Velocity® Control Panel

Operator Manual

Read and keep this manual for future reference. All personnel operating the equipment described in this manual should review and understand all instructions before use.

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Introduction

About Global Finishing Solutions LLC

Leading the Industry in Paint Booth and Finishing System Technology

With decades of experience, Global Finishing Solutions is the leading manufacturer of paint booths and finishing systems for many industries, including automotive refinish, aerospace and defense, industrial manufacturing, woodworking, and large equipment. By combining high-quality components, strong relationships with paint manufacturers, and our experienced distribution network, GFS provides the best equipment and support to set your business up for success.

Contacting Global Finishing Solutions

General information

- Toll-free: 800-848-8738
- Fax: 715-597-2193
- Email: info@globalfinishing.com
- Online: www.globalfinishing.com

Technical support

- Toll-free: 800-848-8738
- Fax: 715-597-8818
- Email: techservices@globalfinishing.com

Parts and filters

- Toll-free: 800-848-8738
- Fax: 888-338-4584
- Email: parts@globalfinishing.com

Target audience

This document is intended for use by trained, experienced paint booth installers and maintenance technicians. If you have questions about the installation procedure described in this manual, contact GFS as described above.

Conventions used in this manual

This section describes how information is presented, organized, and referenced within this manual.

Safety notices

This manual uses the following standards to identify conditions related to safety hazards and equipment damage.

Table 1. Safety notices

Symbol	Description
DANGER	Indicates an imminent hazard that will result in death.
WARNING	Indicates a hazard that can result in serious personal injury or death.
CAUTION	Indicates a hazard that can result in personal injury.
NOTICE	Indicates a situation that can result in equipment or property damage, but poses no risk of personal injury.

Information notices

In addition to the safety notices described above, this manual uses a boldface keyword to identify certain other types of information.

Table 2. Information notices

Keyword	Description
NOTE	Denotes general information that provides additional context or guidance.
Important	Denotes information to which you should pay special attention.
Reference	Directs you to related content in a separate document.
Prerequisites	Specifies other tasks that must be completed or conditions that must exist before you perform the current task.
Scope	Describes limitations to the current task or conditions under which the task applies or does not apply to the procedure.

General safety

Follow all safety guidelines when assembling, operating, or servicing this product.

WARNING
There are inherent hazards associated with the operation and service of this equipment. For your personal safety, observe all safety information. Failure to observe these safety practices can result in personal injury or death.

WARNING
Operation and maintenance of this product must be performed properly by qualified personnel who observe the warnings in all documentation and notes provided with and on the product.

WARNING
Follow all general standards for installation and safety for work on installations. Follow all good practices for the proper use of lifting tackle and equipment. The use of protective equipment such as safety goggles and protective footwear must be considered.

WARNING
All persons who will operate, service, inspect, or otherwise handle this product must read and understand the safe operating practices, safety precautions, and warning messages in this documentation.

WARNING
The roofs of GFS equipment are not designed or intended to be walked upon or to support weight of any kind. As designed and manufactured, equipment roofs do not meet the minimum requirements of a safe walking and/or working surface under OSHA 1910.22. Under no circumstances should the roof be used by maintenance personnel or others for walking, standing, or storage of any kind. When necessary, roof access should be secured through the use of a properly supported platform that satisfies the minimum load requirements specified by ASCE 7 (Minimum Design Loads and Associated Criteria for Buildings and Other Structures) and ASCE 37 (Design Loads on Structures during Construction). Additionally, personnel should always utilize appropriate fall safety protocols when using an elevated platform. Use of the roof in a contrary manner may result in injury and/or death.

WARNING
Comply with OSHA guidelines and with all applicable local electrical, safety, and fire codes and standards.

WARNING
All field wiring provided must comply with local codes or, in the absence of local codes, the National Electrical Code (NFPA 70).

WARNING
Electrical installation should be completed by a qualified electrician. Installation must meet all applicable national, state, and local electrical codes.

WARNING
Ensure that all electrical components are grounded to a central ground.

WARNING
Disconnect and lock out the main electrical service before installing, adjusting, or servicing the product.

WARNING
Guards and covers that prevent contact with electrically energized or moving parts are required and must not be removed or left open during operation.

WARNING
Local fire and building codes require fire protection. Check with local inspector authorities for requirements.

CAUTION
Read and save these instructions before attempting to assemble, install, operate, or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage. Retain these instructions for future reference.

CAUTION
This manual contains statements that relate to worker safety. Read this manual thoroughly and comply as directed. Operate this equipment in accordance with the guidelines set forth in this manual. It is impossible to list all potential hazards of this equipment. Instruct all personnel involved with this equipment in the safe conduct and operation of the system. GFS recommends that only qualified personnel operate and maintain this equipment.

CAUTION
Safety signs, panels, and labels that are normally affixed to the product must be replaced immediately if illegible or missing.

CAUTION
New or replacement parts that are installed during repair or maintenance must include all safety signs, panels, and labels as specified by the manufacturer. These must be affixed to the new or replacement parts as specified by the manufacturer.

CAUTION
Where applicable, use earplugs or take other safety measures for hearing protection.

NOTICE
The product must be installed and serviced only by a trained, qualified service technician. Incorrect installation may void the warranty.

NOTICE
If you have questions about the warranty, please contact your distributor prior to contacting GFS.

Product safety

For booth safety information, refer to the documentation that accompanied your equipment.

NOTICE
The values shown on the screens are for illustrative purposes only and are not intended to be correct or accurate representations of times and temperatures.

Operator interface terminal

The Velocity® operator interface terminal provides pushbuttons for routine painting operations and an HMI touchscreen for monitoring booth performance and viewing or editing settings.

The operator interface terminal may be mounted on the outside of the booth or on a nearby wall.
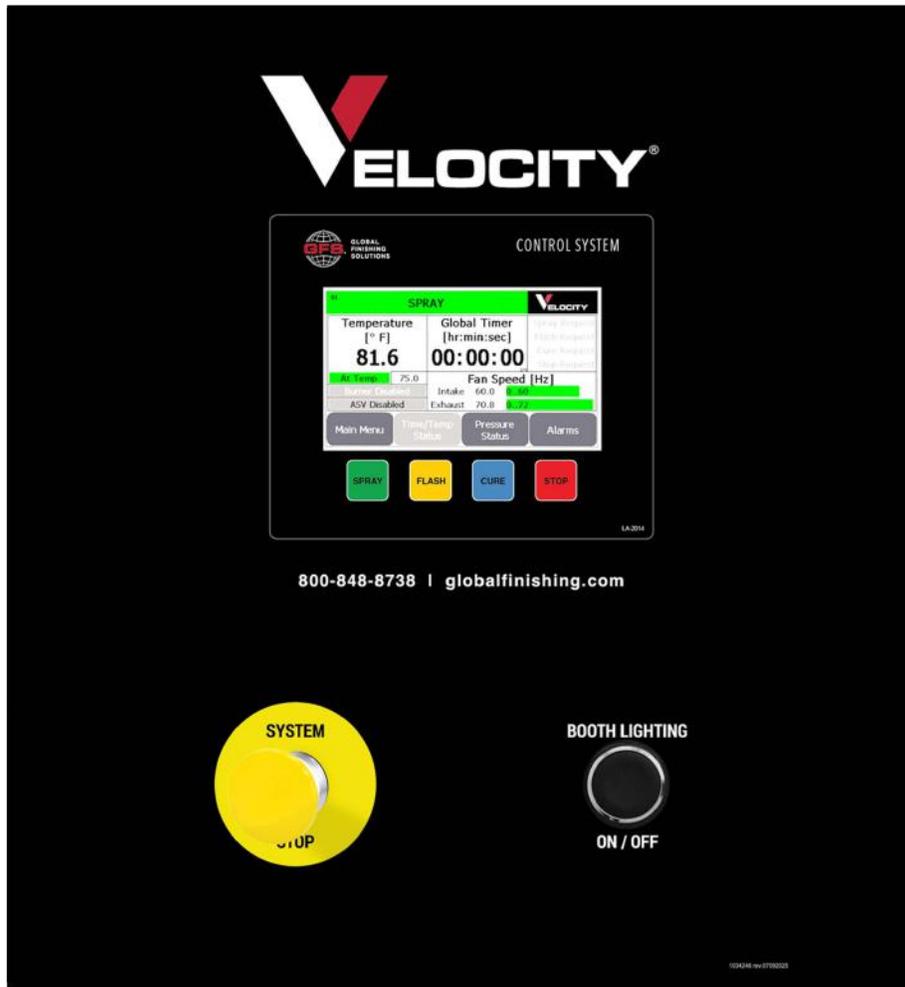

Figure 1. Velocity Operator interface terminal

Operating modes

At the operator interface terminal, the pushbuttons below the touchscreen let you select one of the main operating modes: Spray, Flash, or Cure. Additional modes are initiated automatically during the painting process, including Economy (if applicable), Purge, Cool Down, and Standby. See Table 3 for more information about each mode.

