

iControl® Operator Interface Configuration, Preset Setup, Operation

Customer Product Manual

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Contact Us

Nordson Corporation welcomes requests for information, comments, and inquiries about its products. General information about Nordson can be found on the Internet using the following address:
<http://www.nordson.com>.

Address all correspondence to:

Nordson Corporation
Attn: Customer Service
555 Jackson Street
Amherst, OH 44001

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Section 1

Introduction

This manual covers Configuration, Preset (Recipe) Setup, and Operation of the Nordson iControl and iControl 2 Integrated Control Systems. All tasks described in this manual are accomplished using the iControl Operator Interface.

NOTE: This version of this manual covers iControl software up to and including version 3.6. This manual is updated as features are added. If your software has not been upgraded, you may not have all the screens and features described here. Contact your Nordson representative for upgrade information.

iControl Systems

Standard, Encore, and the new iControl 2 systems are used with venturi-type powder pumps and automatic spray guns supplied by those pumps. Standard systems are used with Nordson Versa-Spray, Sure Coat and Tribomatic automatic guns. Encore systems are used with Encore automatic guns. iControl 2 systems are used with Encore automatic guns. A system can consist of a master console for the first 16 guns, and an auxiliary console for guns 17–32. The master console houses the I/O card, touch screen and computer that runs the iControl software. iControl 2 systems can also consist of an auxiliary console and a pedestal housing the touch screen, PC, and I/O card.

Prodigy and Encore HD iControl systems control up to 32 spray guns from each master console. No auxiliary consoles are used.

If the system includes manual guns, the manual gun controllers communicate with the PC through the system CAN network.

iControl systems control gun triggering and spraying, and gun movers such as in/out positioners and reciprocators. The system uses signals from conveyor encoders, photoeyes, light curtains, and proximity sensors to identify and track the movement of parts through the spray booth and control the spray guns and gun movers. An Ethernet network is used to communicate with the gun movers and some part ID system components. Up to 10 devices can be addressed over the Ethernet network.

For iControl hardware specifications, installation, troubleshooting, repair, parts, and wiring diagrams, refer to the following manuals:

- Standard iControl (Sure Coat, Versa-Spray, and Tribomatic: 1105779
- Prodigy iControl: 1105820
- Encore iControl: 1105821
- Encore HD iControl: 1603054
- IControl 2: 1603638

These manuals are included on the CD shipped with your iControl system.

Operator Controls

The iControl system runs two sets of software. The operating system is a real-time industrial operating system. The iControl system software runs on top of the operating system. When the system boots up, the operating system screen appears momentarily, then the iControl software loads. The operating system utilities such as touch screen calibration, are accessed by performing a Program Shutdown and waiting until the iControl software shuts down. Refer to *Operation* for more information.

See Figure 1-1. Use the iControl operator interface to

- configure system devices.
- set up and adjust spray and gun mover recipes (presets) for parts.
- monitor and control gun operation and purging.
- control part ID operation.
- monitor inputs from photoeyes, scanners, and encoders.
- respond to system alarms.

All setup and operation of the iControl system is done using the **Touch Screen, Rotary Dial (iControl only), and Interlock Keyswitch**.

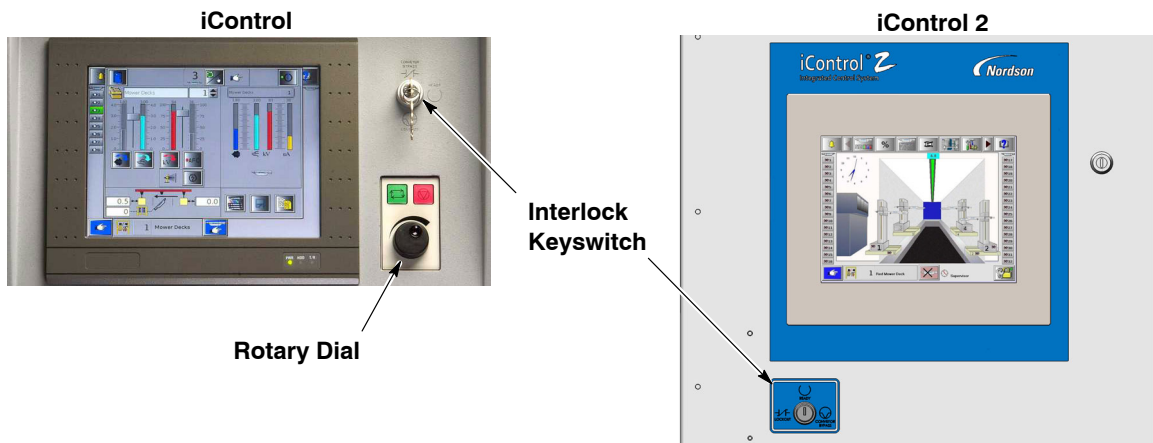


Figure 1-1 iControl and iControl 2 Operator Interfaces

Touch Screen: Touch the buttons, controls, and fields displayed on the iControl screens to make settings, control system devices, and open and close screens. The touch screen must be calibrated in order to respond correctly to your touch. **To re-calibrate the touch screen, refer to Section 3, Configuration.**

Rotary Dial (iControl 1 only): Use the dial to increase and decrease numerical values in data fields or to toggle through a range of possible settings. Select a data field and rotate the dial clockwise to increase; counterclockwise to decrease.

NOTE: IControl 2 master consoles and pedestals have an enhanced on-screen keypad with arrow keys that perform the same function as the rotary dial.

Interlock Keyswitch: The keyswitch has three positions:

- **Ready:** Run system (conveyor on signal is required)
- **Lockout:** Use to shut off guns, in/out positioners, and reciprocators
- **Conveyor Bypass:** Use to trigger guns without a conveyor ON signal

NOTE: Lockout can be overridden for in/out positioners and reciprocators through their configuration screens.

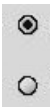
Common Interface Objects and Buttons



Configure: Touch this button to open most configuration screens.



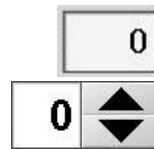
Close: Touch this button to close open screens.



Radio Buttons: Touch a button to select an option. Only one button in a group can be selected.



Drop-down Fields: Touch the field to open a drop-down list and select a value.



Data Fields: Touch a field to select it, then use the rotary dial or up and down arrows to edit the field value.



Keypad: Select a data field, then touch this button to open the keypad and enter values.



OK: Touch to acknowledge a message, proceed with an action, or enable a feature.



Cancel: Touch to cancel changes or an action, or disable a feature.

Help



Touch the **Help** button on the Main screen to open the Help screen.

Tap on [blue underlined links](#) to jump from one topic to another.

The **Previous** and **Next** buttons jump to previously opened pages. The **Home** button and the HOME link at the bottom of each page jump to the home page. Touching the **Top** button returns you to the top of the page. Use the scroll bars on the right side of the page to scroll up and down the page.



Figure 1-2 Help Screen

Section 2

Security System

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Introduction

A new iControl system, at power up, starts with the security system disabled. All iControl screens and functions (except for those restricted to Nordson representatives only) are available to any user.

Use the Security Configuration screens to set up users, define their access levels, and create passwords.

Touch the **Security** button on the Main screen to open the Log In/Log Out screen.

- If the security system is disabled the **Configure** button is automatically enabled.
- If no user is logged in, then the **Log Out** button is grayed out and no user name is displayed.

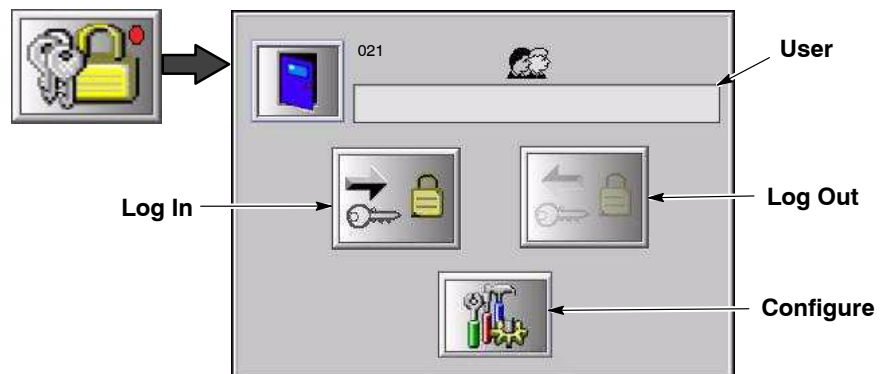


Figure 2-1 Log In/Out Screen

Introduction *(contd)*

On a new system, touching the **Configure** button displays the security configuration screen but all functionality is disabled. **The security system must be set up by a Nordson Customer Service Representative or engineer.** When the CSR logs in the security configuration functionality is enabled. Once the security system is enabled and configured, the Security Configuration screen is only available to a user with level 4 access rights.

NOTE: Even if the security system is disabled, Nordson representatives still have to log in to access the Nordson-only system configuration settings.

Access to screens and functions depends on the security level assigned to the user. Refer to the security access table on page 2-5 for a list of access rights by function and user level.

Logging In

Only one user can be logged in at a time. When a new user logs in the previous user is automatically logged out.

1. See Figure 2-2. Touch the **Log In** button on the Log In/Out screen to open the Log In screen.

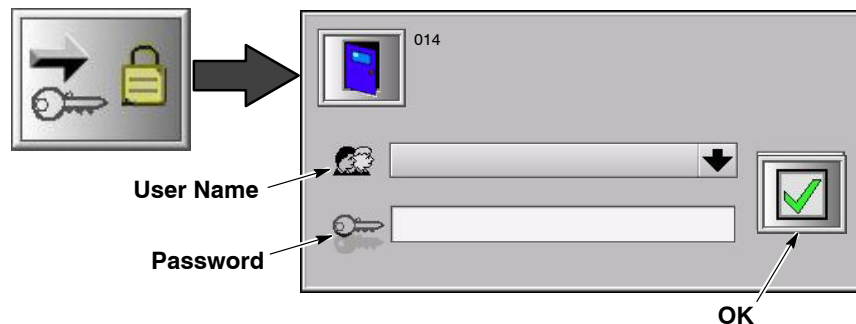


Figure 2-2 Logging In

2. Touch the **User Name** field and select your user name.
3. Touch the **Password** field. The keyboard opens. Enter your password on the keyboard screen. **Passwords are case-sensitive.**
4. Close the keyboard.
5. Touch the **OK** button to log in.

Logging Out

See Figure 2-1. Touch the **Log Out** button. A confirmation window opens. Touch the **OK** button to log out; touch the **Cancel** button to cancel the action.

NOTE: Users with supervisor access rights (level 4) can set an **automatic log out timer** that starts when no activity is detected and logs them out when the timer runs out.

Security Configuration

See Figure 2-1. Touch the **Configure** button to open the Security Configuration screen:

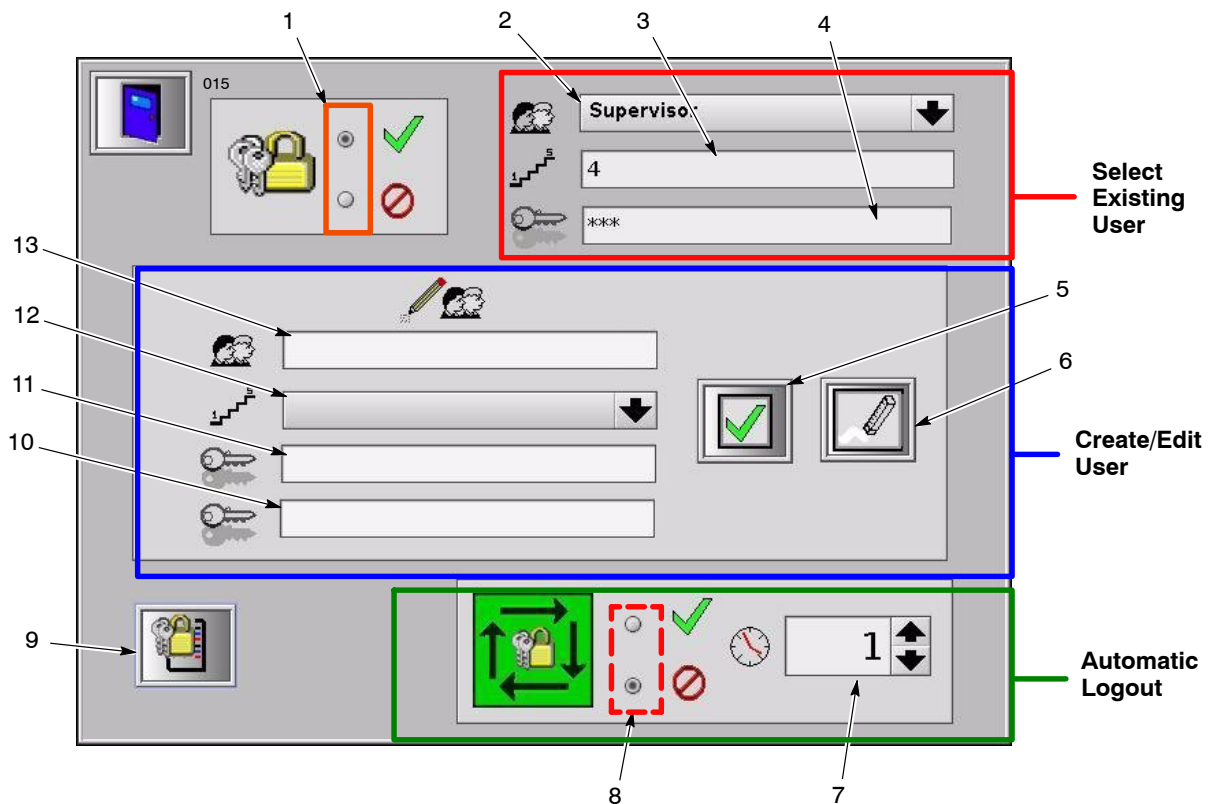


Figure 2-3 Security Configuration Screen

- | | | |
|-----------------------------------|-------------------------------------|-----------------------|
| 1. Enable/disable security system | 6. Delete (erase) user | 10. Re-enter password |
| 2. User name drop-down | 7. Automatic logout timer (minutes) | 11. Password |
| 3. Selected user level | 8. Enable/disable automatic logout | 12. Security level |
| 4. Selected user password | 9. Security log | 13. User name |
| 5. OK changes | | |

Creating a User

See Figure 2-3. Use the **Create/Edit User** area.

1. Enter a user name in the **User Name** field (13).
2. Select a security level from the **Security Level** drop-down list (12). Refer to the *Security Levels and Access Rights* table on page 2-5.
3. Enter a **Password**, once in each password field (11, 10). **Passwords are case-sensitive.**
4. Touch the **OK** button (5). To delete the user touch the **Delete** button (6).

NOTE: All fields must be filled out correctly, or one of the following graphical error messages appears:

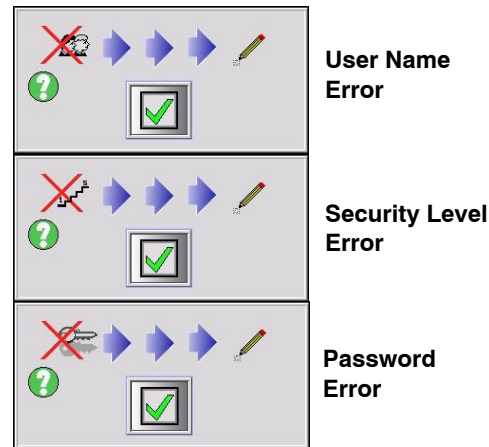


Figure 2-4 User Error Messages

Editing a User

1. See Figure 2-3, Select Existing User area. Select a User name (2). The user name, security level, and password appears in the Create/Edit fields.
2. Edit the fields as desired, then touch the **OK** button (5).
3. To delete the user touch the **Delete** button (6).

Setting the Automatic Log Out Timer

See Figure 2-3. Automatic log out only applies to supervisor-level (level 4) users. To set up automatic logout:

1. Enable automatic log out (8).
2. Set the timer (7). Time is in seconds (0–999).

A clock icon appears next to the user name on the Main screen when automatic log out is enabled. The timer starts when no activity in the user interface is detected, and the user is logged out when the timer expires.

NOTE: Automatic logout is always enabled for Nordson CSRs and Engineers and cannot be changed or disabled for them.

Viewing the Security Log

See Figure 2-3. Touch the **Security Log** button (9) to open the Security Log. The log file contains a list of user names and the times they logged in and out.

Only a Nordson representative can erase the log file. The **Erase** button is inactive for all other users.

Security Levels and Access Rights

The following table lists the access rights for all screens and functions.

Level 4: Supervisor
 Level 3: Lead
 Level 2: Operator
 Level 1: No one logged in

Security Access Rights for Screens and Functions			
Screen	Button	Security Level Required	
		Viewing	Changing
Main Screen	Alarm	All	—
	Global Status	All	—
	Percent Adjust	All	—
	Preset Table	All	—
	Nozzle Purge	All	—
	Gun Mover Preset	All	3, 4
	Reciprocator Preset	All	3, 4
	System Configuration	All	—
	Part ID Status	All	—
	Help	All	—
	Gun Buttons	All	—
	Part ID	All	—
	Security	All	—
Alarm	Reset All Alarms	All	2, 3, 4
	Alarm Log	All	3, 4
	Help	All	—
Global Gun Status	CA/CB (Consoles A, B)	All	—
Percent Adjust	Flow Air	All	2, 3, 4
	Atomizing Air	All	2, 3, 4
<i>Continued...</i>			
Preset Table	All preset settings	All	3, 4
	Save	—	3, 4
Nozzle Purge	Auto	All	2, 3, 4
	Manual	All	2, 3, 4
	- Purge All	—	2, 3, 4

Screen	Button	Viewing	Changing
Trigger Mode	Auto	—	2, 3, 4
	Manual	—	2, 3, 4
	- Preset Number	—	2, 3, 4
	- Trigger All	—	2, 3, 4
	Off	—	2, 3, 4
In/Out Positioner and Reciprocator Presets	Preset settings	2, 3	4
	Copy All	2, 3	4
	Save	2, 3	4
Help	All buttons	All	—
Security	Login/Logout	All	All
	Configuration	All	4
Gun Control	Trigger Mode/Trigger	All	2, 3, 4
	Preset Number/Name	All	3, 4
	Preset settings	All	3, 4
	Copy Functions	All	3, 4
Part ID	Auto	All	2, 3, 4
	Manual	All	2, 3, 4
	Manual Part ID select/enter	All	2, 3, 4
System Configuration	Conveyor Encoder	All	4
	Photoeyes and Scanners	All	4
	Pickoff	All	4
	Consoles/Guns	All	4
	Purge	All	3, 4
	In/Out Positioners	All	3, 4
	- Positioner Encoder	All	Nordson Only
	Reciprocators	All	3, 4
	- Reciprocator Encoder	All	Nordson Only
	- Maximum Speed	All	Nordson Only
	- Turn Around Fine Tuning	All	Nordson Only
	Network Status	All	—
	Network – Host Configuration	All	Nordson Only
	Network – Node Configuration	All	Nordson Only
	Units	All	4
	Data Backup	All	4
	Shutdown	All	2, 3, 4
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Configuration Flowchart

Use this flowchart to help you configure your system. Certain configuration tasks must be performed in order. Refer to the indicated manual sections for instructions.

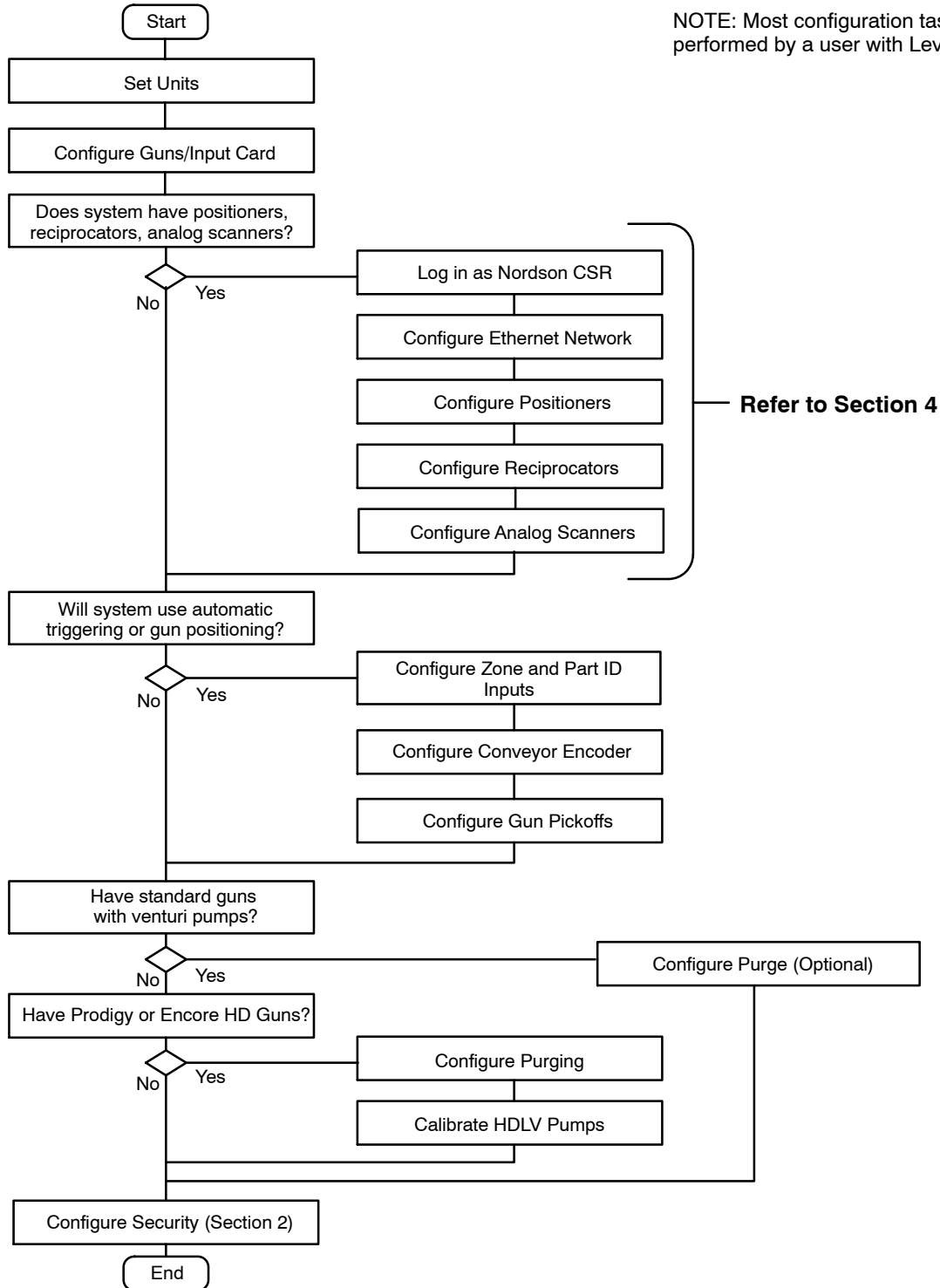


Figure 3-1 Configuration Flowchart

System Configuration Screen



Touch the **Configure** button on the Main screen to open the System Configuration screen.

IMPORTANT: When setting up a system for the first time, perform the System Configuration tasks in the order shown in the Configuration Flowchart on page 3-2.

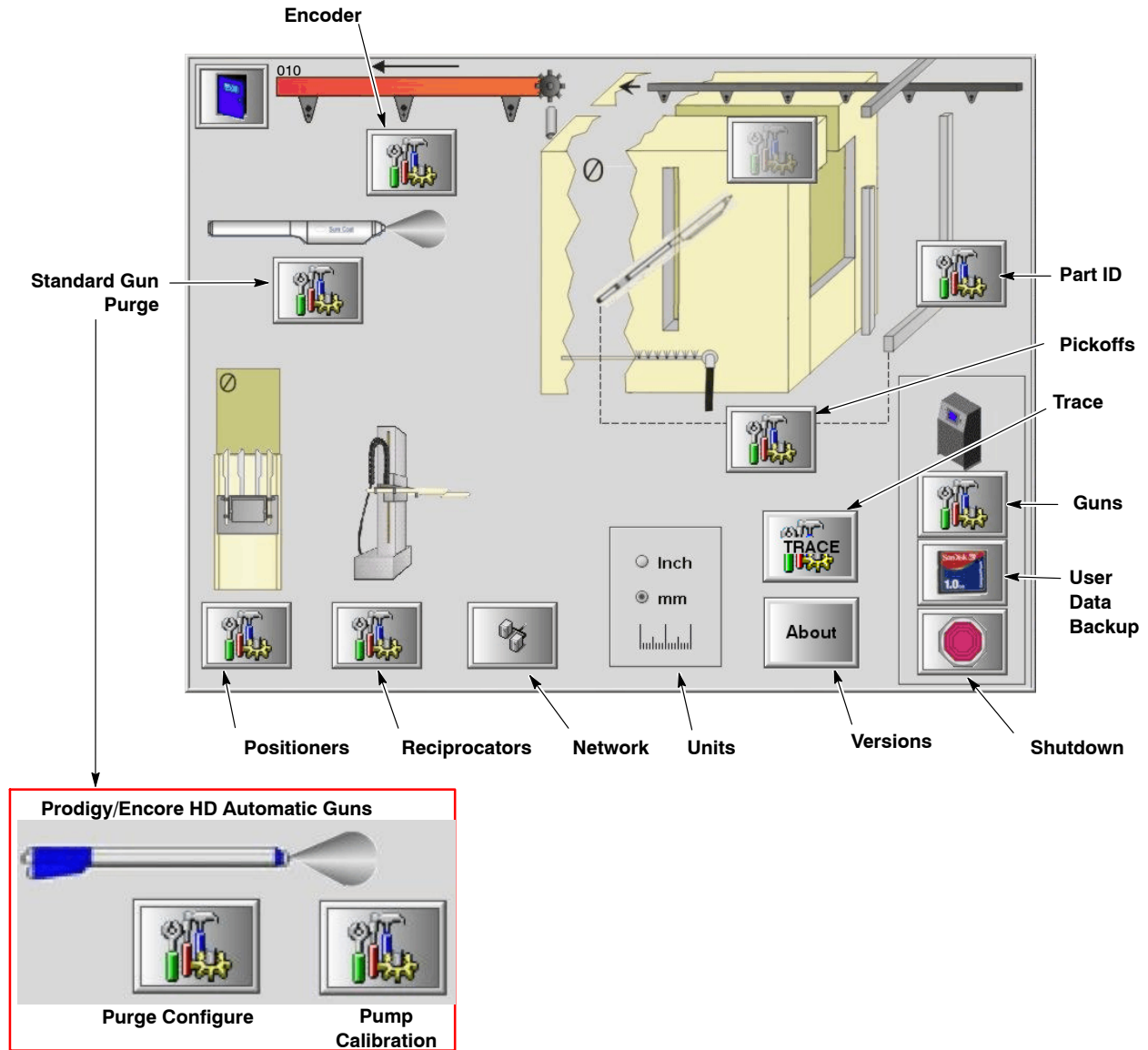


Figure 3-2 System Configuration Screen

Note: Grayed-out items on your screen require a specific user login, are not applicable to your application, or are features not yet available.

Units Configuration

See Figure 3-2. Select the units of measurement you want to use: **Inches** (English) or **Millimeters** (Metric). This setting applies to displayed values such as dimensions and air flow.

Guns/Input Card Configuration

See Figure 3-2. Touch the **Gun Configuration** button on the System Configuration screen to open the Guns/Input Card Configuration screen.

Screen Functions Overview

This screen is automatically displayed if the iControl system is started with an empty database. The guns must be configured and the system restarted before proceeding with the rest of the system configuration.

NOTE: If the number of guns per console is not set, values set in the configuration are not retained after the system is restarted.

This screen is also used to select the Digital Input Card installed in the console, by part number. The Conveyor Indicator is used to ensure that the correct card is selected. Touch the **Help** button to open a screen that will provide additional information on the input cards.

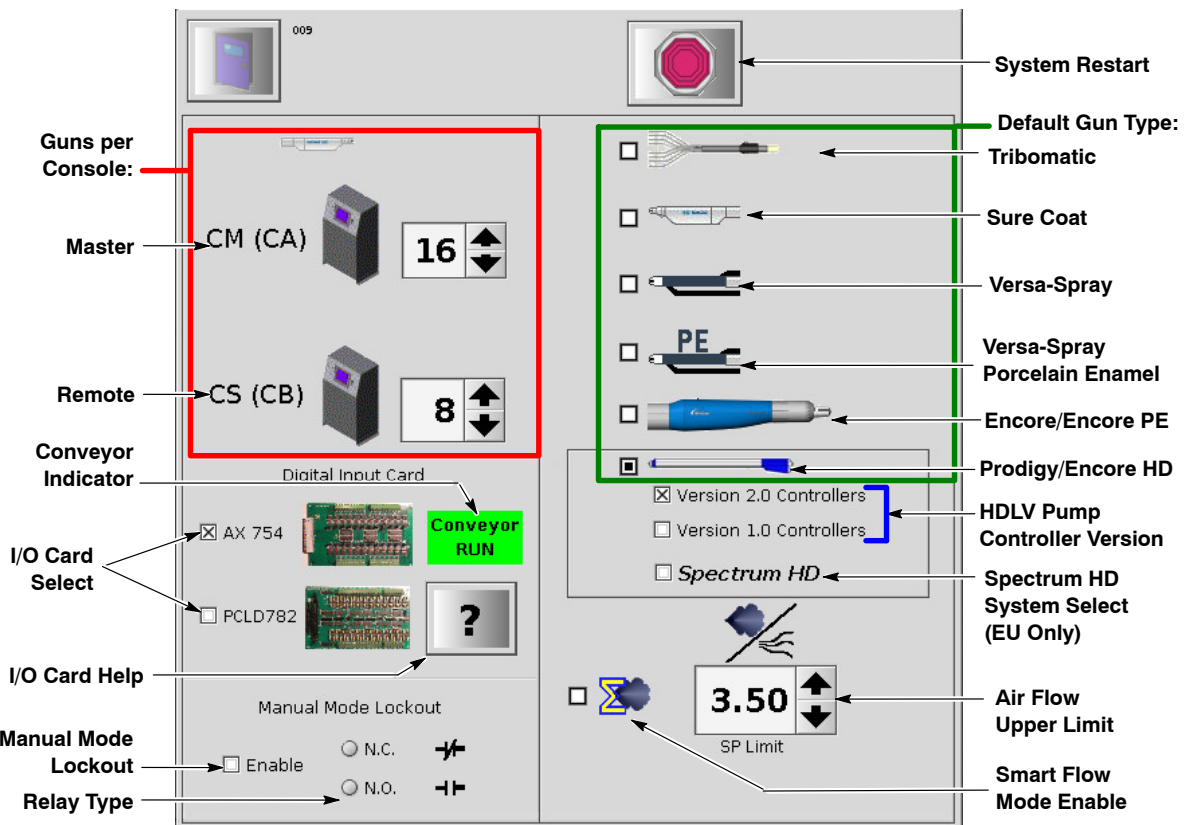


Figure 3-3 Guns/Input Card Configuration Screen

Default Gun Type

Select a default gun type.

NOTE: If you are using HDLV feed pumps, you must select Prodigy/Encore HD guns even if you are actually using a different type of gun.

Normally, the iControl system reads the gun type from the resistors in the gun cables and displays the gun icon on the gun control screens. If the exhaust fan is off, the gun control cards are powered off and the iControl system cannot read the gun type from the hardware. Instead, the system uses the default gun type for all guns. This allows you to set up or edit Spray Preset settings while the exhaust fan is off.

HDLV Pump Controller Version

Select the version of HDLV pump controller firmware used in your system. Version 2.0 is required to use the pump Fast Mode, which allows the pump to operate faster and push more powder out to the spray gun. When fast mode is set for a preset, all guns using that preset use fast mode.

NOTE: You cannot have a mix of version 1 and version 2 pump firmware in your system; an alarm will occur if a mix of version 1 and 2 is detected.

Spectrum HD

Select Spectrum HD if your system is a Spectrum HD system with Easy Clean Hopper. This equipment is only sold in the EU.

Number of Guns per Console

Set the number of guns connected to the iControl consoles:

Systems with Encore, Sure Coat, Tribomatic, or Versa-Spray guns:

Standard systems control 16 guns per console. Set CM for guns 1–16, and if the system has more than 16 guns, set CS for the remainder of the guns (17–32).

Systems with Prodigy/Encore HD guns: A Prodigy or Encore HD iControl master console controls 32 guns. Set CM for guns 1–16, and if the system has more than 16 guns, set CS for the remainder of the guns (17–32).

Flow Air Upper Limit

Use this setting to limit the air flow settings for all guns. The iControl system supports values that may not be appropriate for the number of guns and the air volume and pressure available. Limiting the value prevents flow related error messages when the flow settings are too high and the system cannot attain the commanded value.

Smart Flow Mode Enable

Smart Flow mode can be used with all spray guns that use venturi-type pumps, except the Tribomatic automatic gun. **It cannot be used for Prodigy or Encore HD guns.**

In this mode, you set Total Air (powder velocity) and Flow Air % (powder flow) setpoints. The controller automatically adjusts flow-rate and atomizing air flows to the pump based on the setpoints.

For a full description of how to use the Smart Flow mode, refer to *Section 5, Spray Gun Preset Settings*.

Digital Input Card Select

Two different digital input cards are used in the iControl system. Both cards have a manufacturer part number located in the upper left corner.

1. Open the iControl enclosure and locate the card part number.
2. Select the correct part number on the Guns/Input Card Configuration screen.
 - When the AX 754 card is installed and selected, the Conveyor Indicator will light when the interlock is connected and the conveyor is running.
 - When the PCLD782 card is installed and selected, the Conveyor Indicator will NOT light when the interlock is connected and the conveyor is running.

Touch the **Help** button for additional information.

Manual Mode Lockout

This feature is used when a single iControl console is used with multiple booths where 1 or more booths may be offline at any time. This feature prevents manual triggering of the guns in all booths, so that the guns in an offline booth cannot triggered accidentally.

The feature must first be enabled. Then the type of relay used must be chosen. It is recommended that the NC (normally closed) option be used, and all interlocks wired in series, so that any one booth that is offline with its exhaust fan off will break the circuit and prevent manual operation of any booths.

System Restart

Changes to the default gun type or number of guns require a system restart. These changes disable the **Close** button and enable the **Shutdown** button. Changing the flow limit does not require a system restart.

To restart the system:

1. Touch the **Shutdown** button.
2. A dialog box is displayed with the following choices:
 - Logout (End Photon session)
 - Shut down system
 - Shut down and reboot
3. Choose **Shut down and reboot** then touch the **OK** button. Allow the system to reboot.

Refer to *Program Shutdown* on page 3-33 for a description of the shutdown procedure.

Zone Configuration

Use the following procedures to configure the devices and inputs used for zone detection. Refer to Section 4 for instructions on configuring analog scanners to detect part height and width for positioners and reciprocators.

See Figure 3-2. Touch the **Photoeye and Scanner Configure** button on the System Configuration screen to open the Photoeye and Scanner Configuration screen.

Zone Overview

Gun triggering is accomplished by dividing the area in front of the guns into vertical zones, so that as a part passes in front of a gun it is triggered on and off. Photoeyes or scanners (light curtains) are used to detect both the length of the parts and the zones the part occupies.

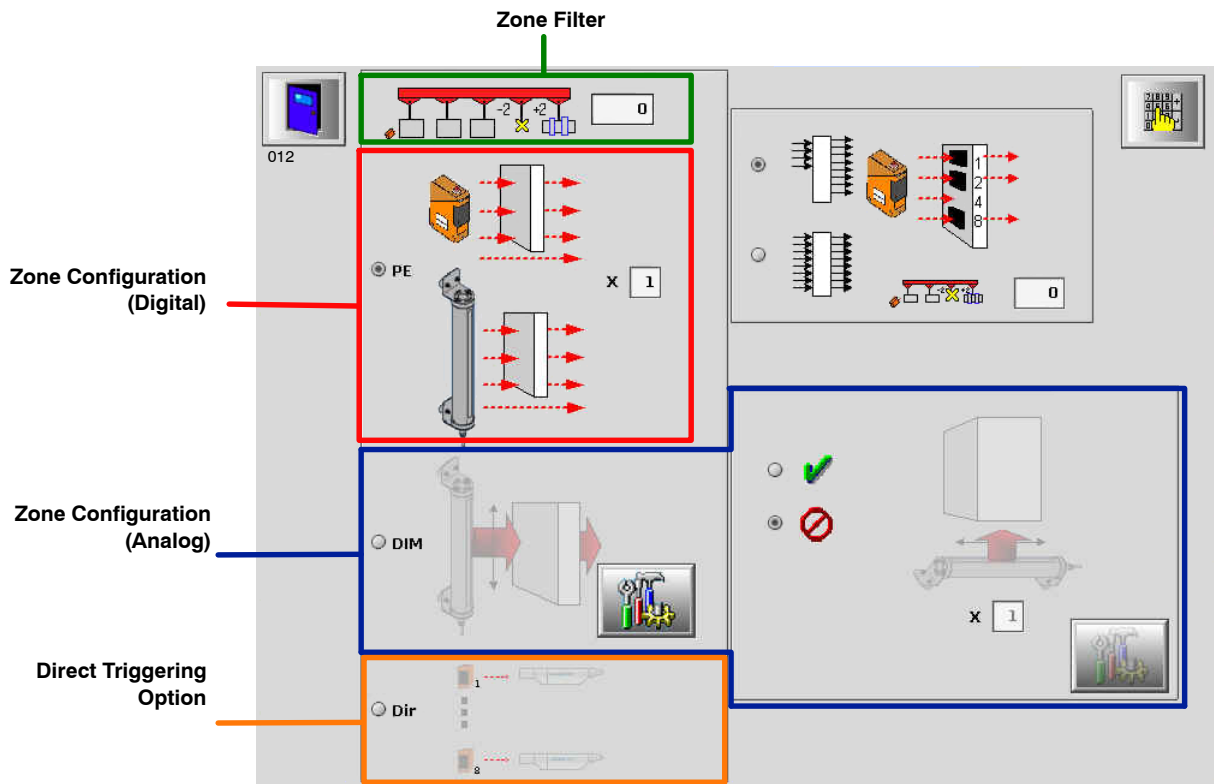


Figure 3-4 Zone Photoeye and Scanner Configuration Screen

Digital Zone Inputs: Photoeyes or discrete scanners provide an 8-bit binary signal to the 8 digital zone inputs provided in the iControl hardware. They are connected to the iControl system by the discrete 25 conductor cable.

Analog Zone Inputs: Analog scanners can also be used for zone detection. These scanners are typically used only if the system also includes reciprocators, which require them to detect part height, or when an iControl system is retrofitted into an existing system with analog scanners.

Digital Zone Triggering

See Figure 3-5. In this example, eight zone photoeyes are mounted so that they create eight vertical zones within the booth. The guns are assigned to the zones as follows for all three parts:

Gun to Zone Assignments			
Guns	Zones	Guns	Zones
1	1	5	2
2	3	6	4
3	5	7	6
4	7	8	8

See Figure 3-5:

Part 1 occupies all 8 zones, so all guns are triggered on.

Part 2 occupies only zones 1–4 so only the guns assigned to those zones are triggered on.

Part 3 occupies only zones 5–8 so only the guns assigned to those zones are triggered on.

NOTE: **Part 3** is hung so that the hangers occupy zones 1–4. Normally, this could trigger on the spray guns assigned to those zones. Use Zone Filtering to prevent spray guns from triggering on hangers. Refer to *Zone Filter Configuration* on page 3-11.

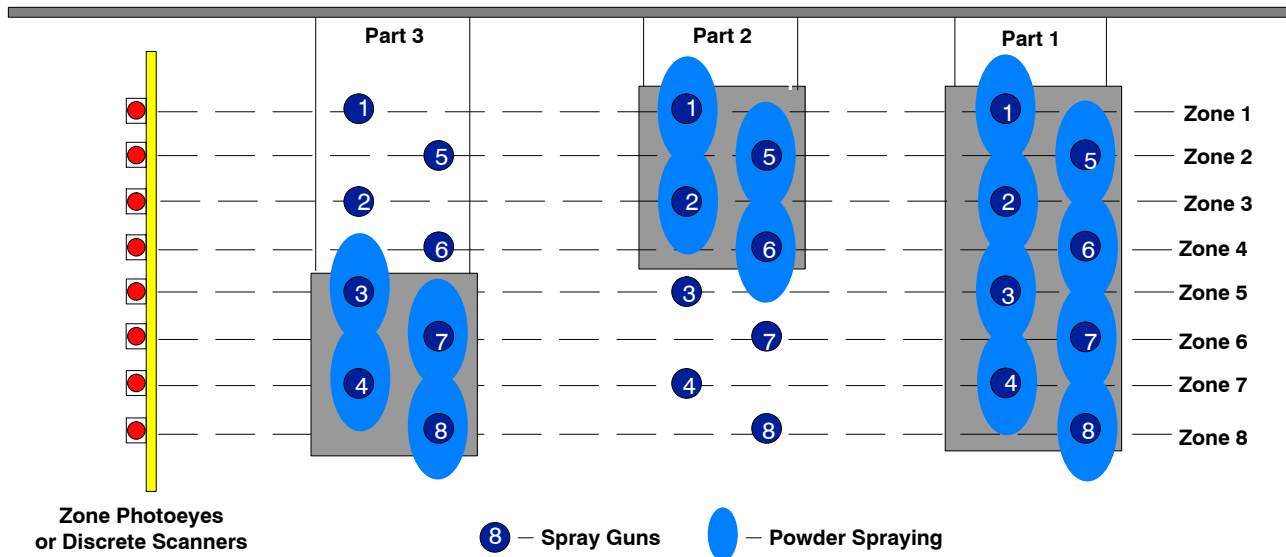


Figure 3-5 Zone Examples with Solid Parts

See Figure 3-6:

As **Part 4** moves past the guns, all guns are turned on at the solid sections, and turned off at the open section. Note that guns 1 and 8 stay on for the length of the part.

Digital Zone Triggering (contd)

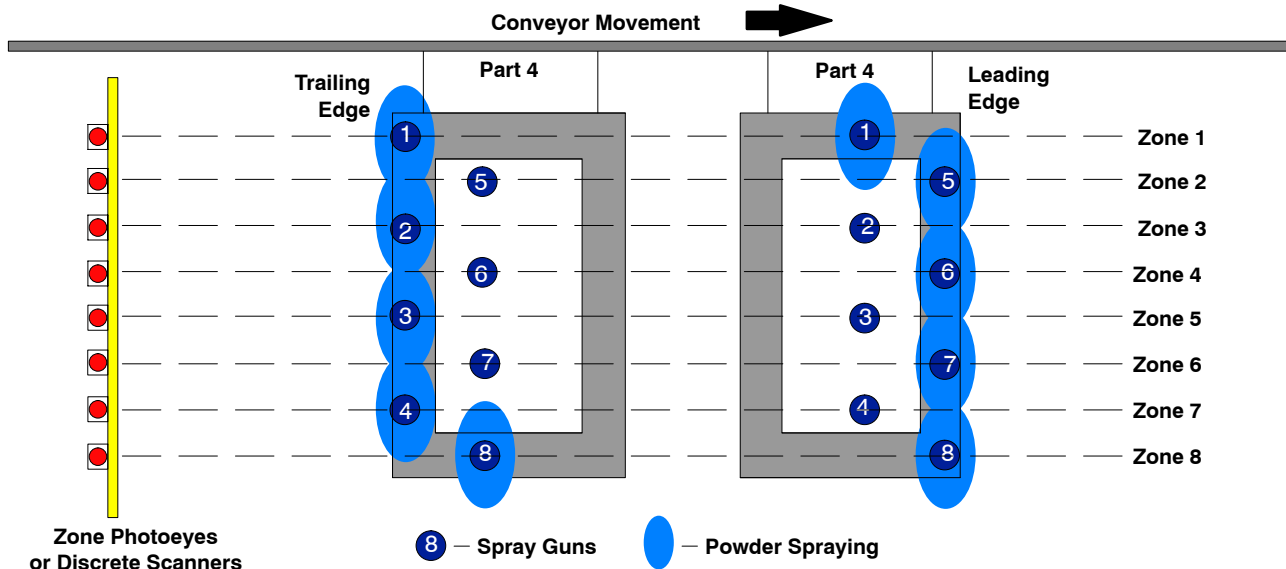


Figure 3-6 Zone Example with Open Part

Analog Zone Triggering

See Figure 3-7. Analog scanners read from top down and from bottom up. The iControl system uses the top-down analog signal for zone detection and the bottom up signal for reciprocator control. Each zone is measured from the top of the scanner, so a part automatically occupies all the zones from the bottom edge of the part to the top of the scanner.

The disadvantage of using an analog scanner for zone triggering is that a low hung part will cause all the guns assigned to the zones above the top edge of the part to be triggered on.

To avoid triggering on the guns above the top edge of the part, create a spray preset for the part with the zones set to zero for those guns.

This drawback also means that the guns in front of an open area of a part will not be triggered off, but will continue to spray.

