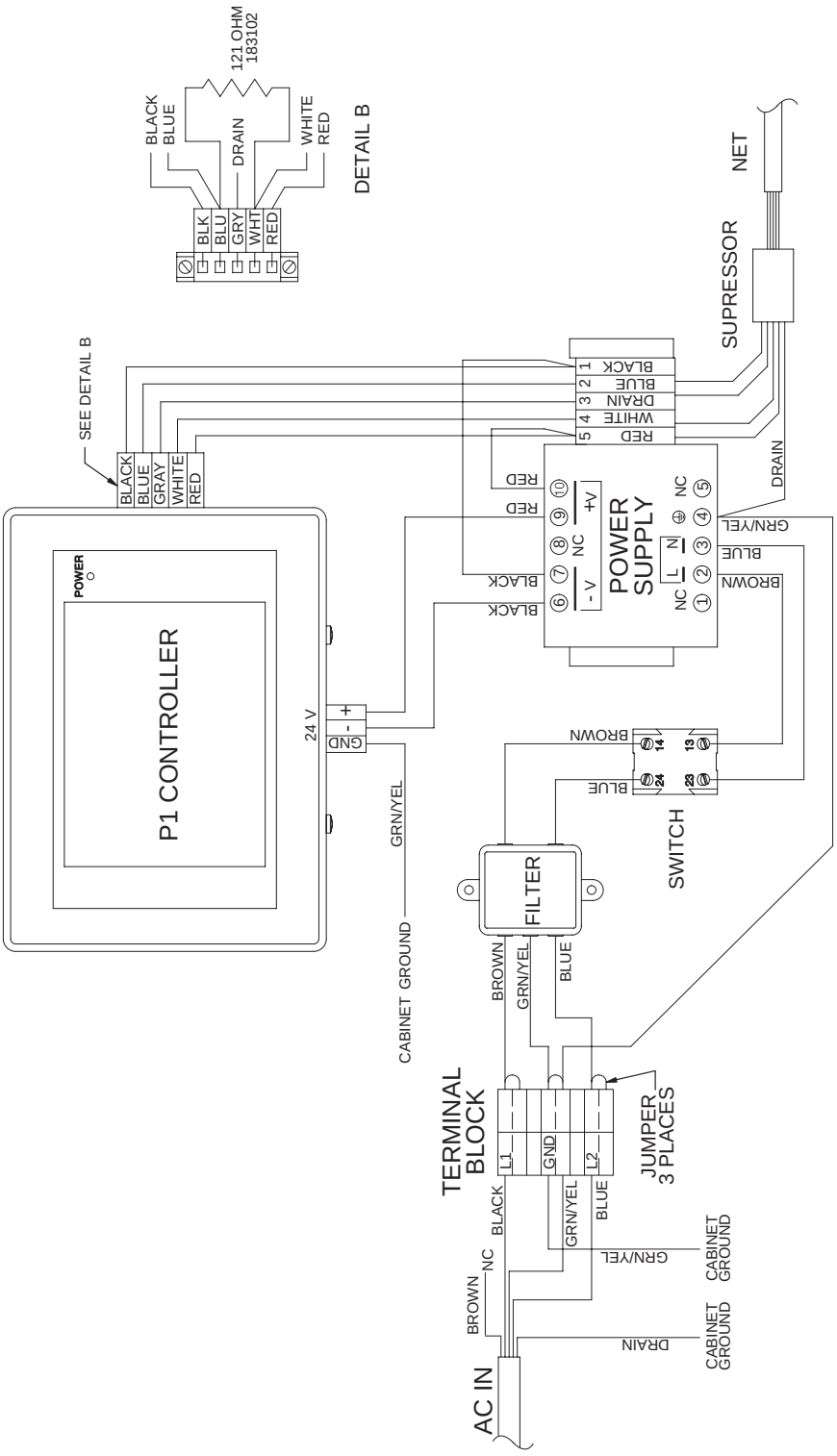

Figure G 4-2 Application Controller Wiring Diagram

Three Photoeye PEJB

See Figure G 4-3.