Table 3. Operating modes

Mode	Description	How initiated
Spray	Spray gun is active, allowing you to paint.	Via pushbutton on operator interface terminal
Flash	Booth temperature is increased so that the paint releases its solvents more rapidly. This mode is used between paint applications or before cure.	Via pushbutton on operator interface terminal or via optional puff switch located inside the booth
Cure	Booth temperature is raised to cure the paint.	Via pushbutton on operator interface terminal
Economy	Booth operates at a reduced airflow to conserve energy when the spray gun is not used for a settable amount of time (minimum of 3 minutes). The booth transitions back to Spray mode automatically when you use the spray gun. **NOTE** Economy mode is available only if you purchased the optional Economy mode switch with your booth. *(Configuration setting: Economy...Yes)*	Automatic
Purge	Contaminated air is removed from the booth. A purge cycle is required before temperature in the booth can be elevated above 90 °F (32.2 °C).	Automatic
Cool Down	Temperature decreases to the cool-down setpoint. This mode starts automatically at the end of Cure mode.	Automatic
Standby	The booth controls are powered, but not operational. When powering on the booth, it first enters Standby mode but is not running. The booth must be in Standby mode to shut down the booth.	Automatic

Using the booth

This section describes how to use a booth that has Velocity controls.

NOTICE
The values shown on the screens are for illustrative purposes only and are not intended to be correct or accurate representations of times and temperatures.

Applying power to the booth

1. At the control panel, turn on the power at the Main Power Disconnect.

2. Wait for the control panel to complete its power-on sequence and perform its self-check.

   The control panel is ready when the Velocity splash screen displays on the operator interface terminal touchscreen.

3. At the operator interface terminal, press the **Booth Lighting On/Off** button to turn on the booth lights.

   The Booth Lights Status screen displays the current status of the booth lights.

4. On the touchscreen, tap the Velocity splash screen.

    The Main Menu displays. The booth is now ready for use.
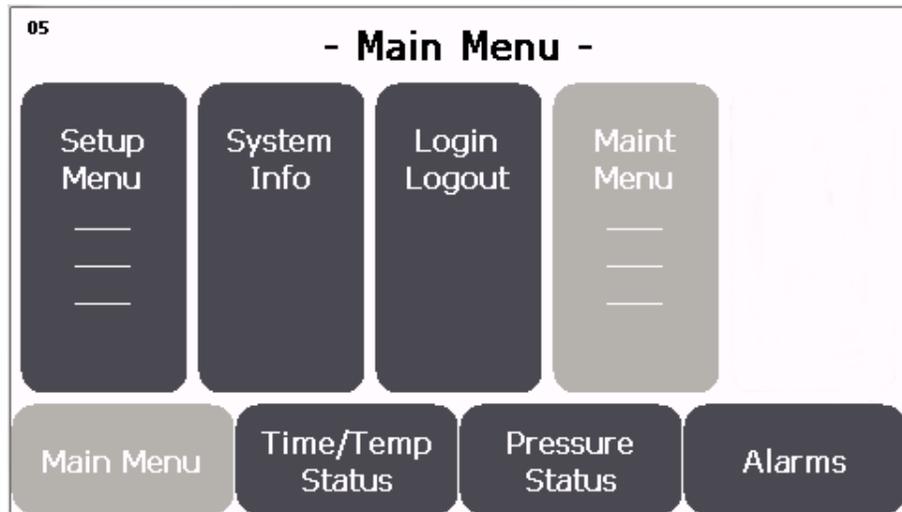
Painting the product (Spray mode)

WARNING

Turn on the exhaust fan before using the booth. Ensure that the exhaust fan is operating correctly before entering the booth.

WARNING

Some spray activities may require the use of an OSHA-approved paint spray respirator for protection.

1. If the touchscreen is not displaying the Time/Temp Status screen, tap the **Time/Temp Status** button to display it.

2. Press the green **Spray** button on the operator interface terminal.

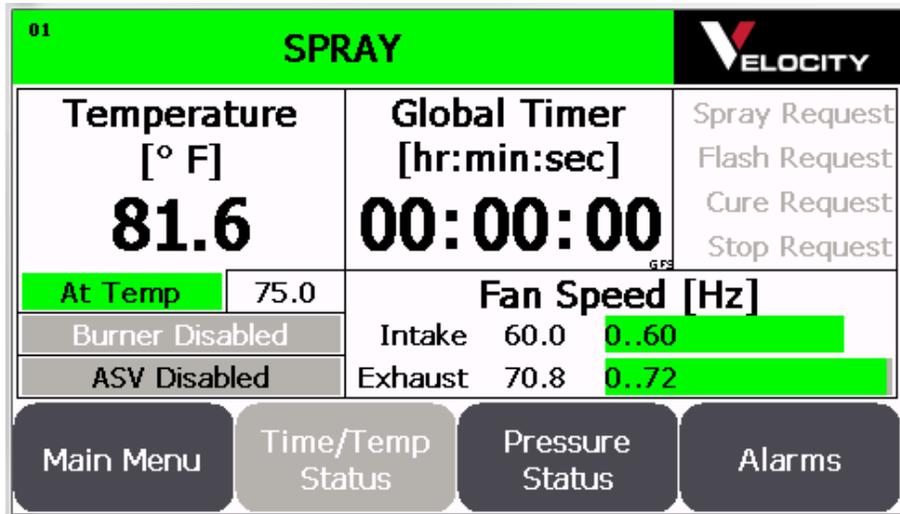   The Spray Request notice text changes to green under the Velocity logo in the upper right corner of the touchscreen. The request notice text remains green while the system transitions from its current mode to the requested mode. This process can take several minutes.

3. Wait for the Spray Request notice text to revert to gray and the green Spray banner to appear, indicating that the booth has completed its transition to Spray mode.

   NOTE
   For more information about booth state banners, see "Status screen text" (page 18).

4. Confirm that the Time/Temp Status screen indicates that the booth is "At Temp."

5. Enter the booth, close the personnel doors securely, and start spraying.

Evaporating paint fumes (Flash mode)

Paint evaporates or releases its solvents during the Flash cycle. You can initiate Flash from the operator interface terminal or via an optional puff switch located inside the paint booth.

1. Initiate Flash mode:

   • Exit the booth and close the personnel door securely; then press the yellow **Flash** button on the operator interface terminal.

   • Alternatively, if the optional puff switch is installed, you can initiate Flash mode by pressing the white puff switch located inside the booth.

   When you initiate Flash mode, the Flash Request notice text changes to green under the Velocity logo in the upper right corner of the touchscreen. The request notice text remains green while the system transitions from its current mode to the requested mode. This process can take several minutes.

   NOTE
   If the Flash temperature is set higher than 90 degrees Fahrenheit, the transition to Flash mode includes a purge cycle to evacuate contaminated air from the booth.

2. Wait for the highlighted Flash Request notice text to revert to gray and the green Flash banner to appear, indicating that the booth has completed its transition to Flash mode.

NOTE
For more information about booth state banners, see "Status screen text" (page 18).

3. Wait for the Flash time cycle to complete.

NOTE
The Flash time and temperature are configurable via the Setup menu. For more information, see "Setup menu" (page 25).

The booth automatically returns to Spray mode when the Flash cycle is completed. If you are using an elevated temperature, the temperature goes down to spray temperature.

4. Add additional coats of paint and use the Flash cycle as needed until done painting.

Curing the product (Cure mode)

Perform the following steps to cure the product:

1. Make sure no one is in the booth and that the personnel and product doors are securely closed.

2. Press the blue **Cure** button on the operator interface terminal.

   The Cure Request notice text changes to green under the Velocity logo in the upper right corner of the touchscreen. The request notice text remains green while the system transitions from its current mode to the requested mode. This process can take several minutes.

3. Wait for the Cure Request notice text to revert to gray and the green Cure banner to appear, indicating that the booth has completed its transition to Cure mode.

   NOTE
   For more information about booth state banners, see "Status screen text" (page 18).

4. Wait for the Cure time cycle to complete.

   NOTE
   The Cure time and temperature are configurable via the Setup menu. For more information, see "Setup menu" (page 25).

   The booth automatically transitions to Cool Down Delay when the Cure cycle is completed.

Shutting down the booth

Perform the following steps to shut down the booth:

1. Press the red **Stop** button on the operator interface terminal.

    The Stop Request notice highlights under the Velocity logo in the upper right corner of the touchscreen, and the system begins transitioning from the current mode to the stopped state.

    NOTE
    The transition occurs in accordance with any system settings that define the shutdown procedure (for example, a 1.0-minute shutdown delay).

2. Press the **Booth Lighting On/Off** button to turn off the booth lights.

3. *If required:* Turn off the booth power at the Main Power Disconnect.

Emergency shutdown

In case of emergency, press the yellow **System Stop** pushbutton to stop all equipment immediately. The System Stop button bypasses the normal ramp shutdown and should only be used in an emergency.

Velocity interface

The touchscreen is mounted on the front of the operator interface terminal so you can monitor booth performance and view or edit settings.

The interface provides four primary navigation buttons:
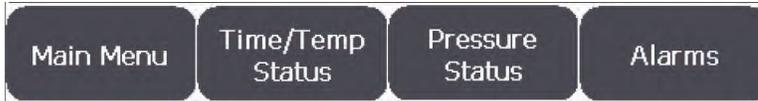
Figure 2. Velocity navigation buttons

These buttons persist at the bottom of the screen unless you are working in a sub-menu.

Tap a navigation button to select it. The corresponding screen or menu displays:

- **Main Menu:** See "Main menu" (page 25).
- **Time/Temp Status:** See "Time/Temp Status screen" (page 17).
- **Pressure Status:** See "Pressure Status screen" (page 17).
- **Alarms:** See "Alarms" (page 22).