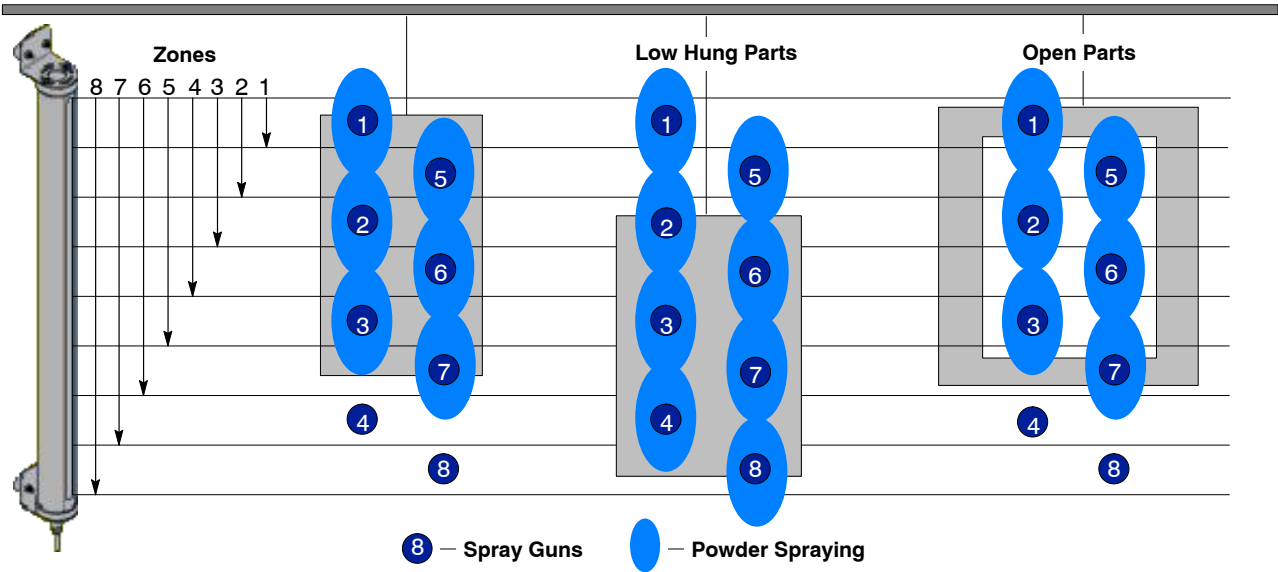


Figure 3-7 Zone Triggering with Analog Scanners

Configuring Zone Filters

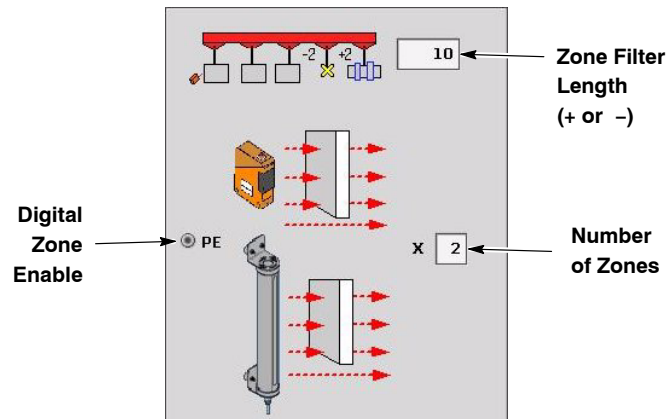


Figure 3-8 Zone Configuration

See Figure 3-8. The zone filter adds or subtracts a given length from the zone signal to effectively increase or decrease the length of parts. Use the zone filter in the following ways.

Negative filter value: Part length is reduced by subtracting the filter value from the leading edge. Use to prevent hanger detection (hanger skip). For example, for hangers 1 inch wide, a -1 inch zone filter reduces the hanger width to zero, so the spray guns are not triggered on for the hangers.

Positive filter value: Part length is extended by adding the filter value to the trailing edge. Use when coating small or narrow parts to prevent part skipping and signal chattering. For example, for parts hung with a 1-inch gap between the parts, a 1 inch filter value fills the gap so that the guns are not triggered off between parts.

NOTE: Appropriate lead and lag values should be set for each preset to compensate for the effects of the zone filtering on gun triggering.

Digital Zone Configuration

See Figure 3-8. Select the **PE** radio button, then enter the **number of zones** (1 to 8).

NOTE: Selecting PE does not disable an analog scanner if one is present.

Analog Zone Configuration

Analog scanners must be supplied and configured by Nordson Corporation.

NOTE: Before performing the following steps, go to Section 4 and configure the Ethernet network, then configure a vertical analog scanner.

1. See Figure 3-9. Select the **DIM** radio button, then the **Configure** button. The Analog Zone Scanner screen opens.

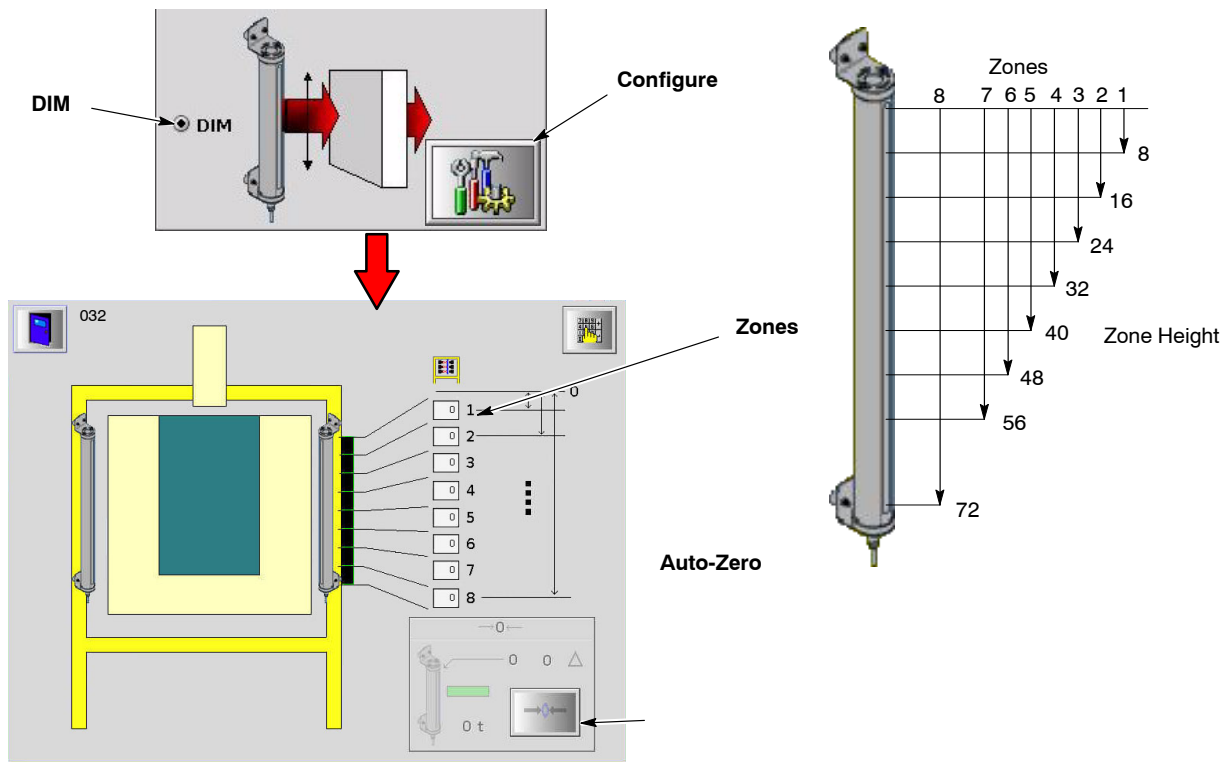


Figure 3-9 Configuring Analog Scanners for Zone Detection

2. For each zone, enter the distance in inches or millimeters from the top of the scanner to the bottom of the zone. This screen shows a 72-inch scanner divided into 8 zones.

Any unused scanner length is automatically added to the last zone configured. Zone 8 is 72 inches long instead of 64 inches because the leftover 8 inches is added.

NOTE: A low-hung part that occupies zones 5–8 will trigger guns assigned to zones 1–4 as well. To prevent this from happening, create a preset for the part with the zone set to zero for the guns in zones 1–4 so that they will not be triggered on.

Configuring the Auto-Zero Function

See Figure 3-9. This function is only available to Nordson CSRs. It allows you to tune out a valid signal from Zone 1, such as when you want to ignore part carriers or hangers. This function is not the same as the noise filtering setting explained in *Section 4, Analog Scanner Configuration*.

Start the conveyor and move the part carrier or hanger in front of the scanner, then touch the **Auto-Zero** button. When the timer reaches zero an offset value is set that ignores the signal in Zone 1.

Using Zone Inputs for Direct Triggering

The zone inputs can also be configured so that an external controller can be connected to the inputs to trigger the spray guns immediately upon the change in state of a bit or series of bits. In this mode, the iControl console acts like a simple gun control console without the need for a conveyor encoder or zone photoeyes or scanners.

To switch to this mode, select the DIR option on the Zone/Part ID Configuration screen. Refer to the Installation section of your iControl hardware manual for the I/O board inputs.

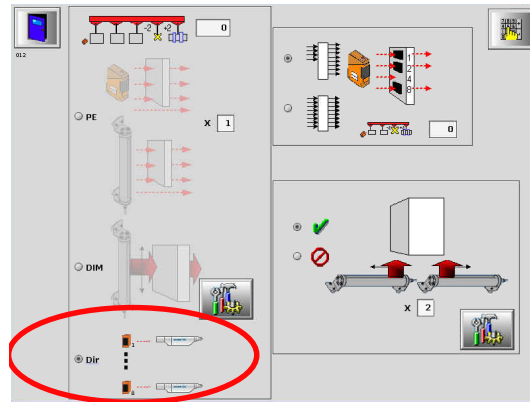


Figure 3-10 Direct Triggering Configuration

When Direct Triggering is selected, zone inputs 1–8 on the I/O board trigger guns 1–8 when activated. Guns 9–16, 17–24, and 25–32 are triggered through these same inputs along with signals on inputs 17 and 18, as follows:

Input 17	Input 18	Guns
0	0	1–8
1	0	9–16
0	1	17–24
1	1	25–32

Input 19 functions as the input strobe, or enable input. When input 19 is turned on the active inputs between 1 and 8 trigger the appropriate gun. When the strobe is removed the guns remain triggered on. Turning the strobe back on will turn the guns off.

Using Zone Inputs for Direct Triggering *(contd)*

To turn on guns 1–16 then, turn on inputs 1–8, strobe input 19, then turn on input 17 and strobe input 19 again. To turn off the guns, turn on input 17 and strobe input 19, turn off input 17 and strobe input 19 again.

Manual Trigger Lockout

When Direct Triggering is selected, input 23 can be used to lockout manual gun triggering. When input 23 is turned on the guns cannot be manually triggered.

Part ID Input Configuration

The iControl system provides eight digital part ID inputs for use with photoeyes, discrete scanners, or a customer-supplied part identification system (such as a bar code reader) that sends the inputs an 8-bit binary number corresponding to the part ID.

The part ID inputs must receive the part ID signal before the zone photoeyes or scanners detect the part.

If using part ID flags, position the photoeyes or scanners:

- in the same vertical plane as the zone photoeyes or scanners if the part ID flag is leading the parts.
- ahead of the zone photoeyes or scanners, if the part ID flag device is integral with or attached to the part hanger.

See Figure 3-2. Open the **Photoeye/Scanner Configuration** screen from the System Configuration screen. Select the part flagging method and the flag filter length. Explanations for each method and filter use are provided on the following pages.

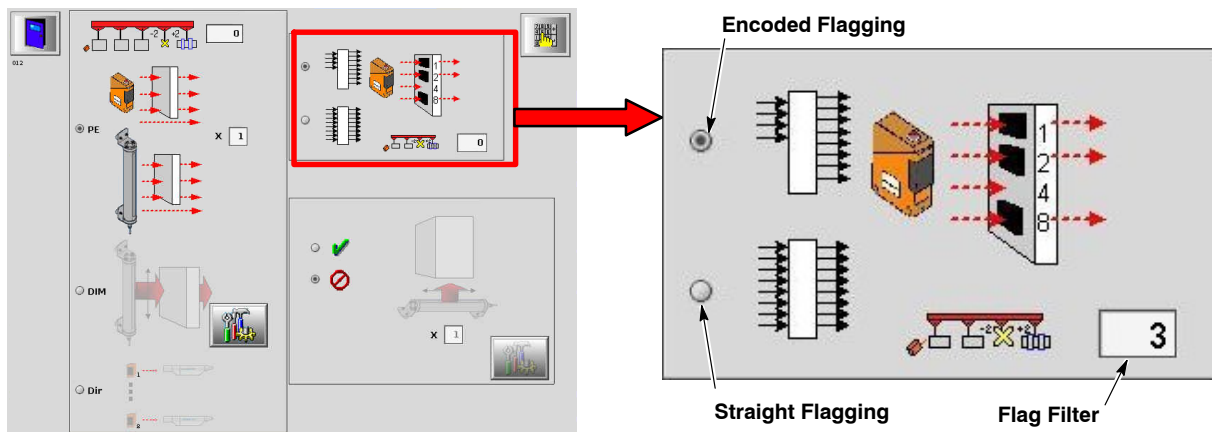


Figure 3-11 Photoeye and Scanner Configuration Screen – Configuring Part ID Inputs

NOTE: If you change the flagging method you must reboot the system for the change to take effect. Use the Program Shutdown/Reboot procedure (page 3-33) and select **Shutdown and reboot** on the operating system dialog box.

Straight Flagging

Straight flagging limits you to 8 part IDs. The highest input number receiving a signal determines the part ID. The following examples illustrate ways to use straight flagging:

Part ID by Part Height: Arrange the part ID sensors to detect parts (or racks of parts) of different heights. When only sensor 1 detects a part, preset 1 is loaded; when sensors 1 and 2 detect a part, preset 2 is loaded. This method can result in mis-reads if the part shape causes the part ID sensor signals to shut off at different times.

Part ID by Part Flag: Arrange the part ID sensors to detect closed slots in a part flag. The highest numbered photoeye detecting a closed slot determines the part ID number. Slot 5 is closed, so part ID 5 is detected and preset 5 is loaded.

NOTE: If you are using straight flagging and you attempt to manually enter a part ID above 8, the system will force the part ID to 8.

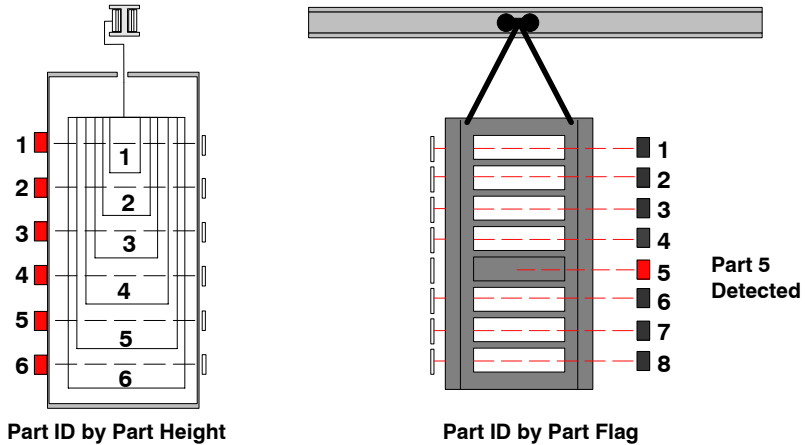


Figure 3-12 Straight Flagging Examples

Encoded Flagging

With encoded flagging, the system reads the 8 part ID inputs as 8-bit binary words. Encoded flagging allows you to identify up to 255 different part IDs. Part ID 0 (no photoeyes blocked) is not a valid part ID. It is ignored.

The following is an example of encoded flagging using a part flag. The table lists the possible part IDs for inputs 1, 2, and 3.

Encoded Flagging (contd)

Flag Example	Signal on Inputs:	Binary Code	Part ID
	1	00000001	1
	2	00000010	2
	1 and 2	00000011	3
	3	00000100	4
	1 and 3	00000101	5
	2 and 3	00000110	6
	1, 2, and 3	00000111	7

Flag Filter

The flag filter is a counter representing the travel distance during which the part ID inputs must receive a valid part ID signal before reading the signal. The counter resets when the part ID changes. The filter prevents the reading a false part ID from the solid edges of a part flag or other objects such as parts or hangers. The filter value must always be positive. The following example illustrates the process:

1. All beams are broken. Part ID is 255. Flag filter counter starts.
2. Beams 1, 2, and 3 are broken. Counter is reset. Part ID is 7.
3. Flag filter counter reaches filter setting. Part ID is read.
4. All beams are broken. Counter is reset. Part ID is 255.
5. No beams are broken. Part ID is 0, which is invalid. Flag filter counter is reset and waits for valid part ID before starting.

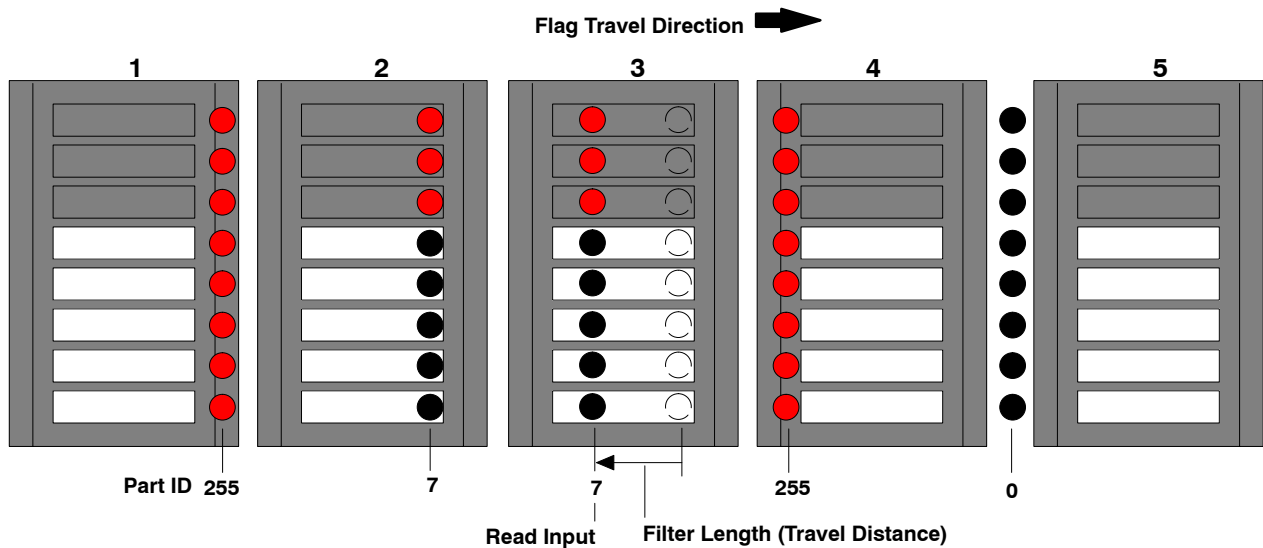


Figure 3-13 Flag Filter Example

Encoder Configuration

See Figure 3-2. Touch the **Encoder Configure** button on the System Configuration screen to open the Encoder Configuration screen. Use this screen to configure the conveyor encoder signal and set the encoder resolution, or select the Clock option.

Encoder Resolution: Number of encoder pulses per unit of movement. A resolution of 1.00 is 1 pulse per 1 inch or 1 millimeter.

NOTE: The encoder resolution limits the conveyor speed at which the iControl system can track parts. A resolution of 1.0 inch limits the conveyor speed to 50 ft/min. (10 Hz), a resolution of 0.100 inch limits the speed to 10 ft/min.

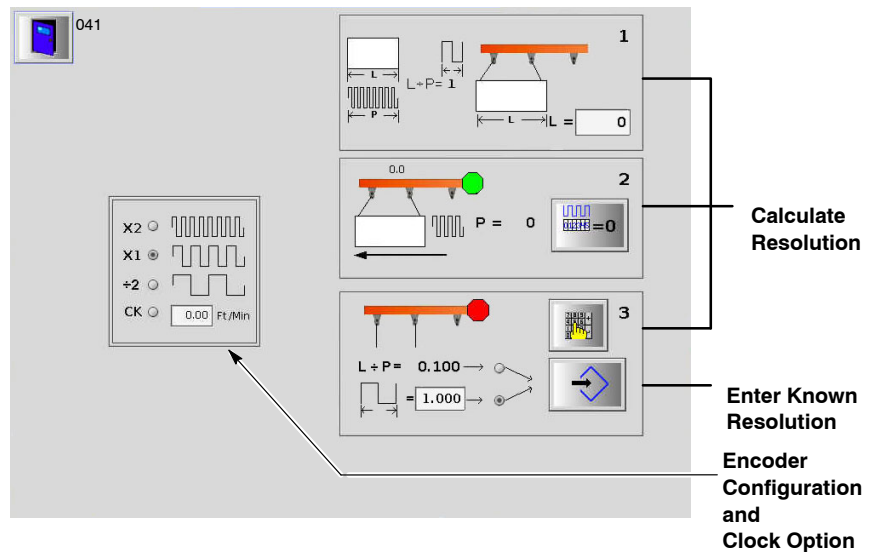


Figure 3-14 Encoder Configuration Screen

Encoder Pulse Configuration

X2: Multiplies the encoder pulses by 2, for a finer resolution and more accurate triggering.

+2: Divides the encoder pulses by 2, for a coarser resolution.

X1: Uses the encoder pulses as is. This is the default configuration.

Clock Option

If your system does not have an encoder, or the encoder malfunctions and you do not have a replacement, you can select the **CK** (clock) option and enter the conveyor speed. This is not as accurate a part tracking method as using an encoder.

Clock Option *(contd)*

The system uses a 25 millisecond clock to generate encoder pulses. Conveyor speeds such as 2, 4, 5, 8, 10, 12, 20, 25, 32, 40 and 50 can all use exactly 1.00 inch resolution. Other speeds require that the encoder resolution be adjusted to offset the fact that 25 milliseconds may not be an even multiple of the speed of the conveyor in terms of the number of milliseconds in an encoder pulse.

Use the following formula to obtain the correct encoder scale to compensate for the resolution of the internal clock:

Conveyor speed (inches per second) x the next even multiple of 25 milliseconds = encoder resolution.

For example:

1. Convert 18 inches/minute to inches/second: $18 \times 12 / 60 = 3.6$ ips.
2. Convert to seconds per inch: $1 / 3.6 = 0.277$ or 277 milliseconds/inch. Next highest even multiple period is .3 or 300 milliseconds.
3. Encoder resolution: $0.3 \times 3.6 = 1.08$.

For example:

1. Convert 50 feet/minute to inches/second: $50 \times 12 / 60 = 10$ ips.
2. Convert to seconds per inch: $1/10 = 0.100$ or 100 milliseconds/inch. 100 is an even multiple of the time period so no additional scaling is required.
3. Encoder resolution: $0.1 \times 10 = 1.00$.

Entering a Known Resolution

If you know your encoder resolution, enter it in the data field in screen box 3, select the Known Resolution radio button, then touch the **Enter** button.

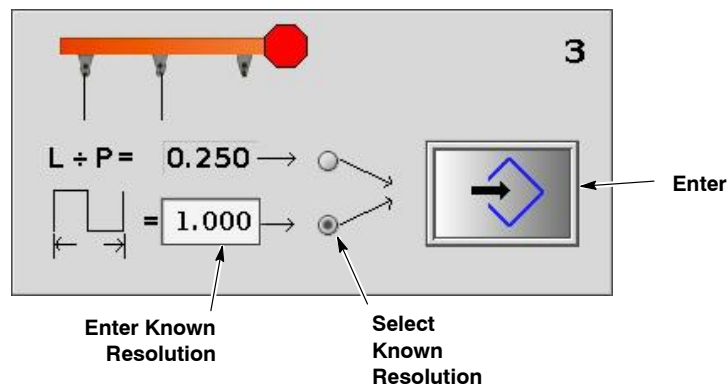


Figure 3-15 Entering a Known Resolution

Calculating Encoder Resolution

See Figure 3-16. If you do not know your encoder resolution, the iControl system can calculate it for you:

1. Hang a part or a piece of cardboard at least 36 inches long (the longer the better) on the conveyor ahead of the zone photoeyes or scanners.
2. Enter the part length into Screen Box 1.
3. Do one of the following:
 - Start the conveyor and reset the counter to zero in Screen Box 2. The conveyor must be moving to reset the counter, but the part must not move in front of the zone photoeyes or scanner before the counter is reset.
 - Put the conveyor in bypass mode, then reset the counter to zero in Screen Box 2, then start the conveyor.
4. Allow the part to move past the zone photoeyes or scanners, then stop the conveyor.
5. The calculated resolution appears in Screen Box 3. Select the calculated resolution radio button, then touch the Enter button.

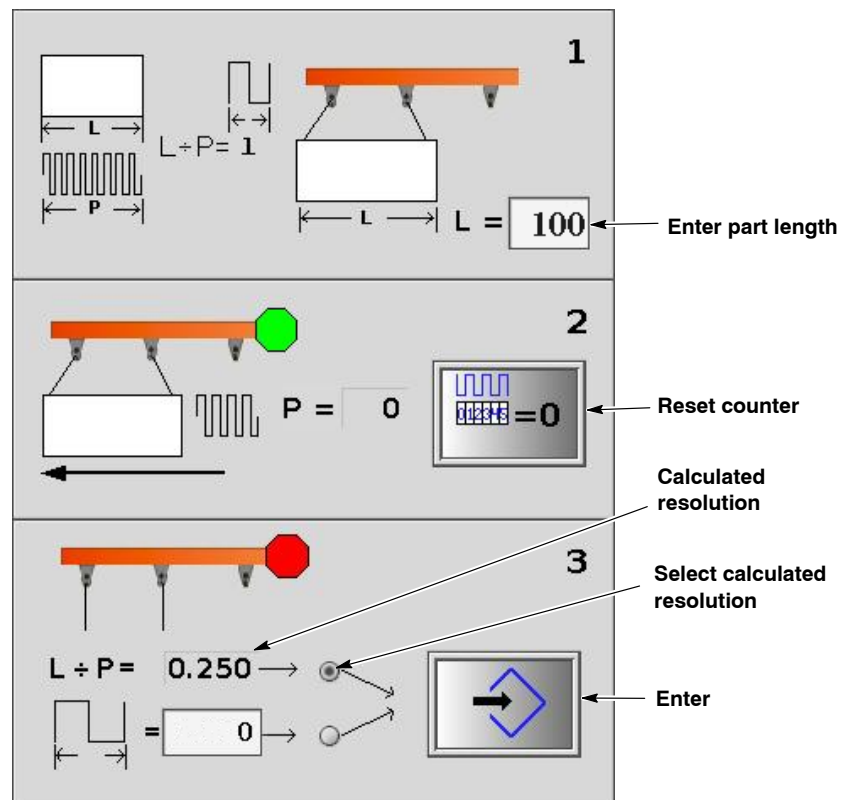


Figure 3-16 Calculating Encoder Resolution

Fine-Tuning Encoder Resolution

You may need to adjust the actual encoder scale or resolution to make it as accurate as possible. For example, a 0.040-inch error in the encoder mechanics can result in a 4-inch error in triggering at a 100-inch pickoff ($0.040 \times 100 = 4$).

Use the following procedure to adjust the resolution setting. You may need to adjust the encoder mechanics also.

1. Set the pickoff (page 3-21) for one of the guns mounted farthest from the zone photoeyes.
2. Hang a part on the conveyor.
3. For the part preset (refer to Section 5), set the lead and lag to zero, and assign the gun to a zone.
4. Run the part through the booth. Make sure the gun triggers on at the leading edge of the part and off at the trailing edge. Adjust the encoder resolution as necessary.

Pickoff Configuration

See Figure 3-2. Touch the **Pickoff Configure** button on the System Configuration screen to open the Pickoff Configuration screen.

NOTE: You must configure the guns first or the correct number of guns will not be displayed on the Pickoff Configuration screen. Refer to page 3-4.

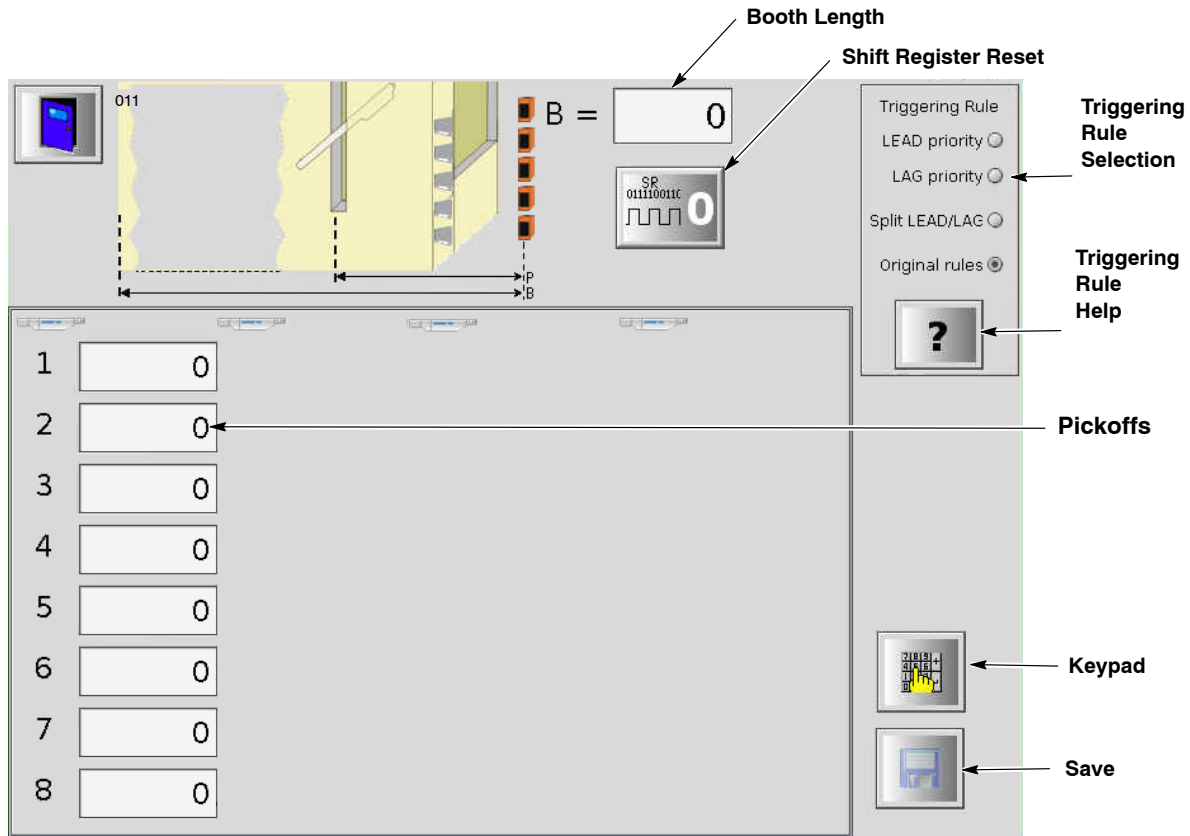


Figure 3-17 Pickoff Configuration

Pickoffs

The pickoff is the distance from the zone photoeyes or scanners to each gun. Enter pickoffs for each of your guns. To use the keypad to enter large numbers, first touch the data field, then the **Keypad** button.

NOTE: The maximum length at an encoder resolution of 1 inch is 4096 inches (104038.4 mm). If you enter a number larger than this the value is forced to 4096 when saved. Finer resolutions result in lower maximum settings.

Length of Booth

Enter the length of the booth, from the zone photoeyes or scanners to the end of the booth. This value is used for automatic color change operations to ensure that all parts have cleared the booth before gun purging starts.

Shift Register Reset

Use this function to clear the shift register if the system loses track of the parts in the booth. This happens if you reverse the direction of the conveyor while parts are in the booth, since the iControl system does not track the direction of conveyor movement.

Triggering Rules

Original Rule: This is the default rule. If a system is upgraded to iControl 3.0 software from a previous version, and the system has already been configured, this rule will be selected by default.

Under this rule, the preset of a new part takes priority. Therefore, as soon as the lead of a new part is reached, the spray guns start spraying with the new preset settings, even if the trailing edge of the previous part has not been reached, or lag of the previous part has not been completed.

NOTE: This rule may cause erratic triggering. For example, the new preset may cause guns to spray when they would normally be off for the current preset.

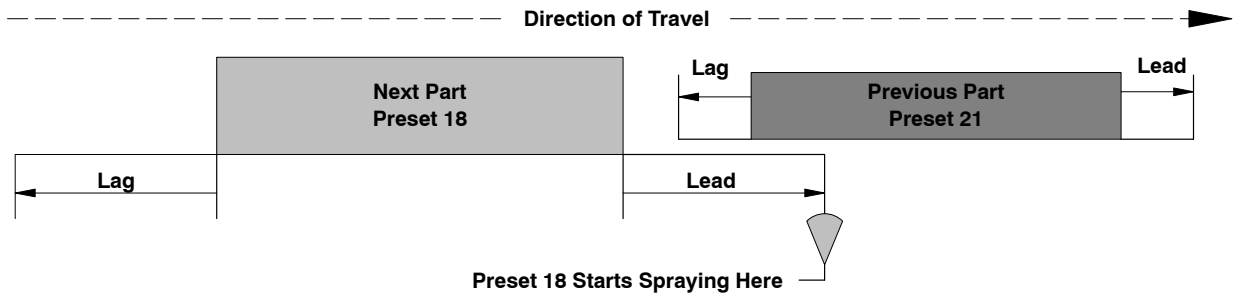


Figure 3-18 Original Triggering Rule

Lead Priority: This rule mandates that the lead of the next part will not start until the trailing edge of the previous part is reached if the new lead overlaps the previous part.

NOTE: When installing iControl 3.0 software on a new system that has no configuration, or updating an older system without an existing database, the Lead Priority rule is the default selection.

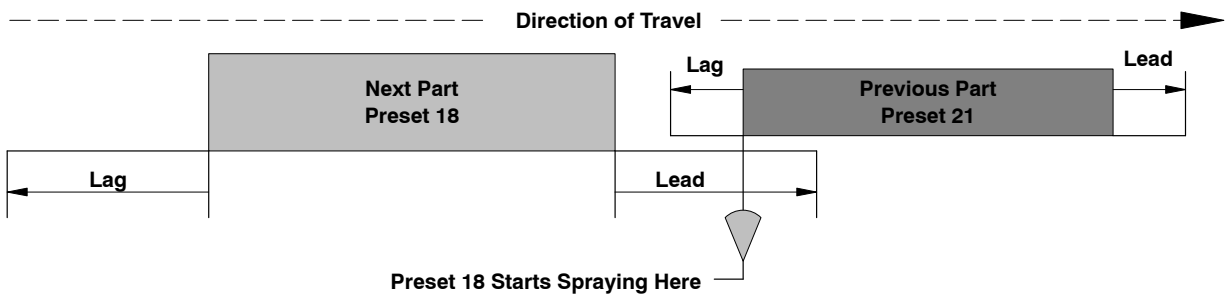


Figure 3-19 Lead Priority Triggering Rule

Triggering Rules (contd)

Lag Priority: This rule mandates that the lag of the previous part continues until complete or the leading edge of the next part is reached.

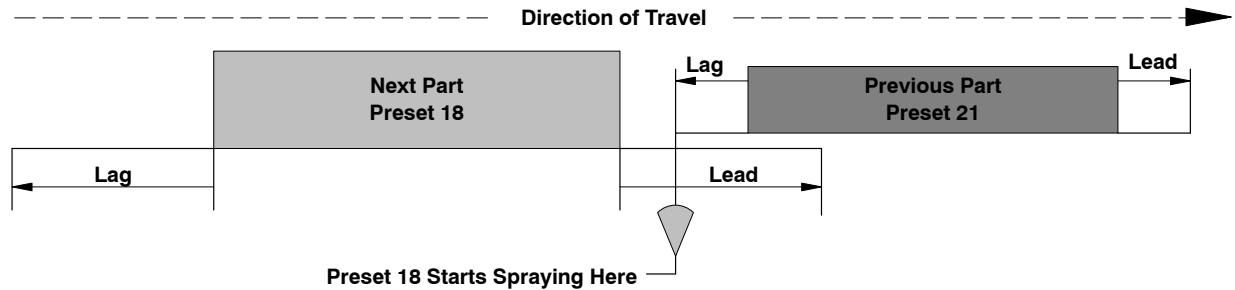


Figure 3-20 Lag Priority Triggering Rule

Split Priority: This rule mandates that if the lead of the next part overlaps the lag of the previous part, the lead and lag are split evenly.

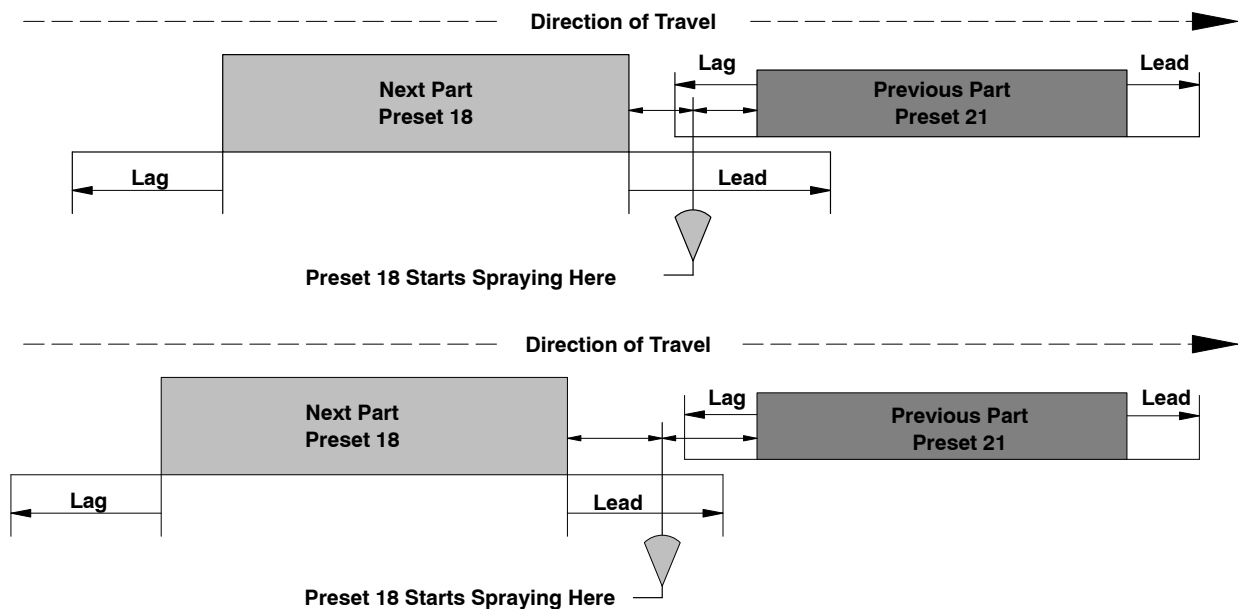


Figure 3-21 Split Priority Triggering Rule

Standard Gun Purge Configuration

See Figure 3-2. Touch the **Purge Configure** button on the System Configuration screen to open the Purge Configuration screen.

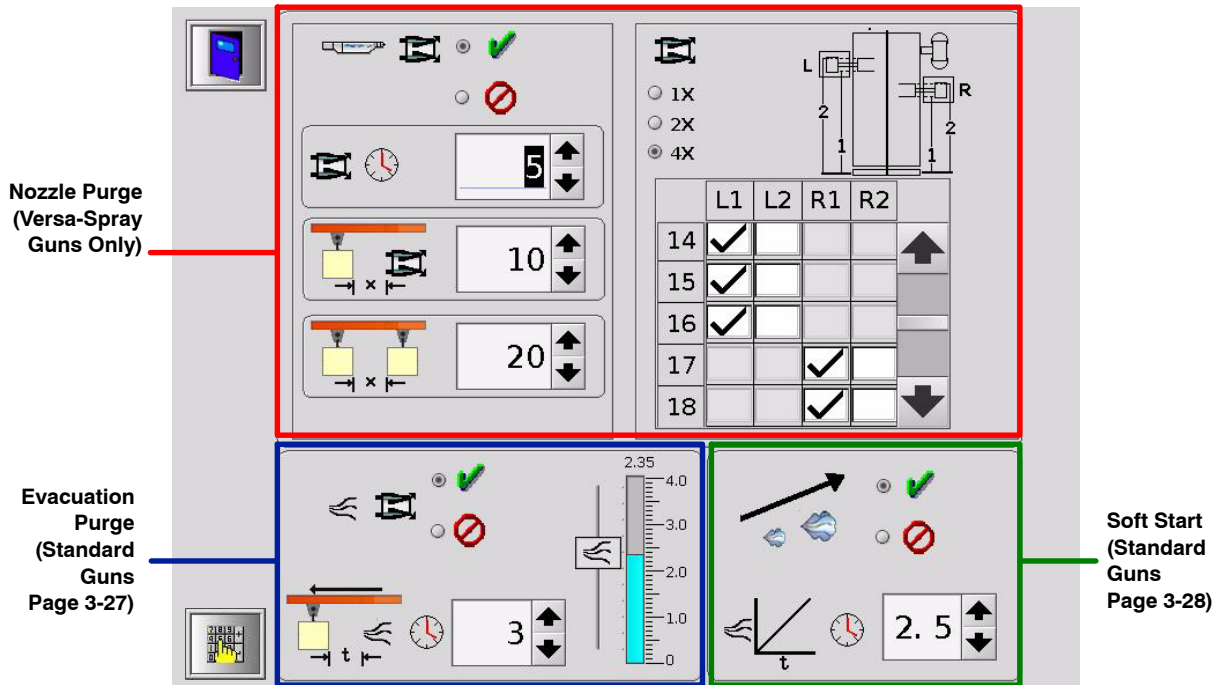


Figure 3-22 Standard Gun Purge Configuration

Versa-Spray Nozzle Purge Configuration

This function uses high air pressure (typically line pressure) to blow powder out of the gun nozzles. It can only be used with Versa-Spray guns equipped with optional purge adapter kits and optional iControl console purge kits, available in single or dual configurations. The purge kits must be field-installed in the consoles. Purge kits are shipped with installation instructions.

The settings on this screen are used for automatic purging. Set the nozzle purge mode, **Auto** or **Manual**, from the Nozzle Purge Control screen (*Section 8, Operation*), which also provides manual purge controls.

NOTE: Nozzle purge settings apply to all guns. They cannot be set or controlled for individual guns or presets.

The purge settings work as follows: If the gap between the part being sprayed and the next part is equal to or greater than the **line gap** setting, then after the trailing edge of the part moves the **purge delay** distance, nozzle purging is activated for the **purge time**.

Purging is terminated when the purge timer runs out, or a part enters the gap area or spray zone, or when the operator turns off **Auto** purge by selecting **Manual** from the Nozzle Purge Control screen.

Versa-Spray Nozzle Purge Configuration *(contd)*

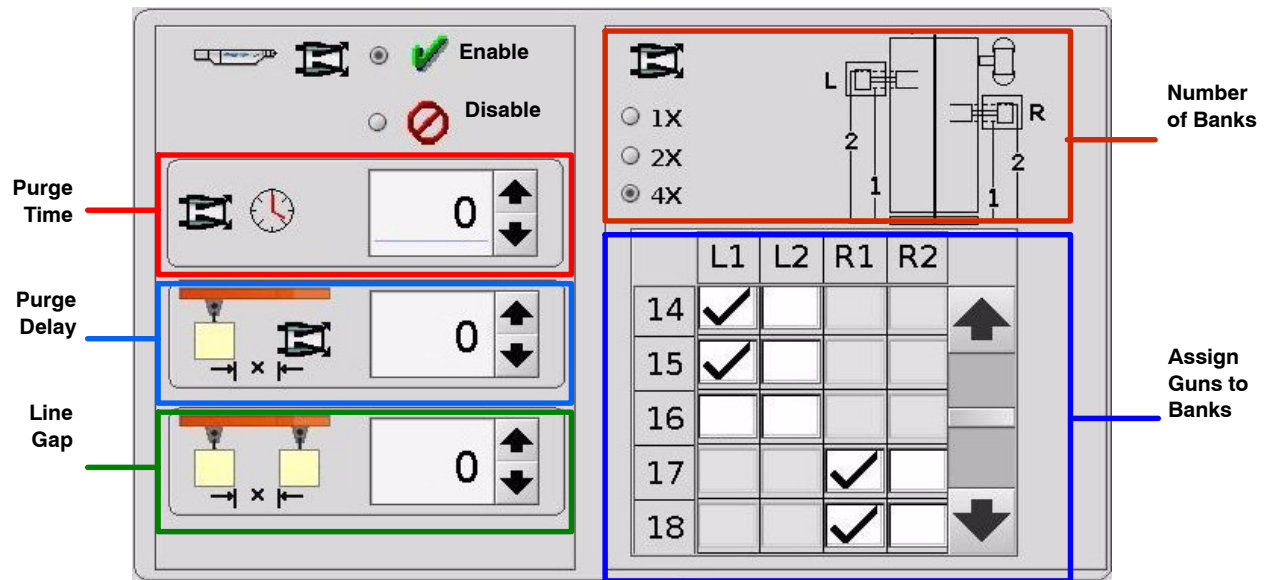


Figure 3-23 Versa-Spray Nozzle Purge Configuration

To configure Nozzle Purging for Versa-Spray guns:

1. See Figure 3-23. **Enable** nozzle purging by touching the radio button next to the check mark.
2. Set the **purge time** (0–30 seconds). Setting the time to zero disables automatic mode, so that nozzle purging can only be done manually.
3. Set the **purge delay** (0–99 inches or 0–2515 millimeters). This is the distance the trailing edge of the part must move past the spray guns before nozzle purging is activated.

Use the purge delay setting with a restricted spray or perfect pickoff (0 or negative lag settings), where the coating could be ruined if purging starts too soon.

With extended spray (positive lag setting), the part moves past the spray guns before purging begins, so a delay may not be necessary.

4. Set the **line gap** (0–240 inches or 0–6096 millimeters). This is the minimum distance you require between parts for nozzle purging.

Purging is only activated if the distance between the part being sprayed and the next part is equal to or greater than line gap setting.

5. See Figure 3-24. Set the **number of banks** desired: 1, 2, or 4. This is dependent on the number and type of purge kits you have installed in your iControl consoles.
6. Assign **guns to banks** by touching the bank field for the gun. Touching the field toggles the bank assignment on or off.

Bank assignments are dependent on the number of banks set in Step 5, and the physical location of the guns. Possibilities are shown in the following table and Figure 3-24.

Consoles	Purge Kits	Banks
1	1 single	1 bank: L1. All guns automatically assigned to L1.
1	1 dual	2 banks: L1 and L2. Assign guns to banks depending on location.
2	2 single	2 banks: L1 for guns 1–32 or L1 for guns 1–16, R1 for guns 17–32.
2	2 dual	4 banks: L1 and L2 for guns 1–16, R1 and R2 for guns 17–32.

For example, if you have two consoles with a dual purge kit in each, then you can set the number of banks to 4 and split up the guns in the master console (guns 1–16) between banks L1 and L2, and the guns in the slave console (guns 17–32) between banks R1 and R2.

If you have one console with a dual kit, then you can choose 2 banks, and assign some guns to L1 and the rest to L2.

