



GLOBAL
FINISHING
SOLUTIONS



Converge Control Panel

Operator Manual

Document Number: 239-153 rev 1
Publication date 12/20/2021

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 equipment 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 and NFPA 86 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

Per NFPA 86, 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 oven safety information, refer to the documentation that accompanied your equipment.

About this manual

This manual is intended for use by the oven operator to perform general navigation and operation sequences on GFS equipment.

For detailed configuration and device setup information, please refer to the MCT4 User Manual, available at <http://www.futuredesigncontrols.com/MCT4/>.

For the full list of flame safety controller error codes, please refer to the Siemens LME7 Technical Instructions, available at <https://scccombustion.com/products/lme7-flame-safeguard/>.

Converge control panel overview

Operator interface terminal

The Converge operator interface terminal provides a button to stop the oven in the case of an emergency. It also includes pushbuttons to start and stop the oven, and lights to monitor the oven's status.

The operator interface terminal also houses the HMI, which is a touchscreen used to monitor oven status and view or edit settings.

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



Figure 1. Converge operator interface terminal

Converge HMI

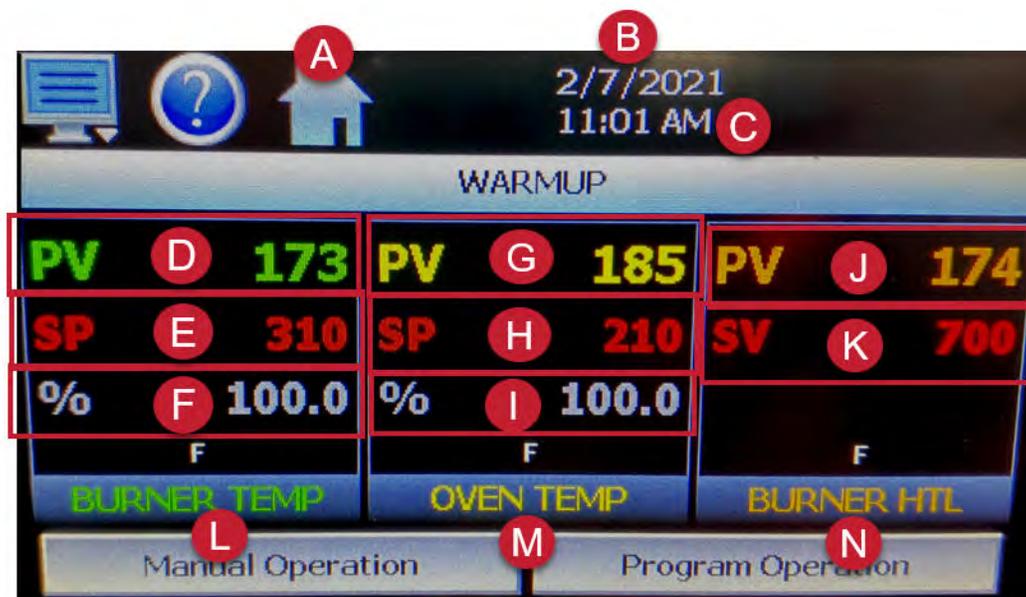
The touchscreen provides useful information, including operating information in the main display, navigation, time, and alarm information.

The banner at the top of the screen provides navigation buttons. These buttons remain on the screen at all times.

The body of the screen will vary dynamically depending on what the operator is trying to accomplish.

NOTE

The operator cannot change the heater box (burner) temperature.



A: Return to Home screen

B: Date

C: Time

D: Current heater box temperature

E: Heater box temperature setpoint

F: Percentage of output; indicates how aggressively the burner is firing to reach setpoint

G: Actual process value oven temperature

H: Oven temperature setpoint (set by operator)

I: Percentage of output; indicates how aggressively the system is signaling the burner in order to reach oven temperature setpoint

J: Current heater box temperature

K: High temperature limit setpoint

L: Heater box temperature display

M: Oven temperature display

N: Burner high temperature limit display

Menu navigation

The following navigation buttons are located at the top of the screen:

Table 3. Upper navigation menu items

Displayed Icons	Description
	The Menu icon opens the main menu, which is used to navigate to the different control and monitoring screens. Menu items will dynamically appear, providing available options based on the system area the operator is in.
	The Information icon displays a help text box associated with the current screen. Help is available in 10 languages based on the operator's selection in the offline setup of section of the control panel.
	The Home icon returns the operator to the main view from anywhere within the application.
	The Alarm icon appears and flashes when a new system alarm occurs. Tap the Alarm icon to access the alarm monitor screen to view and reset the active alarm condition.
	The left and right navigation arrows appear on screens that provide additional information that the operator can scroll to such as the loop view screens, charts, or the program entry screen. NOTE A single tap of the left or right arrows scrolls to the next available step or screen. Pressing and holding the arrow keys continues scrolling the item until the last step of the program is reached or the button is released.