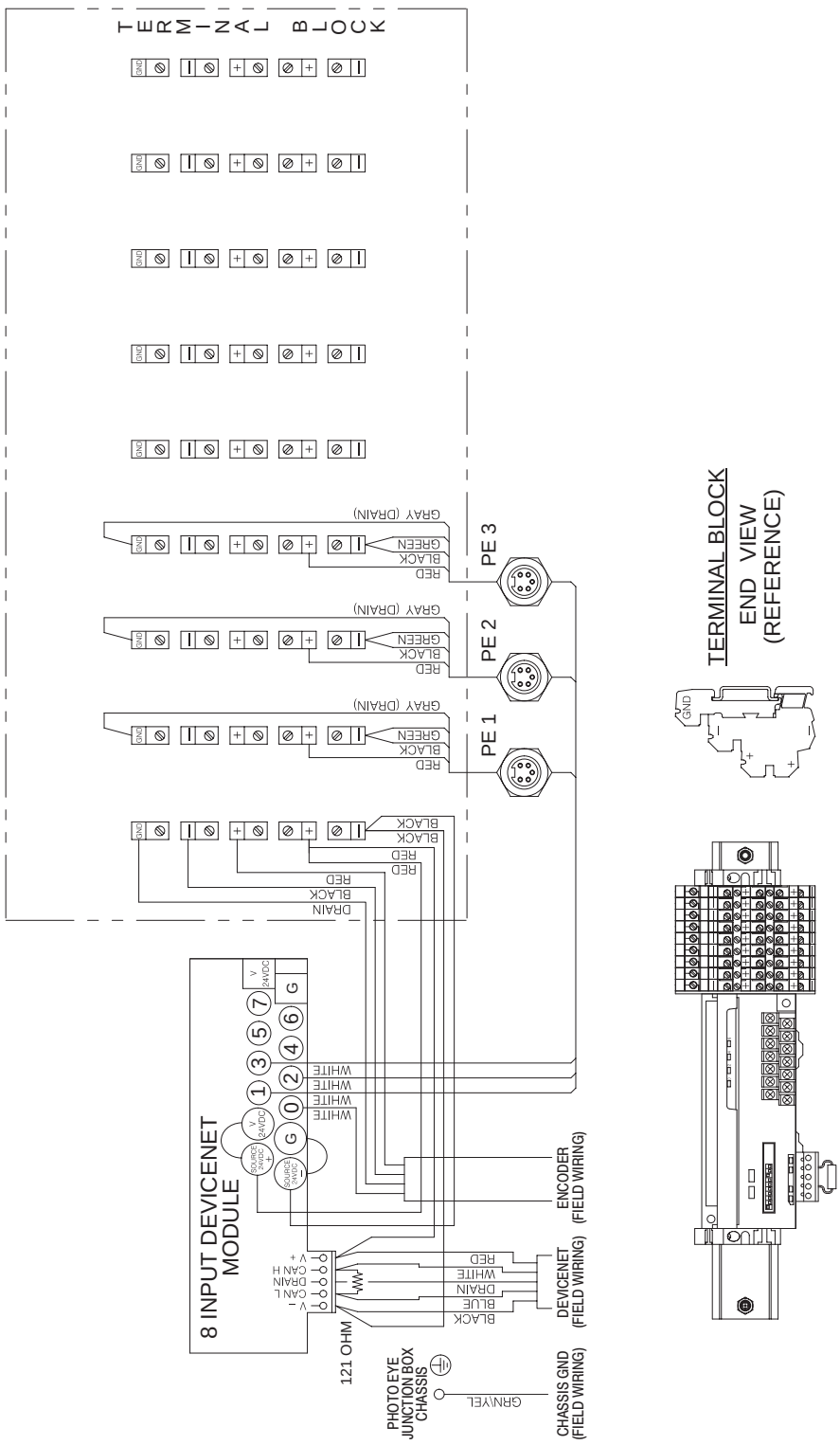

Figure G 4-3 Three Photoeye PEJB Wiring Diagram

Seven Photoeye PEJB

See Figure G 4-4.