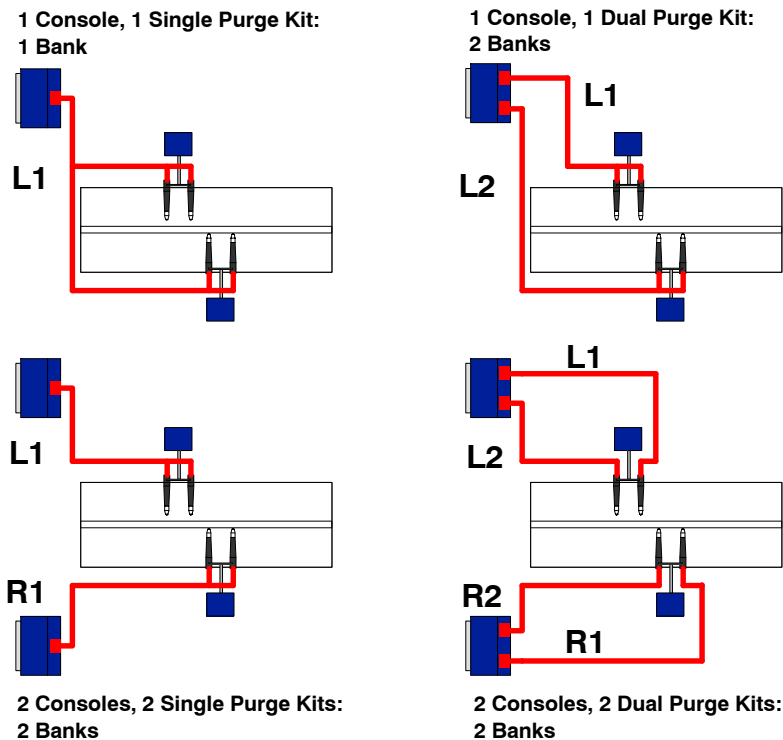


Figure 3-24 Bank Configuration Possibilities

Evacuation Purge Configuration

Evacuation purge can be used with all Sure Coat, Versa-Spray, and Tribomatic guns.

NOTE: These settings apply to all guns. They cannot be set or controlled for individual guns or presets.

Evacuation purge uses atomizing air or Tribomatic diffuser air to softly purge the powder hose and gun (gun only for Tribomatic guns). This function operates automatically for all guns when configured and enabled. It works as follows:

- When the spray guns are triggered off the atomizing air flow changes to the purge setting and flows until the purge timer expires.
- If the guns are triggered on for a new part before the timer expires, purging immediately stops and the guns start spraying at the preset settings.

NOTE: Do not use evacuation purge with Nordson In-Line powder pumps. With these pumps the atomizing air used for purging pumps powder and defeats the purge function.

To use evacuation purge:

1. **Enable** evacuation purge.
2. Set the **purge timer** (0–999 seconds).
3. Set the **purge air flow** (0.5–4.0 scfm).

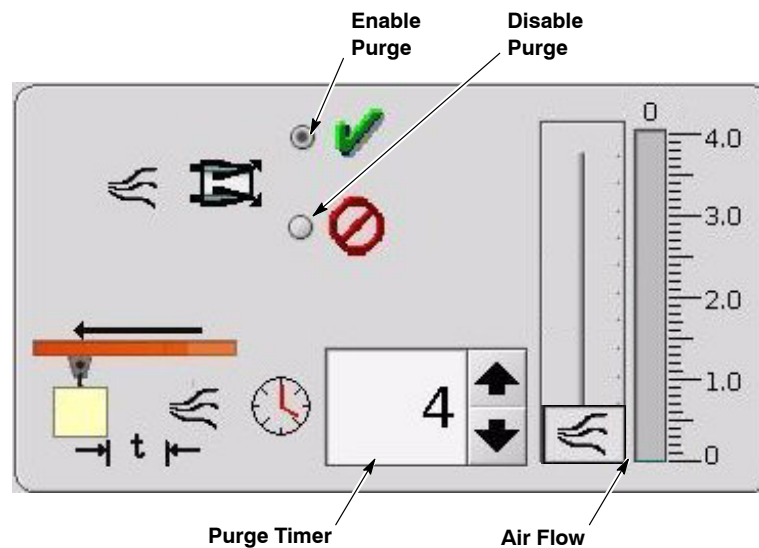


Figure 3-25 Evacuation Purge Settings

Soft Start Configuration

Soft start minimizes powder surging when the guns are triggered on. It can be used with all Sure Coat, Versa-Spray, or Tribomatic guns.

NOTE: These settings apply to all guns. They cannot be set or controlled for individual guns or presets.

Soft start ramps up the flow-rate and atomizing air flow to the preset flow settings over the specified time. It starts automatically when the spray guns are triggered on.

NOTE: With soft start, the powder flow takes longer to reach the preset setting, which could cause low film build at the leading edge of a part. To compensate for this, increase the preset lead settings so that the spray guns turn on farther ahead of the part.

To use soft start:

1. **Enable** soft start.
2. Set the **ramp timer** (0–7.5 seconds, in 0.5 second intervals).

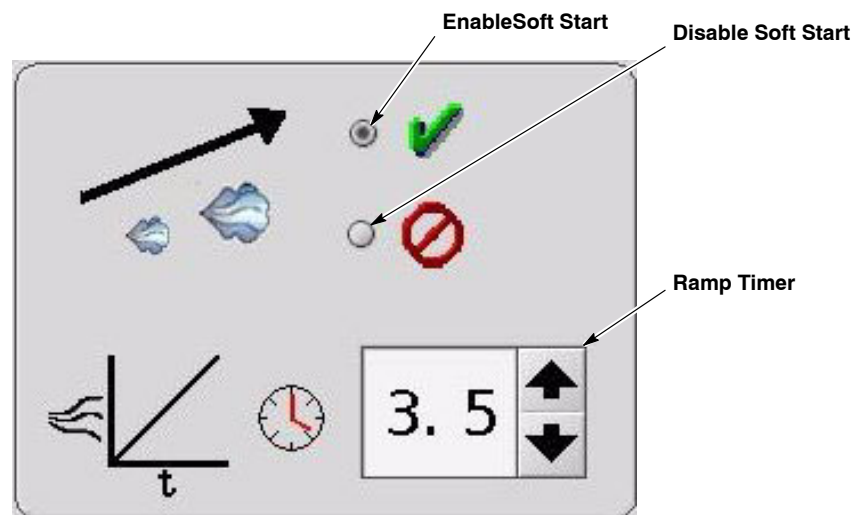


Figure 3-26 Soft Start Settings

Prodigy/Encore HD Gun Purge Configuration

See Figure 3-2. Touch the **Purge Configure** button on the System Configuration screen to open the Prodigy/Encore HD Purge Configuration screen.

Gun purging takes place automatically as part of a color change cycle, which is initiated by the feed center controls. Gun purging can also be controlled manually by the operator, using the Prodigy/Encore HD Purge Control screen on the Main screen. Refer to *Section 8, Operation* section for instructions.

NOTE: The Spectrum HD Service Panel is only activated when Spectrum HD is selected on the Gun Configuration screen. The service panel is used to override and force on or off stages in the Spectrum HD purge sequence.

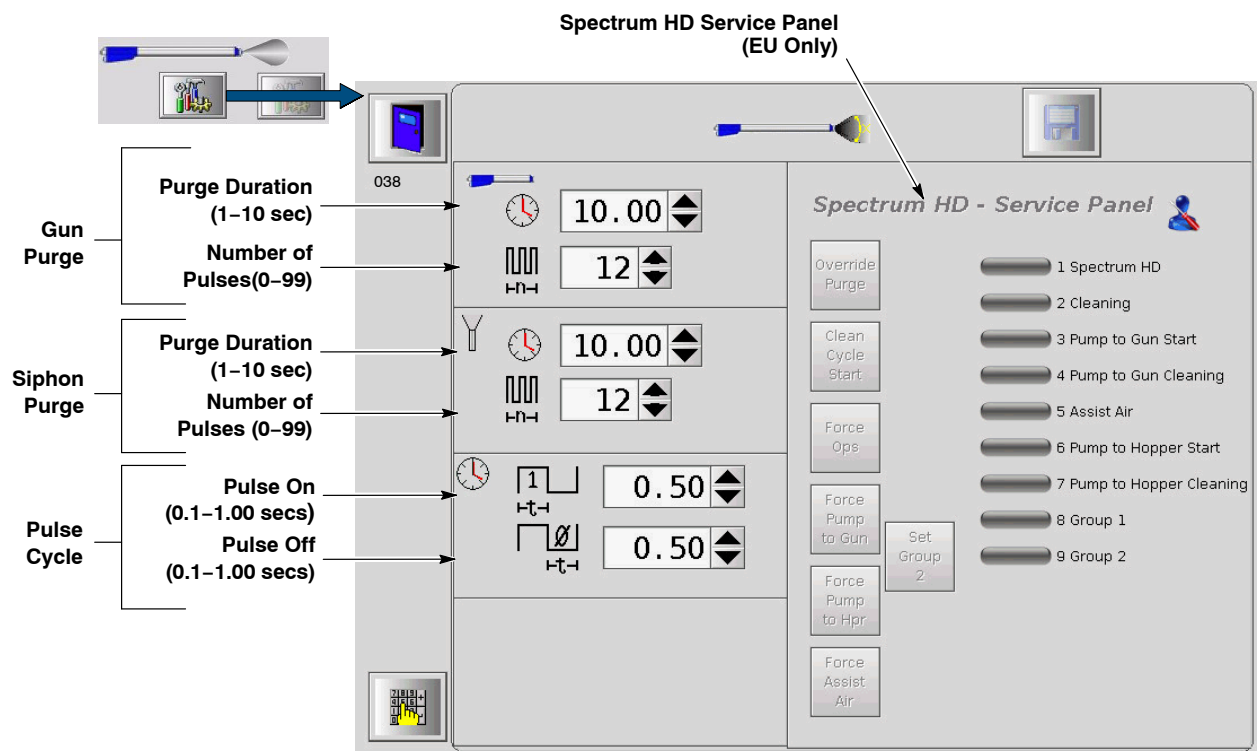


Figure 3-27 Prodigy/Encore HD Gun Purge Configuration

The gun purge sequence proceeds as follows:

1. **Purge Cycle:** For the specified time, assist air is directed through the pump and siphon tubing back to the powder supply (Siphon), then through the pump and delivery tubing to the spray gun (Gun).
2. **Pulse Cycle:** For the specified number of pulses, purge air is pulsed from the pump to the powder supply (Siphon Pulsing), then from the pump to the spray gun (Gun Pulsing). Pulse On sets the pulse duration; Pulse Off sets the time between pulses.

Make settings for the Gun and Siphon Purge Duration and Number of Pulses. The Pulse Cycle On and Off settings apply to both Gun and Siphon pulsing.

Prodigy HDLV Pump Calibration

See Figure 3-28. This function is only available to Nordson CSRs or field engineers. Touching the **Pump Calibration** button on the System Configuration screen opens the Calibration screen.

Each spray gun has its own HDLV pump, located on a pump panel. Inside the panel are the pump control board and manifold. On each pump manifold is a label with Pump Flow and Pattern Flow A, B, and C calibration constants which must be entered into the Pump Calibration screen.

Calibration Procedure:

1. Select spray gun number 1.
2. Enter the calibration numbers on the pump manifold label for the gun 1 pump.
3. Touch **Send**.
4. Repeat for each spray gun/pump combination.

NOTE: If you replace a pump control manifold or pump control board you must use this screen to enter the new manifold calibration numbers.

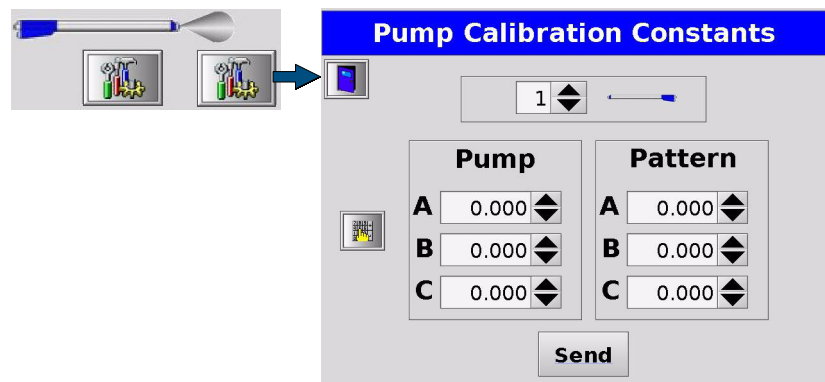


Figure 3-28 HDLV Pump Calibration

Data Backup

Use the Data Backup utility to make a copy of your user data after you configure your system and set up and test presets for your parts (refer to the sections on Presets), or any time you make changes that you want to save.

During the backup operation, all data on the user data card is copied to the program card, and then written back to the data card when the system reboots. Any data on the card in the user data slot is overwritten. All data in iControl memory is written to the program card, then restored on reboot.



CAUTION: You **MUST** do a complete system shutdown then cycle console power and allow the system to reboot to complete the backup process. If you cancel the program shutdown or select reboot, then you have not made a backup and any changes made since the last backup will be lost.

NOTE: Approved cards are SanDisk, Toshiba, PNY, and Memorex 128 Mb (minimum) CompactFlash cards. Do not use unapproved cards. For more information contact your Nordson representative.



CAUTION: Do not remove the CompactFlash cards while console power is on. Doing so will corrupt the data on the card.

1. Touch the **Backup Data** button on the System Configuration screen to open the Data Backup screen:

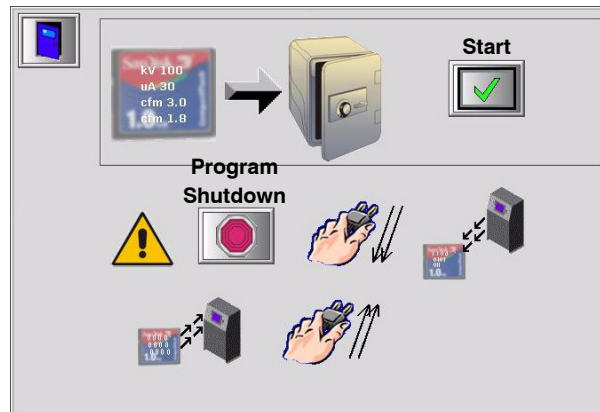


Figure 3-29 Data Back Screen

2. Touch the **OK** button to start the backup operation. The stop watch cursor is displayed during the backup operation.
3. When the **Program Shutdown** button is activated, touch it to continue the process. Wait until the iControl program shuts down, then choose **Shut down system** on the operating system dialog box. Refer to *Program Shutdown* on page 3-33.
4. Turn off console power at the switch on the rear panel.
5. See Figure 3-30. Open the enclosure door and press the eject button next to the data card slot. Remove the user data card.

Trace

This button is grayed out unless a Nordson engineer or CSR is logged in. It opens a diagnostic screen that can be used for troubleshooting a system.

Program Shutdown

The shutdown and reboot procedures shut down all running processes in an orderly sequence and prevent file corruption. Use the Shutdown button to:

- shut down the iControl program and access the operating system tools and utilities.
- shut down and reboot the iControl program and the operating system when you make a change that requires a reboot.
- shut down the iControl program and operating system before you turn off power to the console.



CAUTION: Do not turn off console power without first performing a complete shutdown. Repeatedly doing so could corrupt the iControl program and operating system on the program card or the user data on the user data card.

1. Touch the **Shutdown** button on the System Configuration screen.
2. See Figure 3-31. The iControl Shutdown Confirmation screen appears. Touch the **OK** button to confirm that you want to shutdown the iControl program. Touch the **Cancel** button if you change your mind.

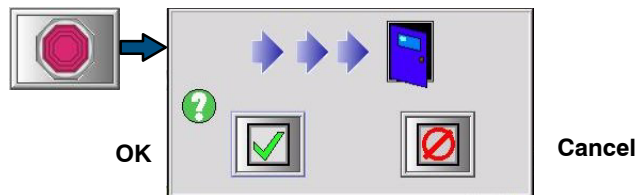


Figure 3-31 Shutdown Confirmation Screen

When the iControl program shutdown is complete, the operating system desktop appears, with the Shutdown dialog shown superimposed on the desktop:

Program Shutdown *(contd)*

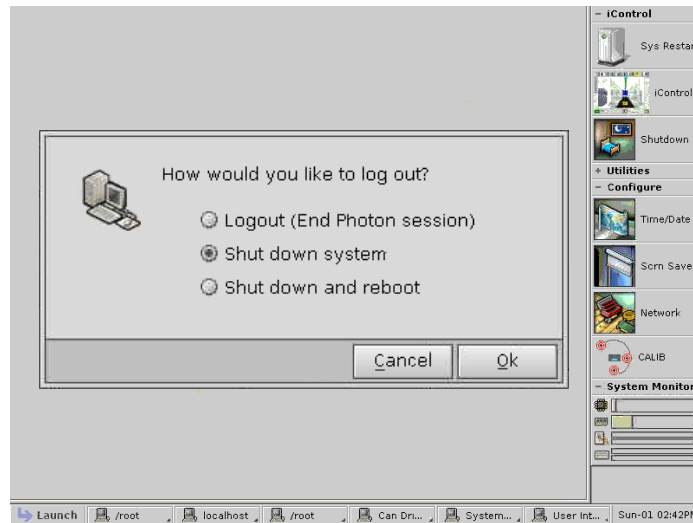


Figure 3-32 Operating System Desktop and Shutdown Dialog

3. Choose one of these actions from the Shutdown dialog:
 - Select **Logout (Photon session)** and touch **OK** to log out and completely restart all iControl programs.
 - Select **Shut down system** and touch **OK** to shut down the operating system. Wait for the operating system to completely shut down and the screen to go black before turning off console power.
 - Select **Shut down and reboot** and touch **OK** to shut down the operating system and then reboot both the operating system and the iControl program.
 - Touch **Cancel** to close the dialog box and use the operating system desktop utilities.

NOTE: The shutdown procedures force all recently changed data to be written to disk. The data in memory is compared to the data on the user data card. If differences are found, dialog boxes will be displayed notifying you of the problem.

Desktop Utilities

See Figure 3-32. The operating system desktop is visible when the iControl user interface is shut down. From the desktop you can select a series of utilities, change certain configuration settings, and perform restart and shutdown procedures.



CAUTION: Do not make changes or use utilities that are not described in this manual without first consulting with a Nordson controls engineer.

Launch: The Launch button opens a menu with the functions that are available on the sidebar.

Other Buttons: The buttons on the bottom of the desktop are minimized application windows that may be used to view diagnostic or status information for selected programs.

Sys Restart: Performs a restart of the primary iControl program and user interface. The only program that remains running is the CAN driver.

iControl: Performs a restart of the iControl user interface only.

Shutdown: Displays the Shutdown dialog shown in Figure 3-32.

Utilities: Displays a menu of file system tools. These tools should only be used with the direction of Nordson technical support.

Configuration: Displays a menu of configuration tools. These tools should only be used with the direction of Nordson technical support.

Time/Date: Use this utility to set the time and date.

Screensaver: Use this utility to enable or disable the screen saver and power saver. The default settings are screen saver disabled and power saver set to shut off the LCD backlights after 1 hour of no activity. Touching the screen will turn on the backlights and make the screen visible again.

NOTE: If a system failure should occur when the screen backlights are off, the screen will not turn back on. If this happens you must cycle console power to restart the system. Instruct all operators on the operation of the screen saver. The power saver can be disabled by “unchecking” the screen shutdown option on the power saver tab.

Network: Provides access to Ethernet settings. Most settings are typically configured from the iControl user interface, but this utility includes specialized settings. These settings should only be changed with the direction of Nordson technical support.

Calib: Starts the touch screen calibration process. Refer to *Touch Screen Calibration* below.

System Monitor: Indicates status of system components.

Touch Screen Calibration

See Figure 3-32. Use the calibration procedure to recalibrate your touch screen. The calibration values are stored on the program card.

- If you install a program card that has not been used before there will be no calibration file on the card, so the system will automatically start the calibration procedure on bootup.
- If you install a program card that was previously used on another iControl console, you **MUST** perform the *Calibration with a Mouse* procedure in the iControl hardware manual 1044158 or 1056419.

Touch the **CAL** (previous versions) or **CALIB** button to start the procedure. The calibration instructions appear on the screen. Follow the instructions exactly.

Touch Screen Calibration (contd)

NOTE: Previous versions of the calibration procedure only required a single touch to each target. The new version requires that the user touch and hold the target until it moves. If the targets are not responsive, there may be a problem with the touch screen hardware.

If you do not follow the calibration instructions exactly, you will not be able to touch the center **Completion** or **Accept** button and exit the calibration procedure. If this happens, stop and wait until the procedure times out and restarts. You should then be able to repeat the procedure and complete it correctly.

The complete procedure times out in 90 seconds. If you do not touch the **Completion** or **Accept** button within 10 seconds of pressing the third target the procedure will restart.

When you have completed the calibration procedure, touch the **iControl** button to start the iControl software.

Section 4

Ethernet and Gun Mover Configuration

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Introduction

For most configuration tasks you must be logged in as a level 4 user. Some configuration tasks are reserved for Nordson CSRs or engineers.

NOTE: The configuration process for positioners and reciprocators includes setting default move settings that apply to all parts. If part-specific settings are required, create positioner and reciprocator presets as described in Sections 6 and 7 of this manual.

System Configuration Screen



Touch the **Configure** button on the Main screen button bar to open the System Configuration screen.

IMPORTANT: You must configure the Ethernet network before you can configure the positioners, reciprocators, and analog scanners.

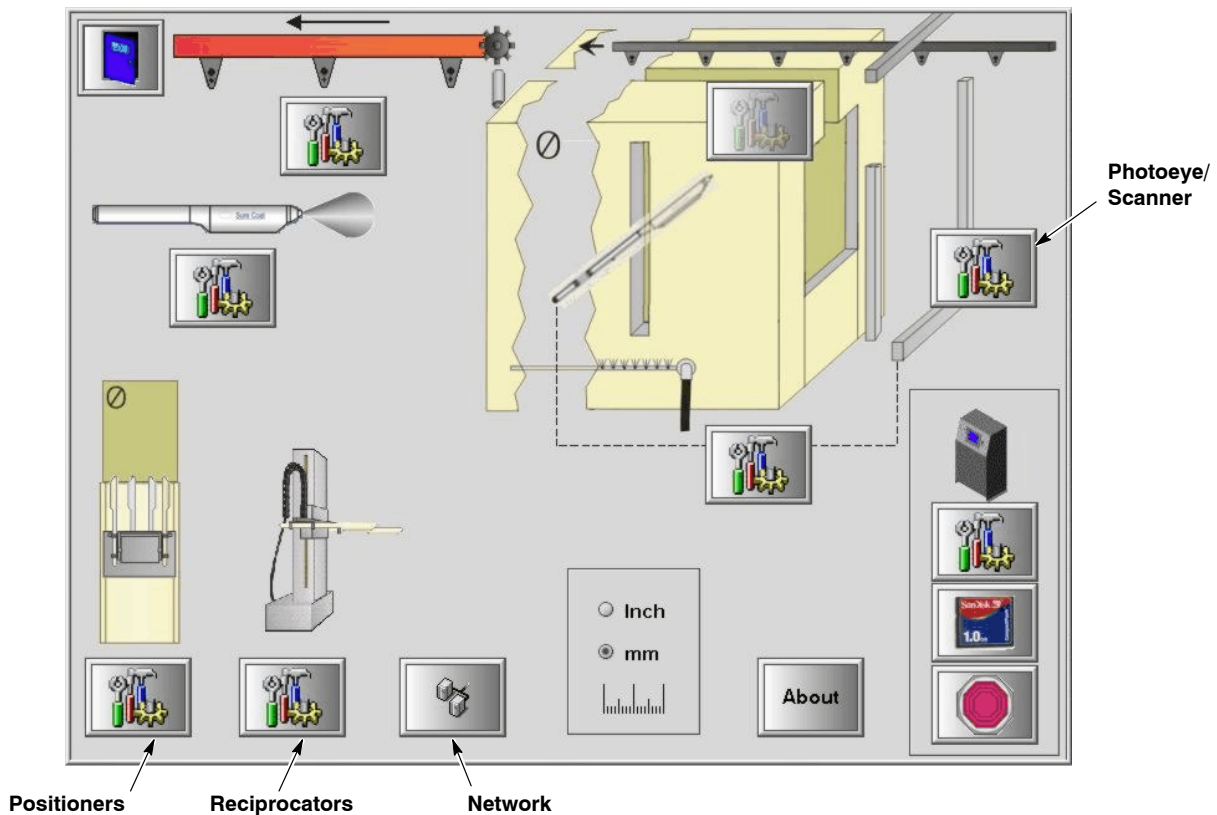


Figure 4-1 System Configuration Screen

Note: Grayed-out items on your screen require a specific user login, are not applicable to your application, or are features not yet available.

Ethernet Network Configuration

See Figure 4-1. Touch the **Network Configure** button on the System Configuration screen. This opens the Network Status screen (Figure 4-2) and provides access to the network configuration tools. Only Nordson CSRs or engineers can configure the network.

There are two networks used in the iControl system:

The **Ethernet (Remote I/O)** network provides communications with remote system devices (nodes) for the positioner, reciprocator, and analog scanner controllers.

The **CAN** network provides communications with gun driver cards, and for iFlow modules in standard systems, or to pump control cards and manual gun controllers in Prodigy systems.

Network Status Functions

Use the **Network Status** screen to check the status of the Ethernet network and the CAN network and to access the Node and Host Configuration screens.

The **Node icons** on this screen represent the devices on the Ethernet network. Green means the system is communicating normally with the nodes. Red means there is a problem with the network connections or the node. Touching the icon opens the Node Status screens. Refer to *Section 9, Network and Node Status* for information on the Node Status screens and corrective actions for error codes.

The **CAN Status** button opens the CAN Status screen. Your Nordson CSR can use this screen to diagnose problems with the CAN network.

The **LAN Reset** button resets the Ethernet network. This function is also used for diagnostics.

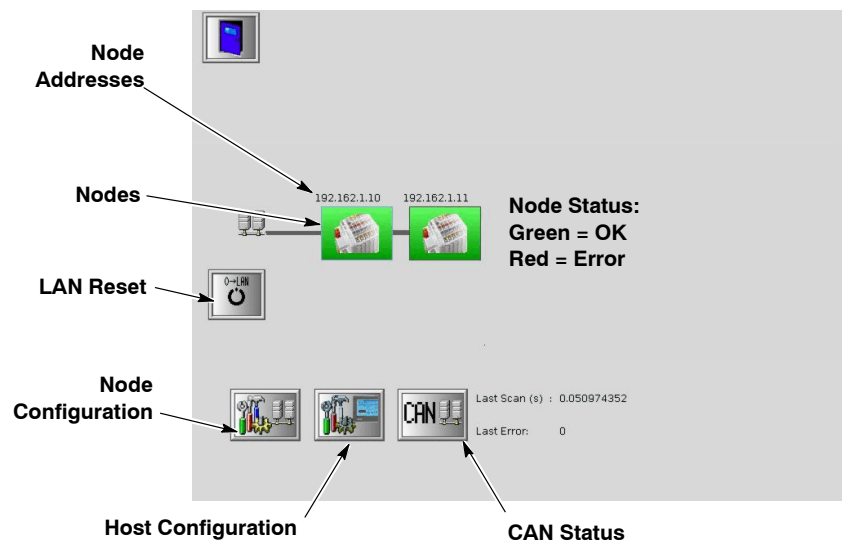


Figure 4-2 Network Status Screen

Host Configuration

Touch the **Host Configuration** button on the Network Status screen to open the Host Configuration screen (Figure 4-3).

Remote I/O Network: Set the IP address for the iControl Console in the Remote I/O Network section.

Recommended host addresses:

1st booth: 192.162.1.1
 2nd booth: 192.162.1.2
 and so on.

The Mask should always be set to 255.255.255.0.

NOTE: Newer versions of the software provide auto-addressing to ensure address conflicts are handled correctly. This feature attempts to set the first booth powered on to 192.162.1.1, the next to 192.162.1.2, and so on up to 192.162.1.5. The software attempts to resolve any address conflicts automatically.

LAN Network: This feature is not active at this time.

The screenshot shows a software interface for configuring network settings. It is divided into two main sections: 'iControl Console Address' and 'Customer LAN Settings (Future Release)'. The 'iControl Console Address' section includes fields for 'Remote I/O Network' with IP address 192.162.1.3 and MASK 255.255.255.0, labeled as EN1. The 'Customer LAN Settings' section is currently set to 'MANUAL' and includes fields for 'LAN Network' with IP address 192.189.180.196, MASK 255.255.255.0, GTWY 192.189.180.254, NAME QNXDEV4_621, and DOMAIN nordson.com, labeled as EN0.

Figure 4-3 Host Configuration Screen

Node Configuration

Refer to Table 4-1 and Figure 4-4. The nodes are devices on the Ethernet network such as the positioner, reciprocator, or analog scanner controllers.

Touch the **Node Configuration** button on the Network Status screen to open the Node Configuration screen.

Security Login: This button opens the Login screen so Nordson CSRs can log in and change settings.

1. Enter the **MAC Address**, **TCP/IP Address**, and **Machine Type** for each node on the network, as described in Table 4-1. If you make an invalid entry the field will turn yellow.

When entering the machine type, select the field, then use the rotary dial to toggle through the possible selections:

Heading	
GP1 through GP4 (positioners 1 through 4)	GP1_RC1 (positioner 1 and reciprocator 1)
RC1 through RC4(reciprocators 1 through 4)	GP2_RC2 (positioner 2 and reciprocator 2)
GP1_GP2 (positioners 1 and 2)	GP3_RC3 (positioner 3 and reciprocator 3)
GP3_GP4 (positioners 3 and 4)	GP4_RC4 (positioner 4 and reciprocator 4)
RC1_RC2 (reciprocators 1 and 2)	PE (scanners)
RC3_RC4 (reciprocators 3 and 4)	

Configure the positioners first, always entering them in numerical order. If the system has reciprocators but no positioners, then configure the reciprocators first, always entering them in numerical order.

If two positioners or reciprocators use the same controller, select a combination such as GP1_GP2 or RC1_RC2. If one controller controls a positioner and reciprocator, the system always assumes that reciprocator 1 is mounted on positioner 1 (GP1_RC1).

2. Touch the **Send IP Address** button or the **Save** button.
 - The **Send IP Address** button sends the IP addresses to the controllers.
 - The **Save** button saves the data entries and sends the IP addresses to the controllers if not done already.

iControl Versions Below 3.0

When you touch the **IP Send** or **Save** button, you are prompted to cycle power on the node controllers by three messages. If you do not cycle power correctly, the system will not be able to communicate with the nodes on the network.

iControl Version 3 and Above Procedure

When you touch the **IP Send** or **Save** button, the following dialog box opens and stay open until it is closed. You **must** now cycle power on the controllers.

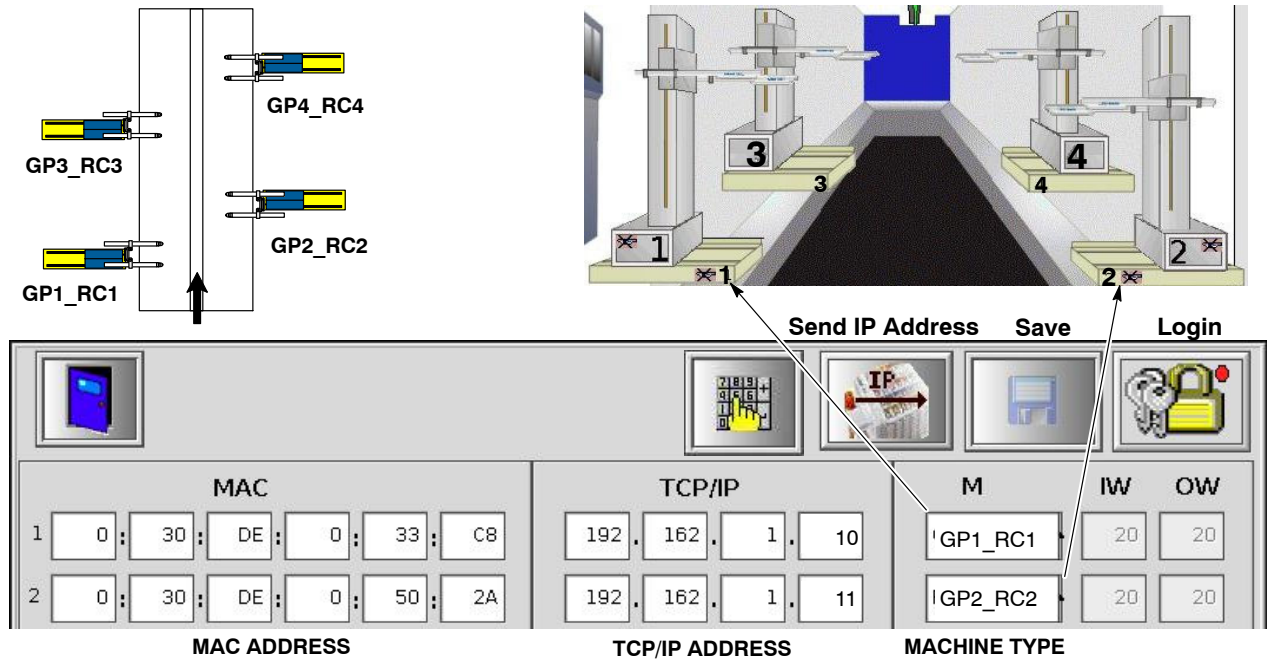


Figure 4-4 Node Configuration Screen

Positioner Configuration

See Figure 4-1. Touch the **Configure** button on the System Configuration screen to open the Positioner Configuration screen. The positioners are used to move the spray guns either horizontally or vertically.

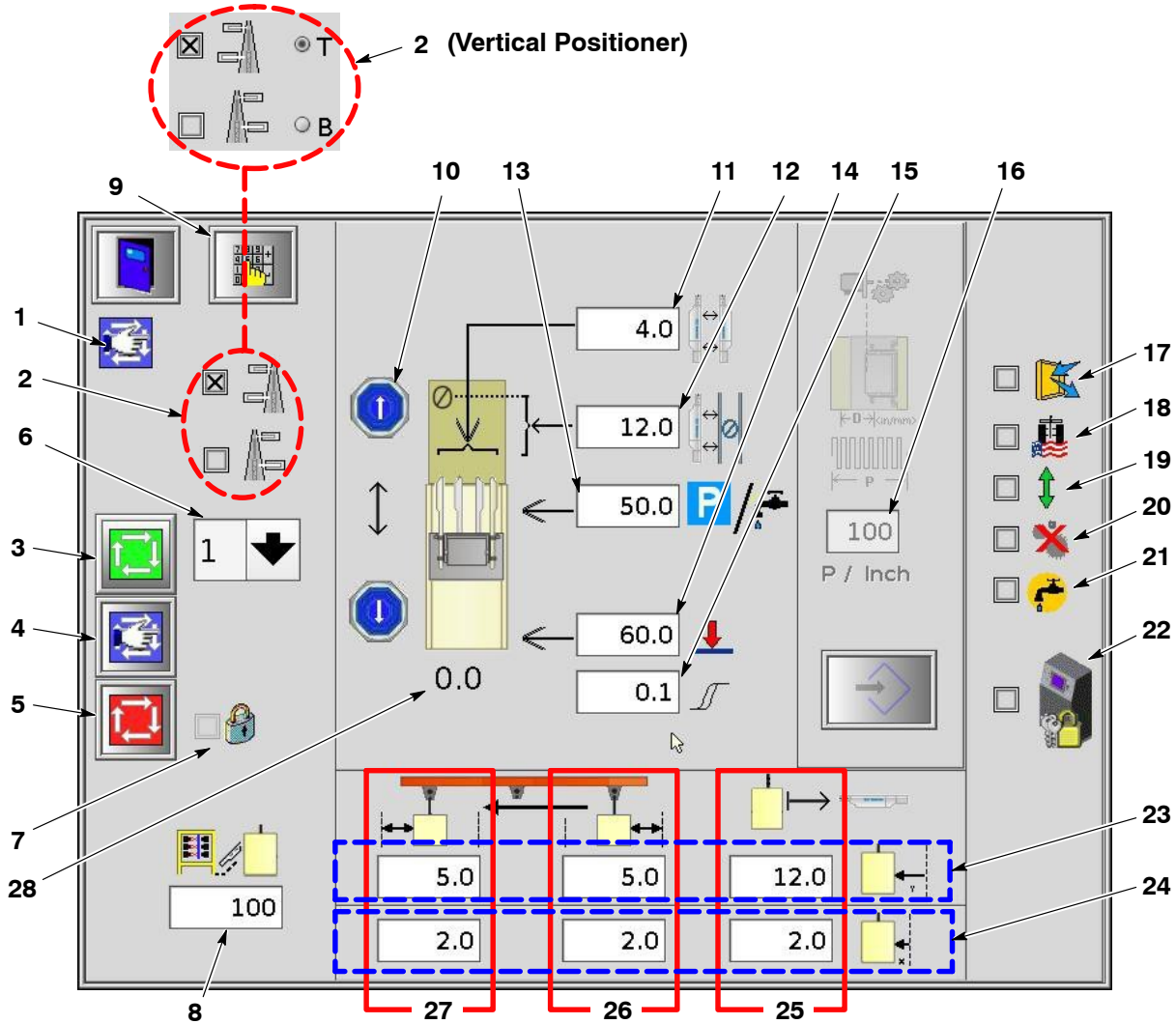


Figure 4-5 Positioner Configuration Screen

- | | | |
|---------------------------|---------------------------------------|-----------------------------|
| 1. Mode Indicator | 11. Gun Separation | 20. No Drive Encoder option |
| 2. Positioner Orientation | 12. Gun to Conveyor Centerline | 21. Clean Only option |
| 3. Auto Mode | 13. Park/Clean Position | 22. Lockout Override |
| 4. Manual Mode | 14. Retract Position | 23. Default Move Settings |
| 5. Off Mode | 15. Hysteresis | 24. Minimum Move Settings |
| 6. Positioner Selector | 16. Encoder Resolution (Nordson Only) | 25. Gun to Part Setting |
| 7. Off Lock | 17. Lance option | 26. Lag Setting |
| 8. Pickoff | 18. USA ColorMax Booth option | 27. Lead Setting |
| 9. Keypad | 19. Vertical Positioner option | 28. Actual Position |

Operating Mode Buttons and Locks



Auto: The positioner moves automatically according to the default or preset settings as parts move through the booth.



Manual: Shuts off the positioner and activates the **Jog** buttons so the positioner can be moved manually. If switched from Auto to Manual mode, the positioner automatically moves to the Park position.



Off: Shuts off the selected positioner. If in Auto mode, the positioner moves to the Park position.



CAUTION: If set to Manual or Off mode, the positioners do not automatically move the guns out of the way of parts moving through the booth. Make sure parts will not collide with the spray guns.



Off Mode Lock: When selected, locks the positioner in Off mode and disables the controls on the Positioner Control screen.



Lockout Override: Overrides the keyswitch lockout so that the positioners can be moved manually while the system is locked out.

Actual Position

Actual Position: This is the actual position of the positioner carriage in relation to the forward limit switch (0). This position is not the position of the gun tips.

Setting Encoder Resolution

1. Log in as Nordson CSR and open the System Configuration screen, then the Positioner Configuration screen.
2. Select a positioner (1–4) and set the positioner mode to **OFF**.
3. Set the positioner encoder resolution:
 - Manual only or analog retrofit: 1
 - Nutro VO618N belt-drive: 224
 - Nutro VO618N rack and pinion: 262
 - Nordson belt-drive: 68
 - Others: Check system drawing or machine nameplate.

NOTE: If you configured multiple Z-axis mover machines during Node Configuration, you must configure the encoder resolution for each machine before trying to access the mover control screens from the main screen.

Setting Zero and Home Positions

1. Set the positioner mode to **Manual**.
2. Set Zero and Home reference positions:
 - a. Jog the positioner forward to the forward limit switch (all the way down for a top-down positioner, all the way up for a bottom-up positioner). The limit switch icon should appear and the current position should read 0.
 - b. Jog the positioner back to the rear limit switch (all the way up for a top-down positioner, all the way down for a bottom-up positioner). The limit switch icon should appear and the current position should be the same as the positioner travel length. This is the Home position.

NOTE: Set the Zero and Home positions on initial startup and whenever the positioner carriage is moved and the positioner I/O controller is turned off. Auto mode is not allowed until the zero position is established. If the zero position is not established and the positioner is set to Auto mode, the positioner will automatically go to the the Home position.

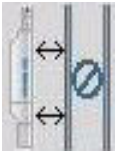



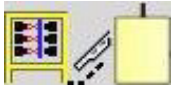
Standard Positioner Configuration Settings

The following table describes the standard positioner configuration settings. Item numbers in parenthesis correspond to the item numbers in Figure 4-5. These settings apply to both horizontal or vertical positioners except where noted.






NOTE: Acceleration, deceleration and speed values are fixed and set at the positioner motor speed controller. Only a Nordson engineer should change these values.

Manual Positioner Operation: If the positioners will only be operated manually, then the only settings required are to select the Clean Only option and set the Orientation.

Standard Positioner Configuration Settings		
	<p>Orientation (2)</p>	<p>Select the side of the booth the positioner is physically located on (right or left). For vertical positioners, select Top-Down (T) or Bottom-Up (B).</p> <p>NOTE: For horizontal and vertical positioners, the Main screen changes to match the right/left settings for positioners 1–4. The control screen for positioner 1 will control physical positioner 1 if the node configuration was done in the correct order.</p>
	<p>Gun Separation (11)</p>	<p>If guns are mounted in a straight vertical array, such as on a fixed gun stand or oscillator, enter the gun width. If the guns are staggered then enter the width of the array.</p> <p>If the guns are mounted in a horizontal array, such as on a reciprocator, enter the width of the array.</p>
<i>Continued...</i>		

Standard Positioner Configuration Settings		
	Gun to Conveyor Centerline (12)	<p>For horizontal positioners, enter the distance from the conveyor centerline to the tip of guns, with the positioner at zero (full in). This value must always be a positive number or zero. Refer to page 4-12 for instructions on positioning guns.</p> <p>For vertical positioners, refer to page 4-12 for instructions on positioning guns and calculating the value to enter for this setting.</p>
	Park/Clean Position (13)	<p>This is a position within the positioner range of travel, measured from zero. This is the position the positioner will go to:</p> <ul style="list-style-type: none"> when the Park button is touched. when the operation mode is changed from Auto to Manual or Auto to Off. if the booth interlock signal turns off (exhaust fan is shut off), or the network malfunctions. when a color change sequence is started (application specific, consult your Nordson controls engineer). <p>NOTE: The Park/Clean position should not be greater than the distance from the forward limit switch to the reverse limit switch.</p>
	Retract Position (14)	<p>Position within the positioner range of travel, measured from the forward limit switch. This position is used as follows:</p> <ul style="list-style-type: none"> At system start up, the positioner waits at the Retract position until valid parts are tracked on the conveyor and the positioner is commanded to move. If the Lance option is selected, move sequences start from the Retract position. <p>For analog positioners (retrofit positioners without an encoder for position feedback), set this value to the maximum travel distance.</p> <p>NOTE: The Retract setting should not be greater than the maximum travel distance (from limit switch to limit switch).</p>
	Hysteresis (15)	<p>Slop compensation distance. Prevents the positioner from hunting for a commanded position. If the positioner is within this distance of the commanded position when it stops, it will not move again to try to stop exactly at the commanded position. Set to a small number (0.3–2.0 in.).</p> <p>A good starting point is one inch (25 mm). Adjust this value as needed to prevent hunting, but for the best position accuracy, make it no larger than needed.</p>
	Pickoff (8)	<p>Distance from the positioner scanners to the guns (leading gun in horizontal array).</p>

Application-Specific Positioner Configuration Settings

Application-Specific In/Out Positioner Configuration Settings		
	Lance (17)	When selected, all move sequences start from the Retract position and move towards the parts. Use this setting when moving inside the parts to coat recesses.
	USA ColorMax (18)	Sets the cleaning sequence for a US-designed ColorMax powder coating system. If this option is selected the iControl system has no control over the cleaning sequence.
	Vertical Positioner (19)	Select if the positioner moves the guns vertically instead of horizontally.
	No Drive (20)	Select if the in/out positioner has reversing contactors for direction control and no speed controller. Used primarily in Europe.
	Clean Only (21)	Select if the positioner is manual control only. Used to move guns out of booth for cleaning. Default, minimum, and preset move settings are ignored when this option is selected.

Positioning Guns on Horizontal Positioners

If you need help positioning your guns contact your Nordson representative. For each horizontal positioner:

1. Hang a plumb bob from the conveyor centerline.
2. Move the in/out positioner to the forward limit switch.
3. Position the guns on the stand, oscillator, or reciprocator so that the gun tips are the desired distance from the conveyor centerline. A typical distance is 6 inches, but this is always determined by the application.
4. Enter this measurement into the Configuration screen as the **Gun to Conveyor Centerline** setting.

Positioning Guns on Vertical Positioners

See Figure 4-6.

1. Position the guns on the positioners so that the gun tips are the desired distance into the booth with the positioners at full down or full up.
2. Calculate the vertical offset and enter it into the **Gun to Conveyor Centerline** setting (item 12 in Figure 4-5) as described in the following procedures.

The vertical offset should be calculated as follows:

- Bottom-Up positioners use the Last Beam Broken (LBB) value, which is the signal measured from the last (top) beam toward the cable end of the scanner. Enter the value (**A**) from the topmost beam (LBB) to the gun tips at positioner zero (positioner at full up).
- Top-Down positioners use the First Beam Broken (FBB) value, which is the signal measured from the first (bottom) beam at the cable end toward the top of the scanner. Enter the value (**B**) from the first beam (FBB) to the gun tips at positioner zero (positioner full down).

To calculate the gun-to-conveyor centerline offset, measure the distance from the booth floor to the gun tip with the positioner fully extended, and the distance from the booth floor to the location of the appropriate beam (LBB for Bottom-Up, FBB for Top-Down) on the scanner. The difference between these values is the **Gun-to-Conveyor Centerline** value. For example:

Bottom-Up positioner: The guns are 65 inches from the floor at full up. The topmost beam (LBB) of the scanner is 108 inches from the floor. The gun-to-conveyor centerline value is $108 - 65 = 43$.

Top-Down positioner: The guns are 85 inches from the floor at full down. The bottommost beam (FBB) of the scanner is 36 inches from the floor. The gun-to-conveyor centerline value is $85 - 36 = 49$.