The Converge control panel provides the operator with the ability to use text-based navigation via the main menu or icon-based navigation where you can touch to select icons or drag to switch between the menu pages.

You can switch back and forth between text- or icon-based menus in the Setup menu.

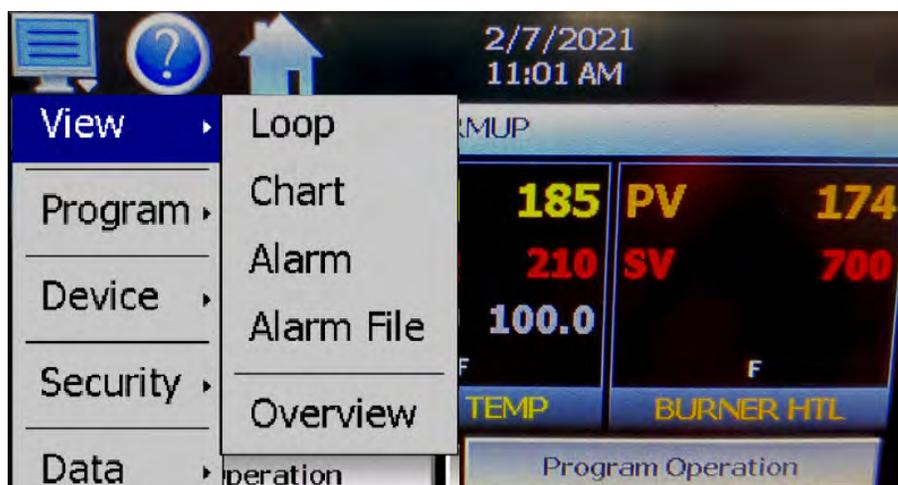


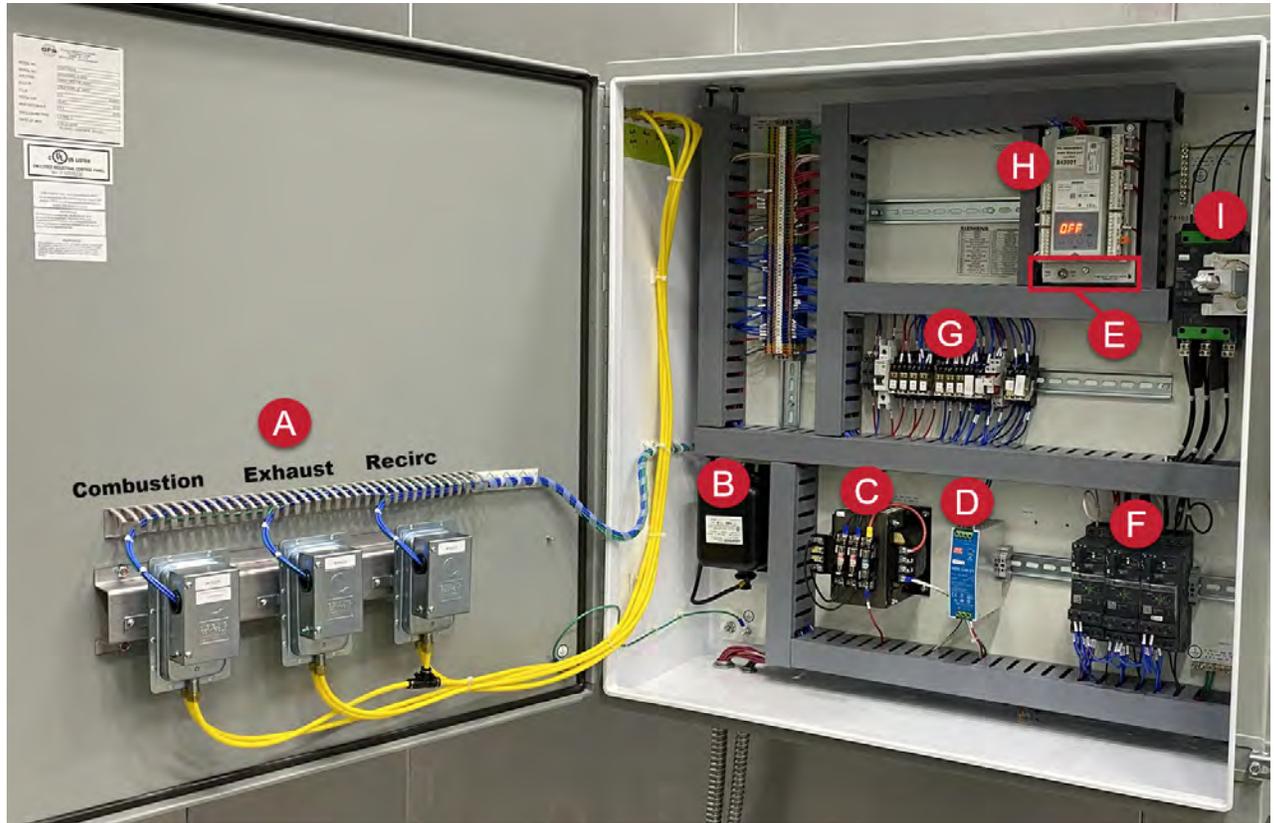
Figure 2. Text-based navigation



Figure 3. Icon-based/slide-page navigation

Control panel interior

Refer to Figure 4 to identify the components inside the Converge control panel.



- A: Air proving switches*
- B: Ignition transformer*
- C: Control transformer*
- D: 24 volt power supply*
- E: Flame safety relay service switch*
- F: Motor starters*
- G: Control relays*
- H: Flame safety controller*
- I: Main breaker disconnect*

Figure 4. Converge control panel interior

Using the oven

This section describes how to use an oven that has Converge controls.

Starting the oven

Prerequisite: Make sure the Emergency Stop button is not depressed.

TIP

It is recommended that the parts are loaded into the oven prior to startup.

Perform the following steps to start the oven:

1. At the operator interface terminal, press the **System Start** pushbutton.
2. Ensure that all of the ventilation indicator lights illuminate.
3. Turn the Burner switch to the right.

NOTE

The System Purging light illuminates and remains lit as the oven purges and the burner does an automatic sequence start. Upon a successful burner light, the burner light illuminates and the purge light will go out.

NOTE

The oven will ramp to the current manual setpoint and remains at the manual setpoint until a program is selected or the temperature is changed manually.

4. Select the oven setpoint:
 - **To select and run an existing oven program:** Continue to "Select programs" (page 14). To create, modify, or delete a program, continue to "Programs" (page 20).