Status screens

The Velocity control panel provides two status screens that allow you to monitor booth operation: the **Time/Temp Status** screen and the **Pressure Status** screen. This section describes each status screen and the status screen text.
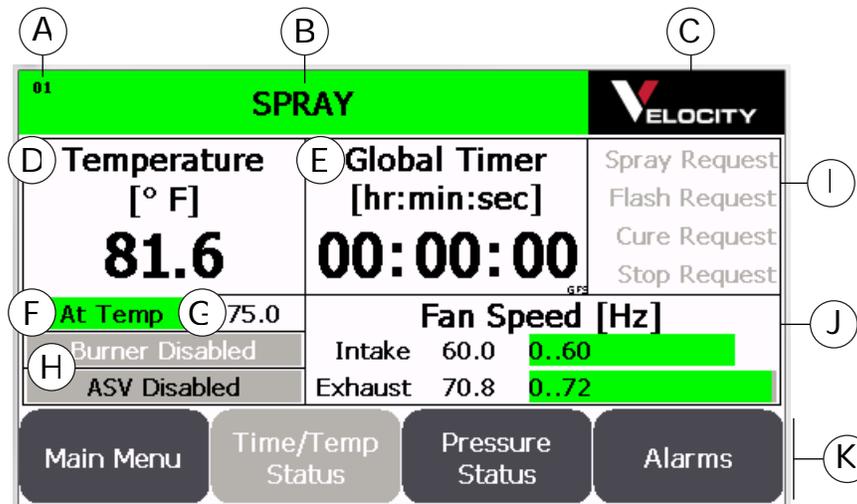
Time/Temp Status screen

You can view the **Time/Temp Status** screen during normal booth operation to determine the present operating conditions of the booth. The **Time/Temp Status** screen serves as the home screen.

To access the **Time/Temp Status** screen, tap **Time/Temp Status** on the control panel touchscreen.

NOTE
The color under the booth's temperature status (F in the image below) provides a quick visual indicator. Green indicates the temperature is within specified tolerances (At Temp). Yellow indicates the temperature is above (Over Temp) or below (Under Temp) the specified tolerances.

A: Screen number
B: Current mode
C: Velocity logo
D: Current booth temperature
E: Global timer
F: Booth's temperature status
G: Booth's target temperature as defined by system settings
H: Status of burner and air solenoid valve (ASV)
I: Pending mode change (highlighted if a mode request is active)
J: Current speed of fans (min..max range in green bar)
K: Screen-selection buttons (button for current screen is grayed out)
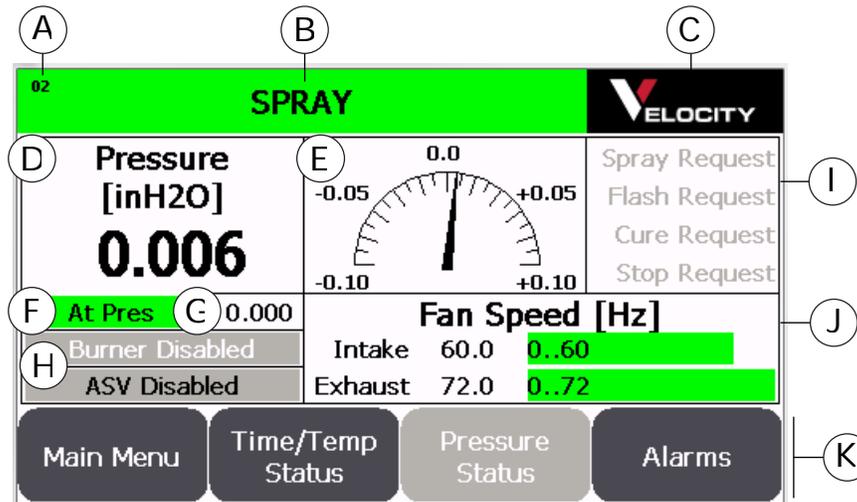
Pressure Status screen

You can view the Pressure Status screen during normal booth operation to determine the present operating conditions of the booth.

To access the Pressure Status screen, tap **Pressure Status** from the control panel touchscreen.

NOTE
The color under the booth's pressure status (F in the image below) provides a quick visual indicator. Green indicates the pressure is within specified tolerances (At Pres). Yellow indicates the pressure is above (Over Pres) or below (Under Pres) the specified tolerances.

A: Screen number
B: Current mode
C: Velocity logo
D: Current booth pressure (numeric)
E: Current booth pressure (graphical)
F: Booth's pressure status
G: Booth's target pressure as defined by system settings
H: Status of burner and air solenoid valve (ASV)
I: Pending mode change (highlighted if a mode request is active)
J: Current speed of fans (min..max range in green bar)
K: Screen-selection buttons (button for current screen is grayed out)

Status screen text

The tables in this section describe the entries that appear on the Time/Temp Status and Pressure Status screens.

Table 4. Booth-state banner

Banner color	Banner text	Description
Red	Unconfigured	Booth configuration is invalid or incomplete.
Red	Fire Alarm	Fire suppression system is indicating a fire alarm. The booth will remain in this state until the fire suppression system no longer indicates a fire alarm.
Red	Faulted	Fault is active or needs to be reset.
Red	Fault Delay	Mandatory delay after a fault has occurred.
Gray	Standby	The booth is in a stopped and ready state. An operational mode request will start the booth.

Banner color	Banner text	Description
Green	Standby Delay	Mandatory delay after booth has completed a shutdown sequence.
Green	Damper Proof Startup [1]	Checking for proper damper and door positions before starting fans or proceeding to Motor Test.
Green	Ramp Start	Ramping fan(s) up to desired speed(s).
Green	Ramp Stop	Ramping fan(s) down to stop.
Green	Spray	Spray operational mode is active.
Green	Economy [1]	Economy operational mode is active.
Green	Flash	Flash operational mode is active.
Green	Cure	Cure operational mode is active.
Green	Cool Down Delay	Delay following Cure to allow the booth to cool down.
Green	Purge	Purge prior to Cure and/or Flash.
Green	Shut Down Delay [1]	Delay prior to shutting down the booth. This state is bypassed if coming from Economy.
Yellow	Manual	The booth is in Manual operational mode.

[1]The associated displayed text requires a specific parameter setting. To view present settings, tap **System Info** from the Main menu (see "Main menu" (page 25)).

Table 5. Temperature status

Displayed Text	Description
At Temp	Temperature Feedback is within specified Over/Under Temperature Tolerances.
Over Temp	Temperature Feedback is greater than the Temperature Reference + Over Temperature Tolerance (TF > TR + OTT). The Over Temperature Tolerance is an adjustable parameter within the Maint Menu.
Under Temp	Temperature Feedback is less than the Temperature Reference - Under Temperature Tolerance (TF < TR - UTT). The Under Temperature Tolerance is an adjustable parameter within the Maint Menu.

Table 6. Pressure status

Displayed Text	Description
At Pressure	Pressure Feedback is within specified pressure tolerances.
Over Press	Pressure Feedback is greater than the Pressure Reference + Over Pressure Tolerance (PF > PR + OPT). The Over Pressure Tolerance is an adjustable parameter within the Maint Menu.
Under Press	Pressure Feedback is less than the Pressure Reference - Under Pressure Tolerance (PF < PR - UPT). The Under Pressure Tolerance is an adjustable parameter within the Maint Menu.

Table 7. Air solenoid valve (ASV) status

Displayed Text	Description
ASV Disabled	Compressed air to the spray gun is off.
ASV Enabled	Compressed air to the spray gun is on.

Table 8. Burner status

Displayed Text	Description
Burner Active [1]	**Green background:** The burner is enabled and the main flame is detected. The gas valve is in automatic mode controlling to the specified temperature. **Yellow background:** The burner is enabled and the main flame is detected. The gas valve is in manual mode controlling to a manual position reference.
Burner Disabled	Burner is disabled and will only be requested during Purge (with a Cure Request), during Cure, and when performing manual control functions.
Burner Off	Burner is not enabled.
Burner Requested [1]	**Gray background:** The burner is enabled and the booth is in a state that requires the burner, but the burner safety circuit is not complete or satisfied. **Yellow background:** The burner is enabled and the burner request to the flame safety has been issued. The flame safety relay is going through its Purge, Pilot Flame Establishing Period (PFEP), and Main Flame Establishing Period (MFEP).
Pre Ign Purge	Pre Ignition Purge active. After completion of the Pre Ignition Purge, the burner request to the flame safety will be issued.

[1]The associated displayed text requires a specific parameter setting. To view present settings, tap **System Info** from the Main menu (see "Main menu" (page 25)).

Table 9. Fan speed status

Displayed Text	Description
Fan Speed [Hz] Exhaust	Exhaust fan speed reference: • First Number: The exhaust fan speed setting (the speed the fan is commanded to operate). • Second Number Set: The range of speeds available (for example, "0..72" means from a low of 0 to a high of 72).
Fan Speed [Hz] Intake	Intake fan speed reference: • First Number: The intake fan speed setting (the speed the fan is commanded to operate). • Second Number Set: The range of speeds available (for example, "0..60" means from a low of 0 to a high of 60).

Table 10. Global Timer

Displayed Text	Description
Global Timer [hr:min:sec] 00:00:00	The Global Timer displays time remaining for all timed booth states. The timed booth states include: Purge, Cure, Flash, Standby Delay, and Fault Delay.

Table 11. Requests

Displayed Text	Description
Spray Request	Spray button was pressed. Request will be removed once booth is in the Spray operational state. Green when active; grayed when inactive.
Flash Request	Flash button was pressed. Request will be removed once booth is in the Flash operational state. Green when active; grayed when inactive.
Cure Request	Cure button was pressed. The request will be removed once the booth is in the Cure operational state. Green when active; grayed when inactive.
Stop Request	Stop button was pressed. Request will be removed once booth is in Standby. Green when active; grayed when inactive.