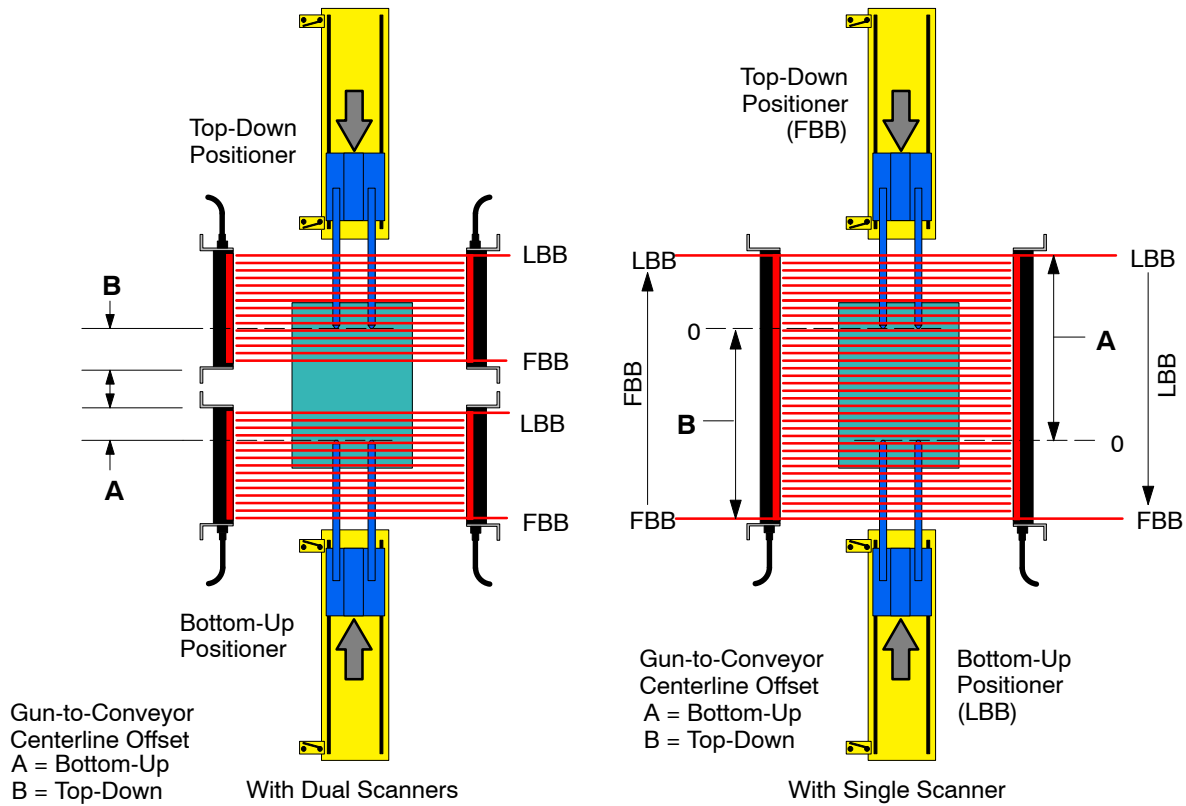
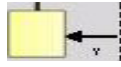


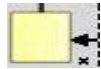
Figure 4-6 Vertical Positioner Configuration (View from Front of Booth)

Move Settings

Use the positioner configuration screen to set the values for **Default and Minimum Moves**.



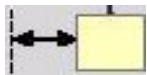
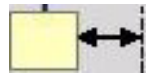

Default Move Settings: Default move settings apply to all parts that have no positioner preset settings. To create part-specific moves, refer to *Section 6, Positioner Presets*.



Minimum Move Settings: The minimum move settings are the minimum limits for all Positioner Presets. The minimum settings override the preset settings and prevent collisions.

Lead and Lag Overlap: If two parts of different widths are moving through the booth and their lead and lag settings overlap, then the gun-to-part distance for the widest part takes precedence to avoid collisions between guns and parts.

NOTE: To prevent gun/part collisions, all move settings must take into account the part dimensions and the conveyor and positioner speed.

Minimum and Default Move Settings		
	Lead	Distance from the guns to the leading edge of the part. When the part reaches this point, the positioner starts moving to the gun-to-part setting. Positive lead: Moves the guns BEFORE the leading edge of the part reaches them. Negative lead: Moves the guns AFTER the leading edge of the part reaches them.
	Lag	Distance from the guns to the trailing edge of the part. When the part reaches this point, the positioner starts moving inward or outward, depending on the configuration settings. Positive lag: Moves the guns AFTER the trailing edge of the part reaches them. Negative lag: Moves the guns BEFORE the trailing edge of the part reaches them.
	Gun-To-Part	Distance to maintain between guns and parts as parts go by guns.

Normal Default Move Example

For this example, the default move settings are:
 Gun-to-Part Distance = 10, Lead = 4, Lag = 4

1. Part at Lead: When the **leading edge** of the part is 4 inches from the guns (Lead), the positioner moves the guns to 10 inches from the part (Figure 4-7).

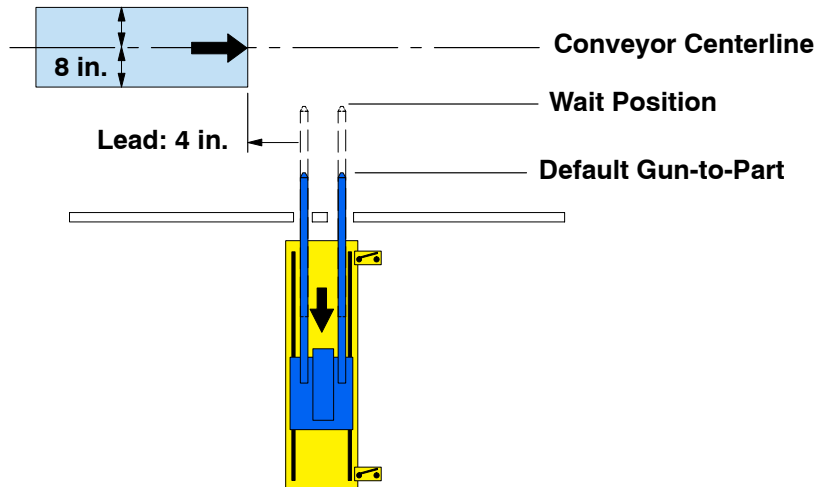


Figure 4-7 Part at Lead: Move Back Until Guns are 10 in. From Part (Top View)

2. Part in front of guns: The positioner follows the contours of the part as the part moves by the spray guns, maintaining the 10-inch **gun to part** distance (Figure 4-8).

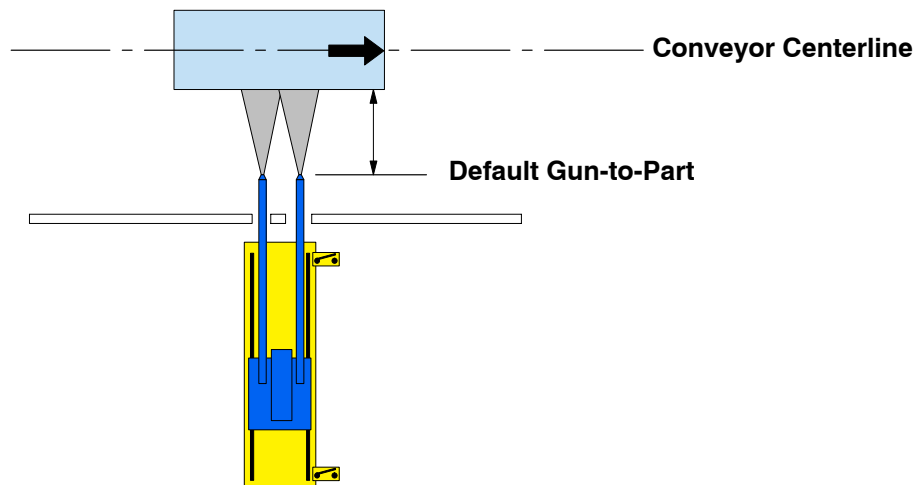


Figure 4-8 Part in Front of Guns: Gun-to-Part Distance Maintained (Top View)

Normal Default Move Example *(contd)*

- Part at Lag: When the **trailing edge** of the part is 4 inches past the guns (Lag), the positioner moves forward to wait for the next part if the lag does not overlap the lead of the next part.

NOTE: The positioner waits for the next part with the gun tips at the default gun-to-part setting distance from the centerline, or at the forward limit switch position if the switch is contacted first.

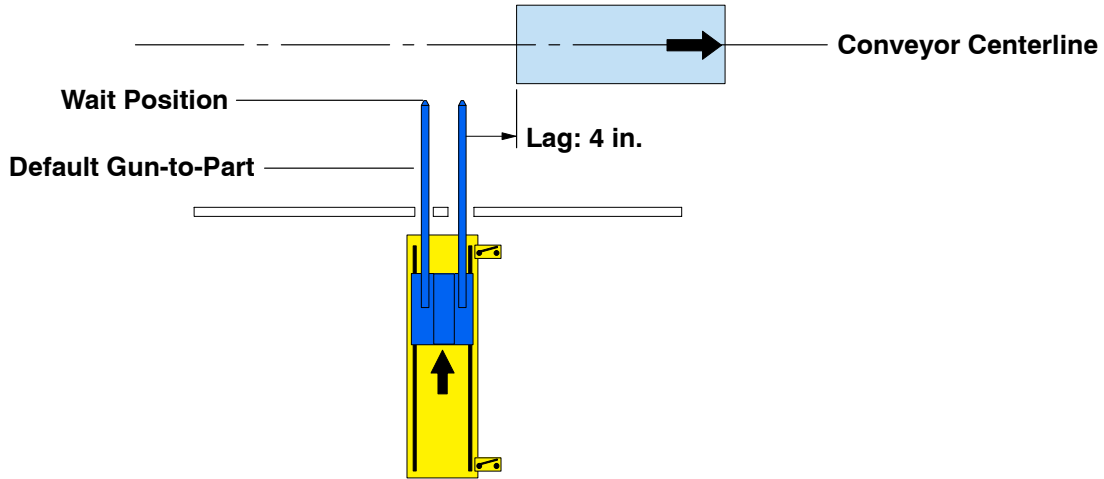


Figure 4-9 Part at Lag: Move Forward to Default Gun to Part Distance (Top View)

Lancing Default Moves Example

For this example, the default move settings are:
Lance Option selected, Gun to part = -5, Lead = -2, Lag = -2

- Part at Lead: The positioner starts from the Retract position. When the **leading edge** of the part is 2 inches past from the guns, the positioner moves forward until the guns are -5 inches from the part (5 inches inside the part).

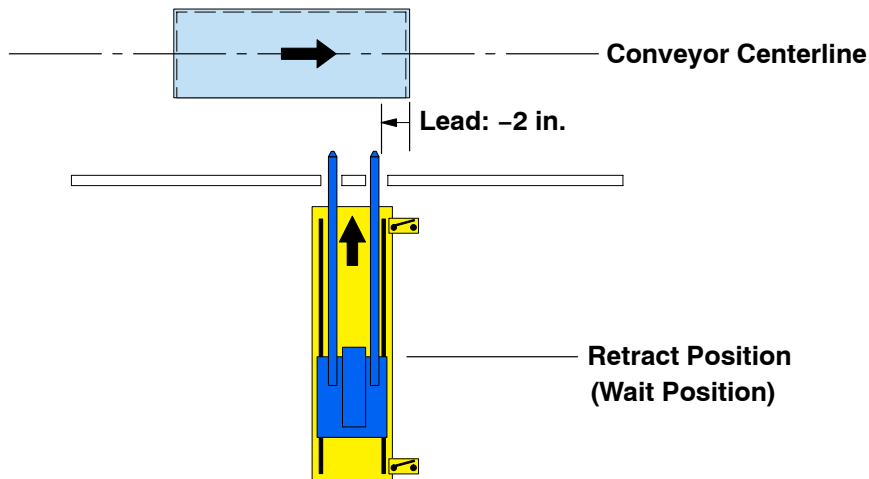


Figure 4-10 Part at Lead: Move Forward to Default Gun to Part Distance (Top View)

Lancing Default Moves Example *(contd)*

- Part in front of guns: The positioner follows the contours of the part as the part moves by the spray guns, maintaining the 10-inch gun to part distance.

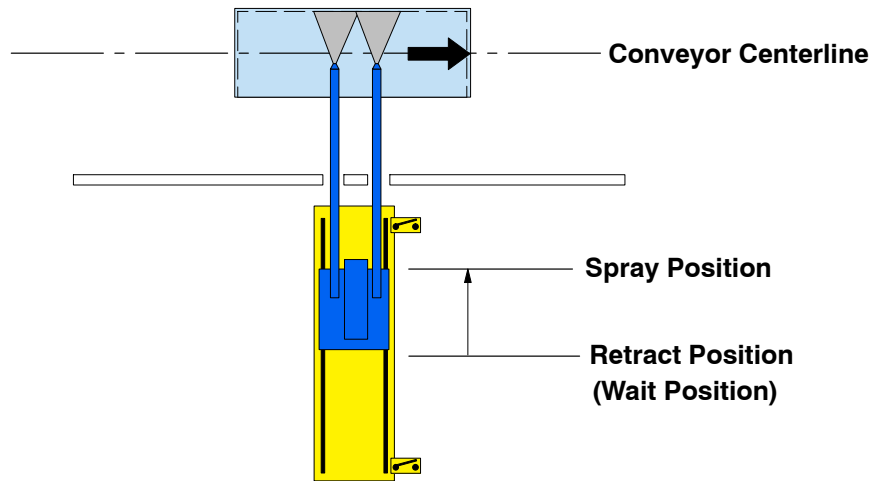


Figure 4-11 Part in Front of Guns: Gun-to-Part Distance Maintained (Top View)

- Part at Lag: When the **trailing edge** of the part is 2 inches from the guns, the positioner moves the guns back to the Retract position.

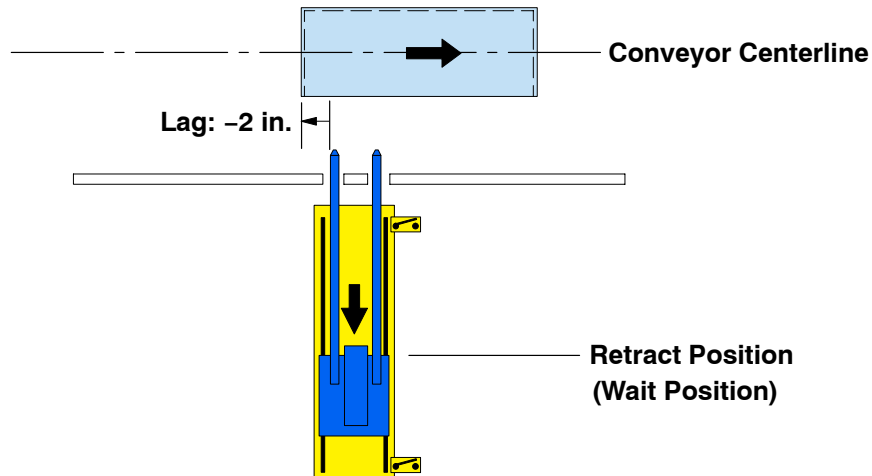


Figure 4-12 Part at Lead: Move Forward to Default Gun to Part Distance (Top View)

Reciprocator Configuration

Touch the **Reciprocator Configure** button on the System Configuration screen to open the Reciprocator Configuration screen.

Use this screen to configure your reciprocators and make default move settings that apply to all parts. To make part-specific reciprocator move settings, refer to *Section 6, Reciprocator Presets*.

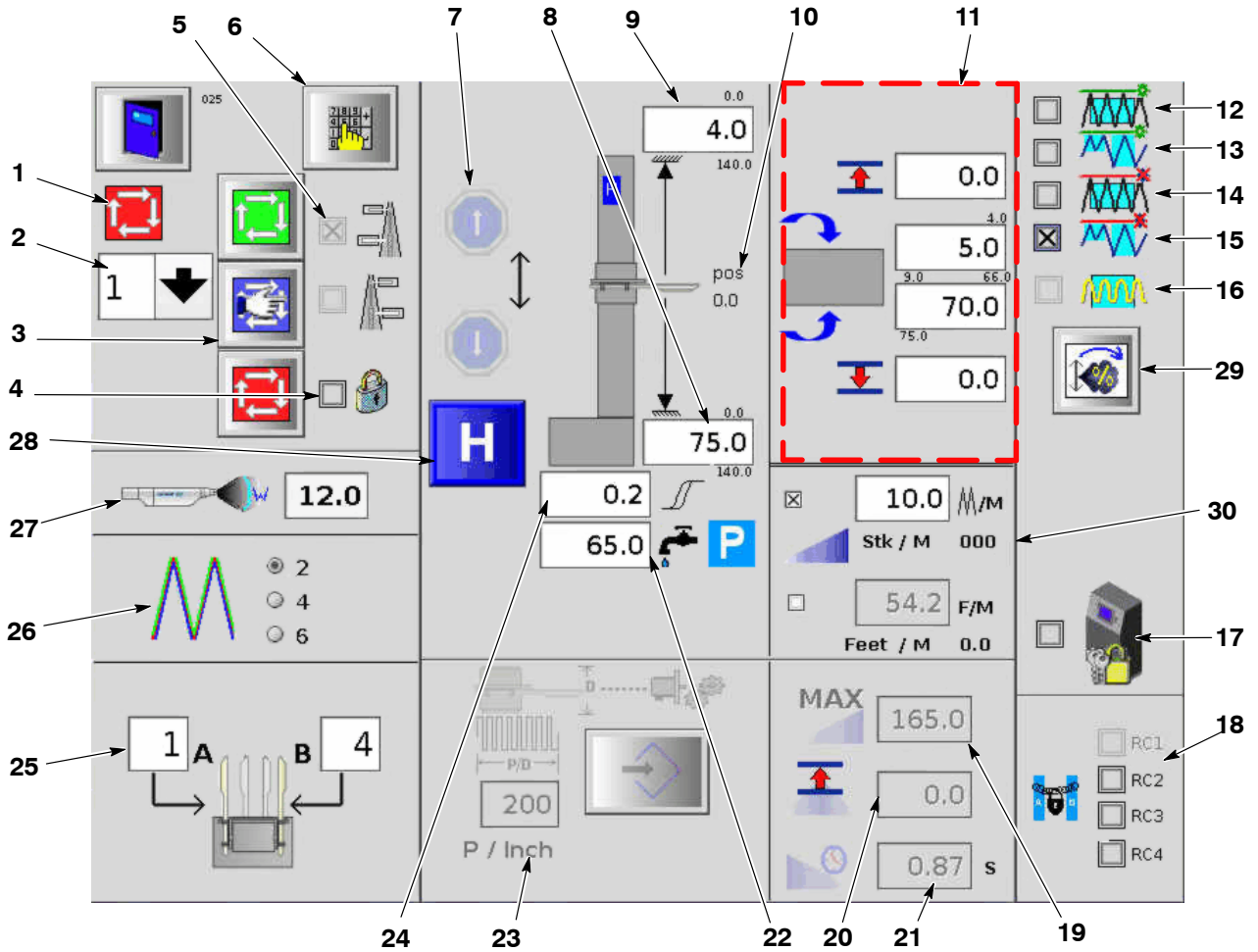


Figure 4-13 Reciprocator Configuration Screen

- | | | |
|------------------------------------|----------------------------------|-------------------------------|
| 1. Mode Indicator | 11. Fixed/Variable Move Settings | 21. Accel/Decel Time |
| 2. Reciprocator Selector | 12. Fixed, Conveyor Sync Mode | 22. Park/Clean Position |
| 3. Mode Buttons: Off, Manual, Auto | 13. Variable, Conveyor Sync Mode | 23. Encoder Resolution |
| 4. Lock in Off Mode | 14. Fixed, No Sync Mode | 24. Hysteresis Setting |
| 5. Select Side of Booth | 15. Variable, No Sync Mode | 25. Guns on Reciprocator |
| 6. Open Keypad | 16. Oscillator Mode | 26. Number of Laps |
| 7. Jog Up/Down | 17. Lockout Override | 27. Width of Pattern |
| 8. Bottom Soft Limit | 18. Master/Slave Setting | 28. Home Button |
| 9. Top Soft Limit | 19. Maximum Speed | 29. Air Flow Percent Adjust |
| 10. Current Position | 20. Turn-Around Offset | 30. Speed (No Sync Mode Only) |

Note: Settings 19, 20, and 21 can only be changed by a Nordson representative.

Operating Mode Buttons and Locks



Auto: In Auto mode the reciprocator moves automatically according to the configured or preset settings as parts move through the booth.



Manual: Shuts off the reciprocator if in Auto mode and activates the Jog buttons so you can move the reciprocator manually.



Off: Shuts off the selected reciprocator.



Off Mode Lock: When selected, locks the reciprocator in Off mode and disables the controls on the Reciprocator Control screen (refer to Section 5).



Lockout Override: Selecting this option overrides the keyswitch lockout so that the selected reciprocator can be moved manually.



Home: To manually home the reciprocator, touch the Home button. If reciprocator controller power is cycled, the reciprocator must be homed. When homed, the reciprocator should move slowly to the top limit switch and then stop approximately 1 inch below the top limit switch. This sets the zero position. The current position displayed on the screen will be greater than zero, because the reciprocator cannot stop at exactly zero.

Nordson Service Settings

The encoder resolution, maximum speed setting, and turn-around offset must be set by a Nordson service representative.

1. Log in as Nordson CSR.
2. Select a reciprocator.
3. Set the mode to **OFF**.

Encoder Resolution and Maximum Speed

Set the encoder resolution and the maximum speed (refer to your system drawings, or the reciprocator nameplate or documentation).

NOTE: If you configured multiple Z-axis mover machines during Node Configuration, you must configure the encoder resolution for each machine before trying to access the mover control screens from the main screen.

Accel/Decel Time

NOTE: You cannot use both Accel/Decel Time and Turn-Around Offset. If you enter a value for one function you must enter zero for the other.

Set the acceleration and deceleration time for the reciprocator. This should be exactly the same as the motor driver setting.

NOTE: This value is only effective if the controller, located in the reciprocator panel, is p/n 1055963 version A16 or greater.

Turn-Around Offset

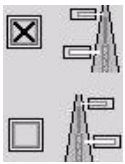





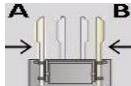

NOTE: You cannot use both Accel/Decel Time and Turn-Around Offset. If you enter a value for one function you must enter zero for the other.

NOTE: If the reciprocator controller is p/n 1055963 version A16 or greater, do not enter a value for Turn-Around Offset. Instead, enter a value for the Accel/Decel Time.

The Turn-Around Offset compensates for reciprocator overtravel at the set Turn-Around points.

1. Touch the Home button to home the reciprocator. When home is completed move the reciprocator carriage down by hand until the current position (10, Fig. 4-13) reads 6 inches or some other even number.
2. Place aligned reference marks on the reciprocator carriage and the reciprocator housing.
3. Set the Top Soft Limit to the current position.
4. Move the reciprocator down until the current position reads 24 inches (or any other even number).
5. Place a reference mark on the reciprocator housing aligned with the mark on the carriage.
6. Set the Bottom Soft Limit to the current position.
7. Set the reciprocator speed to 50% of maximum.
8. Select Auto mode. The reciprocator will start after a five second delay and audible warning.
9. Mark the turn around points, and enter the average distance between the actual turn around points and the top and bottom limit marks into the Turn-Around Offset field.
10. Adjust the Turn-Around Offset value as necessary until the reciprocator turns around as close to the soft limits as possible.

Standard Reciprocator Configuration Settings

Standard Reciprocator Configuration Settings		
	Side of Booth (5)	<p>If in/out positioners have been configured first as recommended then this setting will be grayed out it is always assumed that reciprocator 1 is mounted on positioner 1.</p> <p>If your system has reciprocators only, then select the side of the booth the reciprocator is physically located on (right or left).</p> <p>NOTE: The reciprocator numbers on the Main screen change to match this setting. The Reciprocator 1 control screen controls physical reciprocator 1 if the node configuration was done in the correct order. Refer to <i>Node Configuration</i> on page 4-5.</p>
	Soft Limits (8, 9)	<p>The soft limit positions are measured from the zero (0) position. Set the soft limits so the reciprocator never contacts the top and bottom limit switches during normal operation.</p> <p>Tripping the limit switches during any movement other than a Home will cause a fault and require a reset from the alarm screen.</p>
	Hysteresis (23)	<p>Slop compensation. This setting prevents the reciprocator from hunting when sent to the Park position. If the reciprocator stops within this distance from Park it will not move again in an attempt to stop exactly on the Park position. Set this value to a 0.5 or less and adjust as necessary.</p>
	Park/Clean Position (21)	<p>This is the position that you want the reciprocator to move to:</p> <ul style="list-style-type: none"> when the Park button is touched. when a color change sequence is started (application specific, consult with your Nordson controls engineer).
	Spray Pattern Width (26)	<p>Width, in inches or millimeters, of one spray gun fan pattern. If your spray gun fan patterns overlap, then enter the average fan pattern width (total fan width of all guns / number of guns).</p>
	Number of Laps (25)	<p>Number of times the effective fan width passes over a certain point. Typically, the more laps the better the powder coverage will be:</p> <p>2 = normal 4 = fine 6 = extra fine</p> <p>For any given conveyor speed, the greater the number of laps, the faster the reciprocator speed required. Make sure that the reciprocator speed does not cause the fan pattern to collapse. If the fan pattern collapses or the maximum speed is exceeded then select a lower number of laps.</p> <p>Use the lap calculator on the Reciprocator Control screens to see the effect of each selection.</p>
	Guns on Reciprocator (24)	<p>Starting and ending number of the guns on the reciprocator. For example, 1 and 4 means that guns 1, 2, 3, and 4 are on the reciprocator. The gun numbers must be unique; you cannot have gun number 3 on both reciprocator 1 and 2.</p> <p>NOTE: The iControl system supports only one horizontal array of guns. It does not support multiple stacks of horizontal guns.</p>
	Master/Slave Select (18)	<p>Allows you to slave reciprocators to the current reciprocator. The settings for the master are then used for the slaves. In Figure 4-13, reciprocator RC2 is slaved to reciprocator RC1.</p>

Application-Specific Reciprocator Settings

Operation Mode Settings

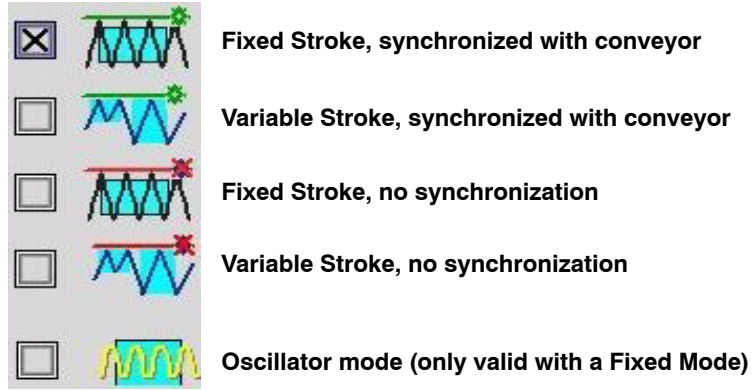


Figure 4-14 Reciprocator Operation Mode Settings

Reciprocator Speed Settings

If a synchronization mode is selected, then the reciprocator speed is calculated using the conveyor speed, stroke length, number of laps, number of guns, and pattern width.

Without synchronization the reciprocator speed is controlled by the mode's speed setting. Speed can set in **Strokes per minute**, or **Feet per minute**. The speed setting cannot exceed the maximum speed setting.

NOTE: The strokes per minute setting are approximate. The actual strokes per minute will vary with the length of the stroke. Shorter strokes will result in larger errors because the machine does not have sufficient time running at full speed.

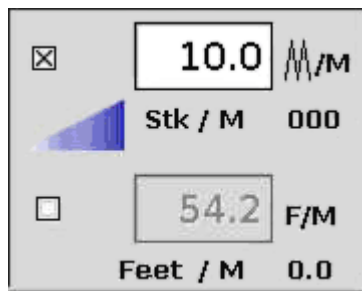


Figure 4-15 Reciprocator Speed Settings

Fixed Mode

See Figure 4-16. In fixed mode, the stroke length is controlled by the turn-around points, without regard for the part height. The gun trigger points are controlled to vary the spray length with the part height.

NOTE: In fixed mode, the Air Flow Percent Adjust function is not available.

Top and bottom turn-around limits – These limits set the stroke length, and are measured from Reciprocator Home. Set the top turn-around limit below the soft top limit, and the bottom turn-around limit above the soft bottom limit.

Gun On/Off Trigger Points – These are the distances **above and below** the part edge to trigger the guns on and off on the downstroke and upstroke. They are similar to lead and lag settings:

- Positive trigger points extend the spray pattern (see Figure 4-17).
- Negative trigger points restrict the spray pattern (see Figure 4-18).
- If the trigger points are set to zero the guns turn on and off at the part edges.

NOTE: These settings can be modified from the **Reciprocator Control screens**, accessible from the Main screen (refer to Section 8). The Control screens also provide access to the **Lap Calculator** screens. Use the lap calculator to experiment with different settings.

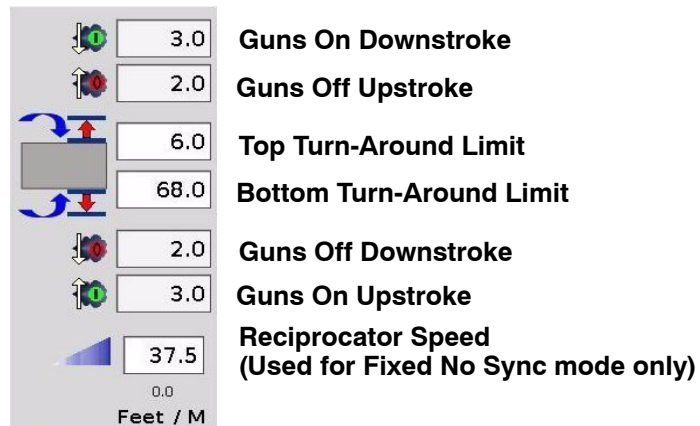


Figure 4-16 Fixed Mode Settings

Fixed Mode: Trigger Settings Positive, Extended Pattern

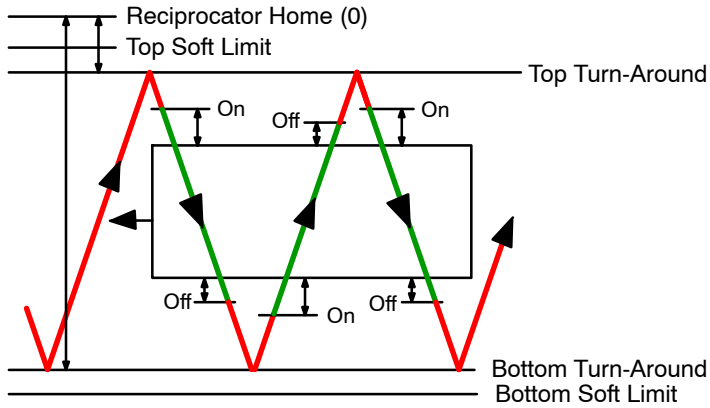


Figure 4-17 Fixed Mode – Trigger Settings Positive, Extended Pattern

Fixed Mode: Trigger Settings Negative, Restricted Pattern

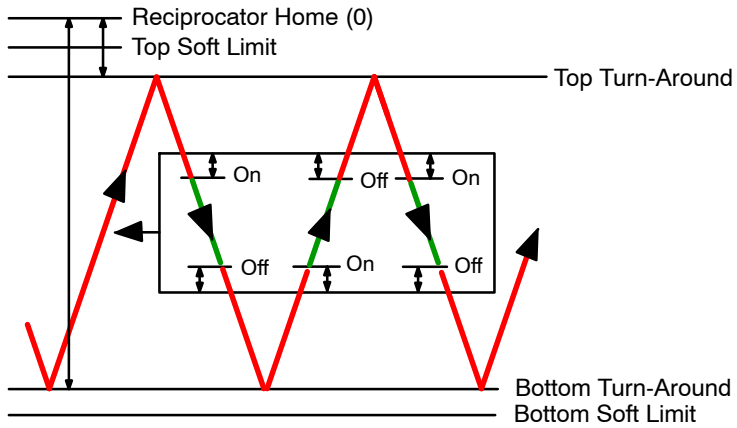


Figure 4-18 Fixed Mode – Trigger Settings Negative, Restricted Pattern

Oscillator Mode

To use the the Oscillator mode select a Fixed mode and then the Oscillator mode. Set the Fixed mode turnaround points to set the stroke length. Any trigger point settings are ignored. The spray guns are triggered on and off by the Spray Preset lead and lag settings only.

Variable Modes

In Variable mode, the reciprocator stroke length is fixed when no parts are in front of the guns, and varies according to the part dimensions when parts arrive in front of the guns. The spray guns are triggered on and off by the spray gun preset lead and lag settings. See Figure 4-19 for these settings:

Top and bottom turn-around limits – These limits determine the reciprocator stroke length when no parts are in front of the guns. They are measured from Reciprocator Home. Set the top turn-around limit below the soft top limit value, and the bottom turn-around limit above the soft bottom limit value.

Variable Modes *(contd)*

Overtravel limits – Distance from part edge to turn around when a part is in front of the guns. The total stroke length is the part height plus or minus the overtravel limits. Settings can be positive or negative:

- Positive overtravel settings extend the spray pattern (see Figure 4-20).
- Negative overtravel settings restrict the spray pattern (see Figure 4-21).
- If the overtravel settings are set to zero then the reciprocator turns around at the part edge.

NOTE: These settings can be modified from the **Reciprocator Control screens**, which are accessible from the Main screen (refer to Section 8). The Control screens also provide access to the **Lap Calculator** screens. Use the lap calculator to display the results of your settings and experiment with different settings.

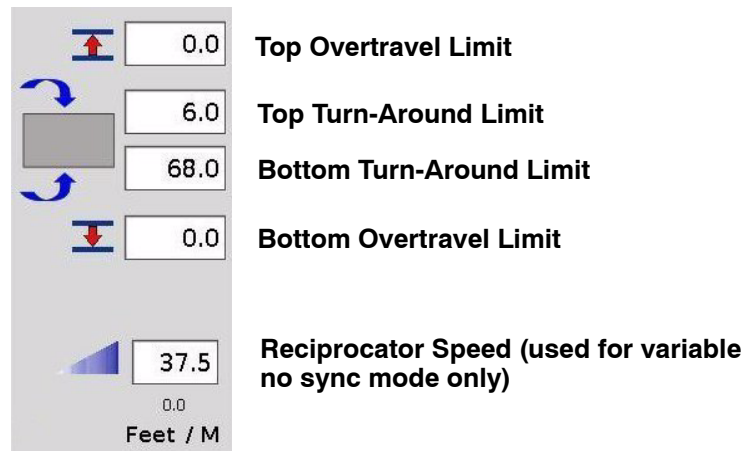


Figure 4-19 Variable Mode Settings

Variable Mode: Overtravel Settings Positive, Extended Pattern

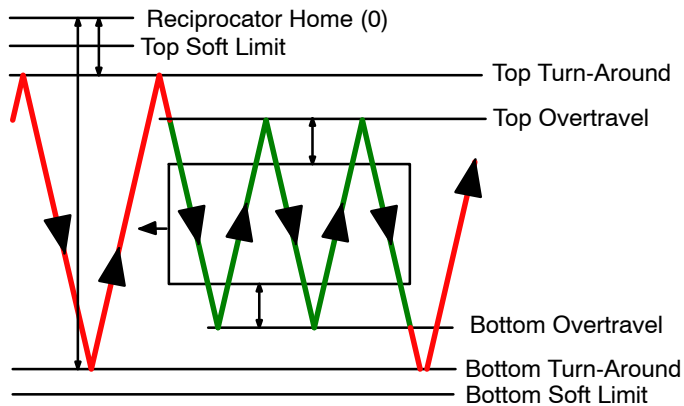


Figure 4-20 Variable Mode: Overtravel Settings Positive, Extended Pattern

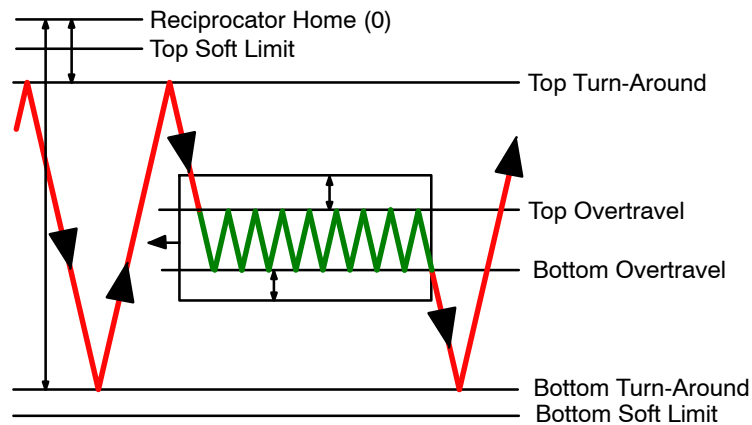
Variable Mode: Overtravel Settings Negative, Restricted Pattern

Figure 4-21 Variable Mode: Overtravel Settings Negative, Restricted Pattern

Air Flow Percent Adjust Control

This function allows you to control powder pump flow-rate and atomizing air flow based on stroke length. It can only be used with the two variable stroke modes.



This button becomes active when a variable mode is selected; otherwise it is grayed out. Touch it to open the Air Flow Percent Adjust Control screen shown in Figure 4-22. When the percent adjust function is enabled the button is green.

This function changes flow-rate and atomizing air by percentages as the stroke length increases or decreases. As the reciprocator is commanded to a given stroke length the change is sent to the gun control cards associated with the reciprocator.

NOTE: This function only supports a single row of guns on a reciprocator. If the reciprocator has multiple rows of guns, only the configured guns on the reciprocator are sent the percent changes. Refer to Guns on Reciprocator in the Standard Reciprocator Configuration Settings table on page 4-21.

NOTE: Percent Adjust is an additive variable. These Percent-Adjust settings are added or subtracted from Reciprocator Preset Percent Adjust settings, Global Percent-Adjust settings, and Conveyor Speed Percent-Adjust settings.

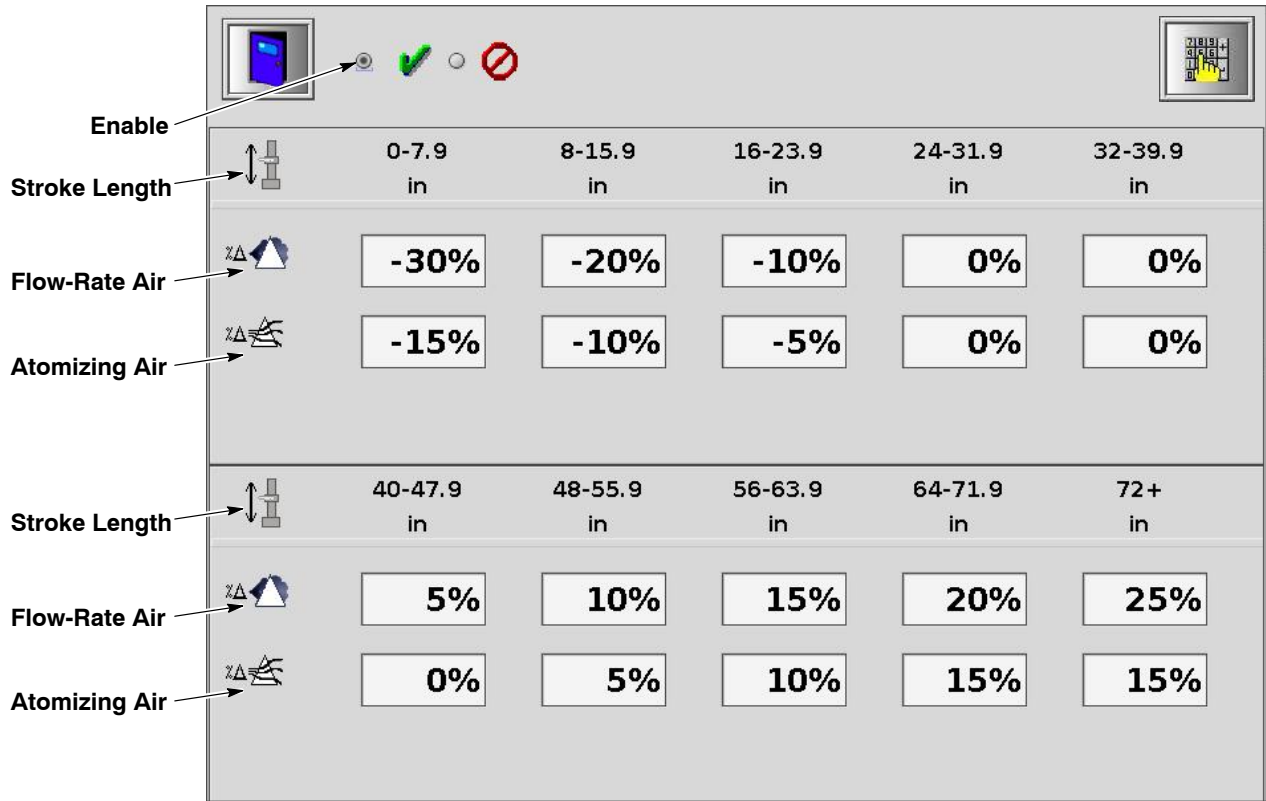


Figure 4-22 Air Flow Percent Adjust Control Screen

Analog Scanner Configuration

Touch the **Photoeye and Scanner Configure** button on the System Configuration screen to open the Photoeye and Scanner Configuration screen.

NOTE: This feature requires analog scanners supplied and configured by Nordson Corporation.

The analog scanners are used to measure the part width and height for positioner and reciprocator control. They can also be used for zone detection, as described in *Section 3, System Configuration*. The analog scanner controllers communicate with the iControl system over the Ethernet network.

For most systems, one or two horizontally mounted scanners are used to detect part width for horizontal (in/out) positioners, while a vertically mounted scanner is used to detect the part height for reciprocators or for vertical (up/down) positioners.

For analog scanners, separation between the emitter and receiver should be no more than:

- 6 meters (20 ft) if the scanner is less than 1.2 meters (4 ft) long
- 4.5 meters (15 ft) if the scanner is more than 1.2 meters (4 ft) long.

Analog Scanner Enable

See Figure 4-23. To enable analog scanners and open the scanner configuration screen:

1. **Enable** the scanners.
2. Enter the **number of horizontal scanners** (1 or 2).
3. Touch the scanner **Configure** button to open the Scanner Configuration screen.

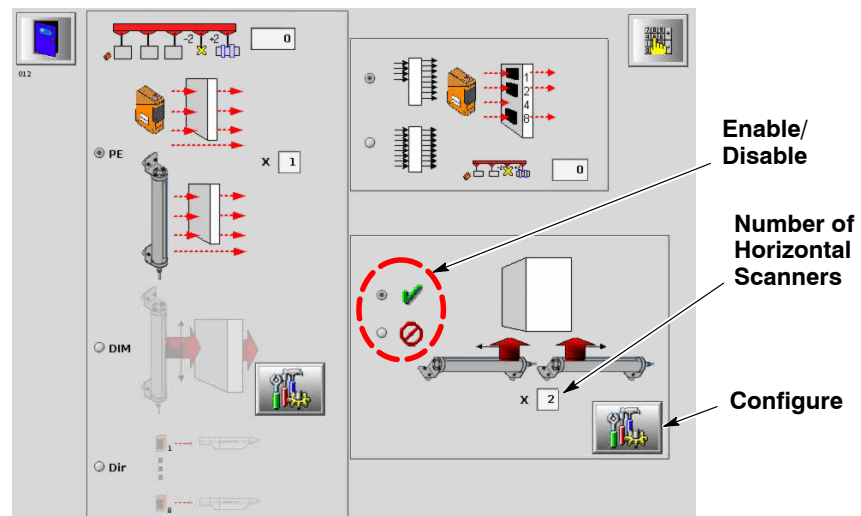


Figure 4-23 Enabling and Selecting Number of Horizontal Scanners

Single In/Out Positioner Scanner Configuration

See Figure 4-24. Use this procedure to configure a single horizontally mounted scanner providing part width data to in/out positioners. The scanner emitter-receiver pair are mounted above the conveyor rail and below the parts. The scanner cable end must be oriented as shown on the configuration screen. Cable end orientation is important because of the way the scanner signal is read.

NOTE: The scanner controller must be configured to ignore the conveyor. Scanner controllers are typically programmed per the application specifications before the system is shipped. Refer to your system drawings for installation specifications.

Enter the following values for the scanner:

- A:** Length of the scanner.
- B:** The width of the conveyor left and right of the scanner centerline.
- C:** Distance from the first scanner beam (cable end) to the conveyor centerline.

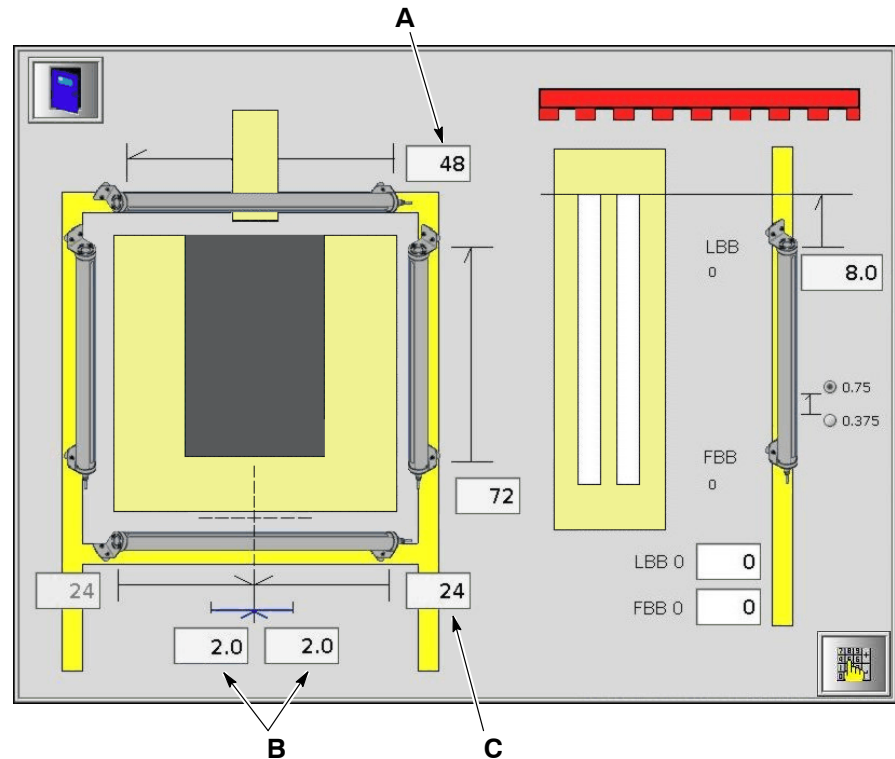


Figure 4-24 Single Scanner Configuration for In/Out Positioners

Vertical Scanner Configuration *(contd)*

F: Scanner beam resolution – 3/4 in. or 3/8 in. This presets the noise compensation to 10% of a single beam voltage. This value varies with the scanner length and resolution.