 - **To run the oven without using a pre-configured program:** Continue to "Manual operation" (page 16).

Select programs

Programs, sometimes referred to as "recipes" by GFS, allow you to customize your cure cycle by specifying the temperature setpoint and duration of time for each step. When a program is run, the controller executes each step of the program automatically and in sequence.

Programs are the preferred method for running the oven using the Converge control panel.

Perform the following steps to initiate an oven program:

1. To access all automated program functions, tap **Program Operation** on the bottom right of the Overview screen.

The Program Operation window allows an operator to run, hold, stop, edit, and select automatic programs.



2. Select the desired program:

- **If the desired program is loaded and displayed at the top of the Program Operation window:** Tap **Run** to run all the steps in the program in their entirety.
- **To run the same program again after the program completes (as indicated by the Batch Cycle Control switch illuminating):** Turn the switch to the left to reset, and then turn right to start the program again. This automatically starts the selected program and turns off the Batch Cycle Control light. This enables the operator to repeat the program with minimal touchscreen interaction.
- **To choose a different program and/or select a start step:** Tap **Select** and choose the desired program from the list. Then tap **Run**. Leave the step selection at 1 to run all the steps in the program or use the arrows to select the desired start step. Tap **Start**.



3. Monitor the operating status using the Program Status view:

- *From the text-based menu:* Select the **Home icon > Program > Status**.
- *From the icon-based menu:* Swipe right to access page two and tap the **Status** icon.