Alarms

When an alarm condition occurs, the color of the **Alarms** button changes from its usual dark gray to either red or yellow, depending on the type of alarm:

* Red indicates a **fault**.

* Yellow indicates a **warning**.
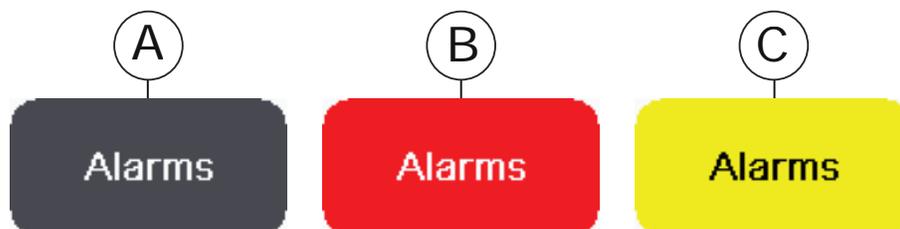
A: *Alarms button: No alarms are active.*
B: *Alarms button: A fault is currently active.*
C: *Alarms button: A warning is currently active.*

Tap the **Alarms** button to navigate to the Alarms screen. From there, you can view details about current and past alarms, reset alarms, and clear alarm history.

Alarm types

The Alarms screen displays two types of alarms:

* **Faults** are the most severe type of alarms. Faults immediately shut down the booth and require a reset. Fault messages begin with a fault code (F##) and are highlighted red on the Alarms screen.

* **Warnings** are less severe than faults, but still indicate something is wrong. Warnings do not shut down the booth, but may prohibit or limit the operation of equipment such as the ASV or Burner. Most warnings do not require a reset. Those that do require a reset display "Reset Required" in the alarm message. Warning messages begin with a warning code (W##) and are highlighted yellow on the Alarms screen.

For guidance on troubleshooting faults and warnings, see "Troubleshooting" (page 40).

Alarms screen

The Alarms screen lists up to 100 historical and active alarms. Each alarm contains the date and time that the alarm occurred, a short message identifying the alarm, and an alarm code. You can use the alarm code to reference specific information about potential causes and suggested troubleshooting actions. (See "Troubleshooting" (page 40).)
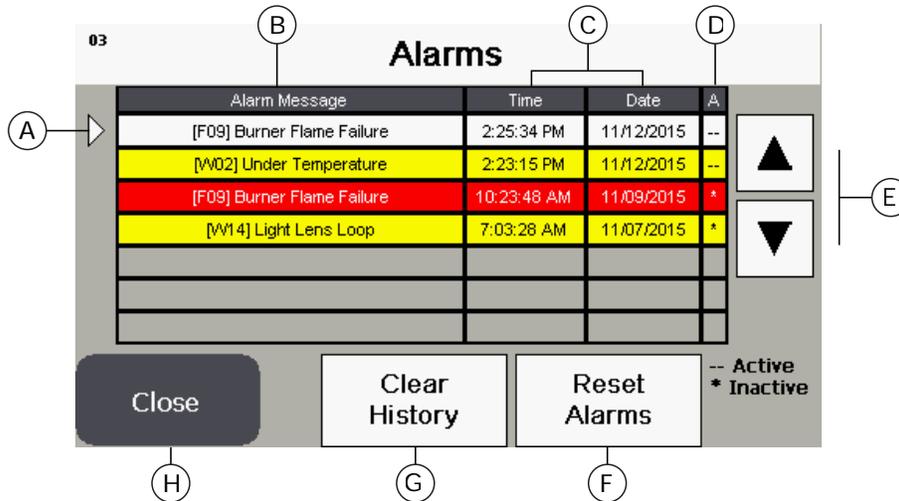
A: Arrow pointing to currently selected message
B: Alarm messages (Red = Fault; Yellow = Warning; White = currently selected)
C: Time and date when the event occurred
D: Active (--) or Inactive (*)
E: Up and Down arrows
F: Reset Alarms button
G: Clear History button
H: Close button

Alarm status

On the Alarms screen, the entry in the "A" column indicates the status of each alarm: either active (represented by "--") or inactive (represented by an asterisk). Table 12 describes how the alarm status is determined for faults and warnings.

The moment an alarm (a row on the Alarms screen) becomes inactive, it is considered to be alarm history. If the conditions that triggered the alarm occur again, the occurrence is logged as a new alarm (a new row on the Alarms screen).

Table 12. Alarm status

Alarm type	Status	Symbol	Description
Fault	Active	--	The conditions that caused the fault to occur are still present and/or the fault needs to be reset.
	Inactive	*	The conditions that caused the fault to occur are no longer present and the fault has been reset.
Warning	Active	--	The conditions that caused the warning to occur are still present and/or a warning that requires a reset has not yet been reset.
	Inactive	*	The conditions that caused the warning to occur are no longer present (and the warning has been reset, if required).

Resetting alarms

On the Alarms screen, tap the **Reset Alarms** button to reset all active alarms.

NOTE

This button acts only on alarms that require a reset, and then only if the conditions that triggered the alarm are no longer present.

Clearing alarm history

On the Alarms screen, tap the **Clear History** button to delete all inactive alarms from the Alarms history.

NOTE

The Alarms screen displays up to seven alarms at a time (out of a maximum of 100). Clearing the alarm history has the effect of refreshing the Alarms screen so that it displays only currently active alarms.

Main menu

Tap the **Main Menu** navigation button (located in the lower left corner of the touchscreen) to display the Main menu.
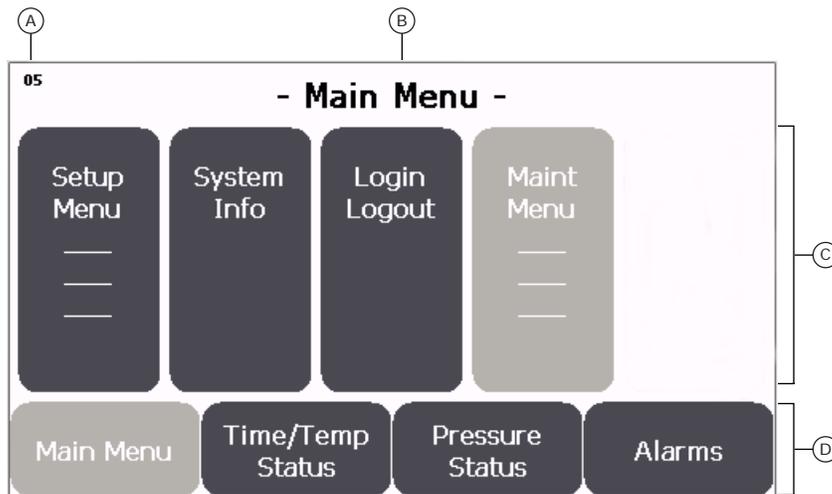
A: Screen number
B: Screen title
C: Functions available from the Main menu
D: Primary functions

From the Main menu, tap a menu button to select any of the following options:

- **Setup Menu:** See "Setup menu" (page 25).
- **System Info:** See "System Information screens" (page 28).
- **Login Logout:** See "Login/Logout" (page 30).
- **Maint Menu:** See "Maintenance menu" (page 31).

To exit the Main menu, tap any other primary navigation button (either **Time/Temp Status**, **Pressure Status**, or **Alarms**).
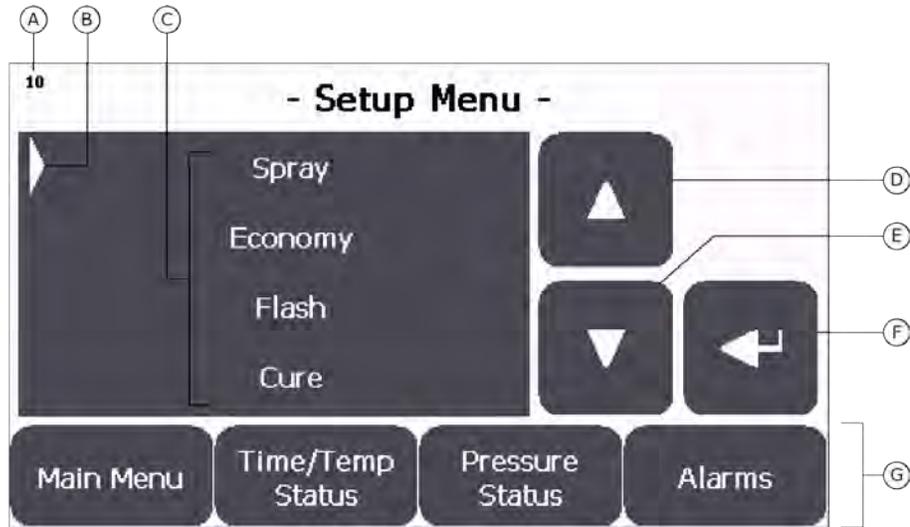
Setup menu

The Setup menu is a sub-section of the Main menu. From the Setup menu, you can access parameters related to the booth's operating modes (Spray, Economy, Flash, and Cure) and the burner.

Viewing/editing Setup parameters

Follow the steps below to view or edit Setup parameters.

1. From the Main menu, tap **Setup Menu**.

    The Setup menu displays.

A: Screen #
B: Selection indicator
C: Menu choices (maximum of four choices visible at one time)
D: Up arrow
E: Down arrow
F: Enter button
G: Primary navigation buttons

2. From the Setup menu, tap the **Up** or **Down** arrow until the desired function aligns with the selection indicator.

    NOTE
    Due to the size of the touchscreen, only four functions are visible at any given time. Tap the **Up** or **Down** arrow to display other functions in the list.