A 72 inch scanner:

- at 3/4 in. has 96 beams with 0.1 volt per beam.
- at 3/8 in. has 192 beams with 0.052 volt per beam.

Z: Zero offset override – for noise and ambient signal compensation. Refer to *Setting the Zero Offset* on page 4-32 for a detailed explanation.

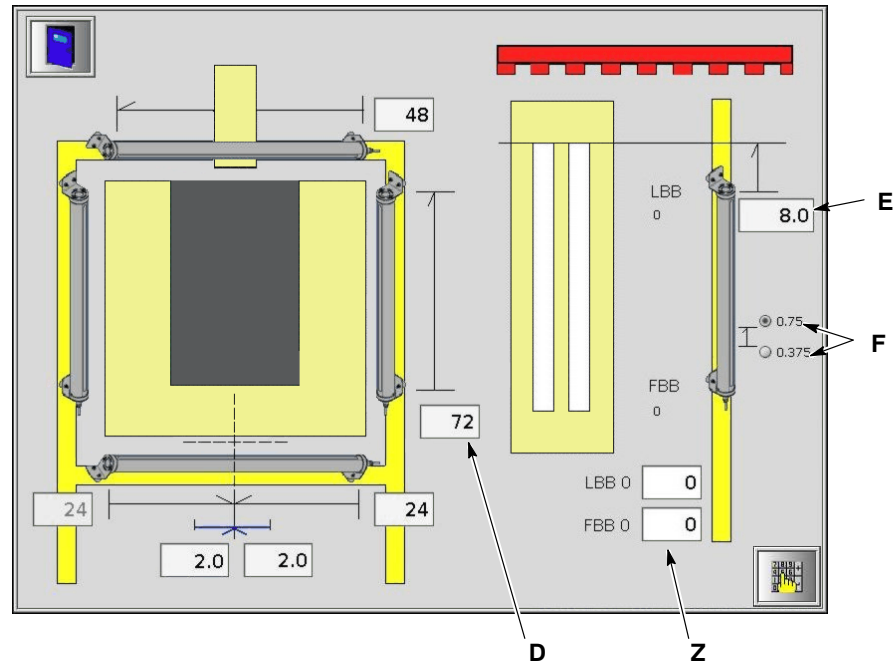


Figure 4-26 Vertical Scanner Configuration

Vertical Offset (Reciprocators Only)

Use the vertical offset for reciprocators only. For vertical (up/down) positioners, set the vertical offset to 0.

See Figure 4-27. The Vertical Offset should be **positive** if the 0 channel of the scanner (topmost beam) is below the gun 0 position. The gun 0 position is the end of the gun travel.

For example, if the offset is 8 in. and the top of a part breaks the 0 channel then moving the gun down by 8 in. from the gun 0 position should align the gun with the top of the part. If the part is 20 in. long, then an 8 in. offset means that the gun must be moved down 28 in. to be aligned with the bottom of the part.

The Vertical Offset should be **negative** if the 0 channel of the scanner (topmost beam) is above the gun 0 position. This causes the scanner area above the gun 0 position to be ignored and reduces the length of the scanner by the offset.

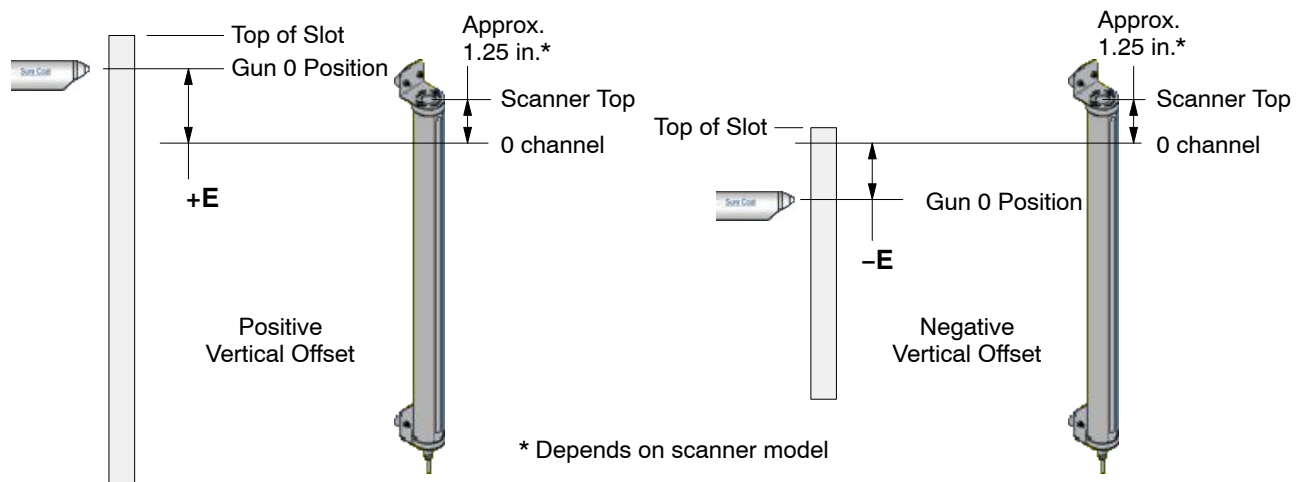


Figure 4-27 Calculating Vertical Offset for Vertical Scanner Configuration

Setting the Zero Offset Override

See Figure 4-26. The zero offset override is used to zero the scanner input and tune out electrical noise on the scanner circuit. Electrical noise can cause the system to detect phantom parts, which can cause erratic reciprocator or up/down positioner movement when no parts are in the booth.

Since the setting of the scanner resolution takes care of most error voltage in the system, this procedure is used in extremely noisy environments.

When the system is powered up the initial values for LBB and FBB should be zero. Noise or ambient signals will cause LBB and FBB to change to some value.

If the noise is in excess 344 for a 3/4 in. scanner or 168 for a 3/8 in. scanner, the LBB and FBB override values can be used to eliminate this noise. The maximum noise that can be eliminated is about 0.3 volts (999 LBB/FBB). Values less than 344 (3/4 in.) or 168 (3/8 in.) are ignored.

To tune out the phantom signal, enter values in the LBB and FBB fields (**Z**) 5–20 units larger than what it takes to display 0. For example, if when a phantom part is detected the LBB value is 125, then enter a value from 130–150 in the LBB field.

Section 5

Spray Gun Preset Settings



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

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Introduction

Spray gun presets are recipes that contain the spray settings and trigger settings for a specific part. Up to 255 unique presets can be created on each user data card.

When the system is operating in Automatic Part ID mode, a part with an ID number of 2 is sprayed with preset 2 settings. Although all guns spray the part using the same preset, the settings for the preset can be different for each gun.

In Manual Part ID mode, you can select any preset for any part. This is commonly called batch mode.

Spray Gun Preset Settings:

- air or powder flow
- voltage output, current output limits, Select Charge mode
- lead and lag trigger points
- zone assignment

Spray Gun Preset Screens

Spray gun presets can be set with either the Gun Control screens or the Preset Table screen.

The **Gun Control** screens allow you to set presets for one gun, one preset at a time. You can use these screens **online or offline**. The Gun Control screens have Copy functions that will copy preset settings to other presets for the same gun and to presets for other guns.

The **Preset Table** screen allows you to view and set preset settings for all guns in the system, one preset at a time, in a table format. Use this screen **offline only** to quickly setup and modify your presets.

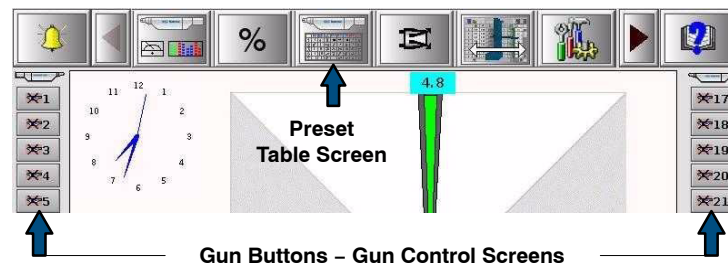


Figure 5-1 Spray Gun Preset Screens

Spray Gun Control Screen

See Figure 5-2. Use the Gun Control screens to set the following preset settings:

- preset number (2) and name (1)
- flow-rate and atomizing air flow (3) for standard guns) or powder flow and pattern air for Prodigy guns
- electrostatics (4)
- lead (5) and lag (7) trigger points
- zone assignment (6)

To copy your settings, use **Copy All** (8) or **Copy Selected** (10). Refer to the explanations starting on page 5-15.

The **Keypad** button (9) opens a keypad that you can use to enter settings.

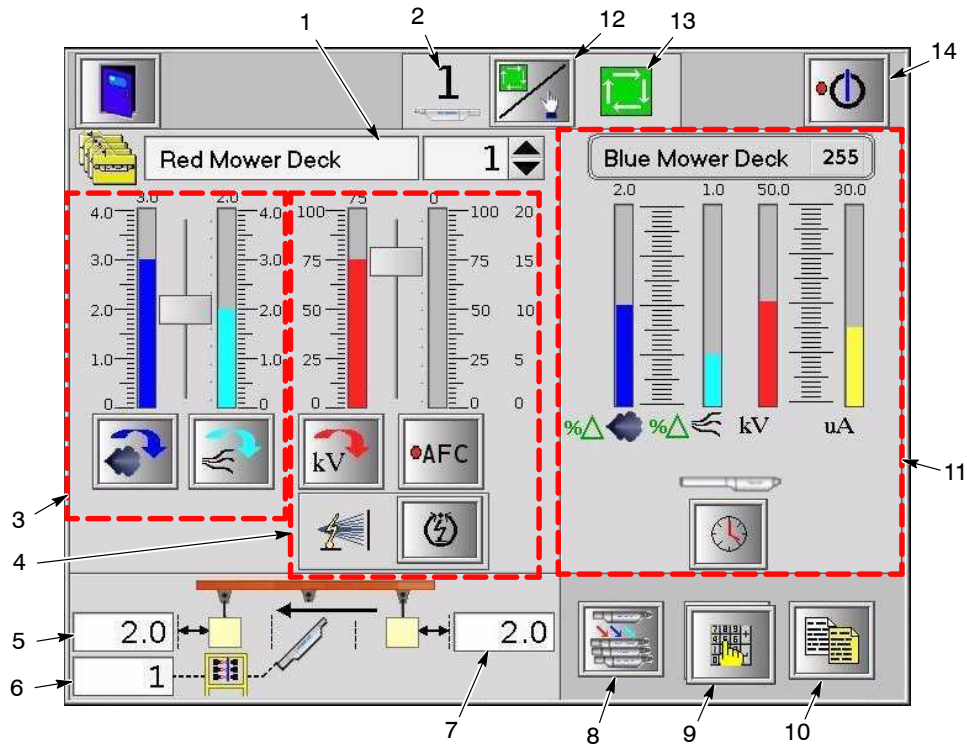


Figure 5-2 Spray Gun Control Screen for Standard Guns

- | | | |
|---------------------------|-------------------|---------------------------|
| 1. Preset name and number | 6. Zone | 11. Output Status Screen |
| 2. Gun number | 7. Lag | 12. Mode Toggle Button |
| 3. Flow settings | 8. Copy All | 13. Mode Indicator |
| 4. Electrostatic settings | 9. Keypad | 14. Manual Trigger Button |
| 5. Lead | 10. Copy Selected | |

Spray Gun Preset Table Screen

This screen displays a list of the preset settings for all guns in the system. Use this screen offline only.

- To scroll the screen, touch and drag the horizontal and vertical scroll bars (6), or touch the scroll bar arrows.
- To enter a value in a data field, touch the field to select it then use the rotary dial or keypad (4).
- To toggle through the Select Charge modes, repeatedly touch the buttons in the **Select Charge mode** column.
- To toggle AFC on (green) or off (red), repeatedly touch the buttons in the **AFC** column.
- To select and copy settings from the current preset for Gun 1 to the same preset for the rest of the guns, select the settings you want to copy by touching the buttons at the top of the columns, then touch the **Copy All** button.
- To save your settings, touch the **Save** button.

NOTE: Saved settings are written to the database. To cancel your changes, including a Copy All operation, **do not touch the Save button.** Close the screen and choose No when asked if you want to save your changes.

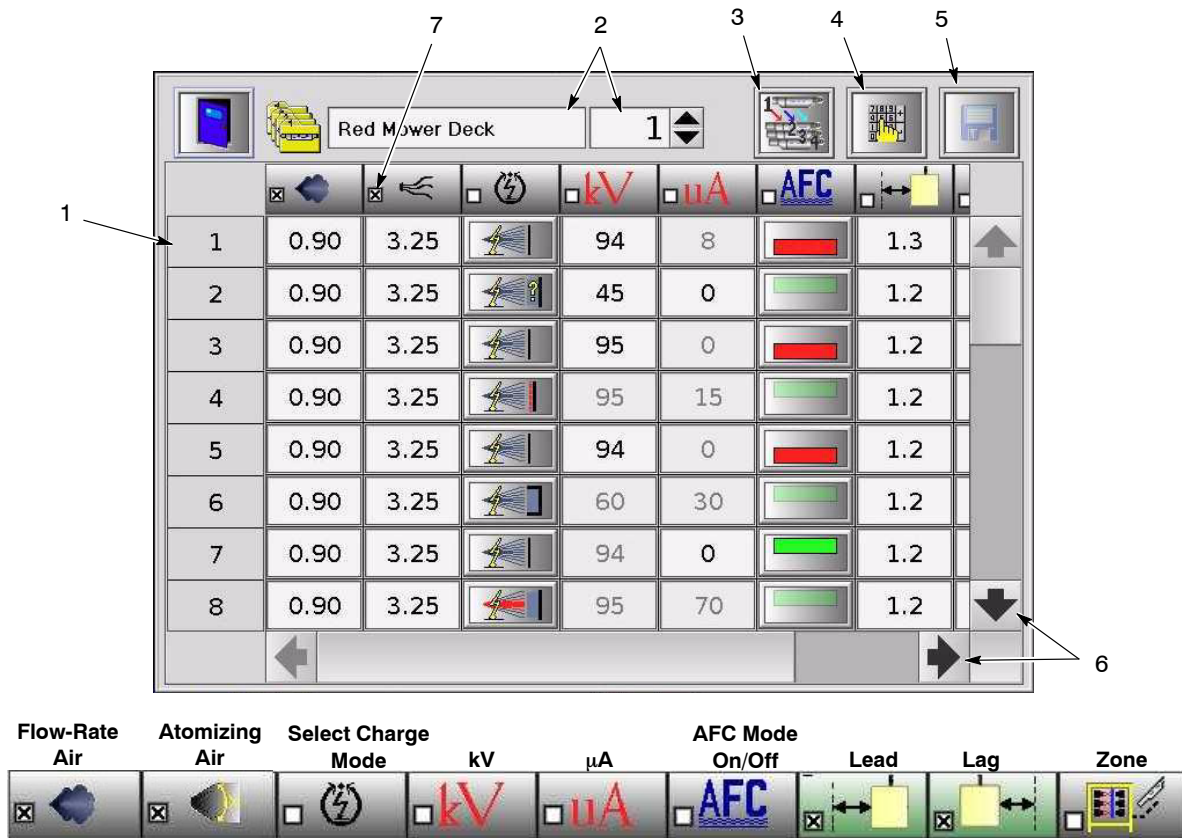


Figure 5-3 Spray Gun Control Screen – Standard Guns

- 1. Gun number
- 2. Preset number and name
- 3. Copy All
- 4. Keypad
- 5. Save
- 6. Scroll bars
- 7. Copy All selection

Preset Number and Name

See Figure 5-4. Use the Preset Name and Preset Number fields to select a preset number and give the preset number a name.

Select a preset number by:

- touching the Up (▲) or Down (▼) arrows.
- touching the Preset Number field and use the rotary dial.

To give a preset number a name, touch the Preset Name field. The keyboard screen opens. Use the keyboard to type in a preset name that allows you to easily identify your parts.

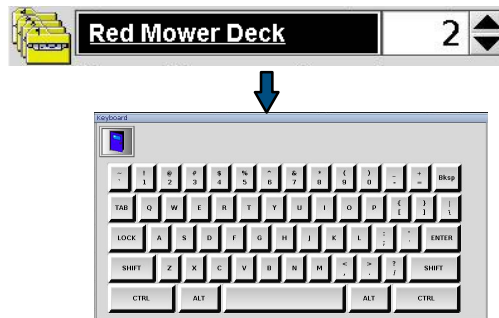


Figure 5-4 Preset Number and Name

Air Flow Settings for Venturi Pumps

Powder output from venturi pumps is controlled by flow-rate and atomizing air flow.

- **Flow-rate air** controls the amount of powder pumped.
- **Atomizing air** diffuses the powder flow for an even spray pattern.

Typically, the flow settings are determined by switching the gun mode to Manual, triggering the gun, and adjusting the air flows while observing the spray pattern and bagging and weighing the powder. Optimum air flows and ratios depend on the powder pump, the diameter of the air tubing, the powder, and other variables.

1. To set air flows, touch a flow button, then use the slider bar or rotary dial. Only one setting can be made at a time.
2. When all guns are set up, spray parts, check the applied coating, and make additional adjustments to the air flows, if necessary.

Refer to your pump manuals for suggested starting points for flow-rate and atomizing air, then adjust the air flows as required to obtain the best results. Use Tables 5-1 and 5-2 on the following pages to convert air pressure to air flow.

NOTE: The air flow settings in the tables will provide slightly more powder to the spray guns when applied to a Nordson Modular powder pump and slightly less powder when applied to a Nordson In-Line powder pump.

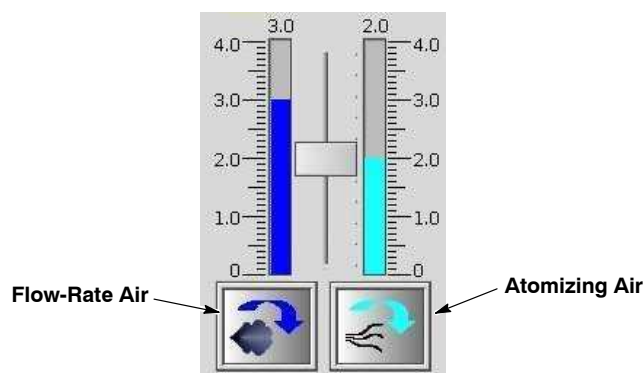


Figure 5-5 Air Flow Settings

Pressure to Flow Conversion Tables

Table 5-1 Pressure to Flow Conversion Table: 6-mm Tubing/100 Plus Nozzle
(P1 is pressure at digital flow module (console) outlet)

20 ft of 6-mm Tubing with 100 Plus Nozzle		40 ft of 6-mm Tubing with 100 Plus Nozzle	
m ³ /hr (scfm)	P1 bar (psi)	m ³ /hr (scfm)	P1 bar (psi)
0.846 (0.50)	0.275 (4.0)	0.846 (0.50)	0.414 (6.0)
1.26 (0.75)	0.482 (7.0)	1.26 (0.75)	0.689 (10.0)
1.68 (1.00)	0.758 (11.0)	1.68 (1.00)	1.03 (15.0)
2.1 (1.25)	1.10 (16.0)	2.1 (1.25)	1.38 (20.0)
2.52 (1.50)	1.45 (21.0)	2.52 (1.50)	1.83 (26.5)
2.94 (1.75)	1.86 (27.0)	2.94 (1.75)	2.24 (32.5)
3.36 (2.00)	2.21 (32.0)	3.36 (2.00)	2.69 (39.0)
3.78 (2.25)	2.55 (37.0)	3.78 (2.25)	3.10 (45.0)
4.2 (2.50)	2.93 (42.5)	4.2 (2.50)	3.55 (51.5)
4.62 (2.75)	3.34 (48.5)	4.62 (3.75)	4.00 (58.0)
5.04 (3.00)	3.72 (54.0)	5.04 (3.00)	4.34 (63.0)
5.52 (3.25)	4.07 (59.0)	5.22 (3.10)	4.48 (65.0)
5.64 (3.35)	4.21 (61.0)	-	-

Table 5-2 Pressure to Flow Conversion Table: 8-mm Tubing/100 Plus Nozzle
(P1 is pressure at digital flow module (console) outlet)

20 ft of 8-mm Tubing with 100 Plus Nozzle		40 ft of 8-mm Tubing with 100 Plus Nozzle	
m ³ /hr (scfm)	P1 bar (psi)	m ³ /hr (scfm)	P1 bar (psi)
0.846 (0.50)	0.137 (2.0)	0.846 (0.50)	0.172 (2.5)
1.26 (0.75)	0.275 (4.0)	1.26 (0.75)	0.345 (5.0)
1.68 (1.00)	0.483 (7.0)	1.68 (1.00)	0.552 (8.0)
2.1 (1.25)	0.724 (10.5)	2.1 (1.25)	0.862 (12.5)
2.52 (1.50)	1.03 (15.0)	2.52 (1.50)	1.17 (17.0)
2.94 (1.75)	1.34 (19.5)	2.94 (1.75)	1.48 (21.5)
3.36 (2.00)	1.65 (24.0)	3.36 (2.00)	1.83 (26.5)
3.78 (2.25)	1.96 (28.5)	3.78 (2.25)	2.14 (31.0)
4.2 (2.50)	2.31 (33.5)	4.2 (2.50)	2.48 (36.0)
4.62 (2.75)	2.65 (38.5)	4.62 (3.75)	2.86 (41.5)
5.04 (3.00)	2.96 (43.0)	5.04 (3.00)	3.21 (46.5)
5.52 (3.25)	3.31 (48.0)	5.52 (3.25)	3.52 (51.0)
5.96 (3.5)	3.59 (52.0)	5.69 (3.35)	3.65 (53.0)

Smart Flow Settings for Venturi Pumps

Smart Flow mode can be used with all spray guns that use venturi-type pumps, except for Tribomatic guns. It cannot be used for Prodigy or Encore HD pumps.

When Smart Flow mode is selected on the Guns Configuration screen, the air flow slider controls on the Gun Control screen changes to the controls shown in Figure 5-6. Refer to *Section 3, Standard System Configuration*.

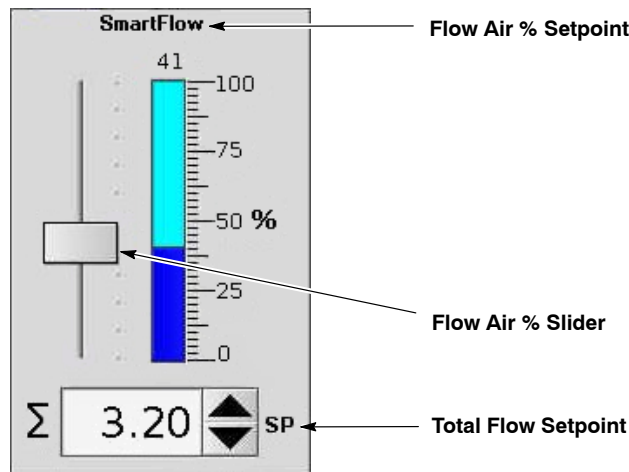


Figure 5-6 Smart Flow Mode Settings

Flow Air %: Sets the powder flow rate. The range is 0–100%. The actual percentage range available varies depending on the total air setpoint and the maximum and minimum outputs for flow and atomizing air.

Total Flow Σ : Total Flow sets the velocity of the powder flow. The range is 2.55–10.2 M³/HR, minimum 0.17 M³/HR increments, or 1.5–6.0 SCFM, minimum 0.1 SCFM increments. Powder velocity is inversely related to transfer efficiency; the higher the velocity the lower the transfer efficiency.

Set the Total Flow setpoint first to obtain the desired pattern size and penetration, then set the Flow Air % setpoint for the desired powder flow.

NOTE: If Total Flow is set to zero, the Flow Air % setpoint cannot be set to anything but zero, and powder cannot be sprayed. To set Flow Air %, set Total Flow to a value greater than zero.

Smart Flow Tables

See Tables 5-3 and 5-4 for examples of possible Smart Flow settings and their equivalents in Atomizing and Flow-rate Air pressures and flows. Figure 5-7 shows the effects of changes in Total Flow and Flow Air % settings.

The Smart Flow tables provide a range of possible Total Flow and Flow Air % setpoints. Read across to the vertical axis for the equivalent atomizing air flows and pressures. Read down to the horizontal axis for the equivalent flow-rate air flows and pressures.

Smart Flow Tables (contd)

The tables show that as you increase Total Flow powder velocity increases while the maximum Flow Air % remains the same. Conversely, for a given Total Flow setting, each increase in Flow Air % increases powder flow.

NOTE: These settings are affected by system variables such as powder characteristics, tubing sizes and types, spray gun type, and others. The following tables are provided for reference only.

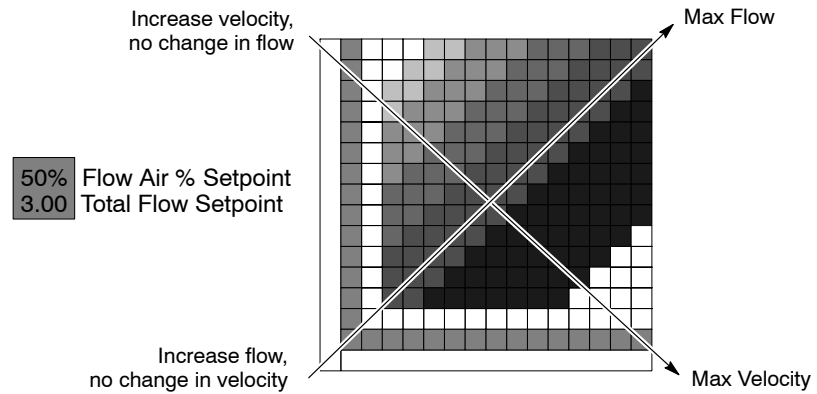


Figure 5-7 Reading the Smart Flow Tables

Smart Flow Settings – Metric Units

Powder Velocity (M ³ /Hr) (Total Flow)		Sure Coat w/100+ Pump: ♦ Air Flow Settings: 1.0 bar Atomizing 2.0 bar Flow Powder Output: 150 g/min. Max. Powder Flow Rate: ★
Low	<3.40	
Soft	3.40–4.25	
Medium	4.25–5.53	
Firm	5.53–7.23	
High	>7.23	

Table 5-3 Smart Flow Settings – Metric Units

Atomizing	0.4	0.85	X	X	67% 2.55	71% 2.97	75% 3.40	78% 3.82	80% 4.25	82% 4.67	83% 5.10	85% 5.52	86% 5.95	87% 6.37	88% 6.80 ★
	0.6	1.27	X	50% 2.54	57% 2.97	63% 3.39	67% 3.82	70% 4.24	73% 4.67	75% 5.09	77% 5.52	79% 5.94	80% 6.37	81% 6.79	82% 7.22
	0.9	1.70	33% 2.55	43% 2.97	50% 3.40	55% 3.82	60% 4.25	64% 4.67	67% 5.10	69% 5.52	71% 5.95	73% 6.37	75% 6.80	76% 7.22	78% 7.65
	1.2	2.12	29% 2.97	37% 3.39	45% 3.82	50% 4.24	55% 4.67	58% 5.09	62% 5.52	64% 5.94	67% 6.37	69% 6.79	71% 7.22	72% 7.64	74% 8.07
	1.6	2.55	25% 3.40	33% 3.82	40% 4.25	45% 4.67	50% 5.10 ♦	54% 5.52	57% 5.95	60% 6.37	63% 6.80	65% 7.22	67% 7.65	68% 8.07	70% 8.50
	1.9	2.97	22% 3.82	30% 4.24	36% 4.67	42% 5.09	46% 5.52	50% 5.94	53% 6.37	56% 6.79	59% 7.22	61% 7.64	63% 8.07	65% 8.49	67% 8.92
	2.3	3.40	20% 4.25	27% 4.67	33% 5.10	38% 5.52	43% 5.95	47% 6.37	50% 6.80	53% 7.22	56% 7.65	58% 8.07	60% 8.50	62% 8.92	64% 9.35
	2.7	3.82	18% 4.67	25% 5.09	31% 5.52	36% 5.94	40% 6.37	44% 6.79	47% 7.22	50% 7.64	53% 8.07	55% 8.49	57% 8.92	59% 9.34	61% 9.77
	3.1	4.25	17% 5.10	23% 5.52	29% 5.95	33% 6.37	38% 6.80	41% 7.22	44% 7.65	47% 8.07	50% 8.50	52% 8.92	55% 9.35	56% 9.77	58% 10.20
	3.5	4.67	15% 5.52	21% 5.94	27% 6.37	31% 6.79	35% 7.22	39% 7.64	42% 8.07	45% 8.49	48% 8.92	50% 9.34	52% 9.77	54% 10.19	X
	3.6	5.10	14% 5.95	20% 6.37	25% 6.80	29% 7.22	33% 7.65	37% 8.07	40% 8.50	43% 8.92	45% 9.35	48% 9.77	50% 10.20	X	X
		5.52	13% 6.37	19% 6.79	24% 7.22	28% 7.64	32% 8.07	35% 8.49	38% 8.92	41% 9.34	44% 9.77	46% 10.19	X	X	X
		5.95	13% 6.80	18% 7.22	22% 7.65	26% 8.07	30% 8.50	33% 8.92	36% 9.35	39% 9.77	42% 10.20	X	X	X	X
		M ³ /Hr	0.85	1.27	1.70	2.12	2.55	2.97	3.40	3.82	4.25	4.67	5.10	5.52	5.95
	BAR		0.2	0.3	0.5	0.8	1.1	1.4	1.7	2.0	2.3	2.6	2.9	3.2	3.5
Flow															

Smart Flow Settings – English Units

Powder Velocity (SCFM) (Total Flow)		Sure Coat w/100+ Pump: ♦ Air Flow Setting: 15 psi Atomizing 20 psi Flow Powder Output: 20 lb/hr Max. Powder Flow Rate: ★
Low	<2.00	
Soft	2.00–2.50	
Medium	2.75–3.25	
Firm	3.50–4.25	
High	>4.25	

Table 5-4 Smart Flow Settings – English Units

Atomizing	5	0.50	X	X	67% 1.50	71% 1.75	75% 2.00	78% 2.25	80% 2.50	82% 2.75	83% 3.00	85% 3.25	86% 3.50	87% 3.75	★88% 4.00
	9	0.75	X	50% 1.50	57% 1.75	63% 2.00	67% 2.25	70% 2.50	73% 2.75	75% 3.00	77% 3.25	79% 3.50	80% 3.75	81% 4.00	82% 4.25
	13	1.00	33% 1.50	43% 1.75	50% 2.00	56% 2.25	60% 2.50	64% 2.75	67% 3.00	69% 3.25	71% 3.50	73% 3.75	75% 4.00	76% 4.25	78% 4.50
	18	1.25	29% 1.75	38% 2.00	44% 2.25	50% 2.50	55% 2.75	58% 3.00	62% 3.25	64% 3.50	67% 3.75	69% 4.00	71% 4.25	72% 4.50	74% 4.75
	23	1.50	25% 2.00	33% 2.25	40% 2.50	45% 2.75	50% 3.00	54% 3.25	57% 3.50	60% 3.75	63% 4.00	65% 4.25	67% 4.50	68% 4.75	70% 5.00
	28	1.75	22% 2.25	30% 2.50	36% 2.75	♦ 42% 3.00	46% 3.25	50% 3.50	53% 3.75	56% 4.00	59% 4.25	61% 4.50	63% 4.75	65% 5.00	67% 5.25
	34	2.00	20% 2.50	27% 2.75	33% 3.00	38% 3.25	43% 3.50	47% 3.75	50% 4.00	53% 4.25	56% 4.50	58% 4.75	60% 5.00	62% 5.25	64% 5.50
	40	2.25	18% 2.75	25% 3.00	31% 3.25	36% 3.50	40% 3.75	44% 4.00	47% 4.25	50% 4.50	53% 4.75	55% 5.00	57% 5.25	59% 5.50	61% 5.75
	45	2.50	17% 3.00	23% 3.25	29% 3.50	33% 3.75	38% 4.00	41% 4.25	44% 4.50	47% 4.75	50% 5.00	52% 5.25	55% 5.50	57% 5.75	58% 6.00
	51	2.75	15% 3.25	21% 3.50	27% 3.75	31% 4.00	35% 4.25	39% 4.50	42% 4.75	45% 5.00	48% 5.25	50% 5.50	52% 5.75	54% 6.00	X
	52	3.00	14% 3.50	20% 3.75	25% 4.00	29% 4.25	33% 4.50	37% 4.75	40% 5.00	43% 5.25	45% 5.50	48% 5.75	50% 6.00	X	X
		3.25	13% 3.75	19% 4.00	24% 4.25	28% 4.50	32% 4.75	35% 5.00	38% 5.25	41% 5.50	43% 5.75	46% 6.00	X	X	X
		3.50	13% 4.00	18% 4.25	22% 4.50	26% 4.75	30% 5.00	33% 5.25	36% 5.50	39% 5.75	42% 6.00	X	X	X	X
		SCFM	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50
	PSI	3	5	8	12	16	20	24	29	34	38	42	47	51	
Flow															

Prodigy/Encore HD Air Flow Settings

When the system is configured for Prodigy/Encore HD guns, the air flow settings portion of the gun control and preset table screens change as shown in Figures 5-8 and 5-9

- **Powder Flow:** Percentage of total flow available (0–100%) from HDLV pumps.
- **Pattern Air Flow:** Width of spray pattern at the gun (0–4 scfm).
- **Assist Air Compensation:** Assist air pushes the powder out of the HDLV pump to the gun. This feature increases or decreases the assist air by a percentage (–100% to +100%) of the current setpoint to optimize pump and spray gun performance. The assist air setpoint is determined by a software algorithm and the powder flow setting.
- **Fast Pump Mode:** This mode increases the HDLV pump cycle rate to 250 milliseconds regardless of the powder flow setting. When used with low flow applications, this pumps smaller quantities of powder at a faster rate, providing a more uniform flow. This feature can also be used with problem powders that are hard to fluidize as it keeps the powder moving through the tubing at a faster rate.

NOTE: This mode must be enabled during Gun Configuration. Refer to the *System Configuration* section for more information.

NOTE: Using the Fast Pump mode can decrease the wear life of the pump pinch valves.

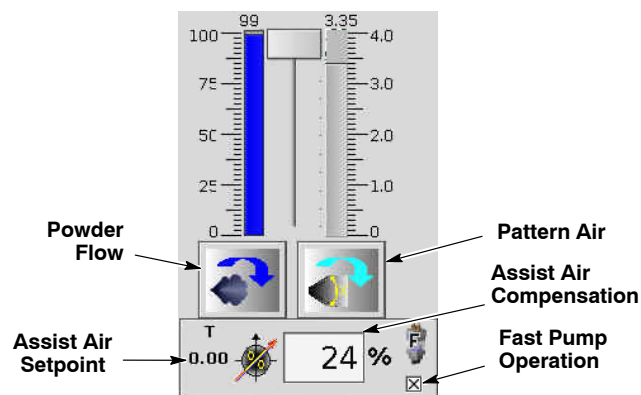


Figure 5-8 Prodigy Air Flow Settings

When using the Preset Table screen to set Assist Air Compensation, the setting for Gun 1 is automatically used for all guns. Similarly, if Fast Pump Operation is turned on from the Preset Table screen for Gun 1, it is turned on for all guns.

To make these settings:

1. Toggle the gun mode to Manual.
2. Trigger the gun on.
3. Adjust the settings while observing the spray pattern and by bagging and weighing the powder.

To set Powder Flow and Pattern Air Flow, touch the flow button, then use the slider bar or rotary dial. Only one setting can be made at a time.

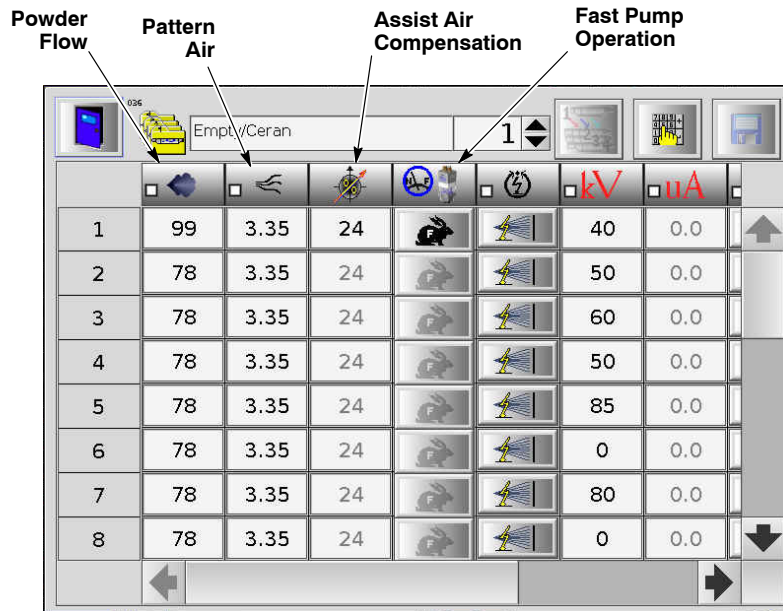


Figure 5-9 Prodigy Air Flow Settings – Preset Table Screen

Electrostatic Settings

For **Versa-Spray**, **Sure Coat**, **Prodigy**, **Encore**, and **Encore HD** guns, you can set kV, AFC, or Select Charge mode. These settings are mutually exclusive, except for Select Coat Mode 4 (User).

For **Tribomatic** guns, only the AFC setting is available. It is used to set the current feedback alarm level.

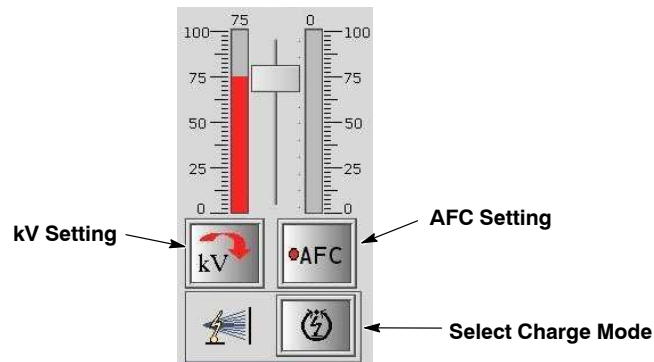


Figure 5-10 Electrostatic Settings

Setting kV

The kV setting determines the voltage output of the spray gun. The higher the output the stronger the electrostatic charge imparted to the powder. Part geometry, distance from the gun to the part, and system and part grounding affect the charge and the powder transfer efficiency.

See Figure 5-10. To set kV, touch the kV button then use the slider bar or rotary dial.

Versa-Spray guns: 0 or 30–100 kV

Sure Coat guns: 0 or 25–95 kV

Prodigy guns: 0 or 25–95 kV

Setting AFC

See Figure 5-10. To set AFC, touch the AFC button and use the slider bar or rotary dial.

Versa-Spray guns: 10–120 μ A

Sure Coat, Prodigy, Encore, Encore HD guns: 10–100 μ A

For **Versa-Spray, Sure Coat, Prodigy, Encore, and Encore HD** guns, AFC (Automatic Feedback Current) sets the maximum current output (μ A) from the spray gun. While coating parts with this setting, the output voltage is automatically set to maximum. If the current feedback reaches the AFC setting then the output voltage is automatically reduced. Use AFC when coating parts with interior corners and deep recesses at close range.

For **Tribomatic** guns, use AFC to set the minimum current feedback level. If the current feedback falls below this level then the powder is not receiving the expected electrostatic charge. The alarm relay trips and a fault message is logged. To disable the alarm, set AFC to zero.

To set the minimum current feedback level, start coating parts. Note the μ A output (yellow) on the status display (page 5-3), then set AFC to a lower number. A typical setting would be 0.5–1.0 μ A lower than the output of a new Tribomatic gun. The setting resolution is 0.1 μ A.

NOTE: Different types of powders tribo-charge at different levels, so if you switch powders you may also have to change the alarm level.

Select Charge Mode

See Figure 5-10 and Tables 5-5 and 5-6. Select Charge mode provides you with three pre-programmed electrostatic charging modes (Modes 1–3) and one user programmable mode (Mode 4). The settings for modes 1–3 cannot be changed. Mode 4 allows both kV and μ A to be set for a particular powder or part. Mode 0 turns off Select Charge so you can set kV or AFC. Select Charge mode is not used with Tribomatic guns.

Touching the **Select Charge button** repeatedly toggles through the modes. The icon next to the button indicates the mode setting. Mode icons and descriptions of each mode are described in the following tables:

Select Charge Mode (contd)

Table 5-5 Select Charge Modes






Select Charge Modes	
	Mode 0 (Off): Turn Select Charge off to set kV or AFC.
	Mode 1 (Recoat): Use this mode for recoating parts that have already been coated and cured. Gun current is aggressively reduced to eliminate back ionization.
	Mode 2 (Special): Use this mode for coating with special powders (dry blend metallics or micas).
	Mode 3 (Deep Cavity): Use this mode for coating inside boxes or other deep cavities. Low kV and current coats the front edges of the cavity and high kV and current coats the back of the cavity.
	Mode 4 (User Programmable): This mode allows you to set both kV and μA for a particular part or powder and store the setting. The settings are loaded each time Mode 4 is selected.

Table 5-6 Select Charge Mode Values

Select Charge Mode	Application	kV/AFC Setting	Initial kV Value		Max. Current
			Prodigy/Encore HD, Encore, Sure Coat	Versa-Spray	All Guns
1	Recoat	not adjustable	95 kV	100 kV	15 μA
2	Special	not adjustable	60 kV	60 kV	30 μA
3	Deep Cavity, gun inside	not adjustable	95 kV	100 kV	70 μA
4	User Programmable	adjustable	60 kV	60 kV	30 μA

Lead and Lag Settings

Lead and lag settings determine where the spray guns turn on and off in relation to the part's leading and trailing edges. Lead and lag values can be zero, positive, or negative. See Figures 5-12 through 5-15 for lead and lag setting examples.

Lead: Distance from the spray guns to the leading edge of the part.

- A lead value of zero turns on the spray guns when the leading edge reaches them (Perfect Pickoff).
- A positive lead value turns on the spray guns **BEFORE** the leading edge reaches them (Extended Spray).
- A negative lead value turns on the spray guns **AFTER** the leading edge passes them (Restricted Spray).

Lag: Distance from the spray guns to the trailing edge of the part. Lag values can be positive, negative, or zero.

- A lag value of zero turns off the spray guns when the trailing edge reaches them (Perfect Pickoff).
- A positive lag value turns off the spray guns **AFTER** the trailing edge passes them (Extended Spray).
- A negative lag value turns off the spray guns **BEFORE** the trailing edge passes them (Restricted Spray).

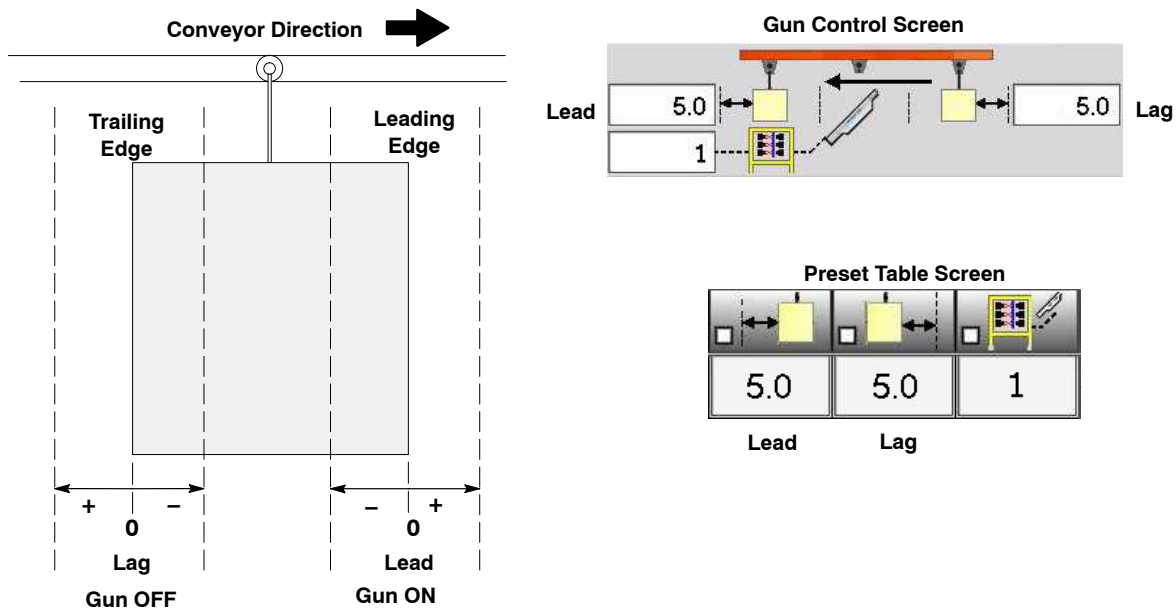


Figure 5-11 Lead and Lag Settings

Perfect Pickoff Example

See Figure 5-12. Lead = 0, Lag = 0. The guns start spraying at leading edge of the part and stop at the trailing edge.

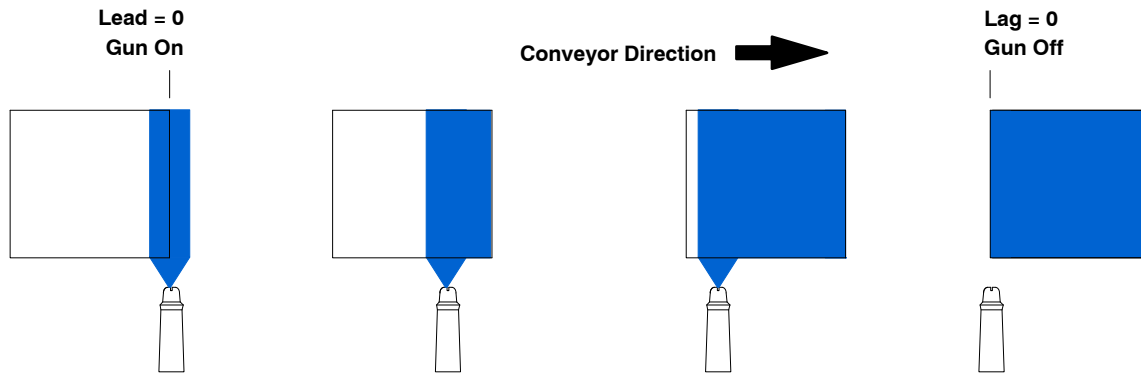


Figure 5-12 Perfect Pickoff

Extended Spray Example

Use extended spray to wrap powder around the leading and trailing edges of parts.