Table 4. Program status

Displayed Text	Description
Status	Indicates the current operating mode of the program, i.e., On, In Hold and Off.
Cycles	Indicates the number of cycles left to be completed for the current jump loop.
Steps	Indicates the total number of steps in the current program.
Step	Indicates the step number that is currently being executed.
Time	Indicates the total length of time programmed for the current step. NOTE Time displays are set to hours and minutes (hh.mm) or minutes and seconds (mm.ss) for the entire program when the program is created.
Time Remaining	Indicates the time remaining in the current step. NOTE Time displays are set to hours and minutes (hh.mm) or minutes and seconds (mm.ss) for the entire program when the program is created.

4. A program can be paused by tapping the **Hold** button or stopped by tapping the **Stop** button.

NOTE

The burner will remain on after a program is completed, paused, or stopped. To fully cool and shut down the oven, complete the procedure in “Shutting down the oven” (page 17).

Manual operation

Manual operation enables you to start and stop the oven without using a pre-configured program.

NOTE

The Converge HMI does not include a timer for ovens running manually. You will need to manually stop the oven.

On the touchscreen, adjust the setpoint (SP) value to the desired temperature.

The oven will ramp to the setpoint and continue to run at setpoint temperature until the oven is turned off.

Shutting down the oven

Perform the following steps to shut down the oven manually:

1. Turn the Burner switch to the OFF position.
2. Allow the setpoint to cool to at least 200 °F.

NOTE

The oven's ventilation system must continue running to effectively cool the oven and prevent mechanical damage. The system will not allow you to shut down until the oven's air temperature cools to 200 °F.

3. Press the **System Stop** pushbutton.
4. When the oven is off, make sure the part load is at a safe handling temperature before attempting to remove it from the oven.

Emergency shutdown

In case of emergency, press the red **Emergency Stop** button to stop all equipment immediately.

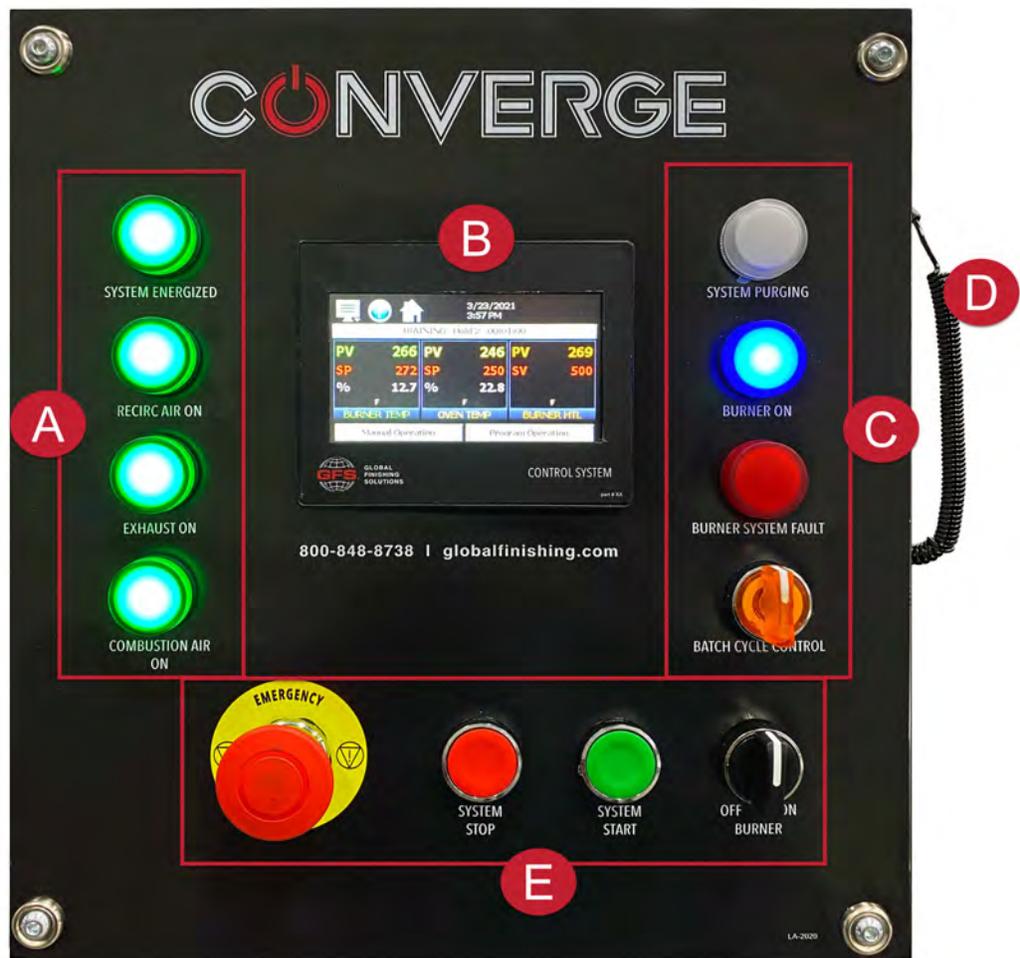
NOTICE

Use of the Emergency Stop button can result in equipment damage and should be reserved only for emergencies.