3. When the selection indicator is pointing to the desired function, tap the **Enter** button.

    The selected screen displays. For example, if you tap **Enter** when the indicator points to **Cure**, the Setup - Cure screen displays (below).
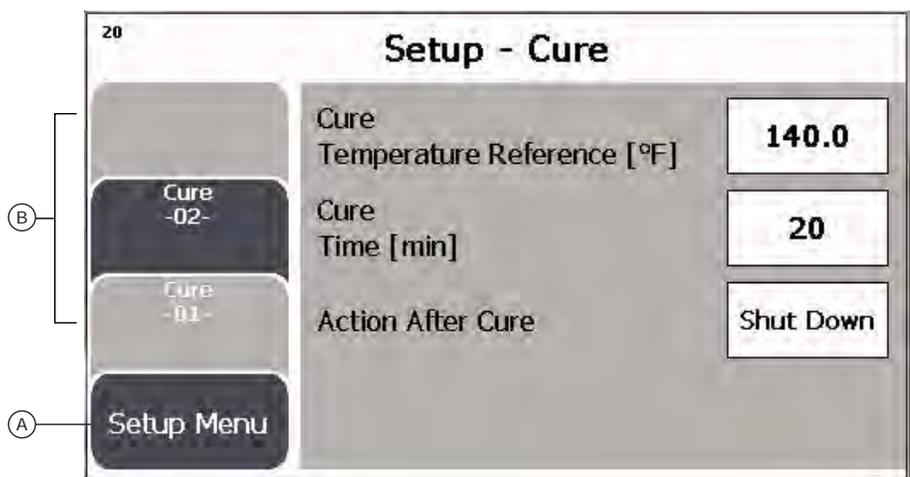
A: Button to return to parent menu
B: Tabs to access sub-screens

NOTE

Setup screens have graphical "tabs" along the left side of the screen. If all parameters associated with a given function can fit on one screen, then only the "-01" tab is present. If more than one screen is required, additional tabs are present, numbered in ascending order from bottom to top. In the example above, the Cure screen has two tabs (labeled "Cure -01-" and "Cure -02-"). The currently displayed tab is grayed out. You can tap any active (non-grayed-out) tab to bring that tab to the front.

4. *If necessary:* Tap the appropriate tab to display the desired parameter.

5. *If desired:* Edit a displayed parameter

    NOTE

    Values that can be edited are displayed on a white field. See "Setup menu parameters" (page 27) for parameter details.

    NOTE

    Some screens include a pair of **Up** and **Down** arrow buttons that increase or decrease a particular numeric field by a small (configurable) amount. In that case, you can tap the arrow buttons to make small adjustments, or you can enter a new value from the number keypad as described above.

6. When you have finished viewing/editing parameters, tap the **Setup Menu** button (in the lower left corner of the screen) to return to the Setup menu.

    From there, you can select a different Setup function, or you can tap a primary navigation button (Main Menu, Time/Temp Status, Pressure Status, or Alarms) to exit the Setup menu.

Setup menu parameters

Table 13 lists the Setup menu parameters and provides the default, maximum, and minimum value for each parameter (where applicable). Within the table, parameters are sorted by the screen on which they appear.

NOTE
Each screen has an ID number in the upper left corner.

NOTE
Some screens and/or parameters appear in the Setup menu only if your booth includes the corresponding option.

Table 13. Setup menu parameters

Screen		Parameter	Description	Units	De-fault	Min	Max
# [1]	Title (tab)[2]						
11	Spray (01)	Spray Temperature Reference (°F)	Temperature the booth will control to in Spray	F/C	75.0/0.0	65.0/18.3	90.0/32.2

Screen		Parameter	Description	Units	De-fault	Min	Max
# [1]	Title (tab)[2]						
14	Econo-my (01)	Enable Econ-omy?	**Yes:** Spray gun inac-tivity will count to-wards the Purge time and cause the booth to go into Economy. **No:** Spray gun inactiv-ity will not count to-wards the Purge time or cause the booth to go into Economy.	- - -	Yes	- - -	- - -
17	Flash (01)	Flash Temper-ature Refer-ence (°F)	Temperature the booth will control to in Flash	F/C	75.0/0.0	65.0/18.3	120.0/48.9
17	Flash (01)	Flash Time	Flash cycle time	min	10	0	999
20	Cure (01)	Cure Temper-ature Refer-ence (°F)	Temperature the booth will control to in Cure	F/C	140.0/0.0	65.0/18.3	160/71.1
20	Cure (01)	Cure Time	Cure cycle timer	min	20	0	999
20	Cure (01)	Action After Cure	Action the booth will take following a Cure	- - -	Shut-down	- - -	- - -
26	Burner	Enabled / Dis-abled	**Enabled:** Burner con-trols to the Tempera-ture Reference any time the booth is run-ning. **Disabled:** Burner controls to the Tem-perature Reference only in Cure.	- - -	Enabled	- - -	- - -

[1]Each screen displays a unique number in the upper left corner.

[2]If a screen is divided into multiple tabs, the tab number where the parameter appears is included in parentheses.

System Information screens

System Information is a sub-section of the Main menu that displays basic configuration data for reference. The data is divided across three screens:

- **System Info 01:** Factory Configuration settings
- **System Info 02:** Customer Configuration and Hour Meters
- **System Info 03:** Software versions

To access the System Information screens, tap **System Info** from the Main Menu. The System Information screen opens with screen 01 in front. To switch between screens, tap the System Info tab for the screen you want to display (01, 02, or 03). An example of each System Information screen is shown below.

To return to the Main Menu, from the System Information screen, tap the **Main Menu** button in the bottom left corner of the screen.
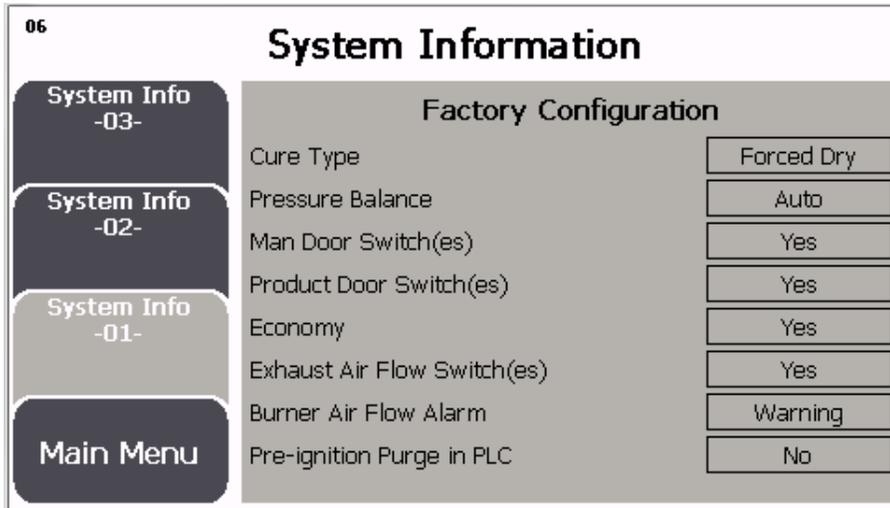
Figure 3. System Info 01 (example)
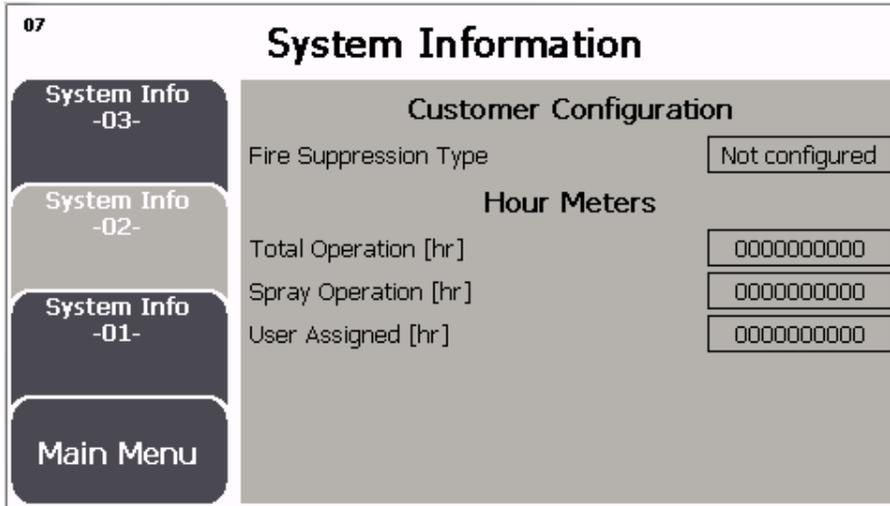
Figure 4. System Info 02 (example)
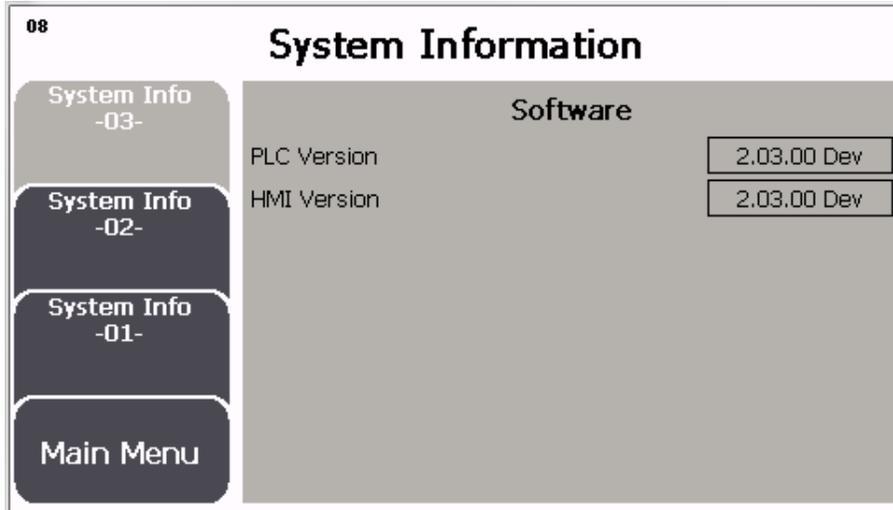
Figure 5. System Info 03 (example)

Login/Logout

The Login/Logout screen allows you to log in as the Maintenance user in order to edit Maintenance parameters. (See "Viewing/editing Setup parameters" (page 25)).