See Figure 5-13. Lead = 5, Lag = 5. 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.

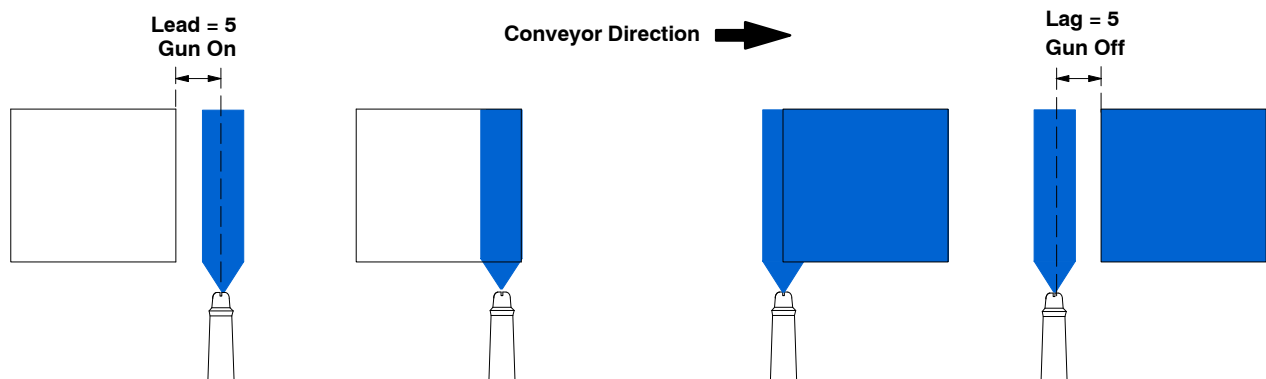


Figure 5-13 Extended Spray

Restricted Spray Example

Use restricted spray to prevent powder wrap around the leading and trailing edges of parts.

See Figure 5-14. Lead = -5, Lag = -5. The guns start spraying 5 units AFTER the leading edge of the part reaches the guns, and stop spraying 5 units BEFORE the trailing edge of the part reaches the guns.

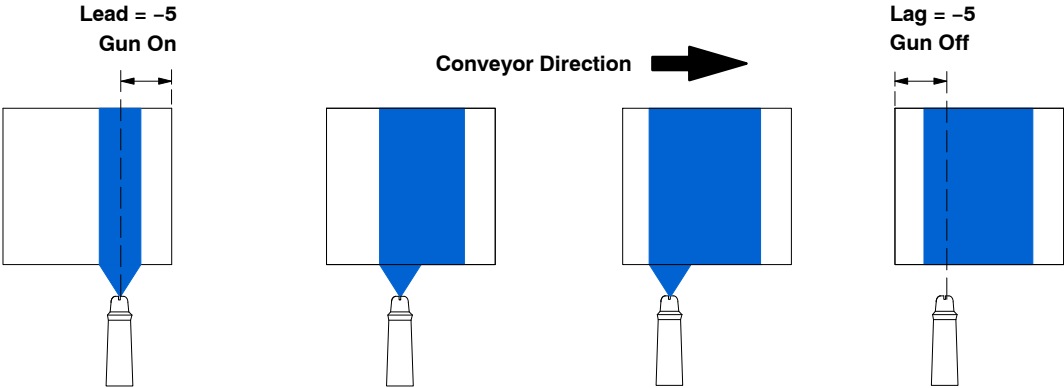


Figure 5-14 Restricted Spray

Extended-Restricted Spray Example

Use extended-restricted spray to wrap around one end of a part and not the other.

See Figure 5-15. Lead = 5, Lag = -5. The guns 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.

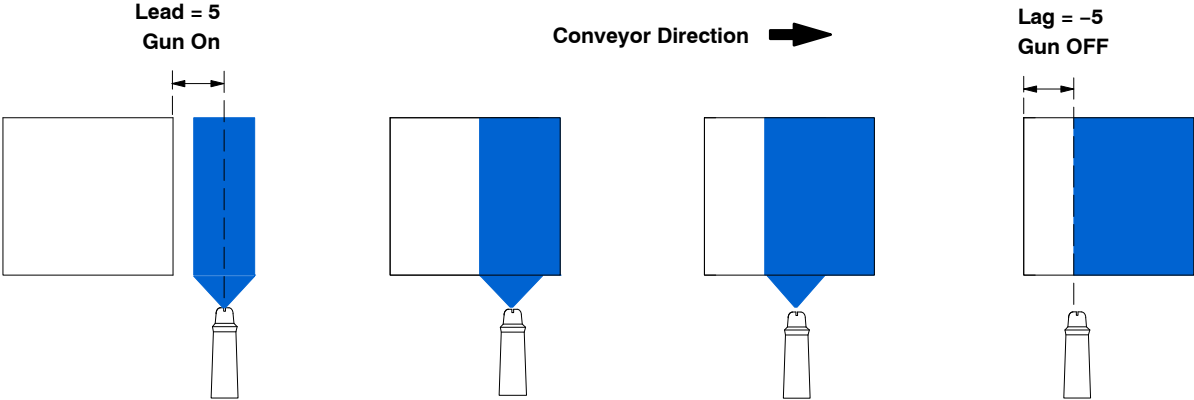


Figure 5-15 Extended-Restricted Spray

Zone Assignment

When a part is detected by a zone photoeye, the spray guns assigned to that zone by the preset for that part are triggered on when the part passes by the guns. Normally spray guns are assigned to the zone the guns are physically in, but can be assigned to any zone.



CAUTION: Do not change zone assignments while parts are moving through the booth. Doing so could cause erratic operation.

Using Zones to Prevent Triggering

To prevent a spray gun from triggering for a particular part, set the zone assignment to zero for the preset. The gun will not be triggered when that part passes by.

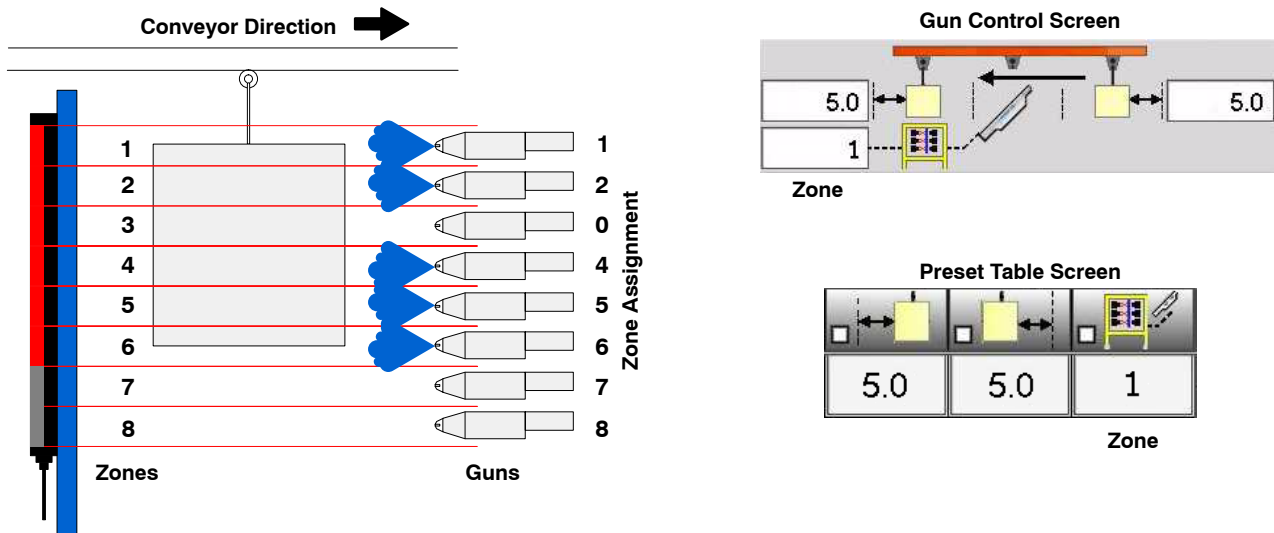


Figure 5-16 Zone Assignments

Copy All: Gun Control Screen

The Copy All function on the Gun Control screens copies **only** the flow and electrostatic settings for the current preset to all presets with the same number for all guns.

For example, if the current preset is preset 1 for gun 1 and you have 16 guns in your system, the Copy All function copies preset 1 flow and electrostatic settings to preset 1 for guns 2 to 16.

To use the Gun Control screen Copy All function:

1. Select the preset number to use as the source.
2. Touch the **Copy All** button. The Copy All confirmation screen opens.
3. Touch the **OK** button to start copying. If you change your mind touch the **Cancel** button.

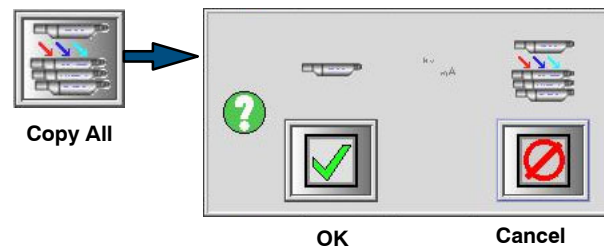


Figure 5-17 Copy All: Gun Control Screen

Copy All: Preset Table Screen

The Copy All function on the Preset Table screen copies the **selected** preset settings for Gun 1 to the same preset for all other guns. For example, if preset 1 is the current preset the Copy All function copies the selected preset 1 settings for gun 1 to preset 1 for all the guns listed.

1. Select the preset number to use as the source.
2. Select the settings to copy by touching the setting buttons. When selected, an **X** appears in the selection box on the button.
3. Touch the **Copy All** button. The settings you selected are copied to the rest of the guns.
4. Touch the **Save** button to save your changes.

NOTE: If you **Save** your changes they are written to the database. To cancel your changes, including a Copy All operation, **do not touch the Save button**. Close the screen and touch the Cancel button on the dialog that asks if you want to save your changes.



Figure 5-18 Copy All: Preset Table Screen

Copy Selected: Gun Control Screens

The Copy Selected function allows you to select preset settings for a range of guns and a range of presets (source), and copy the settings to a different range of guns and range of presets (destination). This function is only available on the Gun Control screens.

NOTE: Use the Global Control screen to shut off all guns before using this function. The iControl system will not allow copying while the guns are in Auto or Manual mode. To copy selected settings:

1. See Figure 5-19. Touch the **Copy Selected** button to open the Copy Selected screen.
2. Select the:
 - a. Source settings. You can select more than one setting. When selected the setting buttons turn green.
 - b. Source range of guns.
 - c. Source preset or range of presets.
 - d. Destination range of guns.
 - e. Destination preset or range of presets.

NOTE: All selections must be valid or the **Copy Start** button will not function. If the button is gray, check your selections for errors such as an unequal number of source and destination presets.

3. Press the **Copy Start** button. The Copy Selected dialog appears.
 - All guns must be turned off. If they are not, the **Copy** button will not function. Use the **Global Control screen** to turn all guns off.
 - If you wish to cancel the copy operation, touch the **Exit** button.
4. Press the **Copy** button to start copying.
5. When the copy operation is complete, the screen closes automatically.

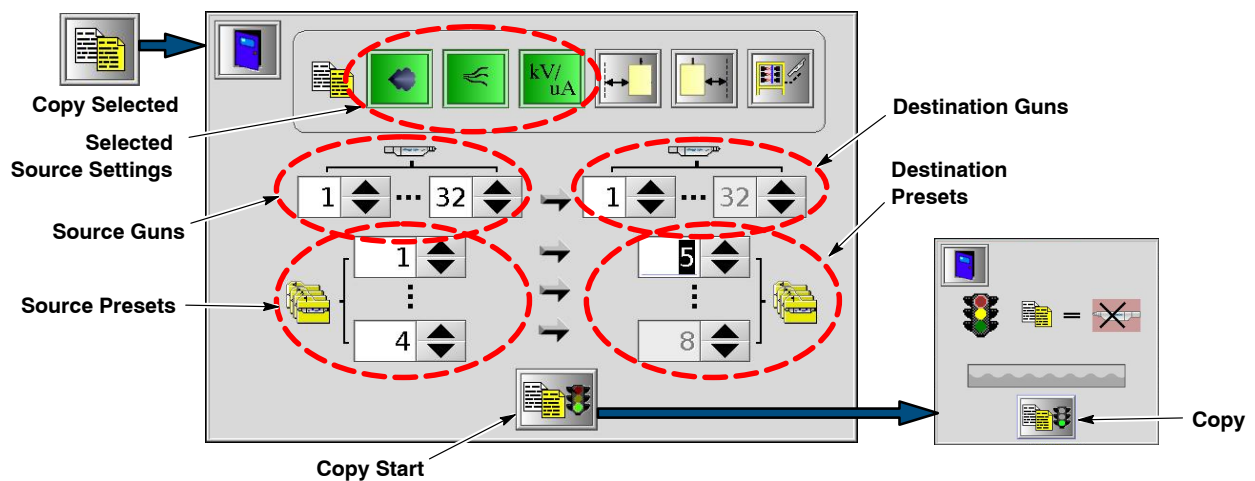


Figure 5-19 Zone Assignments

Section 6

Positioner Preset Settings

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Introduction

Positioner presets are recipes that contain the move settings for a specific part. Up to 255 unique presets can be created on each user data card.

Positioner Preset settings are part-specific. If no preset settings have been made for a part, the system uses the default positioner settings from the Configuration screen.

NOTE: If you set any preset settings to less than the configured minimum settings, then the minimum settings override the preset settings.

Refer to *Section 5, Positioner/Reciprocator Configuration* for more information on default and minimum settings.

In/Out Positioner Settings:

- lead and lag move points
- gun to part distance (variable)
- gun position (fixed)

Positioner Preset Settings

See Figure 6-1. To set up a preset for a positioner:

1. Use the **Preset Selector** to select a preset number first. All settings you make apply to the selected preset. The preset settings for each positioner are displayed on the screen.

NOTE: If no changes have been made to the preset settings since the screen was opened, the **Not Modified** icon is displayed. If you make a change, the **Modified** icon is displayed instead.

2. If you want to view the **Default Settings** for a positioner, use the **Positioner Selector**. The default settings are displayed in the row to the right of the selector.

3. Set **Lead** and **Lag** distances for gun moving.

Lead: Distance from the guns to the leading edge of the part. At the lead the guns are moved to the position setting.

- A positive lead moves the guns **BEFORE** the leading edge of the part reaches the guns.
- A negative lead moves the guns **AFTER** the leading edge of the part reaches the guns.

Lag: Distance from the guns to the trailing edge of the part to the guns. At this setting, the guns are moved in or out.

- A positive lag moves the guns **AFTER** the trailing edge of the part passes the guns.
- A negative lag moves the guns **BEFORE** the trailing edge of the part passes the guns.

4. Set the **Positioning Mode** to **Fixed** or **Variable** with the F/V mode button.

Variable Positioning: Gun-to-part distance to maintain while the part is moving past the guns (contouring). This is the default positioning method.

Fixed Positioning: Position measured from zero (forward limit switch). When a part with a fixed position setting arrives, the positioner moves to the fixed position and remains there until a new part arrives with either:

- no preset move settings (default settings are used) or
- different preset move settings.

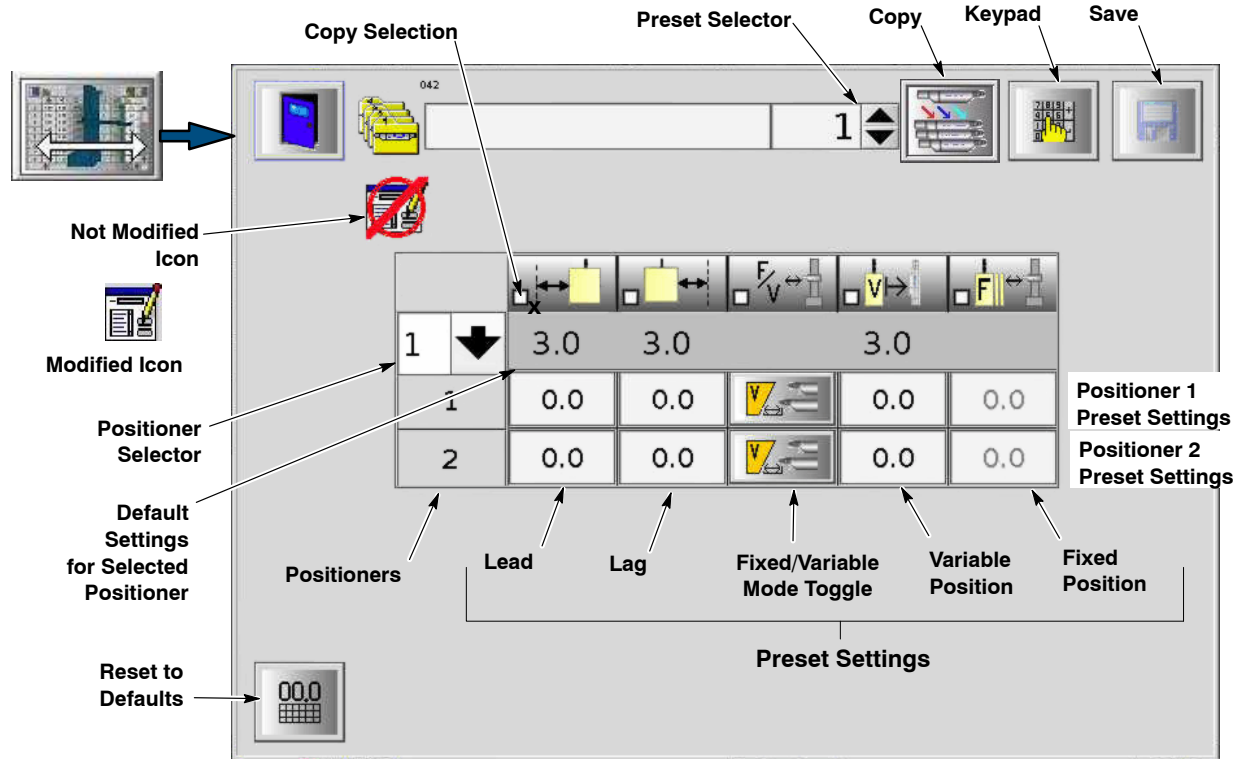


Figure 6-1 Spray Gun Control Screen

Copying Preset Settings

The **Copy** button copies the selected preset settings from positioner 1 to the rest of the positioners.

To select a setting to copy, touch the setting label. When selected, an X appears in the selection box on the label.

Saving Preset Settings

The **Save** button saves the preset settings to the user database. If you close the screen without touching the save button, you will be prompted to save or cancel your changes.

Reset to Defaults

The **Reset** button clears the values in the selected preset. The positioner will then use the configured default values for that preset. Refer to *Positioner Configuration* in Section 4.

Using Preset Settings

Refer to *Positioner Configuration* in Section 4 to make minimum and default lead, lag, and gun-to-part settings. These examples illustrate the most common move sequences. Contact your Nordson representative if you need help setting up move sequences.

NOTE: Preset settings override default settings. Minimum settings override the preset settings. The minimum settings are safety settings to prevent part–gun collisions.

Fixed Positioning

Settings:

Minimum: Lead 2, Lag 2, Gun-to-Part 2

Default: Lead 5, Lag 5, Gun-to-Part 10

Preset 1: Lead 6, Lag 6, Position 10 Fixed

Preset 2: Lead 4, Lag 4, Position 8 Fixed

1. See Figure 6-2. The positioner waits for parts. Its position depends on the configuration and the shift register contents.
2. At 6 inches from the leading edge of part 1, the positioner moves to 10 inches from positioner zero (forward limit switch). It remains at this position until part 2 arrives.
3. At 4 inches from the leading edge of part 2, the positioner moves to 8 inches from positioner zero. It remains at this position until a new part arrives.

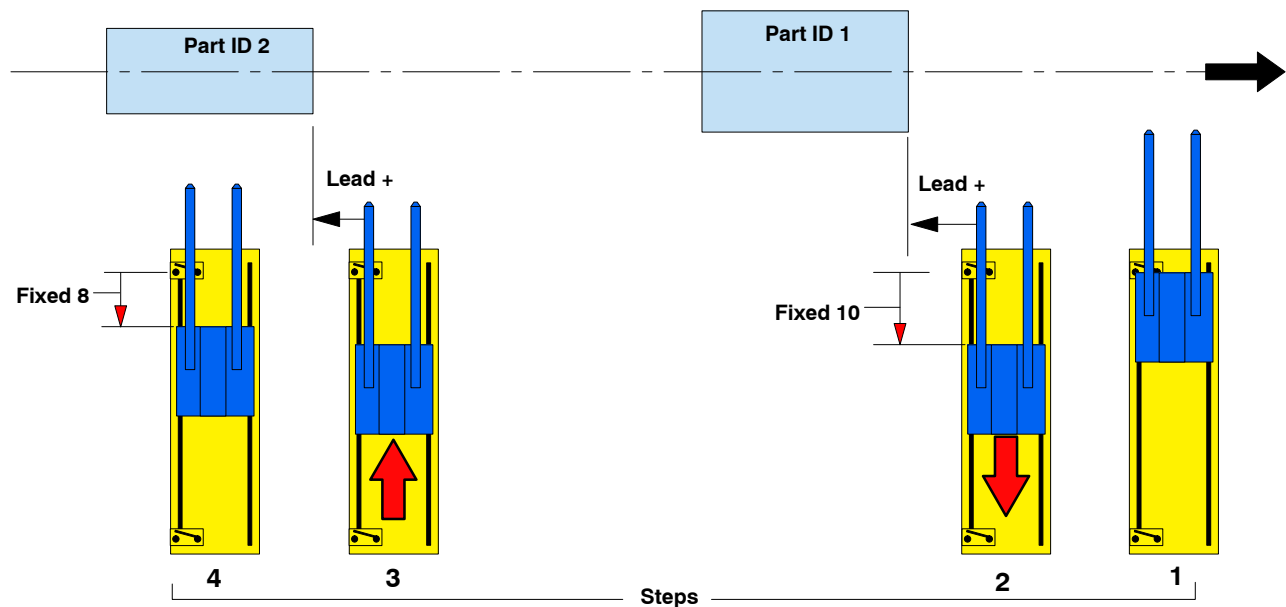


Figure 6-2 Fixed Positioning

Variable Positioning – Contouring

Minimum: Lead 2, Lag 2, Gun-to-Part 2
 Default: Lead 5, Lag 5, Gun-to-Part 10
 Preset: Lead 4, Lag 4, Position 8 Variable

1. See Figure 6-3. The positioner waits at the configured position.
2. Four inches from the leading edge of the part, the guns are moved back to 10 inches from the part.
3. Four inches from the change in part width, the guns are moved back to maintain the gun to part distance.
4. Four inches after the change in part width the guns are moved forward to maintain the distance.
5. Four inches after the trailing edge of the part, the guns are moved forward to wait for the next part.

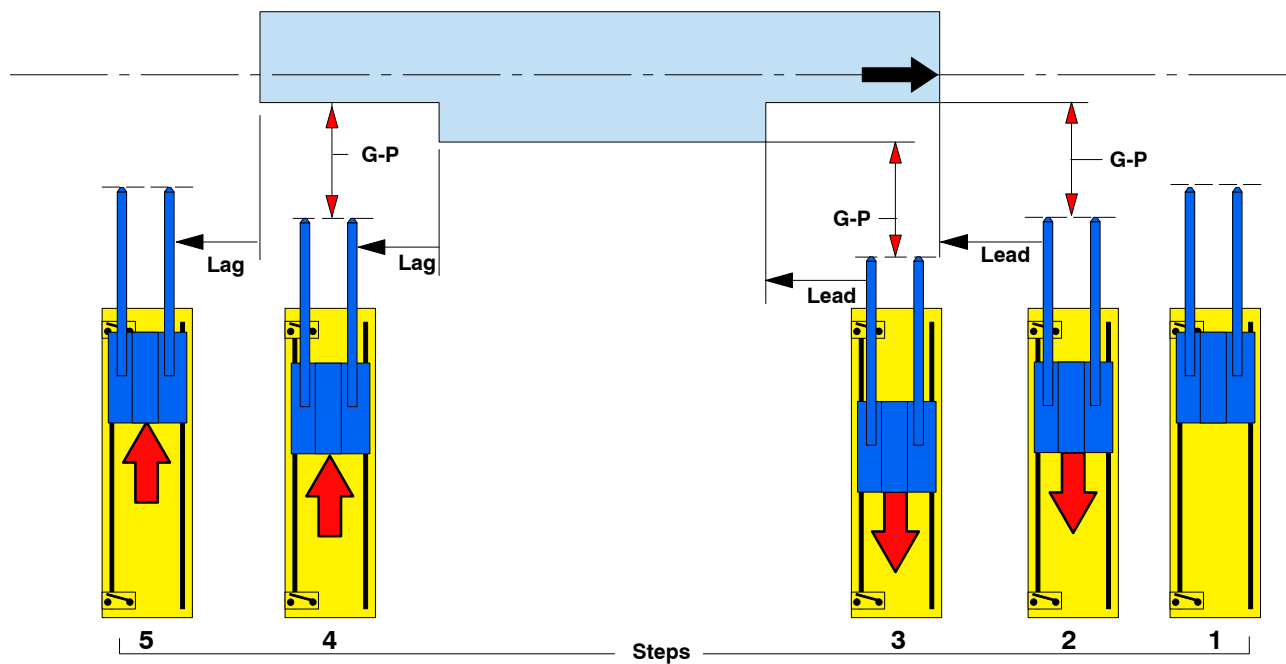


Figure 6-3 Variable Positioning – Contouring

Variable Positioning – Lancing and Contouring

Minimum: Lead 2, Lag 2, Gun-to-Part 8

Default: Lead 5, Lag 5, Gun-to-Part 10

Preset: Lead 4, Lag 4, Position Variable, 10

Lance Option selected in Positioner Configuration

NOTE: When the Lance option is selected in Positioner Configuration, the positioner starts at the Retract position, which is also set on the configuration screen.

1. See Figure 6-4. The positioner waits at the Retract position.
2. Four inches from the leading edge of the part, the guns are moved forward from the Retract position to 10 inches from the part.
3. Four inches from the change in width of the part, the guns are moved back to maintain the 10 in. distance.
4. Four inches after the change in part width, the guns are moved forward to maintain the 10 in. distance.
5. Four inches after the trailing edge of the part passes the trailing gun, the positioner moves back to the Retract position to wait for the next part.

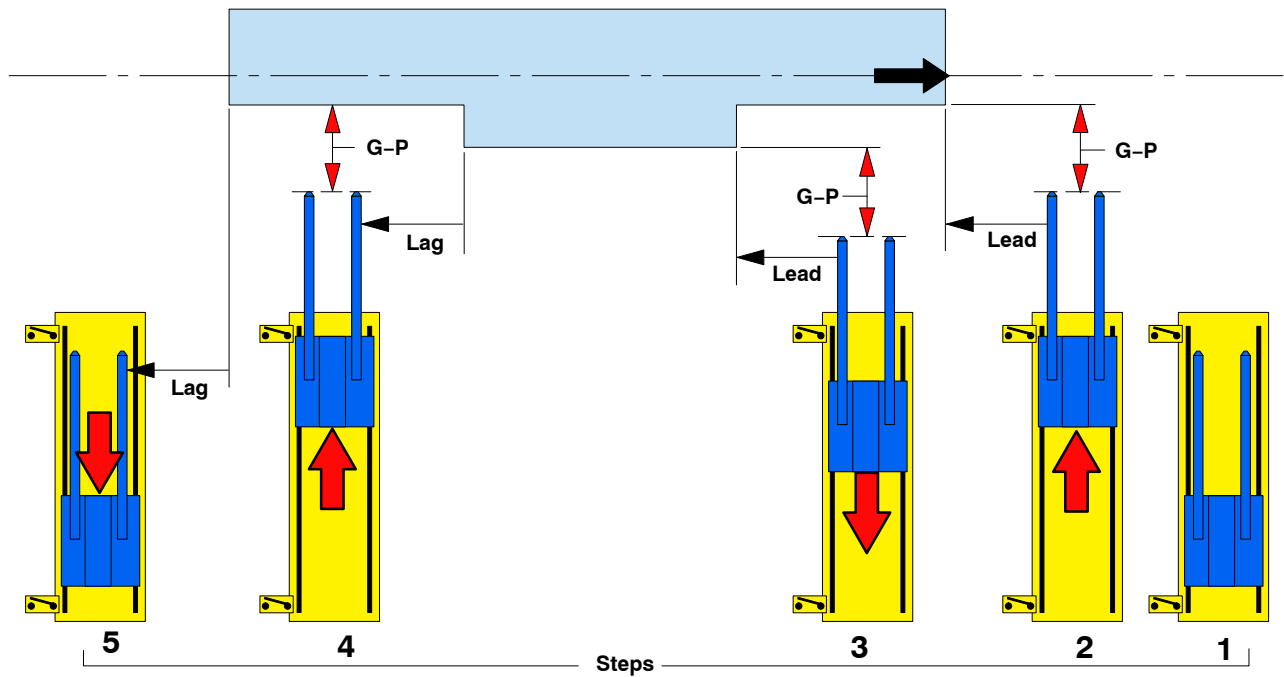


Figure 6-4 Variable Positioning – Lancing and Contouring

Variable Positioning – Lancing into Deep Recesses

Minimum: Lead 2, Lag 2, Gun-to-Part 8

Default: Lead 5, Lag 5, Gun-to-Part 10

Preset: Lead -5, Lag -5, Gun-to-Part -5, Variable

The preset settings are negative, so do not override the default settings. Both default and preset settings are used.

1. See Figure 6-5. The positioner waits at the configured position.
2. At the default lead (BEFORE the leading edge) the guns are moved back to the default gun-to-part distance (10 in.).
3. The leading edge of the part moves by the guns. At the preset lead (-2, or 2 inches AFTER the leading edge), the guns are moved in to -5 inches from the part edge, lancing into the part recess.
4. At the preset lag (-5, or 5 inches BEFORE the trailing edge), the guns are moved out to the default gun-to-part distance (10 in.).
5. At the default lag (5 in. AFTER the trailing edge) the guns are moved in to wait for the next part.

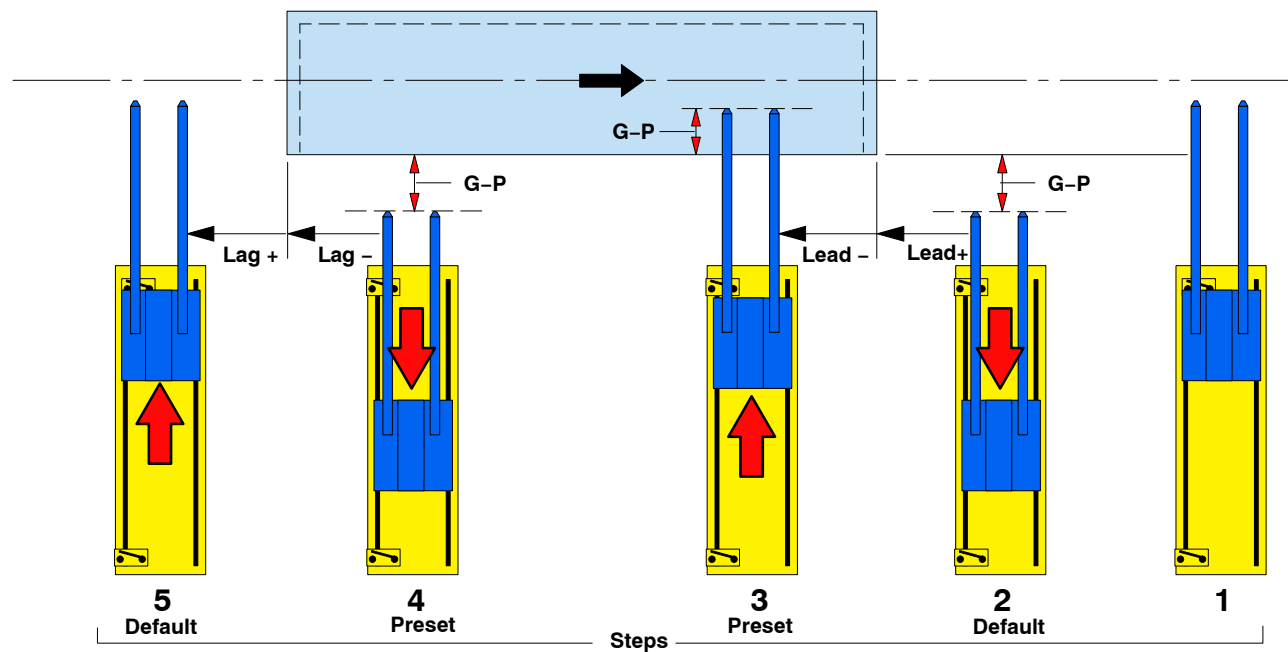


Figure 6-5 Variable Positioning – Lancing into Deep Recesses

Section 7

Reciprocator Preset Settings

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Introduction

Reciprocator presets are recipes that contain reciprocator move settings and trigger settings for a specific part. Up to 255 unique presets can be created on each user data card.

Reciprocator Preset settings are part-specific. The system will use the default reciprocator settings from the Configuration screen for all parts without preset settings.

Refer to *Section 4, Positioner/Reciprocator Configuration* for more information on default and minimum settings.

Reciprocator Settings:

- spray gun trigger on/off up/down points (fixed mode)
- reciprocator turn-around points (fixed and variable modes)
- reciprocator speed (fixed and variable)
- reciprocator overtravel distances (variable)
- flow-rate and atomizing air percent adjust

Reciprocator Preset Screens

See Figure 7-1. To set up a preset for a reciprocator:

1. Use the **Preset Selector** to select a preset number first. All settings you make apply to that preset.

NOTE: If no changes have been made to the preset settings since the screen was opened, the **Not Modified** icon is displayed. If you make a change, the **Modified** icon is displayed instead.

2. If you want to view the **Default Settings** for a reciprocator, use the **Reciprocator Selector**. The default settings are displayed in the row to the right of the selector.
3. Make preset settings for each reciprocator as desired. The mode set during reciprocator configuration determines which preset settings are available. The mode is shown along with the reciprocator number. Refer to Fixed Mode Settings or Variable Mode Settings on the following pages.
4. If desired, enable percent adjust and make settings as desired. Refer to Percent Adjust Settings on page 7-6.

Copying Preset Settings

The **Copy** button copies the selected preset settings from Reciprocator 1 to the rest of the reciprocators.

To select a setting to copy, touch the setting label. When selected, an X appears in the selection box on the label.

Saving Preset Settings

The **Save** button saves the preset settings to the user database. If you close the screen without touching the save button, you will be prompted to save or cancel your changes.

Reset to Defaults

The **Reset** button clears the values in the selected preset. The reciprocator will then use the configured default values for that preset. Refer to *Reciprocator Configuration* in Section 4.

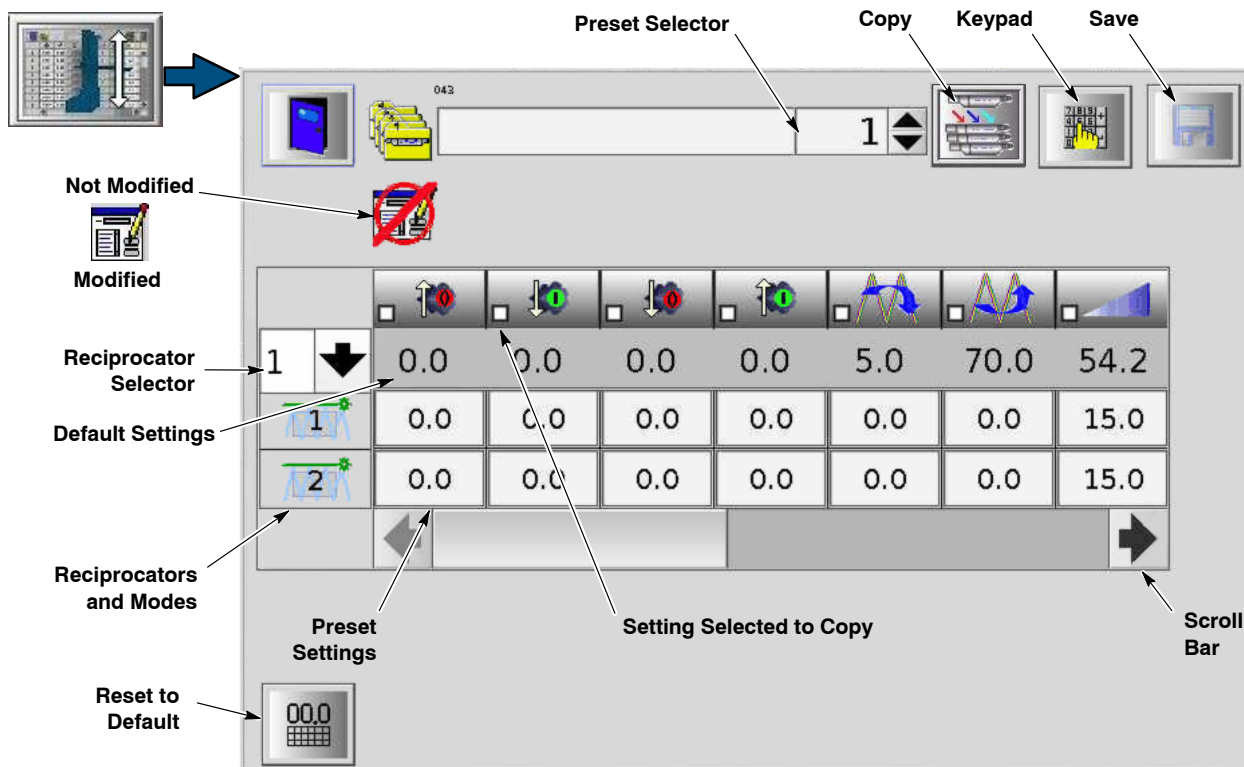


Figure 7-1 Reciprocator Preset Screen

Fixed Mode Settings

See Figure 7-2.

The **Gun On/Off Up/Down** settings are relative to the part edge. Positive settings extend the spray by turning the guns on BEFORE the part edge and off AFTER the part edge. Negative settings restrict the spray by turning the guns on AFTER the part edge and off BEFORE the part edge.

The **Top/Bottom Turn-Around** setpoints are measured from the Home position.

Reciprocator Speed can be set for both Fixed, No Synchronization and Variable, No Synchronization modes. If the mode is Synchronized, then the speed is controlled by the conveyor speed and other configuration settings and cannot be set for presets.

Fixed Mode Settings *(contd)*

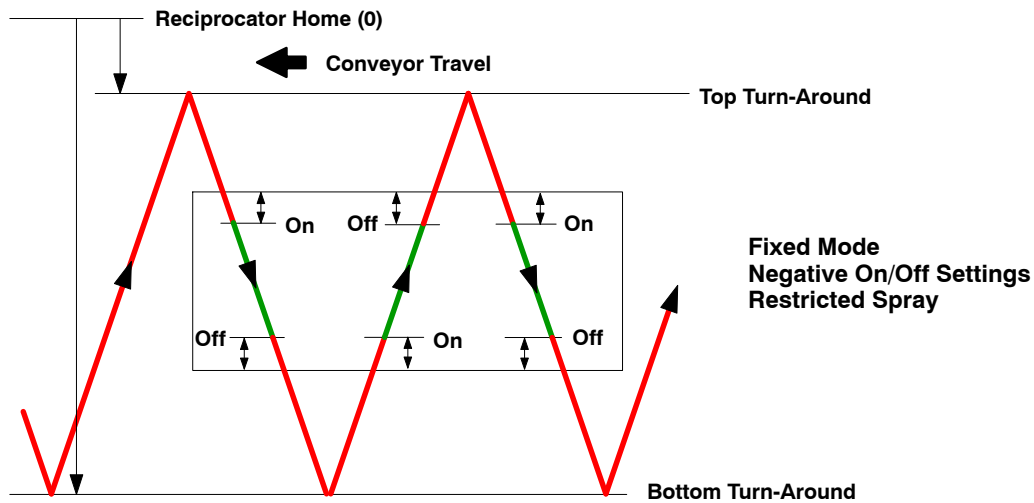
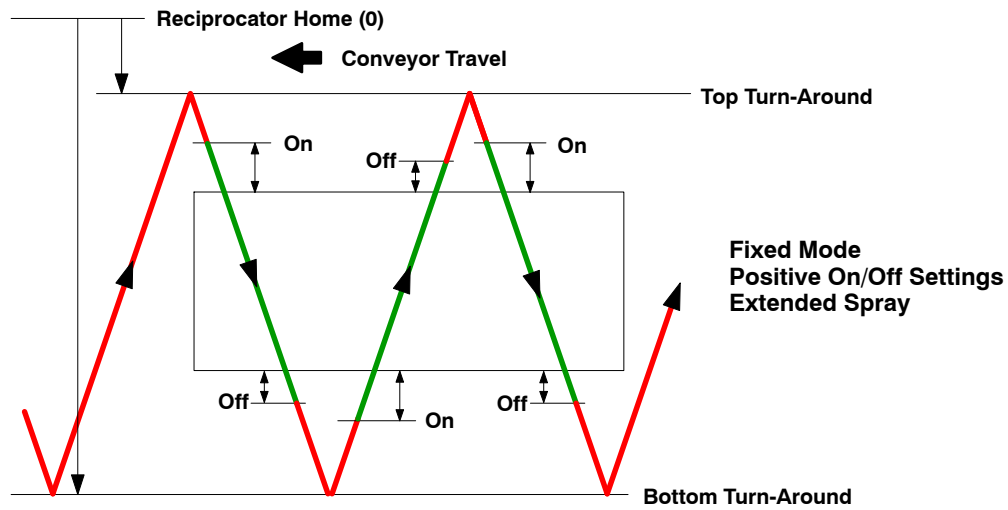
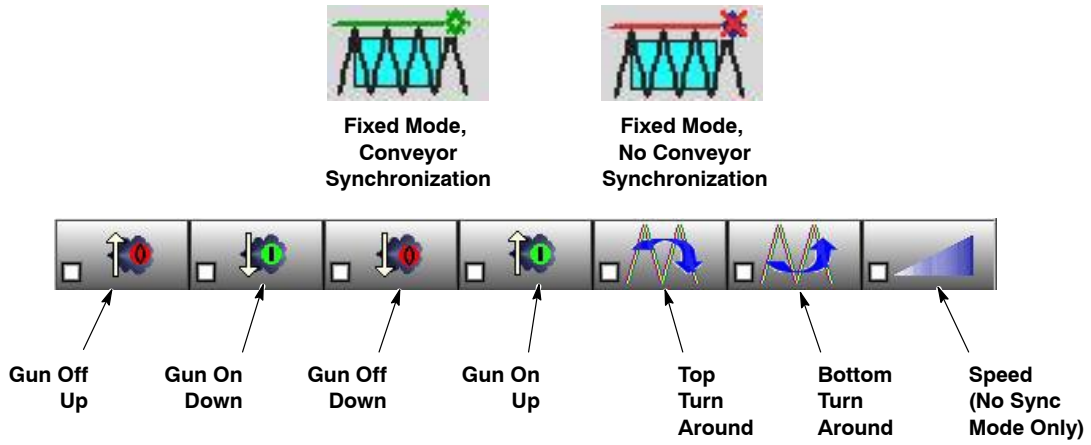


Figure 7-2 Reciprocator Preset Settings – Fixed Mode

Variable Mode Settings

See Figure 7-3. **Reciprocator Speed** can be set for Variable, No Synchronization mode only.

Top and Bottom Overtravel settings are the distance above and below a part that the reciprocator travels before turning around when a part is in front of the guns. Positive overtravel settings extend the spray pattern, turning the guns on BEFORE the part edge and off AFTER the part edge. Negative overtravel settings restrict the spray pattern, turning the guns on AFTER the part edge and off BEFORE the part edge.

If no part is present, then the configured turn-around limits apply.

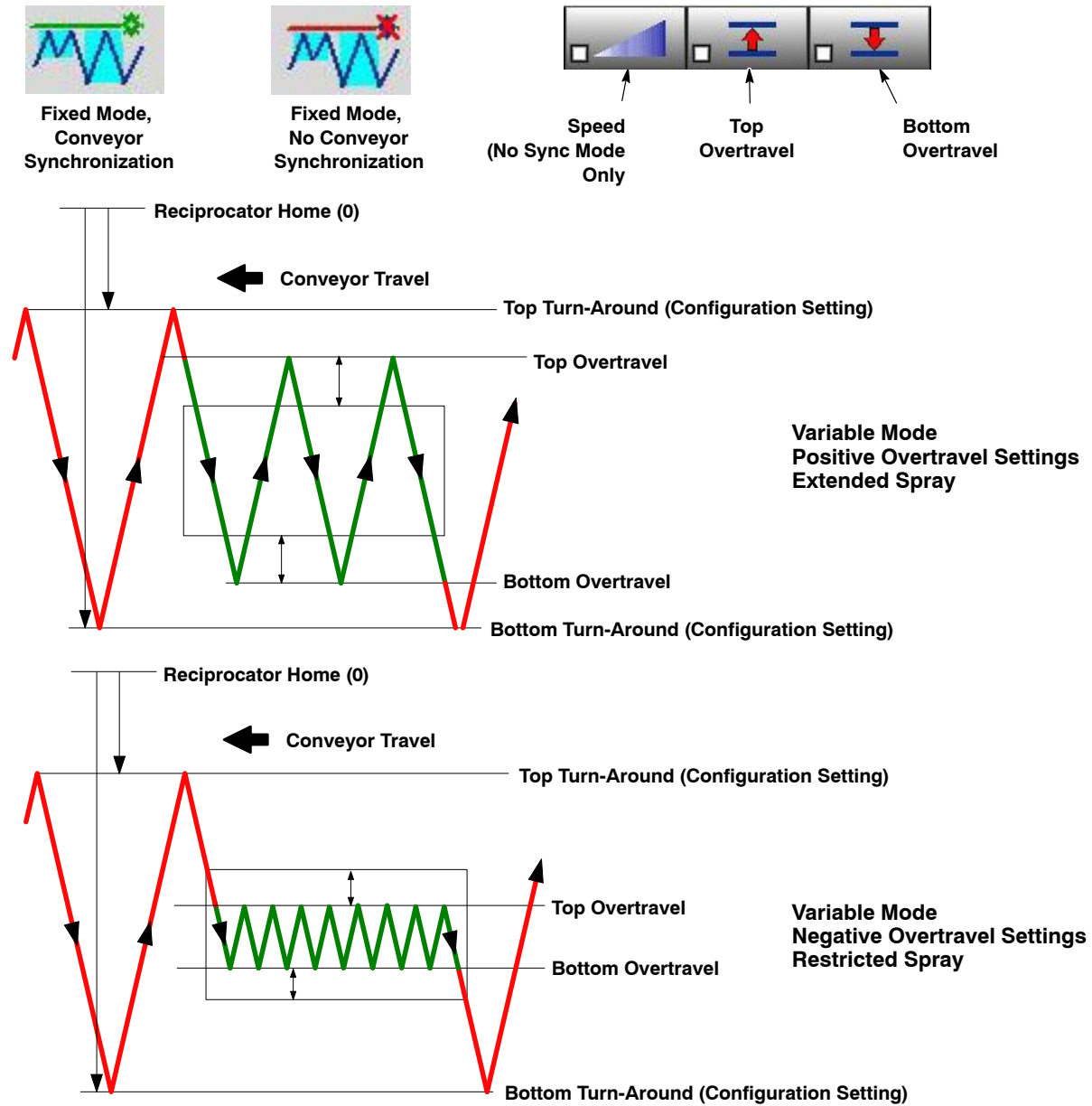


Figure 7-3 Reciprocator Preset Settings – Variable Mode

Reciprocator Preset Percent-Adjust Settings

See Figure 7-4. Reciprocator Preset Percent-Adjust settings change the current spray gun preset flow-rate and atomizing air settings by a percentage at points above and below the part edges.