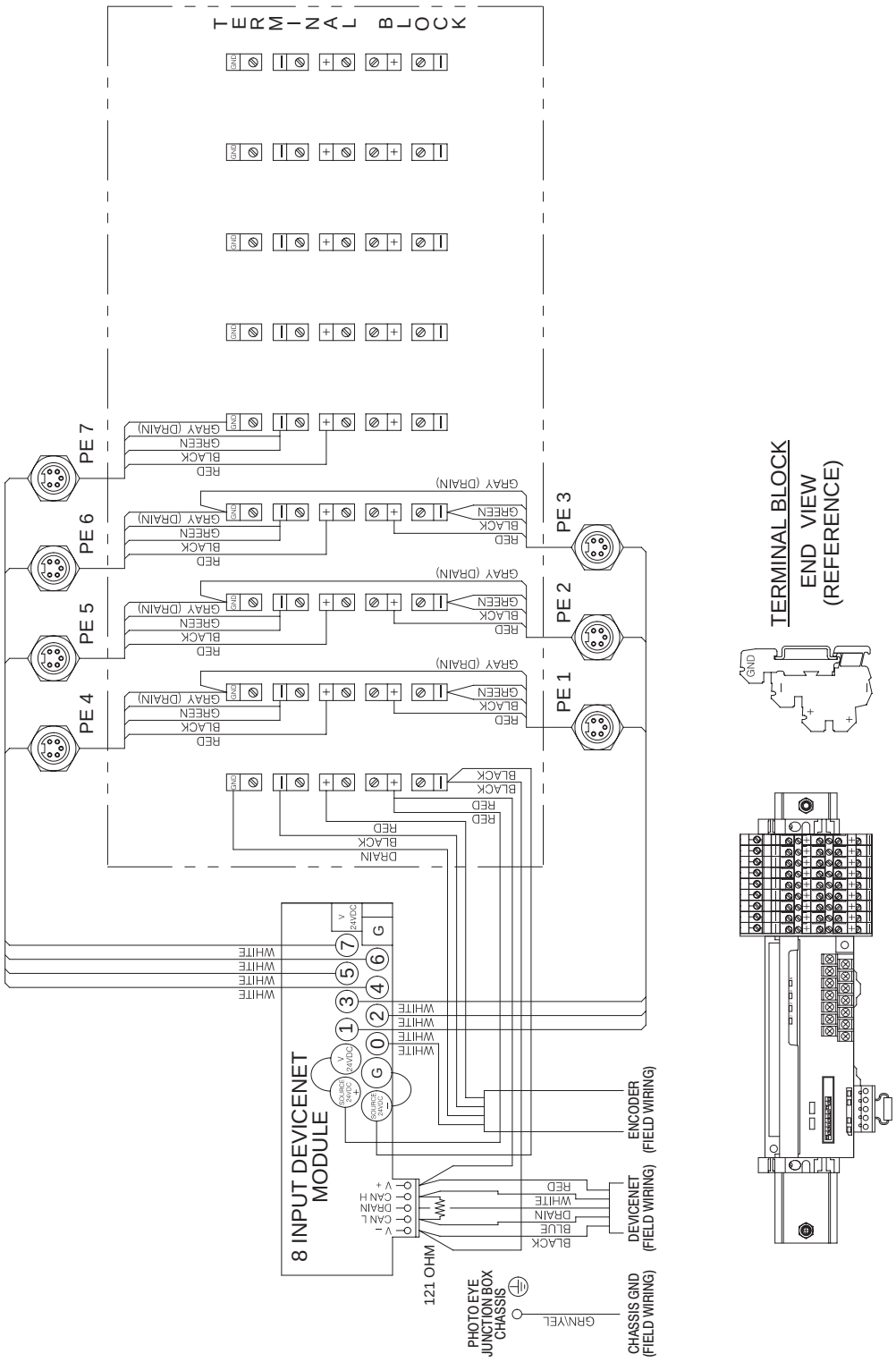

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Figure G 4-4 Seven Photoeye PEJB Wiring Diagram

Fifteen Photoeye PEJB

See Figure G 4-5.