The default login credentials for the Maintenance user are:

- Username: **maint**

- Password (default): **maint**

NOTE
The password is case-sensitive; however, the username is *not* case-sensitive. For example, *MAINT*, *Maint*, and *maint* are all valid entries for the username.

1. From the Main menu, tap **Login Logout**.

    The Login/Logout screen displays.

2. On the Login/Logout screen, tap **Login** to display the username and password popup.

3. Tap the **User** or **Password** field and ensure that the cursor is flashing; then type the username and password for the Maintenance user.

4. Tap **Enter** to log in.
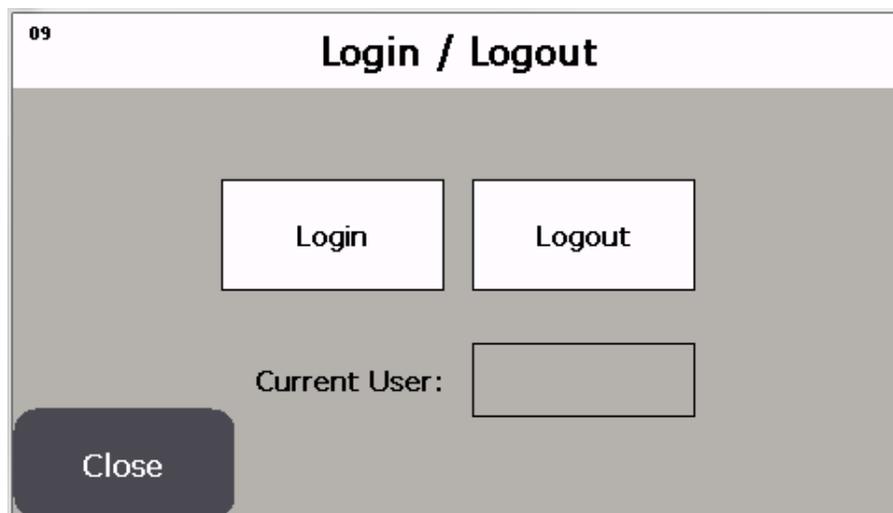
   You are returned to the Main Menu after login. From there, you can edit Maintenance parameters as described in "Viewing/editing Setup parameters" (page 25).

5. When you have finished editing Maintenance parameters, log out of the Maintenance account:

   a. Navigate to the Login/Logout screen as described in Step 1.

   b. On the Login/Logout screen, tap **Logout**.

   The Login/Logout screen closes and you are returned to the Main Menu.

Maintenance menu

The Maintenance menu is a sub-section of the Main menu. The Maintenance menu provides access to various configuration and troubleshooting parameters.

NOTE
Some parameters are intended for use by service technicians and may not be available to operators.
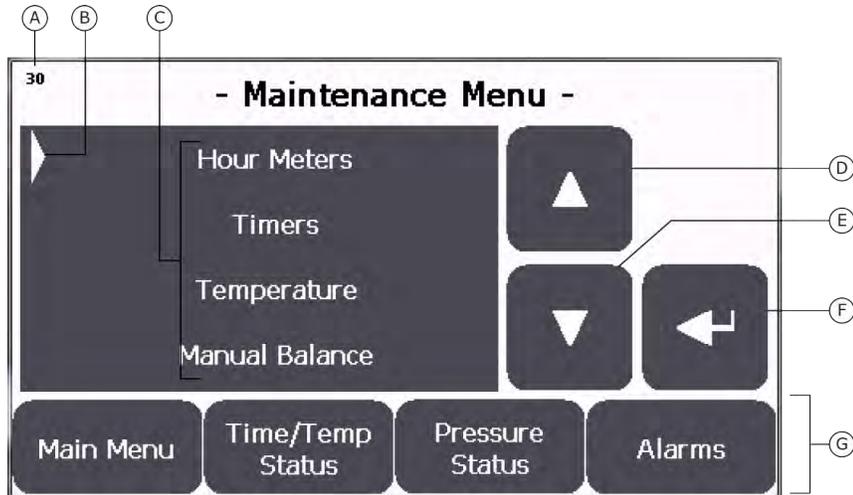
Viewing/editing Maintenance parameters

Follow the steps below to view or edit Maintenance parameters.

NOTE
For the list of parameters, see "Maintenance Menu parameters" (page 33).

1. Log in to the Maintenance account as described in "Login/Logout" (page 30).

2. From the Main Menu, tap **Maint Menu**.

   The Maintenance menu displays.

A: Screen #
B: Selection indicator
C: Menu choices (maximum of four choices visible at one time)
D: Up arrow
E: Down arrow
F: Enter button
G: Primary navigation buttons

3. From the Maintenance menu, tap the **Up** or **Down** arrow until the desired function aligns with the selection indicator.

   NOTE
   Due to the size of the touchscreen, only four functions are visible at any given time. Tap the **Up** or **Down** arrow to display other functions in the list.

4. When the selection indicator is pointing to the desired function, tap the **Enter** button.

   The selected function screen displays. For example, if you tap **Enter** when the indicator points to **System Time**, the System Time screen displays (below).
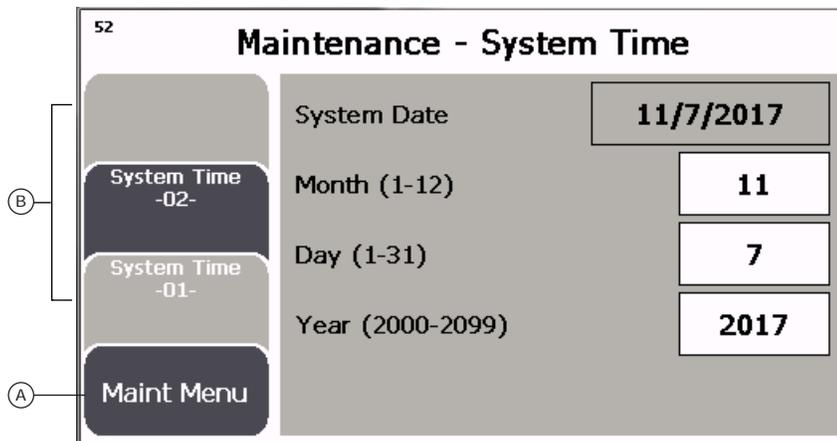
A: Button to return to parent menu
B: Tabs to access sub-screens

NOTE

Function screens have graphical "tabs" along the left side of the screen. If all parameters associated with a given function can fit on one screen, then only the "-01" tab is present. If more than one screen is required, additional tabs are present, numbered in ascending order from bottom to top. In the example above, the "System Time" screen has two tabs (labeled "System Time -01-" and "System Time -02-"). The currently displayed tab is grayed out. You can tap any active (non-grayed-out) tab to bring that tab to the front.

5.   *If necessary:* Tap the appropriate tab to display the desired parameter.

6.   *If desired:* Edit a displayed parameter.

NOTE

Values that can be edited are displayed on a white field. See "Maintenance Menu parameters" (page 33). for parameter details.

NOTE

To edit a numeric value: Tap the currently displayed value. A number keypad opens. Enter the new value on the number keypad; then tap **Enter**. The number keypad closes and the new value is now displayed in that field.

NOTE

To edit a toggle value (for example, Spray/Shutdown): Tap the currently displayed value to toggle to the opposite choice.

7.   When you have finished viewing/editing parameters for the selected function, tap the **Maint Menu** button (in the lower left corner of the screen) to return to the Maintenance menu.

8.   From the Maintenance menu:

   • If you want to view or edit parameters for another Maintenance function, repeat Step 3 through Step 7.

   • If you have finished viewing/editing Maintenance parameters, tap **Main Menu** to exit the Maintenance menu and return to the Main menu.

9.   Log out of the Maintenance account as described in "Login/Logout" (page 30).

Maintenance Menu parameters

Figure 6 shows the parameters associated with the Maintenance menu.