NOTE: Percent Adjust is an additive variable. Reciprocator Preset Percent-Adjust settings are added or subtracted from Reciprocator Stroke Length Percent Adjust settings, Global Percent-Adjust settings, and Conveyor Speed Percent-Adjust settings.

For Spray Gun percent adjust setting instructions, refer to Percent Adjust Functions in *Section 8, Operation*. Refer also to *Section 4, Positioner/Reciprocator Configuration* for Reciprocator Stroke Length Percent Adjust.

Variable mode: The **On/Off Up/Down** settings are the distances from the edge that the Flow-Rate and Atomizing air percent adjust settings are turned on and off. The On/Off Up/Down settings can be positive or negative. Positive settings turn the adjustment on BEFORE the part edge and off AFTER the part edge. Negative settings turn the adjustment on AFTER the part edge and off BEFORE the part edge.

Fixed mode: The **On/Off Up/Down** settings are measured from reciprocator Home and must always be positive.

The **Percent-Adjust Flow-Rate and Atomizing** air settings are the percent by which the current setting is changed. These settings can be positive or negative. Percent adjust can be **Enabled or Disabled** for each reciprocator. Touch the field to toggle the status. When enabled an X is displayed in the field.

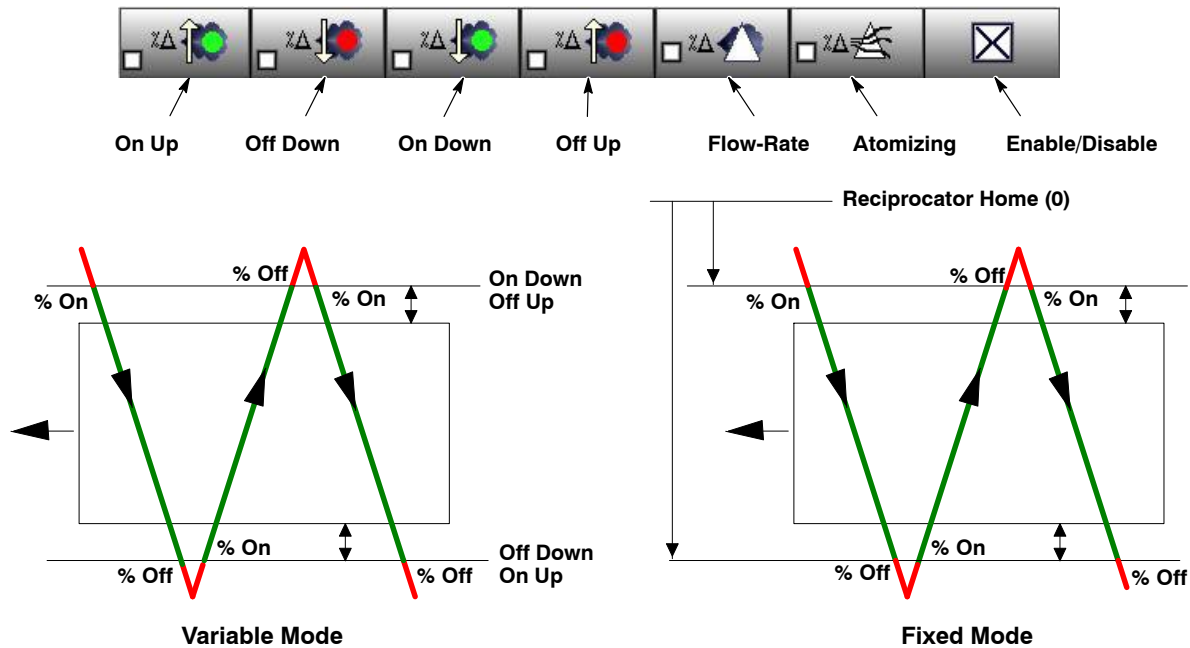


Figure 7-4 Reciprocator Preset Settings – Variable Mode




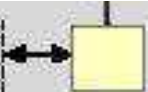

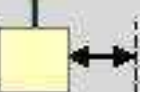



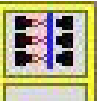


Section 8





Operation

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Screen Icons

Settings		Settings	
	Flow-rate air flow (scfm or m ³ /hr) or Powder flow (Prodigy guns)		Select Charge (electrostatics)
	Atomizing air flow (scfm or m ³ /hr)		Lead
	Pattern air flow (scfm or m ³ /hr) (Prodigy guns only)		Lag
	Assist Air Compensation (Prodigy guns only)		Preset
	Voltage (kilovolts)		Zone
	Microamperes (current)		Part ID

Trigger or Operation Modes	
	Automatic
	Manual
	Off
	Trigger Switch (Toggle)

System Startup

The console power switch is on the rear panel. When the console is turned on, the operating system loads, then the iControl software loads and the Main screen appears. All settings are restored to the state they were in at shutdown.

NOTE: To set the system date and time, calibrate the touch screen, and format or backup Compact Flash user data cards, refer to *Section 4, System Configuration*.

1. Log into the system, if required. Refer to *Section 2, Security*.
2. Set the desired operating mode for all guns, in/out positioners, and reciprocators: *Global Control Screen*, page 8-5.
3. Set the desired Part ID Mode: *Part ID Controls*, page 8-6.
4. If used, set the desired Purge Mode: *Purge Controls*, page 8-7.
5. Start the powder recovery system, booth exhaust fan, and conveyor. Start moving parts through the booth.

Using the Console Keyswitch

The 3-position keyswitch on the front panel provides the following functions:

- **Ready:** Runs the system in normal mode.
- **Lockout:** Shuts off all guns, in/out positioners, and reciprocators, and prevents gun triggering or moves. The Lockout can be overridden for the positioners and reciprocators from their configuration screens.
- **Conveyor Bypass:** Allows you to trigger the guns without running the conveyor (no signal from encoder or conveyor).

Lockout

When you place the keyswitch in the Lockout position, the Lockout notice appears on the touch screen.

NOTE: Lockout cannot be canceled by moving the keyswitch to another position if the booth exhaust fan is shut off after lockout is selected. You must turn the booth exhaust fan on first. Conversely, if the booth exhaust fans are shut off first, then turning the switch to the lockout position has no effect.

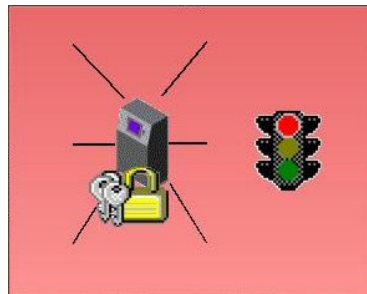


Figure 8-1 Lockout Notice

Main Screen Operating Functions

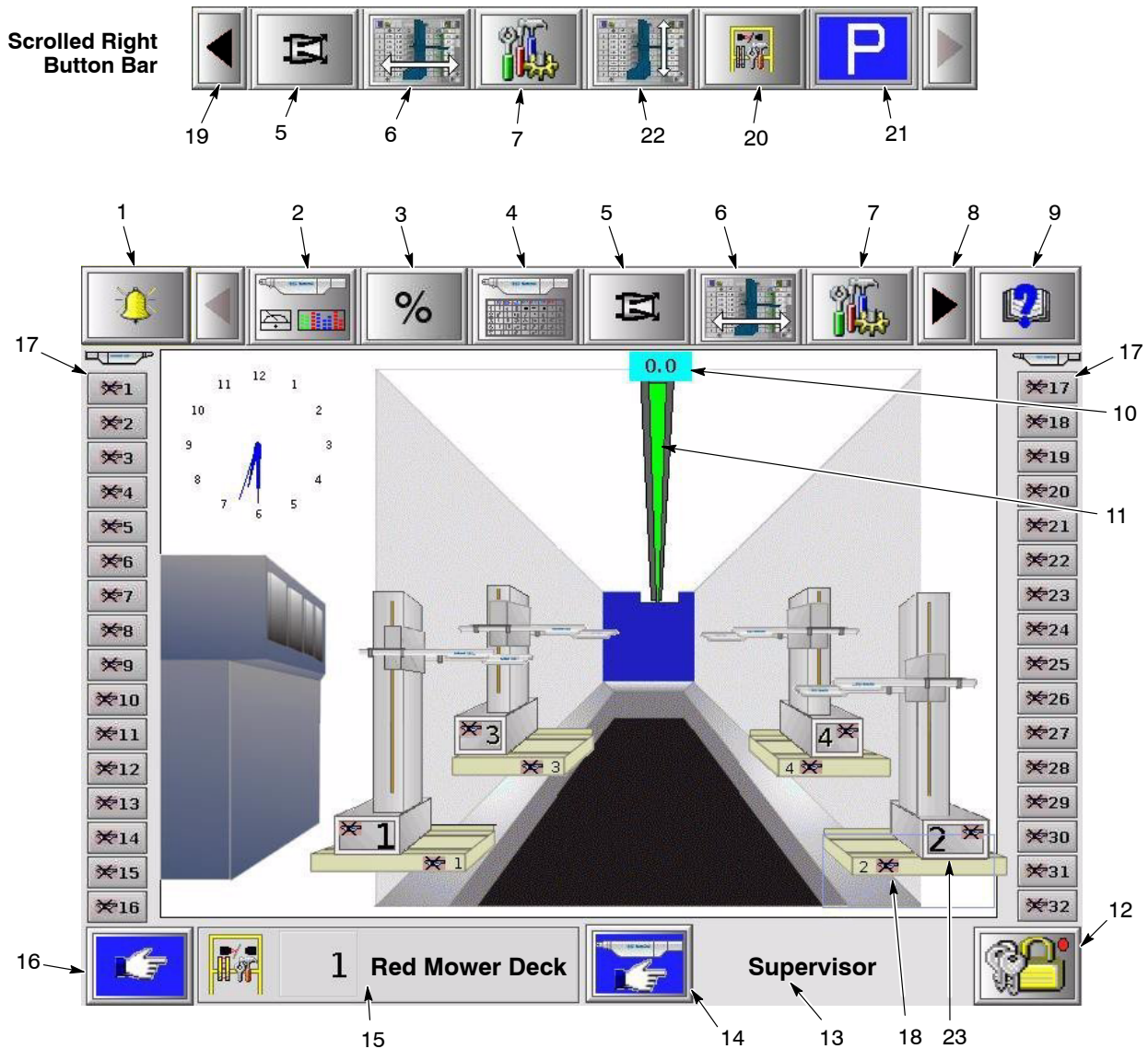


Figure 8-2 Main Screen Operating Functions

- | | | |
|--------------------------------|--------------------------------|------------------------------------|
| 1. Alarm screen | 9. Help screen | 17. Gun control screens |
| 2. Global gun status screen | 10. Conveyor speed | 18. Positioner control screen |
| 3. Percent adjust screen | 11. Conveyor on/off indicator | 19. Scroll left |
| 4. Preset table screen | 12. Log in/out/security screen | 20. Photoeye/scanner status screen |
| 5. Purge control screen | 13. User logged in | 21. Park |
| 6. Positioner preset screen | 14. Global control screen | 22. Reciprocator preset screen |
| 7. System configuration screen | 15. Part ID name and number | 23. Reciprocator control screen |
| 8. Scroll right | 16. Part ID control screen | |

Global Mode Controls

Touch the **Global Mode Control** button on the Main screen to open the Global Mode Control screen. The icon on the button shows the current global mode for the spray guns.

The Global Control screen controls the operating mode for all spray guns, positioners, and reciprocators. Figure 8-3 shows the screen for a system with positioners and reciprocators.

NOTE: For color change operations gun positioners and reciprocators must be in Auto mode.

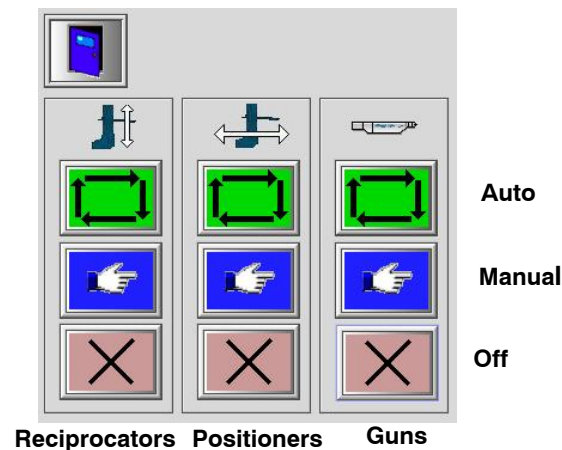


Figure 8-3 Global Control Screen

Spray Gun Global Control – Manual Spray Control

If you use the Global Control screen to put all guns in manual mode, you can then choose any preset and trigger the guns on and off as desired.

Touch the **Guns Manual** button to put all guns in Manual mode. The Gun Control screen buttons display the manual icon. The Global Control screen expands to reveal the **Preset Selector** and **Manual Trigger** button.

Select the desired preset number, then touch the Manual Trigger button to trigger all guns on. Touch the button again to shut all guns off.

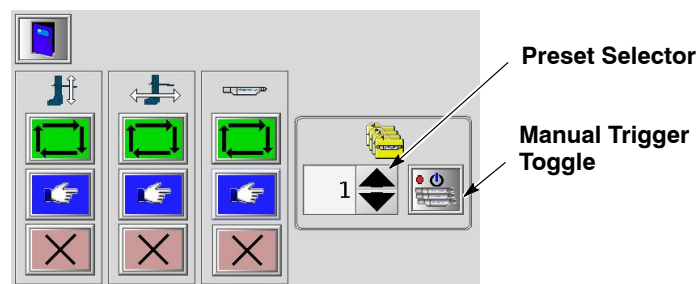


Figure 8-4 Global Control Screen – Manual Preset and Trigger Control

NOTE: To control a single gun manually, use the Gun Control screen for that gun. Refer to page 8-11.

Part ID Control

The **Part ID Control** button on the Main screen displays the current part ID mode. Touching the button opens the Part ID Control screen.

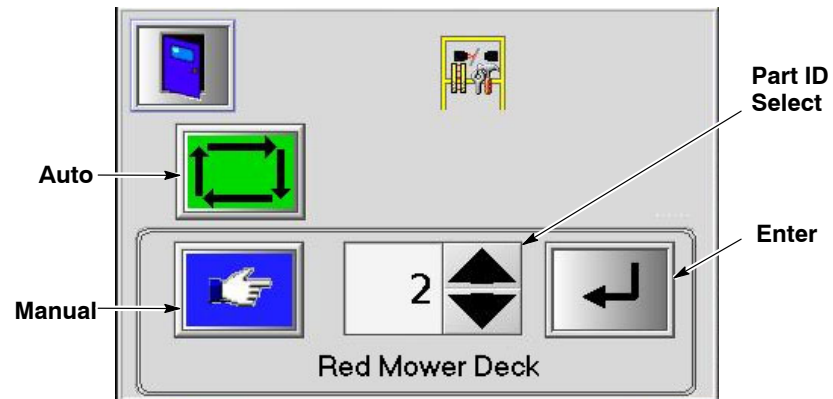


Figure 8-5 Global Control Screen – Manual Preset and Trigger Control

Part ID Modes

Auto: The part ID is entered into the part queue by signals received from the flag photoeyes or a customer part ID system. Parts are sprayed automatically.

Manual: The part ID is selected and entered by the operator. Typically used for batch coating.

NOTE: Manually changing the part ID affects only the part entering the booth, not the part currently being sprayed.

Batch Coating

1. Select **Manual** mode.
2. Select a part ID number.
3. Touch the **Enter** button to enter the new part ID into the part queue.

NOTE: If you enter a new part ID number while a part is passing in front of the zone photoeyes, the part will be sprayed first by the preset for the previous part ID number, then by the preset for the new part ID number.

NOTE: If the part ID inputs are configured for Straight Flagging and you want to spray a part with a preset number greater than 8, you must do it manually using Global Manual Triggering (page 8-5). Straight flagging only allows Part IDs from 1–8. Any preset number greater than 8 will be forced to 8.

Purge Controls

Versa-Spray Manual Purge Controls

Use the Versa-Spray Gun Purge Control screen to manually purge the spray guns. To use this feature purge kits must be installed in the iControl consoles and purge adapters must be installed on the spray guns. Nozzle purge must be configured and enabled during System Configuration.

The **Purge Control** button changes from gray to green when the guns are purging. Touch the button to open the Nozzle Purge Control screen.

Auto: In auto mode, purging takes place automatically according to the configured settings. The purge timer controls the purge duration.

Manual: In manual mode, touch the **Purge Trigger** button to turn purging on. All guns are purged at once. Touch the button again to shut off purging.

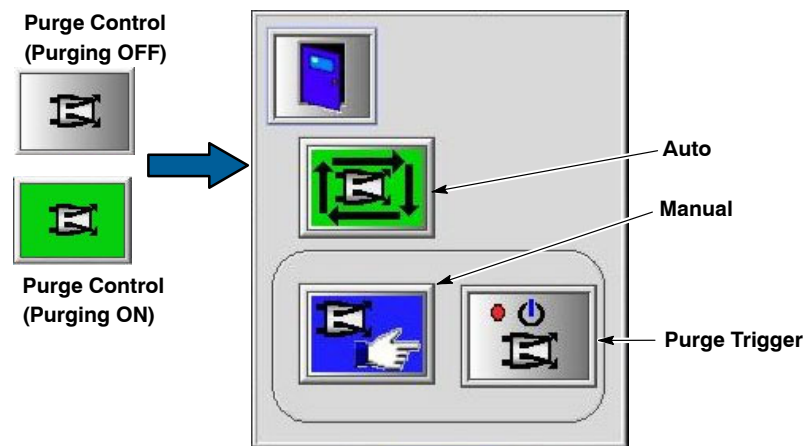


Figure 8-6 Versa-Spray Purge Control Screen

Prodigy/Encore HD Purge Controls

These screens are only used with Prodigy and Encore HD automatic guns. Purging must be configured from the Prodigy/Encore HD Purge Configuration screen.

NOTE: Purging of HDLV systems is part of the booth/gun cleaning function. Manual purging should not be used outside of the cleaning operation.

Touch the **Purge Control** button to open the Purge Control screen. The screen that opens depends on the purge configuration.

Prodigy/Encore HD Purge Controls (contd)

To purge the guns:

1. Touch the **Purge Trigger** button. The Purge Confirm screen appears.

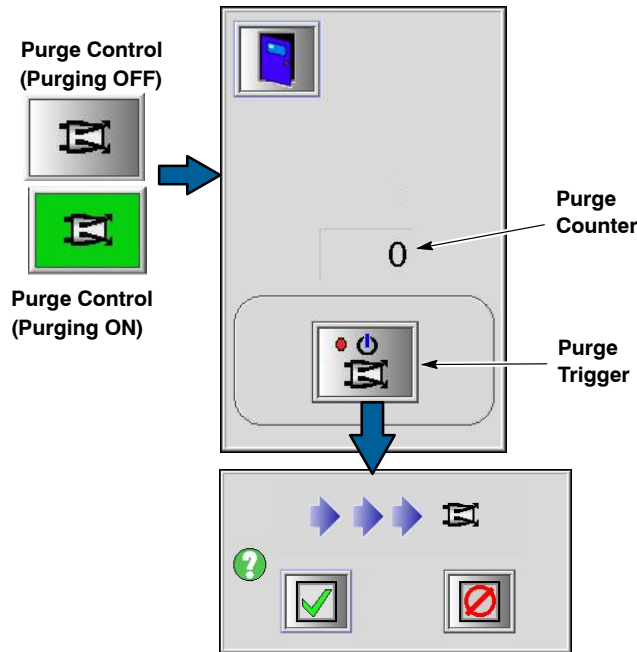


Figure 8-7 Prodigy Purge Control Screen

2. Touch the **OK** button to proceed with the purge; touch the **Cancel** button to stop the purge.
3. When you touch the OK button, the Purge Control screen reappears. The **Purge Counter** counts up until the purge is complete.
4. Stop a purge sequence at any time by touching the **Purge Trigger** button again.

Percent Adjust Functions

See Figure 8-8. Two percent adjust functions are available to the operator from the Main Screen: Global Percent Adjust and Conveyor Speed Percent Adjust.

Both functions allow powder flow and fan pattern adjustments to be made on the fly. The Global Percent Adjust applies to all guns immediately whenever any value other than zero is entered. Conveyor Speed Percent Adjust applies to all guns also, but synchronizes the adjustments with conveyor speed.

The adjustments increase or decrease the preset flow settings by a percentage of each setting. For standard guns, flow-rate and atomizing air flow are adjusted. For Prodigy guns, powder flow and pattern air flow are adjusted.

When Percent Adjust is on the Percent Adjust button on the main screen button bar turns green. % Δ icons also appear on the Gun Control screens to indicate that the outputs are being adjusted. Any settings you make on this control screen are stored on the program card and saved if you shut down the system.

Percent Adjust Additive Effects

The percent adjust functions are additive variables. In other words, if settings are made for Reciprocator Stroke Length Percent Adjust, Reciprocator Preset Percent Adjust, Global Percent Adjust, and Conveyor Speed Percent Adjust, then all the percentages are added together (when active) to arrive at a final adjustment factor.

For example, if Global = 5%, Conveyor = 5%, Reciprocator Preset = 5%, and Reciprocator Stroke Length = 5%, then if all functions are active the total percent adjust = 20%.

If Global = 5 and Conveyor = -5, then the total adjustment = 0.

Refer to *Section 7, Reciprocator Presets* for information on the Reciprocator Preset Percent Adjust function and *Section 4, Positioner/Reciprocator Configuration* for information on the Reciprocator Stroke Length Percent Adjust function.

Global Percent Adjust

The percentage you enter takes effect immediately, for all presets. Positive values increase flow and negative values decrease flow. Setting the values to zero turns Global Percent Adjust off.

The **Percent Adjust Limit** prevents the additive effect from increasing the flow-rate and atomizing air percent adjust beyond the value entered.

Conveyor Speed Percent Adjust

Conveyor Speed Percent Adjust works as follows, using the example in Figure 8-8:

The **nominal** conveyor speed is 16 ft/min. As long as the conveyor speed stays within the **dead band** ($\pm 2\%$, or ± 0.2 ft/min., or 15.68–16.32 ft/min.) nothing happens. If the conveyor speed increases past 16.32 ft/min. then flows are increased linearly until at 18 ft/min. both flow settings have been increased by 10%.

If the conveyor speed decreases below 9.8 ft/min. and keeps decreasing, then flows are decreased linearly until at 8 ft/min. both flow settings have been decreased by 20%. If the conveyor speed goes above 18 ft/min. the adjustment stays at 10%; if it goes below 8 ft/min. the adjustment stays at 20%.

To turn the Conveyor Speed Percent Adjust function off, touch the Enable/Disable selection box.

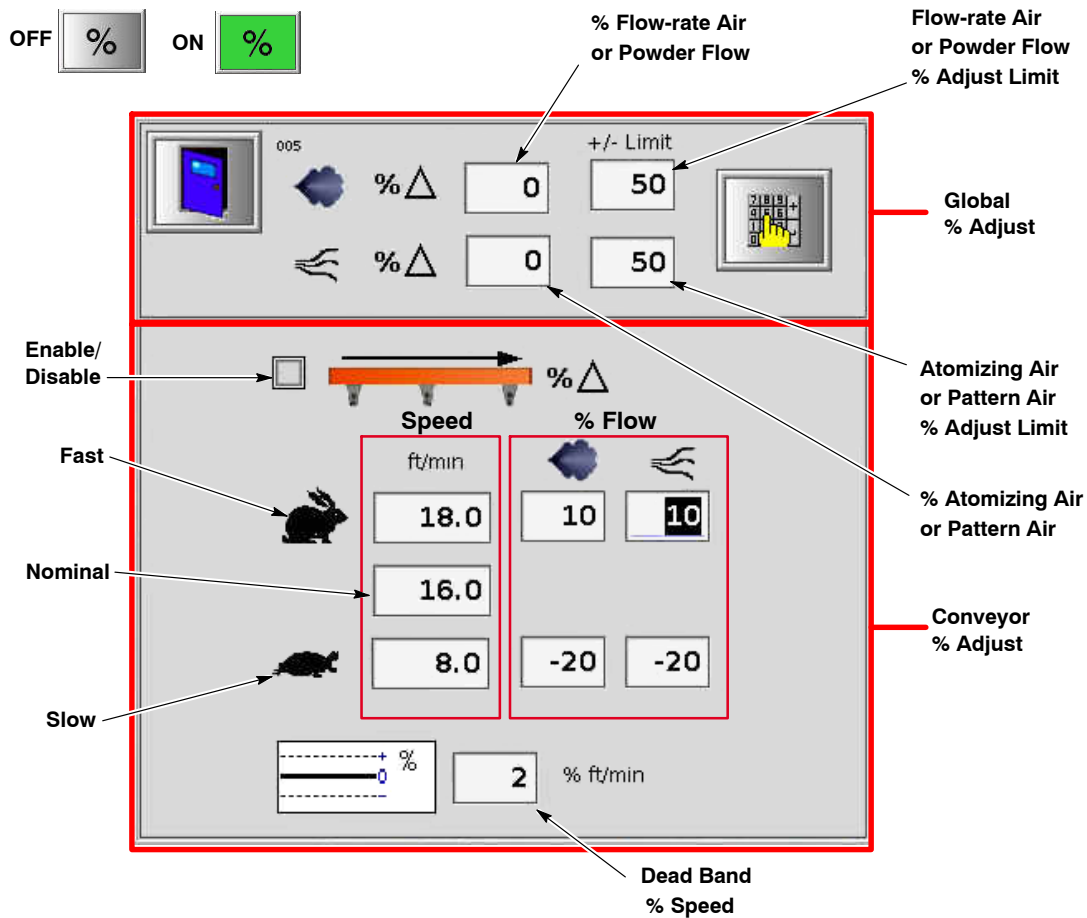


Figure 8-8 Percent Adjust Screen

Spray Gun Controls

See Figure 8-9. Use the Gun Control screens to control individual guns and adjust preset settings. Refer to Section 5 for information on making preset settings.

NOTE: Adjustments to lead and lag settings do not affect any part that is already in front of the zone photoeyes or being sprayed. Changes do not take effect until the next part enters the booth.



CAUTION: Do not change zone assignments while parts are moving through the booth. Doing so could cause erratic operation.

On the Gun Control screens, the Preset Setting and Output Status displays are independent of each other. The Preset Setting display always defaults to the preset being sprayed when you open the screen. If a new part moves in front of the guns the output status display changes but the preset setting display continues to show the preset settings for the previous part.

For example, you open the Gun Control screen for Gun 1 while it is spraying Part 1:

- The Output Status display shows the output of Gun 1 for preset 1.
- The Preset Setting display shows the settings for preset 1.

Part 2 moves in front of the guns.

- The Output Status display shows the output of Gun 1 for Preset 2.
- The Preset Setting display does not change; it still shows the settings for Preset 1.

Copying Changes to Presets

If you make a change to the current preset or another preset while the guns are spraying, only the **Copy All** function can be used. It copies only the flow and electrostatic settings to the same preset for all guns.

To copy other settings with the **Copy Selected** function, you must shut off all guns. Refer to *Copying Preset Settings* on page 5-19.

Trigger Mode and Manual Triggering

See Figure 8-9. To change the gun trigger mode for one gun, or to trigger the gun manually:

1. Touch the **Gun** button for the desired gun to open the Gun Control screen for that gun.
2. Touch the **Trigger Mode** button to toggle through Auto, Manual, and Off modes.
3. To trigger the gun manually, change the gun's trigger mode to Manual, then touch the **Manual Trigger** button to trigger the gun on. Touch the button again to trigger the gun off.

Trigger Mode and Manual Triggering (contd)

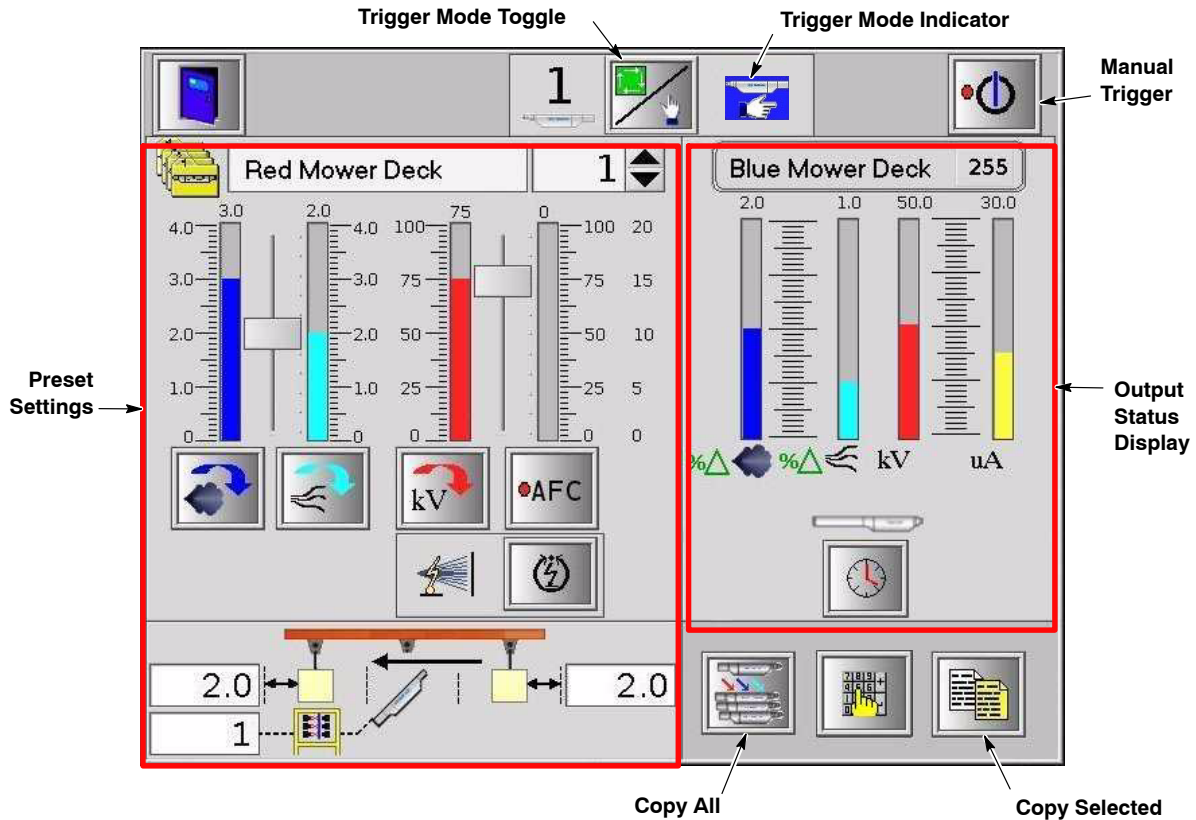


Figure 8-9 Gun Control Screen

Turning Individual Guns On and Off

To shut down one or more guns while the rest continue to spray, touch the **Gun** buttons for the desired guns and change their operating mode to Manual or Off.

To return all guns to operation, touch the **Global Operation Mode** button on the Main screen, then touch the **Auto** mode button. Refer to *Global Controls* on page 8-5.

Positioner Controls

See Figure 8-10. Touch the positioner images on the Main screen to open the Positioner Control screens. These screens allow you to control the positioners individually.

Positioner Operating Modes

NOTE: Positioner operating mode can also be set from the Global Control screen (page 8-5).

Auto: The positioner moves automatically according to the default or preset settings.

Manual: Shuts off auto mode, moves the positioner to the Park position, and activates the **Jog** buttons so you can move the positioner manually.

NOTE: When using the jog buttons, make sure you are moving the positioner in the desired direction.

Off: Moves the positioner to the Park position and shuts it off.



CAUTION: If you set the positioners to Manual or Off mode, make sure the guns will not collide with parts moving through the booth.

Control Screen Indicators and Functions

Current Position: Position of gun tips in relation to conveyor centerline.

Gun to Centerline: Distance of gun tips from centerline when positioner carriage is at zero position (forward limit switch).

Retract Position: Position set in positioner configuration, in relation to zero position. Starting position for lancing mode, wait position in normal mode when shift register is reset and parts are not being tracked.

Manual/Off Mode Locks: Use these to lock the positioner in either Manual mode or Off mode. When locked, the positioner cannot be forced into automatic mode from the Global Control screen or by an external signal.

Lockout Indicator: If not grayed out, the positioner is locked out from the configuration screen. When locked out, it cannot be operated from this control screen or by an external signal.



WARNING: Whenever making adjustments or repairs to a positioner or reciprocator, always disconnect power, then tag and physically lock out the power source.

Positioner Homing and Startup Sequence

Whenever positioner controller power is cycled, the positioner must be homed. If you select Auto mode, the positioner homes itself automatically.

To manually home the positioner, set the mode to manual and move the positioner to the forward limit switch (zero position) and then to the reverse limit switch.

If iControl console power is cycled and Auto mode is selected, the positioner homes itself, then goes to the Retract position to wait for parts to arrive. When the iControl system starts tracking parts moving through the booth, the positioner moves to the default gun to part distance from the centerline or to the forward limit switch (whichever it reaches first) and waits for the leading edge of the part to arrive at the lead setting.

For example, if the gun to centerline distance is 6 in. and the default gun to part distance is 10 in., then the positioner moves to 4 inches from the forward limit switch. On the Configuration screen, the Actual Position is displayed (4 inches). On the Positioner Control screen the Current Position is displayed (10 inches).

The positioner then waits until the part moves to the preset or default lead distance before moving so that the gun tips are at the preset or default gun to part distance.

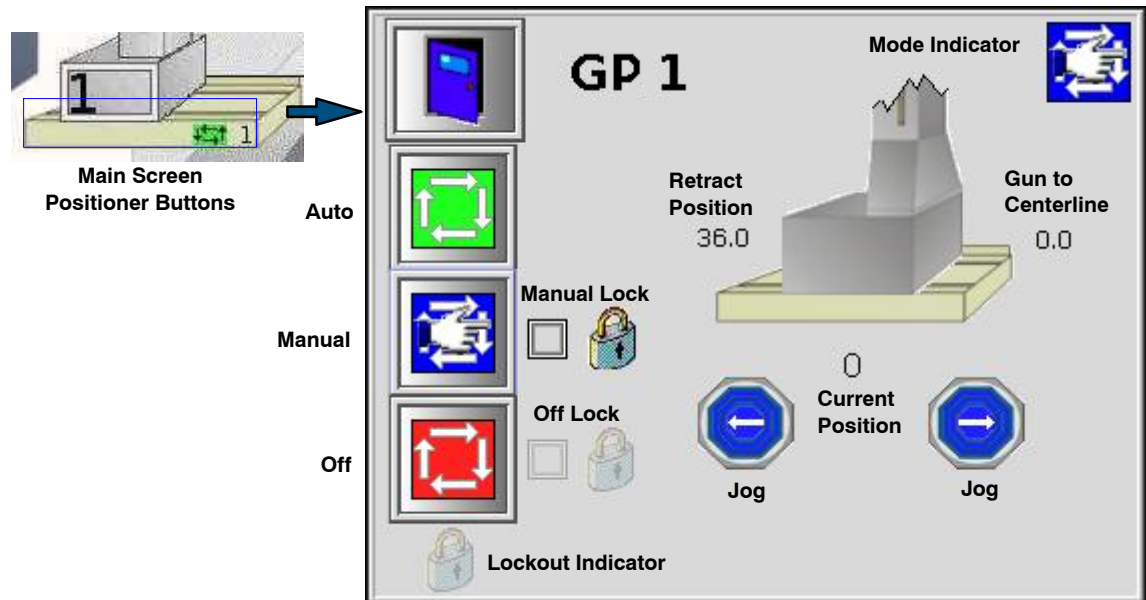


Figure 8-10 Positioner Control Screen

Reciprocator Controls

See Figure 8-11. Touch the reciprocator images on the Main screen to open the Reciprocator Control screens.

Reciprocator Operating Modes

NOTE: Reciprocator operating mode can also be set from the Global Control screen (page 8-5).

Auto: The reciprocator moves automatically according to the default or preset settings.

Manual: Shuts off the reciprocator and activates the **Jog** buttons so you can move it manually.

Off: Shuts off the reciprocator.

Control Screen Indicators and Functions

Manual/Off Mode Locks: Use these to lock the reciprocator in either Manual mode or Off mode. When locked, the reciprocator cannot be forced into Auto mode from the Global Control screen or by an external signal.

Lockout Indicator: If not grayed out, the reciprocator is locked out from the configuration screen. When locked out, it cannot be operated from this control screen or by an external signal.



WARNING: Whenever making adjustments or repairs to a positioner or reciprocator, always disconnect power, then tag and physically lock out the power source.

Home: Touching the Home button moves the reciprocator to the Home position, which is 1.0 inch off the top limit switch.

Top and Bottom Soft Limits: These are set during Reciprocator Configuration. They prevent the reciprocator from tripping the top and bottom limit switches.

Control Screen Indicators and Functions (contd)

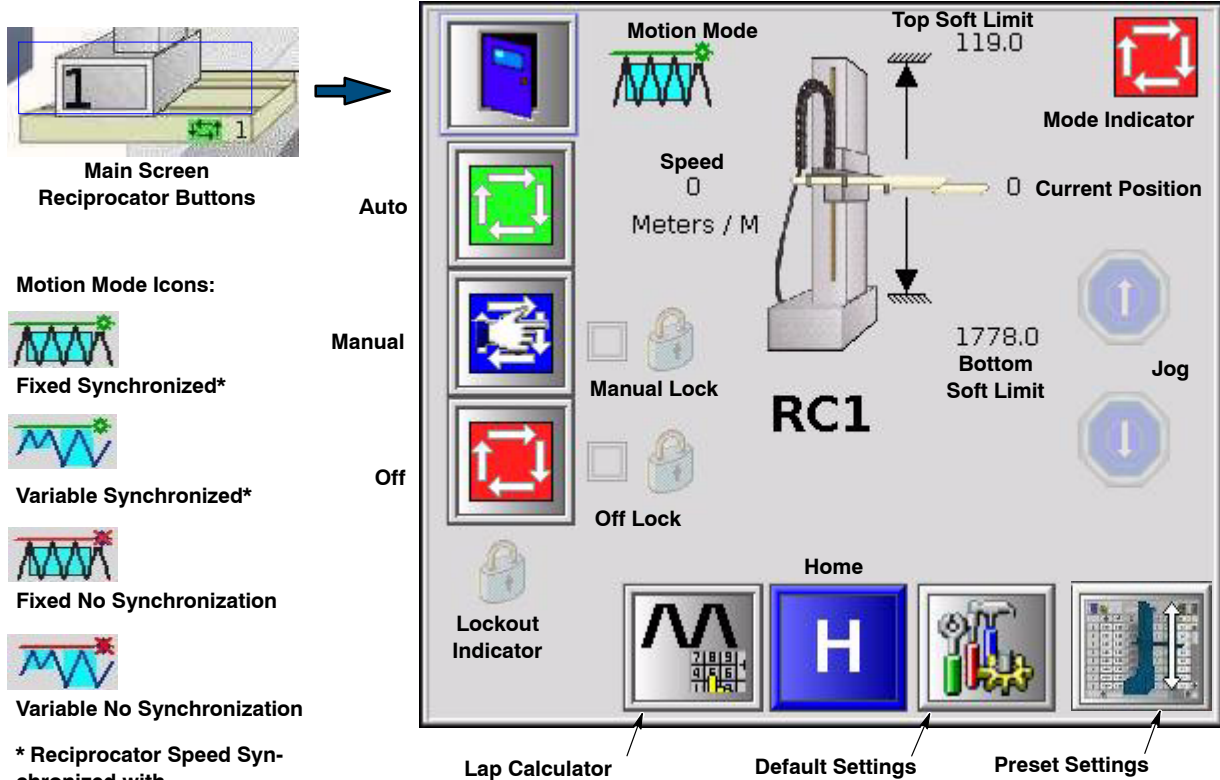


Figure 8-11 Reciprocator Control Screen

Default and Preset Setting Adjustments

The Default Settings or Preset Settings button appears depending on the part currently in front of the guns:

- If no preset settings exist for the current part, then the default settings are used and the Default Settings button displays. Touching the button expands the screen to show the default settings.
- If preset settings exist for the current part, then the Preset Settings button displays. Touching the button opens the Preset Settings screen. Refer to *Section 7, Reciprocator Preset Settings* for detailed information on the preset settings and their effect on reciprocator movement.

The settings displayed depend on the mode selected in the reciprocator configuration: Fixed or Variable. Figure 8-12 lists the settings. The settings can be adjusted as desired.

NOTE: If the reciprocator mode is synchronized with conveyor speed (green conveyor in mode icon) then the reciprocator speed cannot be adjusted.

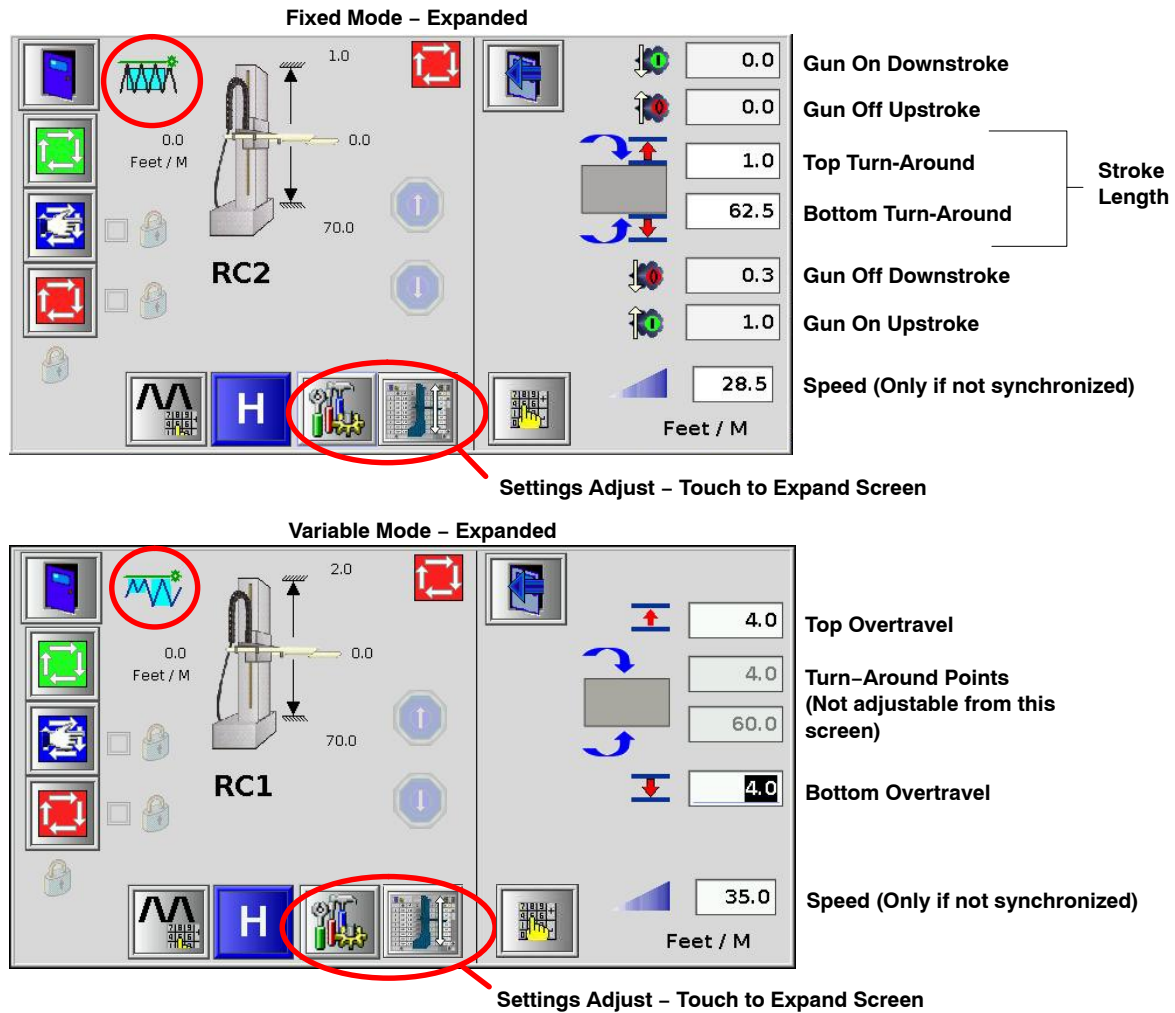


Figure 8-12 Reciprocator Default or Preset Settings

Reciprocator Lap Calculator

The Lap Calculator allows you to experiment with the results of different reciprocator settings.

NOTE: The settings you enter on this screen do not change your reciprocator settings. Use this screen for reference only.

Settings: The settings for conveyor speed, overtravel, and part height can be **automatic** (taken from the actual conveyor speed and current default or preset settings) or **manual** (entered manually on this screen).