Oven operating states

The HMI displays all temperature loops, the high temperature limit, and events on a single screen.

Meanwhile, the indicator lights on the front of the Converge operator interface terminal illuminate to indicate transitions and the current operating state. See Table 5 for more information.



- A:** Ventilation indicator lights
- B:** Converge HMI
- C:** Burner and flame indicator lights
- D:** Stylus
- E:** Manual control pushbuttons and switches

Table 5. Oven states

Displayed Text	Description
System Energized	The control system is energized and is activating the ventilation and burner control.
Recirc. Air On	The recirculating air unit in the oven chamber is operating and proving airflow.
Exhaust On	The exhaust unit is operating and proving airflow.
Combustion Air On	The combustion air blower in the burner is operating and proving airflow.
System Purging	Air is purged out of the oven before the burners can start. A minimum of four complete air changes must be made prior to burner ignition, per factory preset.
Burner On	The purge sequence is complete and the burner is lit.
Burner System Fault	The has detected a burner fault and shut the burner down.
Batch Cycle Control	<p>Starts the selected batch cycle program.</p> <p>When a cycle is complete, the switch illuminates to indicate the end of the program. Turn the switch to the left to reset and then to the right to run the same program.</p> <p>To cancel a program cycle, turn the switch to the left and tap Stop on the touchscreen (see “Select programs” (page 14). The oven will revert back to the manual setpoint.</p> <p>NOTE This switch can be used to minimize interaction with the touchscreen.</p>
Emergency Stop	<p>Immediately shuts down the oven.</p> <p>Use of the Emergency Stop button can result in equipment damage and should be reserved only for emergencies.</p>
System Stop	Manually shuts down the oven. See “Shutting down the oven” (page 17) for more information.
System Start	Starts the oven. See “Starting the oven” (page 14) for more information.
Burner Off/On	The Burner switch must be turned to the right for the burner to light.

Programs

When a program, sometimes referred to as a "recipe" by GFS, is in use, the oven's cure cycle continuously varies the cure cycle setpoints throughout the cycle, according to a timed sequence of steps that was programmed during program creation.

Converge ships with one pre-programmed recipe that is ready for operation. However, Converge can store hundreds of programs with up to 64 steps each.

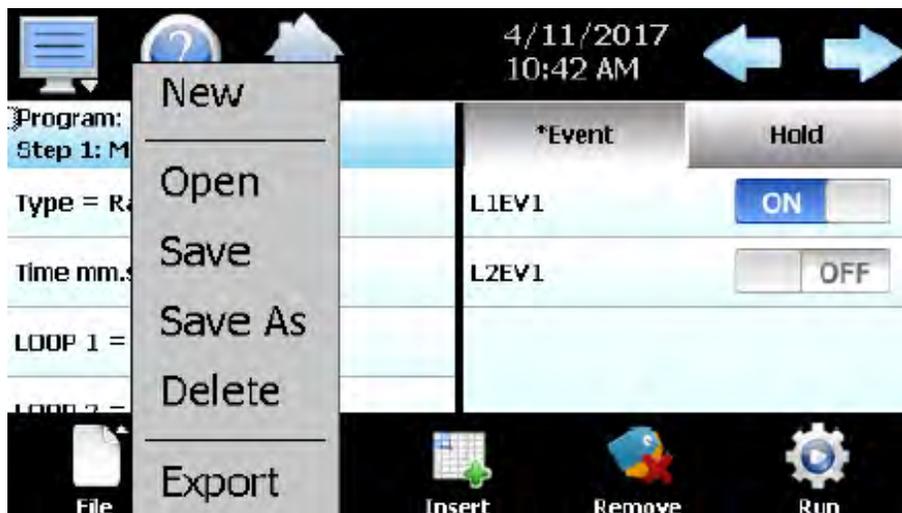
The default profile will ramp to the setpoint of 400 °F and soak at that temperature for 45 minutes. At the end of the soak step, the program ends, the Batch Cycle Control indicator light illuminates, and the oven temperature reverts back to the manual setpoint.