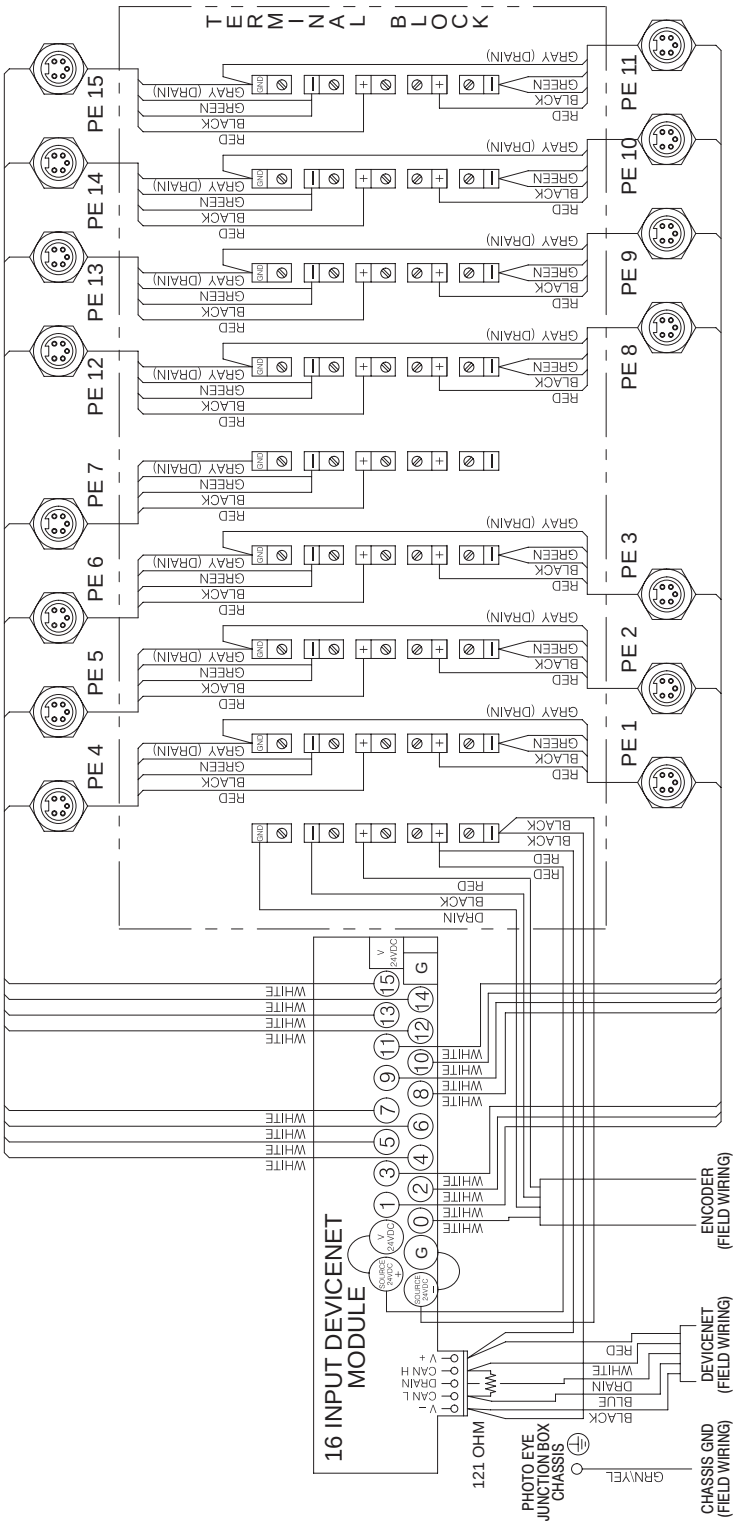

Figure G 4-5 Fifteen Photoeye PEJB Wiring Diagram

Section G 5
Parts

Introduction

This section illustrates the replacement parts and service kits available for the application controller.

NOTE: Refer to the *Parts* section in Part A: *System Overview*, for an explanation of how to use the illustrated parts list.

Application Controller

Main Assembly

See Figure G 5-1.