NOTE

Within the diagram, sections of the menu indicated in yellow are intended for use by service technicians, only.
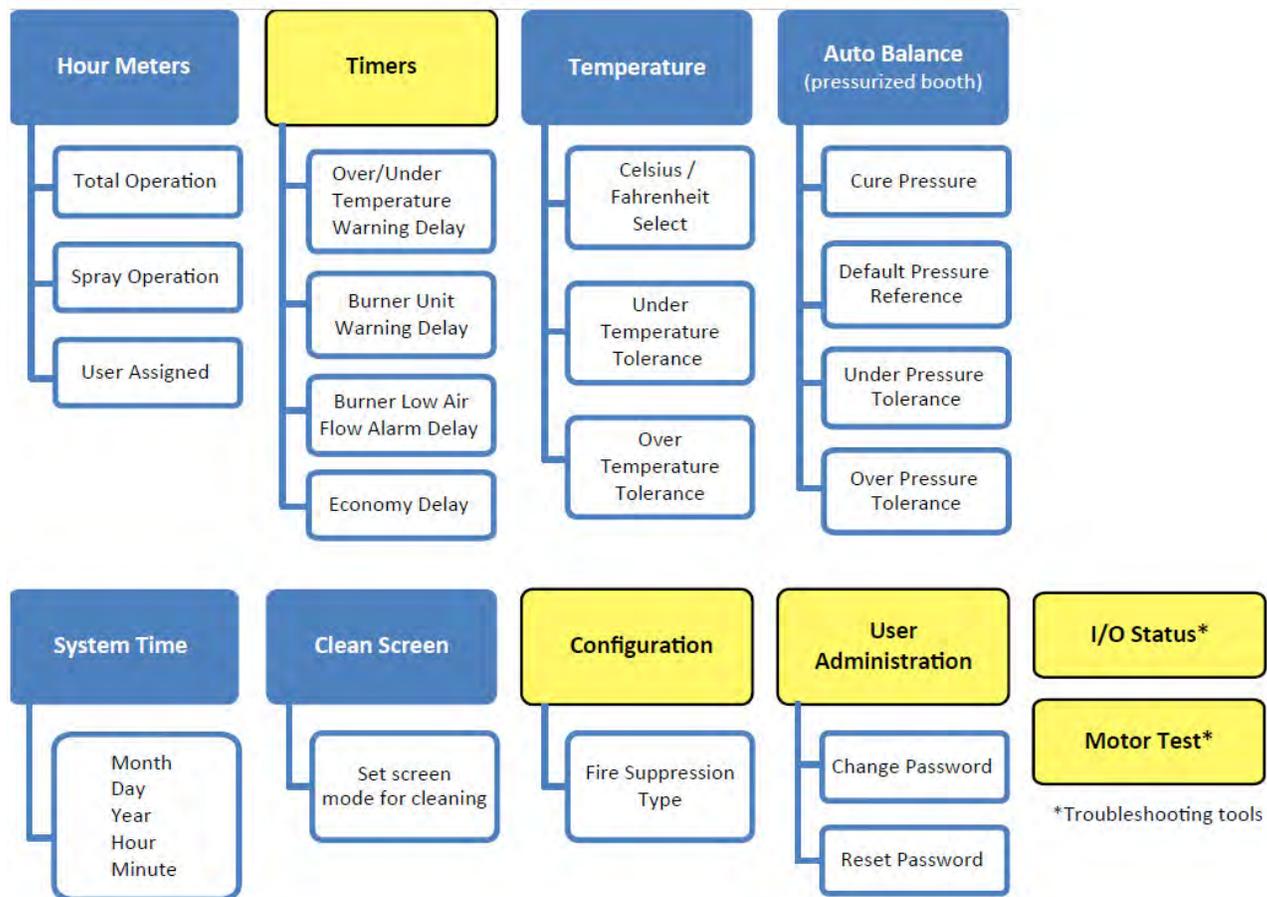
Figure 6. Maintenance menu structure

Table 14 lists the Maintenance Menu parameters that are relevant to operators and provides the default, maximum, and minimum value for each parameter (where applicable). Within the table, parameters are sorted by the screen on which they appear.

NOTE
Some screens and/or parameters appear in the Maintenance menu only if your booth includes the corresponding option.

Table 14. Maintenance Menu parameters

Screen		Parameter	Description	Units	Default	Min	Max
# [1]	Title (tab) [2]						
31	Hour Meters	Total Operation	Total number of hours the booth has been powered on. Cannot be reset.	hr	---	---	---
31	Hour Meters	Spray Operation	Total number of hours the booth has been spraying. Cannot be reset.	hr	---	---	---

Screen		Parameter	Description	Units	De-fault	Min	Max
# [1]	Title (tab) [2]						
31	Hour Meters	User As-signed	Total number of hours the booth has been powered on. Resetta-ble.	hr	---	---	---
32	Timers	Over/Under Temperature Warning De-lay	Delay before Over/Under Temperature warning	min:sec	5:00	0:00	59:59
32	Timers	Burner Unlit Warning De-lay	Delay before "Burner Unlit" warning. This delay will start when the Burner Request is first issued. After the main flame detected input has been con-firmed, a loss of this signal will cause an immediate warning.	min:sec	5:00	0:00	59:59
32	Timers	Burner Low Air Flow Alarm Delay	Delay before "Burner Low Air Flow" alarm. This delay will start when the burner is in a state that calls for heat. After the burner air flow ok input has been confirmed a loss of this input will cause an immediate alarm.	min:sec	1:30	0:00	59:59
32	Timers	Economy De-lay	Delay before booth will automatically tran-sition from Spray to Economy. This delay is initiated by inactivity of the spray gun indi-cated by gun hanger or air flow switch in-put.	min:sec	3:00	3:00	59:59
34	Temper-ature	Celsius/ Fah-renheit Select	Defines the tempera-ture units to be used within status screens and Maint Menu screens.	- - -	Fahren-heit	- - -	- - -
34	Temper-ature	Under Tem-perature Tol-erance	Defines the lower temperature limit. Temperature Feed-back must be greater than this limit before the Cure timer will start. A warning will be triggered if the temperature feedback falls below this limit for the over/under tem-perature delay during Spray, Flash, or Cure.	F/C	10.0/0.0	1.0/0.6	30.0/16.7

Screen		Parameter	Description	Units	Default	Min	Max
# [1]	Title (tab) [2]						
34	Temperature	Over Temperature Tolerance	Defines the upper temperature limit. Temperature Feedback must be less than this limit before the Cure timer will start. A Warning will be triggered if the Temperature Feedback exceeds this limit for the Over/Under Temperature Delay during Spray, Flash, or Cure.	F/C	10.0/0.0	1.0/0.6	30.0/16.7
37	Auto Balance	Cure Pressure Reference	Pressure the booth will control to during Cure	inH2O	0.200	-0.100	0.100
37	Auto Balance	Default Pressure Reference	Pressure the booth will control to for all operating modes except Cure.	inH2O	0.200	-0.100	0.100
37	Auto Balance	Under Pressure Tolerance	Defines the lower pressure limit. Pressure Feedback must be greater than this limit before the booth will transition into Spray, Flash, Purge, or Cure from Ramp Start.	inH2O	0.025	0.005	0.100
37	Auto Balance	Over Pressure Tolerance	Defines the upper pressure limit. Pressure Feedback must be less than this limit before the booth will transition into Spray, Flash, Purge, or Cure from Ramp Start.	inH2O	0.025	0.005	0.100
40	Manual Balance	Exhaust Fan Inc/Dec Amount	Increment and decrement rate when booth is configured to be manually balanced	Hz	1.0	0.1	5.0
41	I/O Status (01)	Embedded Digital In	Troubleshooting tool	---	---	---	---
41	I/O Status (01)	Remote Digital In	Troubleshooting tool	---	---	---	---
42	I/O Status (02)	Embedded Digital Out	Troubleshooting tool	---	---	---	---
42	I/O Status (02)	Remote Digital Out	Troubleshooting tool	---	---	---	---

Screen		Parameter	Description	Units	De-fault	Min	Max
# [1]	Title (tab) [2]						
43	I/O Status (03)	Plug-In Mod 2 Analog In: • Channel 0 • Channel 1	Troubleshooting tool	---	---	---	---
43	I/O Status (03)	Plug-In Mod 3 Analog Out: • Channel 0 • Channel 1	Troubleshooting tool	---	---	---	---
43	I/O Status (03)	Remote Analog In	Troubleshooting tool	---	---	---	---
43	I/O Status (03)	Remote Analog Out	Troubleshooting tool	---	---	---	---
44	Motor Test (Setup 01)	Motor Test Enable [3]	Toggle button to enable motor testing	---	---	---	---
45	Motor Test (Setup 02)	Intake Fan Jog Speed Reference	Speed reference used when the Jog HMI button is pressed. This is an HMI manual control source function only.	Hz	10.0	0.0	60.0
45	Motor Test (Setup 02)	Intake Fan Manual Speed Reference	Speed Reference used when the Start HMI button or the Fan Service Switch is pressed/toggled.	Hz	60.0	18.0	60.0
45	Motor Test (Setup 02)	Intake Fan Manual Ramp Rate	Ramp Rate used for all Manual state functions.	Hz/sec	1.0	1.0	4.0
46	Motor Test (Setup 03)	Exhaust Fan Jog Speed Reference	Speed Reference used when the Jog HMI button is pressed. This is an HMI Manual Control Source function only.	Hz	10.0	0.0	72.0 [4]
46	Motor Test (Setup 03)	Exhaust Fan Manual Speed Reference	Speed Reference used when the Start HMI button or the Fan Service Switch is pressed/toggled.	Hz	50.0	18.0	72.0 ???
46	Motor Test (Setup 03)	Exhaust Fan Manual Ramp Rate	Ramp rate used for all Manual state functions.	Hz/sec	1.0	1.0	6.0 [5]
47	Motor Test (Control 01)	Intake Fan Motor Test	Troubleshooting tool for testing the intake fan	---	---	---	---