Create or modify programs

NOTE

When entering or modifying a program, it is important to create the steps within the limitations of the mechanical equipment. Refer to "Programs" (page 20) for an example of proper program structure.

1. Access the Program Entry Screen to create a program or edit existing programs.
 - *From the text-based menu:* Select the **Home icon > Program > Entry**.
 - *From the icon-based menu:* Swipe right to access page two and tap the **Entry** icon.
2. Select **File > New** to create a new program or **File > Save As** to modify an existing program.



3. Tap the **Insert** icon to enter or alter steps for the program.

NOTE

Steps can be deleted by tapping the **Remove** icon.

4. For each step, tap any row to set the step type.

NOTE

Programs are entered as a sequence of steps, each with a defined setpoint and length of time that a loop should take to reach the setpoint (ramp) or remain at a setpoint (soak). Select the type of step by tapping the first row in the list and make the desired selection from the step type pop-up menu. The ramp and soak units can both be set as hours/minutes or minutes/seconds.



- **Ramp:** Allows the operator to program each loop to ramp to a setpoint in a specific period of time.
- **Soak:** Allows the operator to program each loop to maintain its setpoint for a specific period of time.
- **Jump:** Allows the operator to jump to a previous step in the program and set the number of times the program should execute the jump before continuing to the following step of the program.
- **End:** Allows the operator to program the last step of the program. The end step type includes final temperature setpoints (if configured) and a cycle count entry to enter the number of cycles the program should repeat itself if desired.

5. For each step, tap the rows to enter the time and loop setpoints within the pop-up menu or keypad.



NOTE

Tap **Edit > Time** to select hours and minutes (hh.mm) or minutes and seconds (mm.ss) to be the default time selection. This selection applies to all steps within the program.

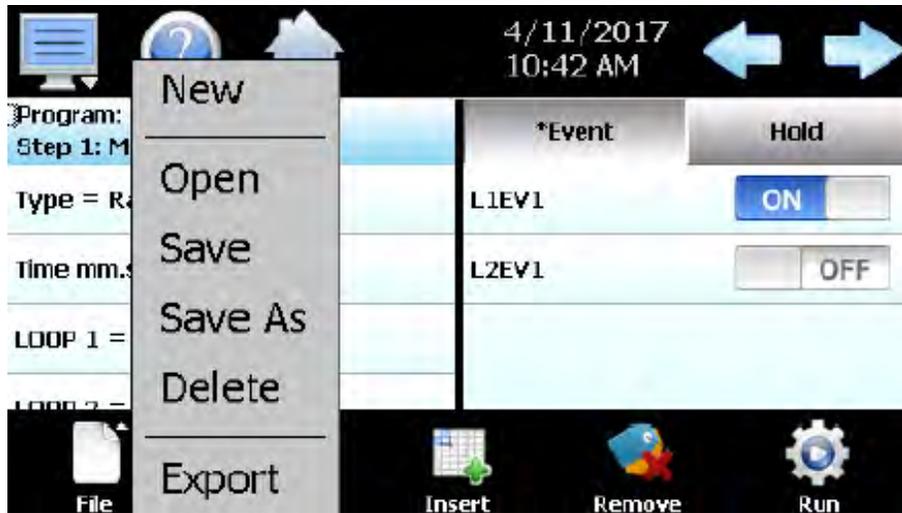
- For each ramp step, set hold to ensure that the timer will pause if the oven temperature needs to catch up:



- If output for the step is required, toggle the icons in the event tab to switch them on. They may be left off if output is not needed.
- Select **File > Save** to name and save the program.

Delete programs

1. Access the Program Entry Screen to create a program or edit existing programs.
 - *From the text-based menu:* Select the **Home icon > Program > Entry**.
 - *From the icon-based menu:* Swipe right to access page two and tap the **Entry** icon.
2. Select **File > Open** to open the program you would like to delete.
3. Select **File > Delete** to remove the current program from memory.



Login/logout

Use the Login/Logout feature to enter the desired account credentials or log out a previous user. Certain actions may require specific privileges that are associated with a username and may not be set at the GFS factory.