Results: The results data can also be displayed automatically or manually. If you choose Manual, and change a setting, touch the Calculate button to update the results data. Touching the Lap Patterns provides access to the Lap Pattern screens, the first shows the lap pattern without fan width data; the other shows the lap pattern with the fan width included.

Reciprocator Lap Calculator (contd)

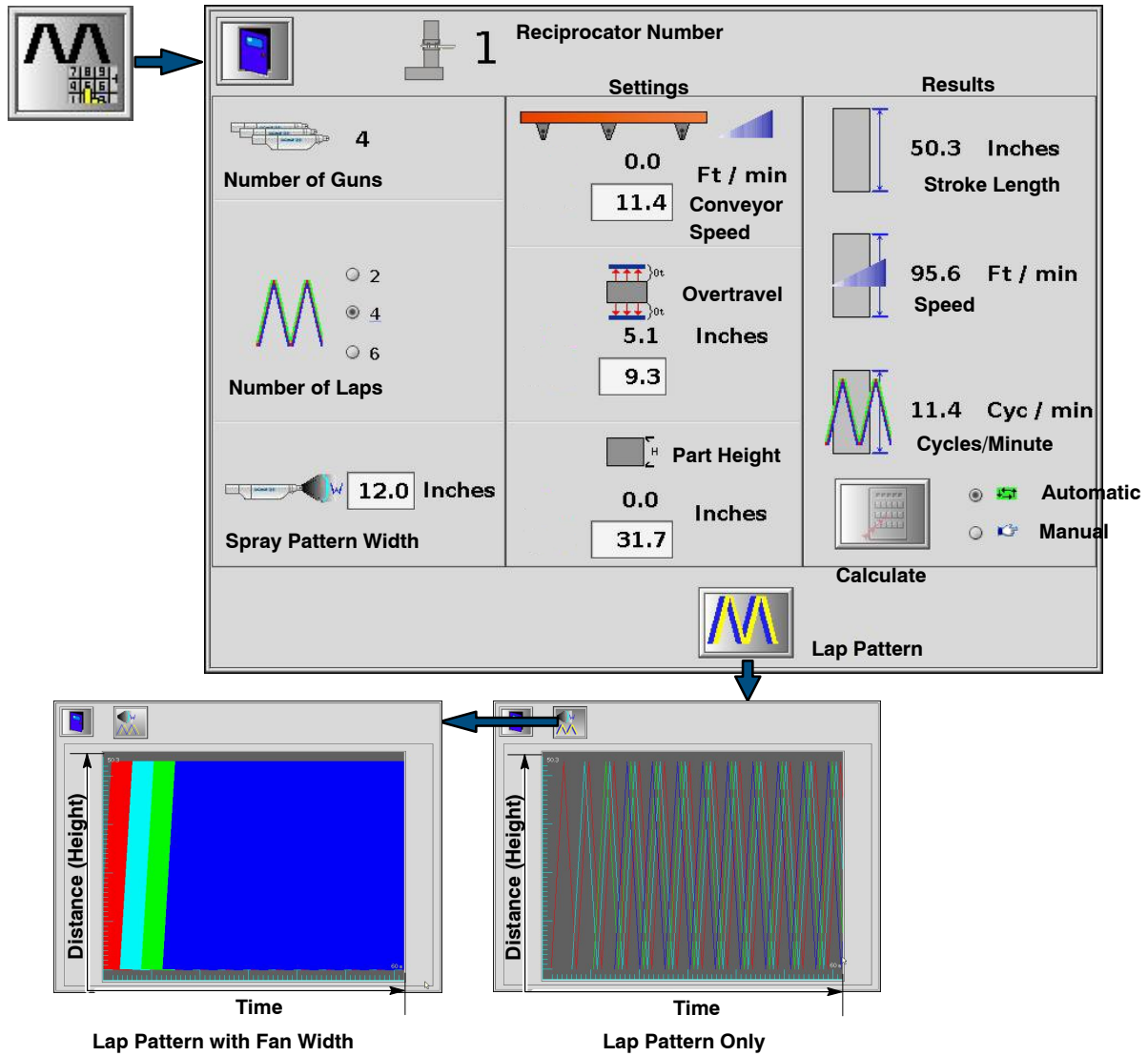


Figure 8-13 Reciprocator Lap Calculator

Lap Calculator settings and results are explained in the following table:

Settings	Description
Number of Guns	Number of guns arrayed horizontally on the reciprocator. It is always assumed that there is only one array of guns and they are all on the same horizontal plane. This number is taken from the reciprocator configuration setting and cannot be changed.
Number of Laps	<p>How many times the effective fan width passes over a certain point. Typically, the more times the better the powder coverage will be.</p> <p>2 = normal quality, 4 = fine quality, 6 = extra fine quality.</p> <p>NOTE: At any given conveyor speed, the higher the number of laps, the faster the reciprocator speed required. Make sure that the reciprocator is not going so fast that the fan pattern collapses. If the fan pattern collapses or the maximum reciprocator speed is exceeded then select a lower number of laps.</p> <p>The number of laps is set on the reciprocator configuration screen.</p>
Spray Pattern Width	<p>Width of one spray gun fan pattern. Assumes all spray guns on the reciprocator have the same pattern width and there is no overlap. If guns are mounted so that their fan patterns overlap, then enter the average fan pattern width (total width of pattern created by all guns, divided by number of guns).</p> <p>The spray pattern width is set on the reciprocator configuration screen.</p>
Conveyor Speed	Can be the actual speed (Auto) or entered manually (Manual) if experimenting with the effect conveyor speed has on reciprocator speed.
Overtravel	Distance above and below a part that reciprocator moves guns. Can be actual distance (Auto) taken from default or preset settings for the current part, or entered manually (Manual) if experimenting with the default or preset turn-around or overtravel settings.
Part Height	Height of part. Can be the actual height (Auto) of current part, or entered manually (Manual) if experimenting with settings.
Results	Description
Stroke Length	Calculated total length of stroke. $(\text{Overtravel} \times 2) + \text{Part Height}$
Reciprocator Speed	Calculated average speed required by settings to cover part. Actual reciprocator speed cannot be set higher than maximum speed limit.
Cycles per minute	A cycle is defined as complete when the guns return to their start position. Number of up and down cycles per minute resulting from settings.

Section 9

Monitoring Operation

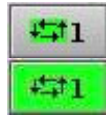
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 - Global Status Screen 9-2
 - Global Hourmeter 9-4
 - Single Gun Status 9-5
 - Gun Hourmeter 9-5
- Part ID 9-6
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 - Node Error Codes 9-13
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Gun Monitoring

Gun Buttons

The **Gun** button icons and colors change to indicate the trigger mode and status of each gun.



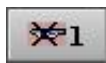
Auto: Auto icon appears on the buttons.

The buttons turn light gray when the gun is off; green when on.



Manual: Manual icon appears on the buttons.

The buttons turn light gray when the gun is off; green when on.



Off: Gun off icon appears on the buttons.

The buttons turn light gray.



Off Line: Gun off icon appears on the buttons.

The buttons turn blue. Cable is disconnected or exhaust fan was off when the iControl software loaded.



Off Line: Gun off icon appears on the buttons.

The buttons turn dark gray. Gun controller, iFlow module, or pump controller not communicating with iControl system.

NOTE: If a gun-related fault occurs, the affected gun button will blink yellow. If this occurs, touch the button to open the Gun Control screen to find the fault code. Refer to *Alarms* in this section for more information.

Global Status Screen

Touching the **Global Status** button at the top of the Main screen opens the Global Status screen, which displays the current preset number being sprayed and the air flow and electrostatic output for up to sixteen guns at a time.

The legend on the left side of the screen shows the color coding used in the bar scales and the meaning of the numbers next to the scales.

Scroll the Consoles/Guns with the Up and Down arrows to display the next 16 guns if your system has more than 16. CA is the master console; CB is the slave console (Prodigy systems do not use slave consoles but still list guns 17–32 on CB).

If a gun control card, iFlow module, or pump control card goes offline or stops communicating with the iControl PC, the **Network Error Indicator** appears on the screen next to the gun and preset number.

Touching the **Global Hourmeter** button opens the Global Hourmeter screen.

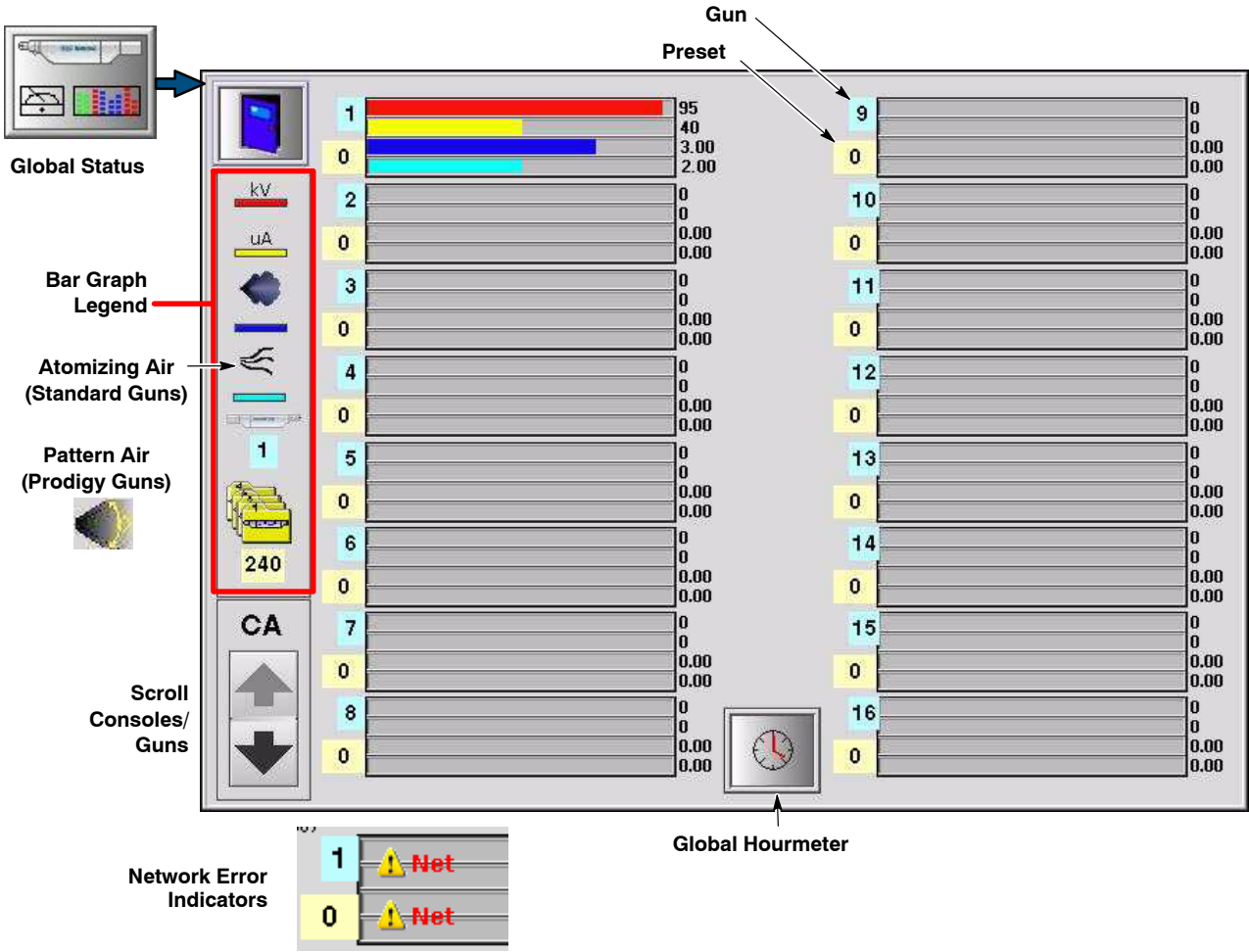


Figure 9-1 Global Status Screen

Global Hourmeter

See Figure 9-1. To open the **Global Hourmeter** screen, touch the **Global Hourmeter** button on the Global Status screen.

See Figure 9-2. The Global Hourmeter screen shows you the Hours On since the last maintenance reset, the Maintenance Timer setting, and the Total Hours On, for 16 pumps and 16 guns at a time.

NOTE: For **Prodigy** systems, pumps also have a maintenance timer.

When the Hours On timer equals the Maintenance Timer setting, an alarm is turned on and you are prompted to perform maintenance.

When the required maintenance is complete, reset the timer by touching the gun reset button.

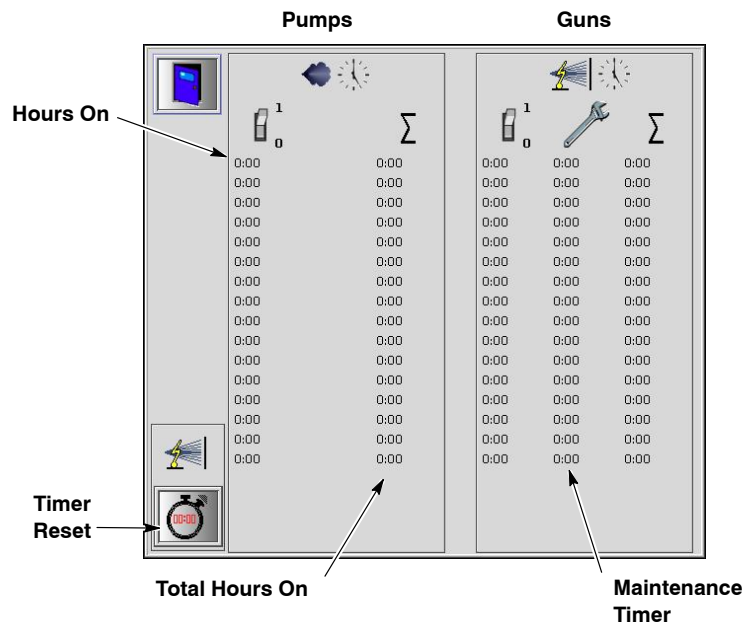


Figure 9-2 Global Hourmeter

Single Gun Status

See Figure 9-3. Touch a **Gun** button to open the Gun Control screen for that gun. The Gun Status area of the screen shows you the:

- part/preset being sprayed
- flow-rate air flow (dark blue) and atomizing air flow (light blue) for standard guns
- powder flow setpoint and actual pump air flow (dark blue) and pattern air flow (light blue) for Prodigy guns
- electrostatic outputs
- gun type
- fault code, if a gun-related fault occurs
- percent adjust status: If $\Delta\%$ (delta %) symbols appear below the flow bar graphs, then the flow is being adjusted automatically with the Percent Adjust function.

NOTE: Gun-related faults are faults that occur in the gun's voltage multiplier, cable, gun control card, or iFlow module. If a gun-related fault occurs, the gun button will blink yellow.

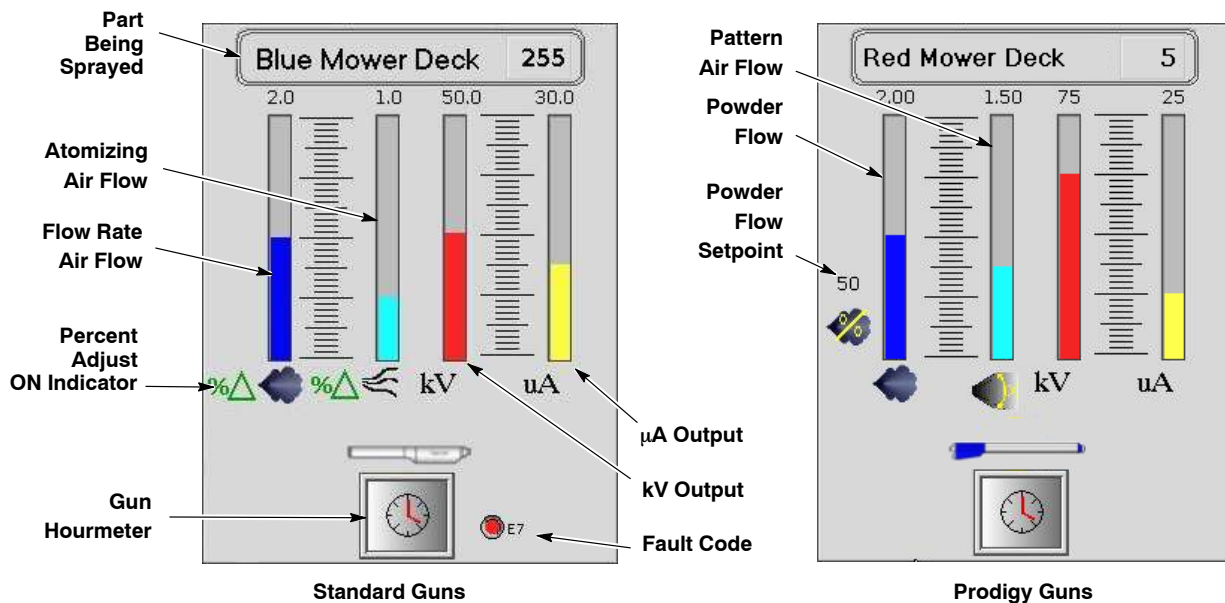


Figure 9-3 Global Status Screen

Gun Hourmeter

The **Gun Hourmeter** button on the Gun Control screen opens the hourmeter screen for the gun. This screen displays

- gun and pump hours on since the last maintenance reset.
- maintenance hours for the guns (also for Prodigy pumps).
- gun and pump total hours.

Gun and pump maintenance hours are reset from the Configure Hourmeter screen.

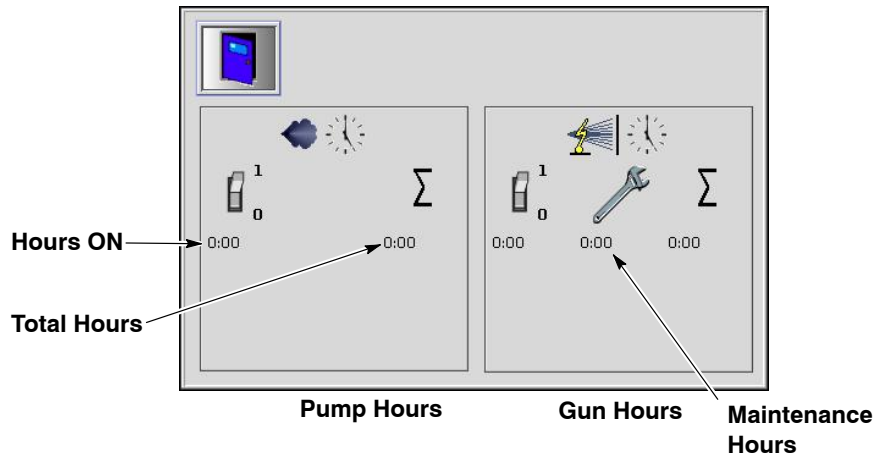


Figure 9-4 Gun Hourmeter

Part ID

The part ID number and name of the part entering the booth is displayed at the bottom left of the main screen.

NOTE: The part information displayed is the part in front of the zone photoeyes, not the part being coated.

The **Part ID Mode** button displays the current Part ID mode: Auto or Manual. Refer to *Setting Part ID Mode* on page 8-6 for information on the part ID modes.



Figure 9-5 Part ID Mode Indicator, Part ID Number, and Part Name

Input Status

Touch the **Input Status** button on the Main screen to open the Input Status screen. Use this screen to check the operation of the zone photoeyes or scanners, part ID inputs, and your gun mover/reciprocator scanners.

The **Zone Indicators** light when a part passes by the zone photoeyes or scanner. They indicate which zones the part occupies. The **Part Height** is displayed when an analog scanner is used to detect part height.

The **Part ID Indicators** light when they receive a part ID signal. The **Part ID Number** is displayed below the indicators.

Input Status *(contd)*

The **Part Width** left and right of the conveyor centerline is displayed when one or two analog scanners are used to detect part width.

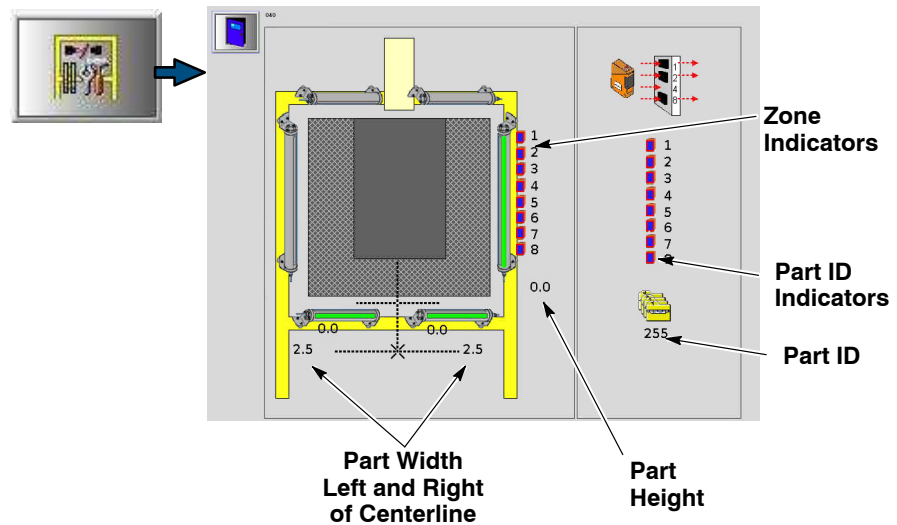


Figure 9-6 Input Status Screen

Color Change Monitoring

If you have a SpeedKing or other booth, the iControl system controls color change operations.

NOTE: If you have a USA ColorMax booth, color change operations are run by a separate PLC. The iControl system has no control over the color change. The in/out positioners are configured for USA ColorMax.

The **Park Indicator** turns yellow during a color change and appears on the Main screen. Touching the **Park Button** will abort the color change operation during all cycles, except for SpeedKing Booths.

For **SpeedKing** booths, the **Park Button** aborts the color change operation only during the gun purge and blowoff cycle. During the Arch Cleaning cycle the Park Button is deactivated.

NOTE: If an external problem aborts a SpeedKing color change operation, touch the **Alarm Reset** button, then the **Park Button** to abort the iControl color change cycle.

The color change states are as follows:

1. Request Clean Cycle from positioner 1: Display cleaning icon.
2. Clean Cycle pending: Indicator 1 lights green. Waiting for parts to exit the booth.
3. Clean Cycle ready: Indicator 2 lights green. Purge permission sent to all positioners.

Color Change Monitoring *(contd)*

4. All guns purging: Indicator 3 lights green.
5. Clean cycle running: Indicator 4 lights green.
6. Arch cleaning (SpeedKing booth only): Indicator 5 lights green.
7. Arch cycle complete: Indicator 6 lights green.

When the color change operation is complete, touch the **Park Button** to return the system to normal.

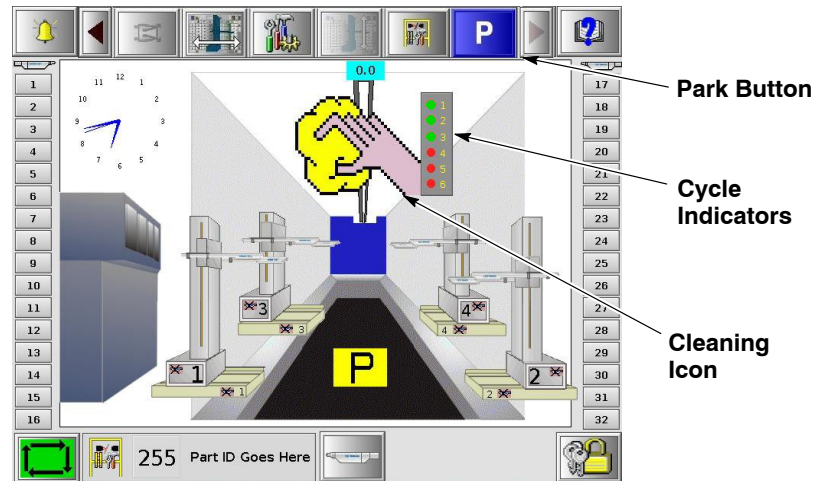


Figure 9-7 Color Change Status Indicators

Alarms

Alarms and fault codes alert you to problems with the iControl system.

Fault Codes

If a problem occurs that is related to the spray gun voltage multiplier, cable, gun control card, or iFlow module, the gun button will blink yellow, and a red indicator and Fault Code will appear on the gun control screen. A fault message will also appear on the Alarm screen.

Refer to the *Troubleshooting* section of your console hardware manual for an explanation of the fault codes and suggested methods to correct the faults. Contact your Nordson representative or call the Finishing Customer Support Center at 800-433-9319 for help.

Alarm Screen

The **Alarm Button** blinks yellow if a fault occurs. Touching the Alarm Button opens the Alarm screen. See Figure 9-8.

To reset all active faults, touch the **Reset All Button**. If the problem that caused a fault is not corrected, the fault will reappear.

To reset a selected fault, touch the **Reset Selected Button**. If the problem that caused the fault is not corrected, the fault will reappear.

Touch the **Erase All Messages Button** to clear routine system messages from the alarm screen.

To display the alarm log, touch the **Alarm Log Button**. Touch the scroll bar arrows to scroll the screen horizontally or vertically.

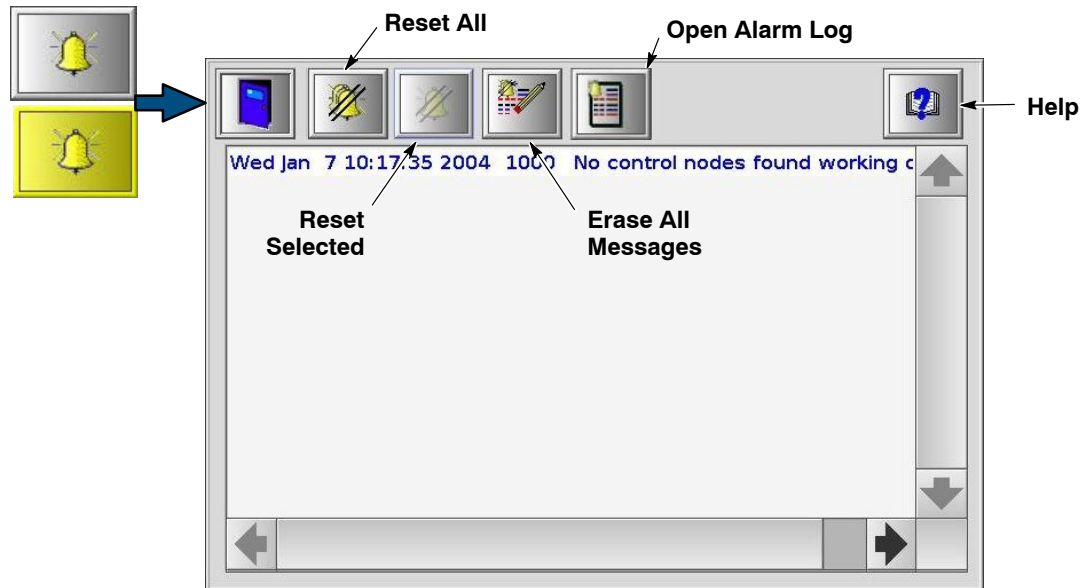


Figure 9-8 Alarm Screen

Alarm Log

The Alarm Log **fstatus** log files list all faults, resets, and status messages for the current day. Use the drop-down menu to open previous **fstatus** logs for up to 5 days.

Other log files include **errors.dat**, which lists errors and information concerning the operator interface, **syserrors.log**, which lists errors and information concerning the iControl system manager, and **CANstatus.log**, which lists CAN messages when the system is configured to not log them into the normal Alarm log. Additional files may be listed. The information in these log files may be used by Nordson field engineers or technical support staff.

Delete Open Log Button: To delete a log, open it and then touch the delete button.

Close Alarm Log Button: Returns you to the Alarm screen.

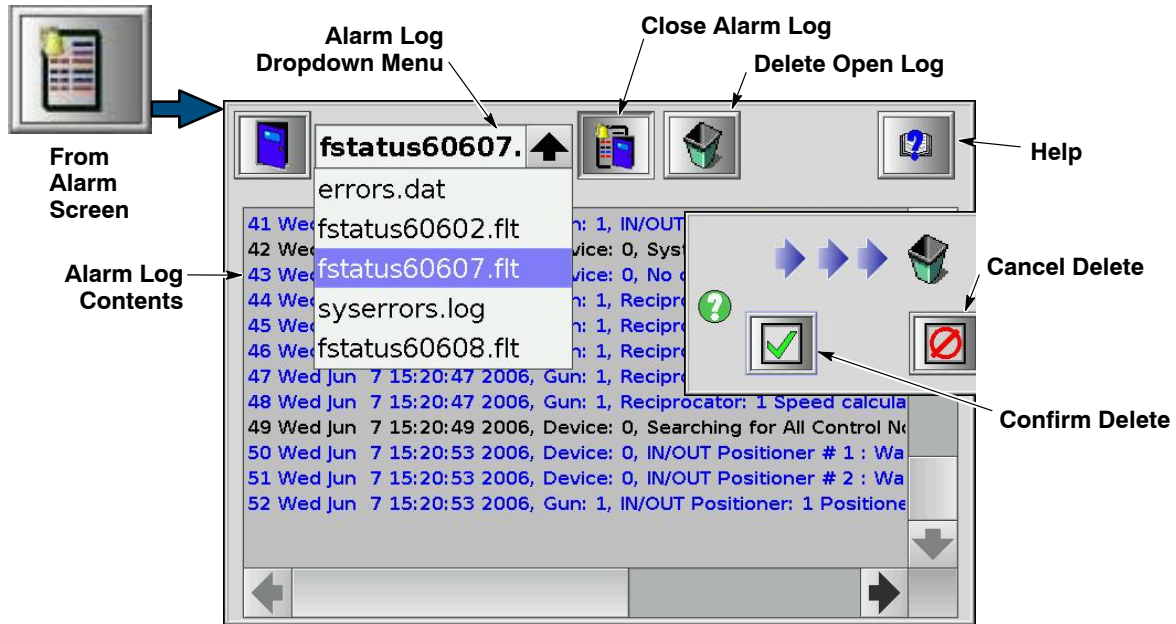


Figure 9-9 Alarm Log Screen

Network Status

Use the Network Status screen and Node Status screens to help diagnose problems with the devices (nodes) on the Remote I/O network, such as the in/out positioners or positioner scanners.

To open the Network Status screen:



Touch the **System Configuration** button on the Main screen to open the System Configuration screen.



Touch the **Network Configuration** button on the System Configuration screen to open the Network Status screen:

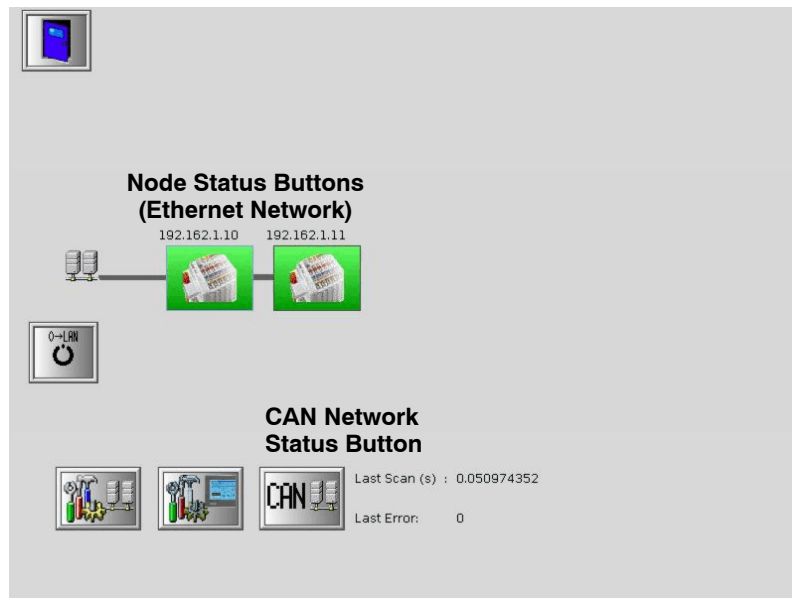


Figure 9-10 Network Status Screen

Ethernet Node Status

The node status buttons indicate the operating status of the nodes on the Ethernet network:

- Green: Nodes are communicating with the network.
- Red: Nodes are not communicating with the network.

NOTE: Only configured nodes will have a button on this screen.

Touching a **Node Status Button** opens the Status screen for that node. See Figure 9-11. This screen is used for diagnosing problems with the network and the nodes.

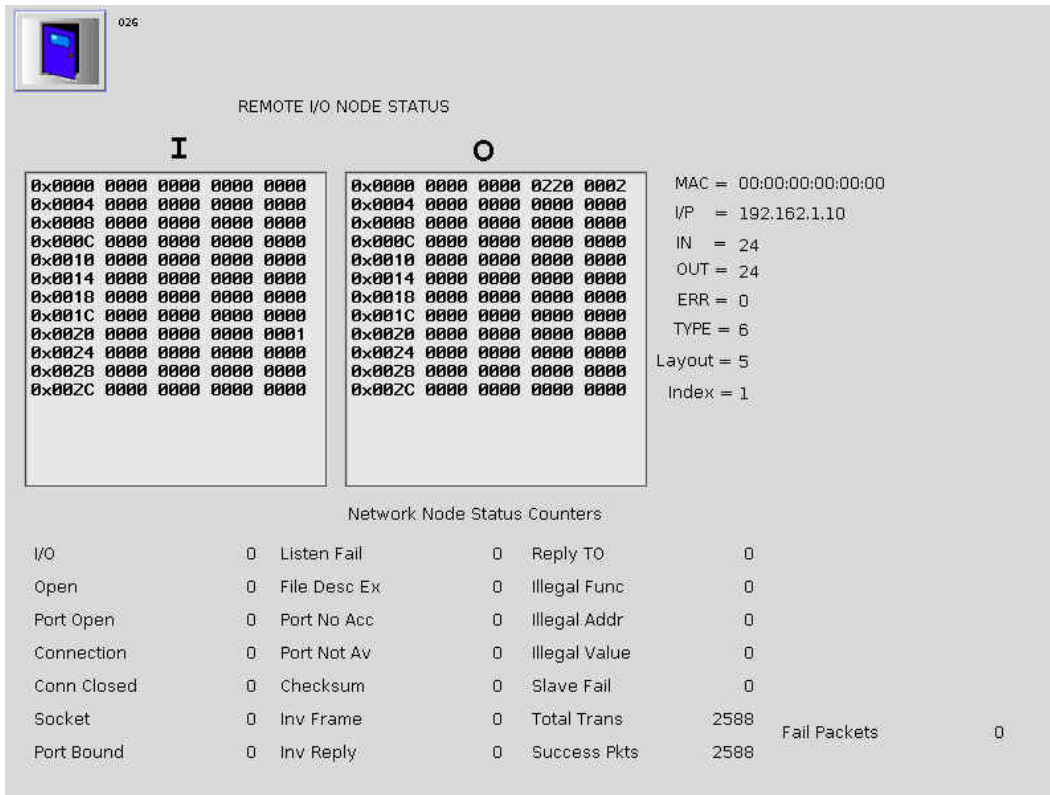


Figure 9-11 Node Status Screen

Node Status Codes

Type Code	Description
6	In/Out Positioner
7	Booth
12	Part ID
13	Feed Center
Layout Code	Description
1	GM1_GM2
2	GM3_GM4
3	RC1_RC2
4	RC3_RC4
5	GM1_RC1
6	GM2_RC2
7	GM3_RC3
8	GM4_RC4
9	PE
10	FC
11	BC
12	BE
13	NO ENTRY

Node Error Codes

Errors 65, 68: Check Ethernet connections. Usually means controller is unplugged or off.

Errors 66, 67, 69–75: Programming errors. Call Nordson Technical Support.

Errors 129–132: Noise on circuit. Check connections. Check to ensure Ethernet cables are not parallel to high voltage or VFDs.

Errors 161–164: Programming errors or hardware error. Call Nordson Technical Support.

Error Code	Description
65	I/O error
66	Port open error
67	Already open
68	Connection error
69	Remote closed connection
70	Library error
71	Port already bound
72	Listen failed
73	File descriptors exceeded
74	No permission
75	Port not available
129	Checksum error
130	Frame error
131	Reply error
132	Reply time-out
161	Modbus exception
162	Illegal address
163	Illegal value
164	Slave device failure

CAN Network Status

The CAN network is the iControl internal network. The iControl system communicates with the gun control cards over the CAN network. The Prodigy iControl system uses the CAN network to communicate with the pump control cards and the manual gun controllers.

Touch the CAN Network Status Button to open the CAN Network Status screen. Nordson service representatives can use this screen to diagnose problems with the CAN network.

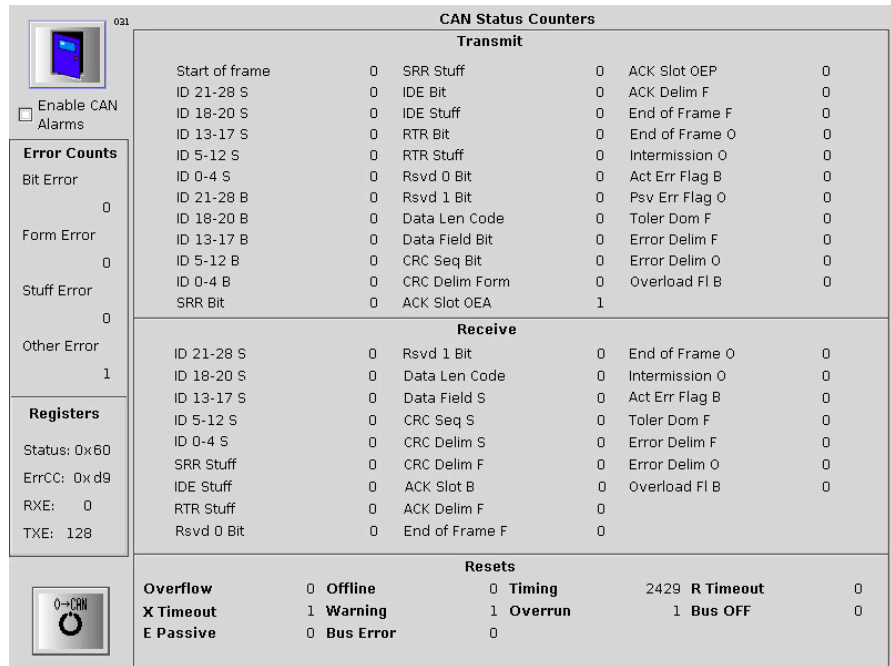


Figure 9-12 CAN Network Status Screen

CAN Network Errors

There are 4 types of CAN network errors:

Bit and Stuff errors – These refer to failures to detect a transition from the recessive to dominant bit or vice versa, within 5 bits.

Form errors – These are errors in the format of a message.

Other errors – These are errors that do not fall into the bit, stuff, or form error categories.

A common error is the “Ack slot OEA.” This indicates that the iControl console is the only device on the bus. It is typical to see this error when the fan is off and the iControl console is powered up. It is also seen if the host fails to transmit a message, but is generally accompanied by other CAN errors.

Transmit errors indicate a failure of the host (the iControl console) to send data correctly.

Receive errors indicate failures on the CAN bus outside the iControl hardware. They can include failures due to a defective iControl CAN interface.

To enable **CAN Alarms**, touch the checkbox below the **Close** button. By default, CAN alarms are written to the **CANstatus.log** but do not appear on the Alarm screen. Enabling the alarms will cause them to appear on the Alarm screen. The CAN alarm and CAN status log file lists all the CAN messages that would normally be in the Alarm log. Up to 5 days of logs are maintained.

Section 10

Configuration and Preset Records

Make copies of the record sheets on the following pages and use them to record your configuration and preset settings.

NOTE: When you are finished configuring your system and setting up your presets, you should **immediately make a backup of the user data card** and store the duplicate card in a safe place. Refer to Data Backup on page 3-31 for instructions.

System Configuration Record

Date: _____ System: _____

Guns	
Default Type of Guns:	Number of Guns Console A: Console B:
Zone Inputs	
Zone Filter:	Type of Zone Sensor: Digital (PE) Analog (DIM)
Number of PE Inputs (number of photoeyes or discrete zones):	Length of vertical analog scanner: Zone Lengths: 1: 2: 3: 4: 5: 6: 7: 8:
Part ID Inputs	
Type of Flagging: Straight Encoded	Flag Filter Length:
Zero Offset: FBB 0:	LBB 0:
Horizontal Analog Scanners	
Single Scanner	Dual Scanners
Length:	Length Left: Right:
Distance from First Beam to Conveyor CL:	Conveyor CL to Last Beam Left: Right:
Width of Conveyor from Scanner CL Left: Right:	
Vertical Analog Scanner	
Length of Scanner:	
Vertical Offset (zero position of guns to top beam of scanner):	
Scanner Beam Resolution: 3/8 in. 3/4 in.	
Zero Offset FBB: LBB:	

Standard Gun Purge Settings

Date: _____ **System:** _____

All Standard Gun Purge Settings	Versa-Spray Gun Purge Settings
Evacuation Purge Enabled? Yes No Evacuation Purge Timer: Evacuation Purge Air Flow:	Nozzle Purge Enabled? Yes No Nozzle Purge Timer: Nozzle Purge Line Gap:
Soft Start Enabled? Yes No Soft Start Ramp Timer:	Nozzle Purge No. of Banks: (Refer to Gun Pickoff and Purge Bank Record for Purge Bank Assignments)

Prodigy Gun Purge Settings

Date: _____ **System:** _____

Purge Settings	Bank Settings
Gun Purge Duration (1–10 secs): Number of Pulses (0–99):	Bank Purge Enabled? Yes No Bank 1 Guns: Bank 2 Guns:
Siphon Purge Duration (1–10 secs): Number of Pulses 0–99):	Bank 3 Guns: Bank 4 Guns:
Pulse Cycle Pulse On (0.1–1.0 secs): Pulse Off (0.1–1.0 secs):	

Gun Pickoff and Purge Bank Record

Date: _____ System: _____

Console (A or B)	Gun Number	Pickoff	Purge Bank No.
	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		
	9		
	10		
	11		
	12		
	13		
	14		
	15		
	16		
	17		
	18		
	19		
	20		
	21		
	22		
	23		
	24		
	25		
	26		
	27		
	28		
	29		
	30		
	31		
	32		

Network Configuration Settings

Date: _____ System: _____

Remote I/O Network				
IP:				
Mask:	255	255	255	0
LAN Network				
Mode:				
IP:				
Mask:				
Gateway:				
Name:				
Domain:				

Node Configuration			
Device	MAC	TCP/IP	Machine Type
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
Machine Types GP: Gun Positioner RC: Reciprocator PE: Analog Scanner GP1_RC1: Gun Positioner1_Reciprocator1 or Oscillator1			

Positioner Configuration Settings

Date: _____ System: _____

Settings	GP 1	GP 2	GP 3	GP 4
Encoder Resolution:				
Side of Booth (L/R) (T/B):				
Distance between Guns:				
Gun to Centerline:				
Park/Clean Position:				
Retract Position:				
Hysteresis:				
Pickoff:				
Minimum Lead:				
Minimum Lag:				
Minimum Gun-to-Part Distance:				
Default Lead:				
Default Lag:				
Default Gun-to-Part Distance:				
Lance (Y/N)?				
USA ColorMax (Y/N)?				
Y-Axis (Y/N)?				
No Drive (Y/N)?				
Clean Only (Y/N)?				

Reciprocator Configuration Settings

Date: _____ System: _____

Settings	Reciprocator 1	Reciprocator 2	Reciprocator 3	Reciprocator 4
Encoder Resolution:				
Maximum Speed:				
Turn-Around Fine Tune:				
Side of Booth (L/R):				
Fan Pattern Width:				
Number of Laps:				
Guns on Reciprocator:				
Top Soft Limit:				
Bottom Soft Limit:				
Hysteresis:				
Park/Clean Position:				
Master-Slaves (Circle Slaves)	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
Mode Setting (Select one):				
Fixed, Synchronized				
Variable, Synchronized				
Fixed, Not Synchronized				
Variable, Not Synchronized				
Oscillator				
Default Fixed Settings				
Guns On Downstroke:				
Guns Off Upstroke:				
Top Turn-Around:				
Bottom Turn-Around:				
Guns Off Downstroke:				
Guns On Upstroke:				
Speed:				
Default Variable Settings				
Top Overtravel:				
Top Turn-Around:				
Bottom Turn-Around:				
Bottom Overtravel:				
Speed:				

Reciprocator Configuration Percent Adjust Settings

Date: _____ System: _____

Stroke (in.)	Air Flow	Reciprocator 1	Reciprocator 2	Reciprocator 3	Reciprocator 4
0-7.9	Flow-Rate				
	Atomizing				
8-15.9	Flow-Rate				
	Atomizing				
16-23.9	Flow-Rate				
	Atomizing				
24-31.9	Flow-Rate				
	Atomizing				
32-39.9	Flow-Rate				
	Atomizing				
40-47.9	Flow-Rate				
	Atomizing				
48-55.9	Flow-Rate				
	Atomizing				
56-63.9	Flow-Rate				
	Atomizing				
64-71.9	Flow-Rate				
	Atomizing				
72 +	Flow-Rate				
	Atomizing				

Spray Gun Preset Settings System: _____

Date: _____ Preset No: _____ Preset Name: _____

Gun	Flow-Rate Air (Powder Flow)	Atomizing Air (Pattern Air)	kV	AFC	Select Charge Mode	Lead	Lag	Zone
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								

Positioner Preset Settings System: _____

Date: _____ Preset No: _____ Preset Name: _____

Positioner	Lead	Lag	Fixed / Variable	Variable Position	Fixed Position
1					
2					
3					
4					

Positioner Preset Settings System: _____

Date: _____ Preset No: _____ Preset Name: _____

Positioner	Lead	Lag	Fixed / Variable	Variable Position	Fixed Position
1					
2					
3					
4					

Positioner Preset Settings System: _____

Date: _____ Preset No: _____ Preset Name: _____

Positioner	Lead	Lag	Fixed / Variable	Variable Position	Fixed Position
1					
2					
3					
4					

Reciprocator Preset Settings **System:** _____

Date: _____ **Preset No:** _____ **Preset Name:** _____

Fixed Settings	Recip 1	Recip 2	Recip 3	Recip 4
Guns Off Up:				
Guns On Down:				
Guns Off Down:				
Guns On Up:				
Top Turn-Around:				
Bottom Turn-Around:				
Speed:				
Variable Settings				
Speed:				
Top Overtravel:				
Bottom Overtravel:				
Percent Adjust Settings				
% On Up:				
% Off Down:				
% On Down:				
% Off Up:				
% Adjust Flow-Rate:				
% Adjust Atomizing:				