Screen		Parameter	Description	Units	Default	Min	Max
# [1]	Title (tab) [2]						
48	Motor Test (Control 02)	Exhaust Fan Motor Test	Troubleshooting tool for testing the exhaust fan	---	---	---	---
52	System Time (01)	Month	Enter the number corresponding to the current month.	---	---	1	12
52	System Time (01)	Day	Enter the current day of the month.	---	---	1	31
52	System Time (01)	Year	Enter the current year.	---	---	2000	2099
53	System Time (02)	Hour	Enter the current hour (using 24-hour time).	---	---	0	23
53	System Time (02)	Minute	Enter the current minute.	---	---	0	59
54	Configuration	Fire Suppression Type	Defines the type of fire suppression installed in the booth (Water or Chemical).	- - -	Not Configured	- - -	- - -
59	Clean Screen	---	Freezes the screen for a set time to allow user to clean screen	---	---	---	---
55	User Administration (01)	Change Password	Allows maintenance user to change login password.	---	---	---	---
56	User Administration (02)	Reset Password	Allows maintenance user to reset password to default password	---	---	---	---
58	Shut Down Application	---	**Shut down:** Shuts down the GFS program and leaves you at the file manager. **Cancel:** Cancels shutdown and returns you to the Maintenance menu.	---	---	---	---

[1]Each screen displays a unique number in the upper left corner.
[2]If a screen is divided into multiple tabs, the tab number where the parameter appears is included in parentheses.
[3]The booth must be in Standby mode (not in operation) to use this function.
[4]This value is limited by the maximum speed reference parameter.
[5]This value is lImited by the maximum ramp rate parameter.

Factory configuration

The factory configuration settings are based on the particular hardware or other options included with your booth, and can be viewed on the System Info screen. (See "System Information screens" (page 28).)

Changing the factory configuration

IMPORTANT: Changing the booth's factory configuration parameters requires GFS technical services.

NOTE
The GFS technical services representative might ask for the serial number of the booth and for the PLC and HMI software versions. Please have this information at hand for your call.

- The booth serial number is located on a data plate affixed to the outside of a personnel door.

- The PLC and HMI software versions are displayed the **System Info 03** screen (**Main Menu > System Info > System Info 03**).

Troubleshooting

Table 15. Fault and Warning codes

Code	Fault & Warning	Basic Cause Categories	Troubleshooting Guide
F01	Emergency Stop	System Stop (previously E-Stop) pressed.	If the System Stop pushbutton was not pressed, check for faulty pushbutton or wiring.
F02	Negative Pressure Limit	Pressure Feedback has exceeded the set Negative Pressure Limit. Default value for Negative Pressure Limit is -0.150 [inH2O].(GFS password required)	1. Check pressure status screen. 2. Check booth pressure transducer (green light illuminated on transducer). 3. Verify damper positions are correct. 4. Verify Intake Fan operation when booth is running. 5. Check Exhaust Fan VFD Speed Command analog signal.
F03	Low Temperature Limit	Temperature Feedback has dropped below 40°F for 5 minutes. This will only be monitored while the booth is in operation.	1. Check that burner is enabled. 2. Check flame safety relay for alarms. 3. Verify Burner Airflow Ok input is not being lost. 4. Confirm Burner Request signal from PLC to flame safety relay. 5. Check temperature sensor. 6. Verify no other alarms are present. 7. Check wiring.
F04	Fire Supp Type Config	Fire suppression system is not configured	Go to the Maintenance screen and tap **Configure** to set the Fire Suppression Type.
F05	Exhaust Low Air Flow	The Exhaust Fan VFD has been commanded to run and was indicating a running status. The Exhaust Air Flow Switch did not indicate airflow for the set amount of time.	1. Verify Exhaust Fan Ramp Rates are appropriate for Exhaust Air Flow. 2. Check exhaust fan belts. 3. Exhaust flow fault delay set too low at HMI. 4. Exhaust airflow switch faulty. 5. Check pilot tubes and air lines connections. 6. Check wiring.
F09	Burner Flame Failure	The flame safety relay has an alarm.	1. Reset flame safety relay. 2. Reset flame safety relay. Try to relight burner. 3. Verify gas pressure. 4. Verify flame rod condition.
F10	Intake Motor Run Feedback	Intake VFD has been issued a run command, but did not indicate running status for 3 seconds or run status from VFD has been lost.	1. Verify the overload device is set properly and not tripped. 2. Check VFD for error code (cycle power to reset). 3. Check for faulty hardware or wiring.

Code	Fault & Warning	Basic Cause Categories	Troubleshooting Guide
F11	Exhaust Motor Run Feedback	Exhaust VFD has been issued a run command, but did not indicate running status for 3 seconds or run status from VFD has been lost.	1. Verify the overload device is set properly and not tripped. 2. Check VFD for error code (cycle power to reset). 3. Check for faulty hardware or wiring.
F12	Intake Damper Position	Intake damper has not indicated an open position while booth was operating. The only exceptions to this are when the booth is in Cure mode.	1. Check intake damper end switch. 2. Check actuator. 3. Check intake damper position. 4. Verify movement of damper and orientation.
F13	Burner Air Flow	Burner high/low air flow switch has not been proven for the set time or burner high/low air flow switch was proven, but has unexpectedly been lost.	1. Check inlet filters. 2. Check fan belts. 3. Check air flow switches wiring. 4. Verify pressure drop across burner. 5. Verify motor is operating correctly.
F33	Fire Alarm	No fire alarm signal for fire alarm system. The fire alarm input is indicating alarm conditions.	1. Verify fire alarm system is not tripped. 2. Check relay for fire alarm. 3. Check wiring is correct. 4. Verify fire suppression is normal.
W01	Over Temperature	The Temperature Feedback has exceeded the set point Temperature Reference plus Over Temperature Tolerance for the set time in Spray, Flash, or Cure.	1. Check outside air temp, +/- 10F° set point of ambient temperature shut off burner. 2. Check PID setting (GFS password required).
W02	Under Temperature	Temperature feedback has dropped below the set point Temperature Reference. Under Temperature Tolerance for the set time in Spray, Flash, or Cure. +/- 10°F set point	1. Check temperature sensor. 2. Check for other warnings and follow troubleshooting guide. 3. Check PID setting (GFS password required).
W03	Burner Unlit	The system was calling for the burner and a flame was not detected within the set amount of time or one or more of the burner safeties is not met.	1. Check high gas pressure switch (reset if needed). 2. Check high temp limit switch (reset if needed). 3. Check burner safeties. 4. Verify gas pressure from gas utilities.
W04	Burner Air Flow	Burner high/low airflow switch has not been proven for the set time or burner high/low airflow switch was proven, but has been lost unexpectedly.	1. Check inlet filters. 2. Check fan belts. 3. Check air flow switches wiring. 4. Verify pressure drop across burner. 5. Verify motor is operating correctly.
W07	I/O Force(s) Active	There is a I/O force active on the PLC.	An input or output is currently being forced. Call GFS Technical Services for assistance (800-848-8738).

Code	Fault & Warning	Basic Cause Categories	Troubleshooting Guide
W08	Fan Service Switch Detected	Fan Service Switch is in the ON position at AMU.	Set Fan Service Switch to its normal OFF (down) position.
W09	Burner Service Switch Detected	Burner Service Switch is in the ON position at AMU.	Set Burner Service Switch to its normal OFF (down) position.
W10	Man Door Open	Personnel door is open longer than time delay. Personnel door has been opened while the booth is operating.	1. Verify all doors are closed. 2. Verify there are no obstruction for the doors. 3. Verify operation of switches. 4. Check for possible overspray on switches.
W11	Product Door Open	Product door is open. Product door has been opened while the booth operating.	1. Verify all doors are closed. 2. Verify there are no obstruction for the doors. 3. Verify operation of switches. 4. Check for possible overspray on switches.
W12	Man Door Open	Personnel door is open. Personnel door has been opened during Cure. Reset on HMI is Required; will put the booth back into Cure mode.	1. Verify all doors are closed. 2. Verify there are no obstruction for the doors. 3. Verify operation of switches. 4. Check for possible overspray on switches.
W13	Prod Door Open	Product door is open. Product door has been opened during Cure. Reset on HMI is Required; will put the booth back into Cure mode.	1. Verify all doors are closed. 2. Verify there are no obstruction for the doors. 3. Verify operation of switches. 4. Check for possible overspray on switches.
W14	Light Lens Loop	A light lens Is loose or has been removed.	1. Verify correct orientation of light lens. 2. Check wiring.
W15	Intake Dirty Filter	Intake filter is indicating it is dirty and needs to be changed	Check filters and replace as needed.
W20	Cure Timer Forced Start	Temperature Feedback has not reached the Temperature Reference minus the Lower Temperature Tolerance for 10 minutes upon entering Cure or following a Man or Product door being opened during Cure.	1. Check recirc and exhaust damper position. 2. Check gas pressure. 3. Check PID setting (GFS password required).
W21	Intake Damper Position	The Intake Damper has not indicated an open position before the Damper Proof Warning Delay timer expired.	1. Check intake damper end switch. 2. Check intake actuator. 3. Check intake damper position. 4. Verify movement of damper and orientation.

Code	Fault & Warning	Basic Cause Categories	Troubleshooting Guide
W22	Cure Aborted	Cure cycle aborted due to flame loss. Burner flame has been lost in Cure.	1. Try to relight burner. 2. Verify gas pressure. 3. Verify flame rod condition. 4. Check high gas pressure switch (reset if needed). 5. Check high temp limit switch (reset if needed). 6. Check burner safeties.