Item	Part	Description	Quantity	Note
—	341620	CONTROLLER, application, DeviceNet, packaged	1	
—	- - - - - -	• MODULE, controller, DeviceNet	1	
1	982825	• • SCREW, pan head, recessed, M4 x 12, with integral lock washer bezel	20	
2	240674	• • TAG, ground	4	
3	983021	• • WASHER, flat, e, 0.203 x 0.406 x 0.040 in., brass	4	
4	983401	• • WASHER, lock, m, split, M5, steel, zinc	6	
5	982437	• • SCREW, pan, recessed, M5 x 10, with integral lock washer bezel	1	
6	- - - - - -	• • CABINET, controller	1	
7	338489	• • HARNESS, controller, DeviceNet	1	
8	183102	• • RESISTOR, MF, 121 ohm, 0.25-in. wide, 1%, axl	1	
9	- - - - - -	• • PANEL, front, controller	1	
10	334769	• • GASKET, central controller, front, Sure Coat	1	
11	326162	• • CONTROLLER, P1	1	
12	1002379	• • MEMORY, programmed, application controller	1	
13	933469	• • LUG, 90, double, 0.250, 0.438 in.	3	
14	984702	• • NUT, hex, M5, brass	3	
15	- - - - - -	• • PANEL, rear	1	A
NS	933005	• CONNECTOR, cord	2	B
NS	939122	• SEAL, conduit fitting, $^1/_2$ in.	2	B
NS	984526	• NUT, lock, $^1/_2$-in. conduit	2	B
NS	303098	• BRACKET, support, number 1	2	B
NS	334799	• SCREW, pan head, recessed, M5 x 10, with integral lock washer bezel	4	B
NS	173124	• SCREW, pan head, cross, with seal, M6 x 8	6	B
NS	341626	• INTERFACE CARD, DeviceNet, packaged	1	B
NS	326138	• CABLE, 4 conductor, 2-22, 2-24, device	24 ft	B
NS	143009	• CONDUIT, carflex, liquid tight, $^1/_2$ in.	20 ft	B
NS	931149	• WIRE, vinyl, 18 AWG, green with yellow	24 ft	B
NS	933071	• TERMINAL, ring tongue, insulated, 22-18, 10	2	B
NS	143010	• FITTING, carflex, liquid tight, $^1/_2$ in.	2	B
NS	230277	• CABLE CLAMP, panel mount, 6/6 nylon, $^3/_8$ in.	2	B

NOTE A: Refer to *Rear Panel* for parts that are on the application controller's back panel.

B: These parts are used to connect the application controller to the Sure Coat modular gun control system.

NS: Not Shown

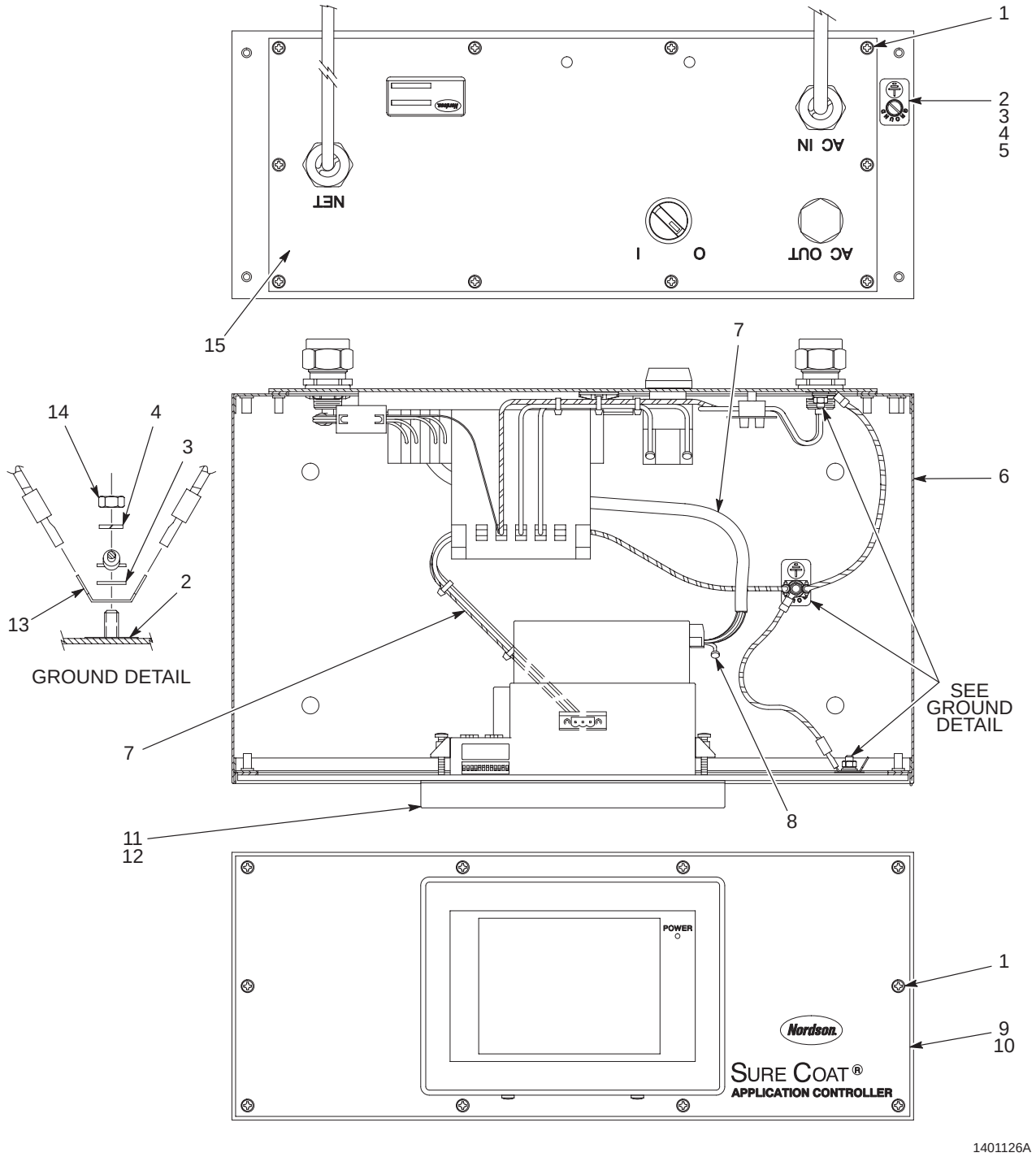

Figure G 5-1 Application Controller Replacement Parts

Rear Panel

See Figure G 5-2.

Item	Part	Description	Quantity	Note
1	334770	GASKET, central controller, rear, Sure Coat	1	
2	982169	SCREW, pan, slotted, M3 x 16, zinc	3	
3	933641	BLOCK, terminal, 8 station	1	
4	933632	MARKER, terminal block, 8 station	1	
5	933630	JUMPER, comb type, 2 pole, 10 mm	3	
6	983403	WASHER, lock, M, split, M4, steel, zinc	2	
7	984715	NUT, hex, M4, steel, zinc	2	
8	288807	FILTER, line, RFI, power	1	
9	303100	POWER SUPPLY assembly	1	
10	983401	WASHER, lock, m, split, M5, steel, zinc	6	
11	983408	WASHER, flat, m, narrow, M5, steel, zinc	2	
12	984706	NUT, hex, M5, steel, zinc	2	
13	185067	SUPPRESSOR, ferrite, 7-mm dia	1	
14	939110	STRAP, cable, 0.875-in. dia	1	
15	187040	MOUNT, cable tie, 4 way, adhesive	1	
16	338489	HARNESS, controller, DeviceNet	1	
17	334806	SWITCH, round, 2 position, 90 degrees	1	
18	288806	CONTACT BLOCK, 2 normally open contacts	1	
19	933005	CONNECTOR, cord	2	
20	939122	SEAL, conduit fitting, $^1/_2$ in.	3	
21	984526	NUT, lock, $^1/_2$-in. conduit	3	
22	334766	PANEL, central controller, I/O, rear	1	
23	341637	CABLE, ac, DeviceNet controller	1	
24	334800	PLUG, $^1/_2$-in. pipe, 1 in. hex	1	

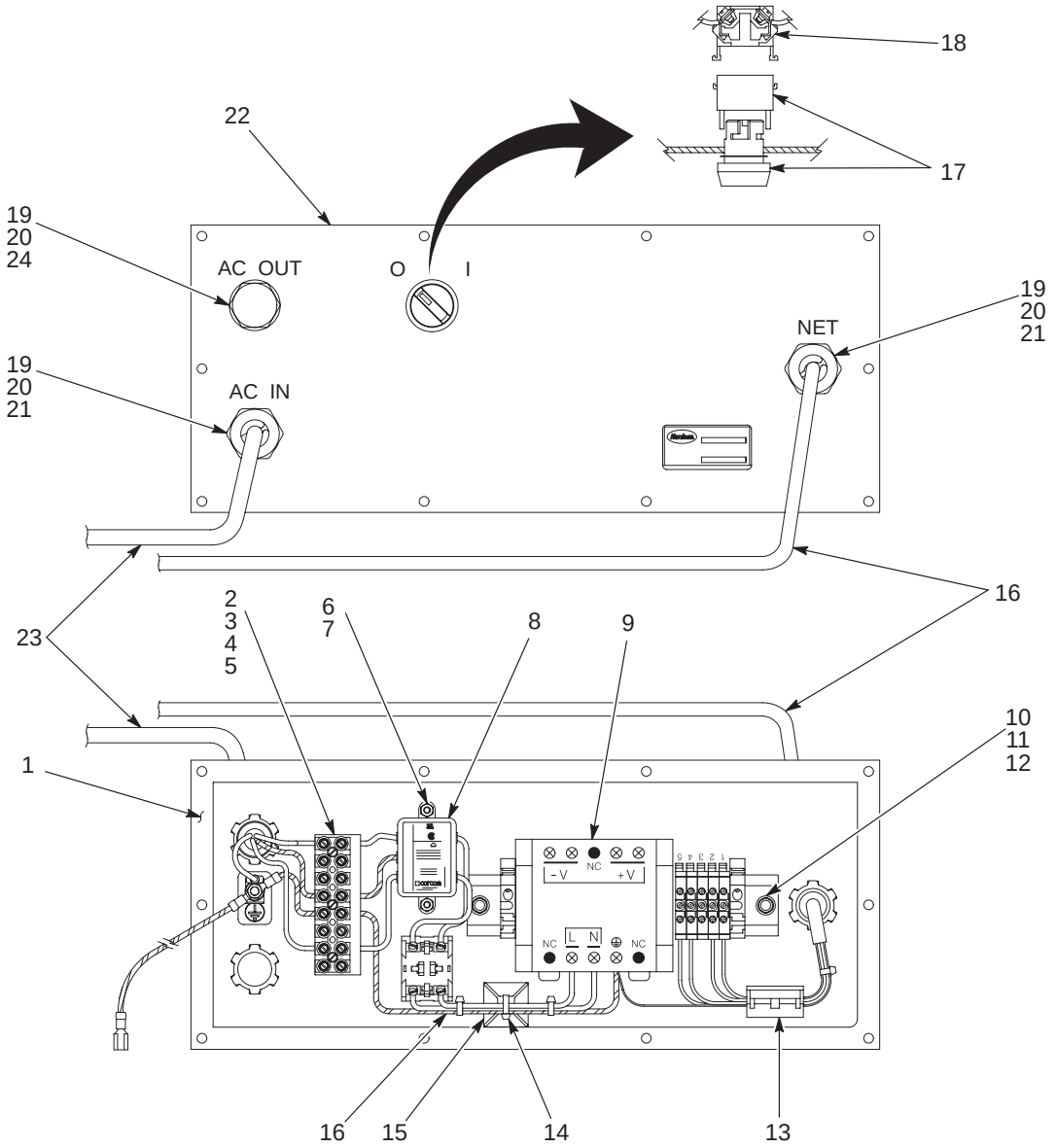

Figure G 5-2 Rear Panel Parts

Photoeye Junction Boxes

Three Eyes

See Figure G 5-3.

Item	Part	Description	Quantity	Note
—	347224	BOX, photoeye junction, three eye	1	
1	347223	• RECEPTACLE, input, 5 wire, female	3	
2	347221	• MODULE, DeviceNet, 8 input	1	
3	183102	• RESISTOR, MF, 121 ohm, 0.25 in. wide, 1%, axl	1	

Seven Eyes

See Figure G 5-3.

Item	Part	Description	Quantity	Note
—	347 225	BOX, photoeye junction, seven eye	1	
1	347 223	• RECEPTACLE, input, 5 wire, female	7	
2	347 221	• MODULE, DeviceNet, 8 input	1	
3	183 102	• RESISTOR, MF, 121 ohm, 0.25 in. wide, 1%, axl	1	

Fifteen Eyes

See Figure G 5-3.

Item	Part	Description	Quantity	Note
—	347226	BOX, photoeye junction, fifteen eye	1	
1	347223	• RECEPTACLE, input, 5 wire, female	15	
2	347222	• MODULE, DeviceNet, 16 input	1	
3	183102	• RESISTOR, MF, 121 ohm, 0.25 in. wide, 1%, axl	1	

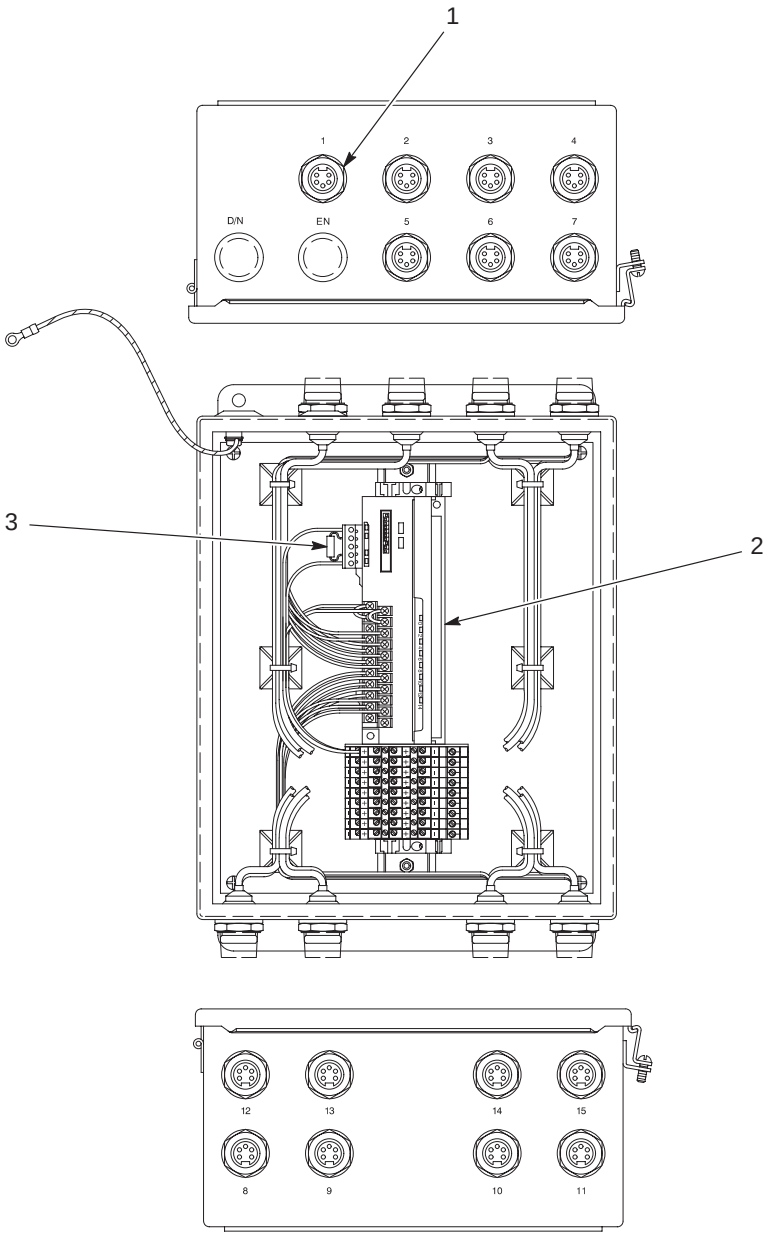

Figure G 5-3 Photoeye Junction Box Replacement Parts

Miscellaneous Components

Part	Description	Quantity
170730	PHOTO CELL, reflective	1
347230	CABLE, input, 5 wire, 6 meter, male	1
326138	CABLE, 4 cond, 2-22, 2-24, DeviceNet	AR
183764	ENCODER, 24 PPR, with cable connector	1
AR: As Required		