1. From the Home menu:
 - *If using the text-based menu:* Tap **Security > Login**.
 - *If using the icon-based menu:* Swipe right and tap the **Login** icon.
2. Select the access level and enter your password.
3. Tap **Login**.

Alarms

When an HMI alarm condition occurs, the alarm icon flashes in the upper navigation bar to provide a visual indication of an alarm condition. An audible alarm will also sound if the alarm requires immediate operator attention.

Each alarm contains the date and time the alarm occurred and a short message identifying the cause of the alarm. The message can be used to reference specific information about the possible causes and suggested troubleshooting actions.

Access the Alarm screen by tapping the **Alarm** icon in the upper navigation bar or by selecting **View > Alarm** in the menu from the Home screen.



For guidance on troubleshooting alarms, refer to the following sections:

- To troubleshoot alarms on the touchscreen, see “HMI alarms” (page 29).
- To troubleshoot the Burner System Fault indicator light and flame safety controller, see “Flame safety controller alarms” (page 27).

Alarm reset and clear

The Alarm screen displays all current and previously acknowledged (but not cleared) alarms.

1. Tap the **Reset** button to acknowledge and remove active alarms.

NOTE

Once the alarm is reset, the alarm icon will be hidden. However, the alarm condition may still be present.

NOTE

If faults reoccur, see the information in “Troubleshooting” (page 27) to correct the issue. If faults continue after troubleshooting, call GFS Technical Service for assistance (800-848-8738).

2. To remove the alarm from the list, tap the **Clear** button. Only inactive alarms can be cleared from the alarm list.

Alarm file

The Alarm File screen displays all historical alarms for any given day. The Converge control panel is capable of storing daily alarm files for a period of a year or longer, up to 650 alarm files.

The Alarm File screen enables the operator to send a copy of the alarm information to any of the email addresses listed.

1. To access the Alarm File screen, select **View > Alarm File** from the Home screen.



2. Review historical alarms,
3. Tap the **Open** button to display a dialog box where the operator can select any alarm file to view.

Troubleshooting

WARNING

Some of the troubleshooting procedures may require access to live circuitry. Dangerous accidental contact with line voltage may be possible. Only qualified service personnel should perform these procedures.

NOTE

If fault and warning codes recur after troubleshooting or you need additional assistance, contact Global Finishing Solutions at 800-848-8738 to speak to a Technical Service Representative.

Flame safety controller alarms

For each Burner System Fault, perform the remedy listed in Table 6 and the procedure below to reset the system faults:

1. Press the **System Stop** pushbutton.
2. Power down the system by turning the handle to open the main control panel door.
3. With the door open, manually turn the main power back on to power up the system.

WARNING

Be sure to don proper PPE while working inside the control panel.

4. Turn the flame safety relay (FSR) service switch on.
5. Take note of the error code on the flame safety controller and perform the troubleshooting procedure in Table 6.
6. Press  and  simultaneously to reset the fault on the flame safety controller.
7. *If applicable*: Reset the alarm on the HMI. (See “Alarms” (page 25).)

Table 6. Troubleshooting error codes on the flame safety controller

Error Code	Clear Text	Probable Cause	Remedy
Loc 2	No establishment of flame at the end of safety time	The gas input is too high or too low for a direct spark oven.	Adjust the start point gas flow.
		The spark is weak or non-existent.	Check that the igniter is not shorted to ground. There should be a 1/8-inch spark gap.
		The igniter is dirty.	Clean the igniter.
		There is no power to the ignition transformer.	1. Restore the power to the ignition transformer. 2. Verify the control circuit.
		There is an open circuit between the ignition transformer and the igniter.	Repair or replace the wiring to the igniter.
Loc 4	Extraneous light	Extraneous light during burner startup	Make sure that the oven doors are shut.

Error Code	Clear Text	Probable Cause	Remedy
Loc 7	Loss of flame	There is not enough gas flow. (The flame will look weak or unstable when the oven is at low fire.)	Check the startup settings and adjust accordingly to increase the gas flow.
		The airflow setting is incorrect. (The flame will look weak or unstable when the oven is at low fire.)	Check the air pressure drop across the burner and adjust as necessary.
Loc 10	Error not reliable (application), internal error	Wiring error or internal error, output contacts, other faults	Check all control wiring to the flame safety controller. If necessary, replace the controller.
Loc 14	POC error	Error valve closure control POC	<ol style="list-style-type: none"> 1. Check to make sure the main automatic gas valves have closed. 2. Check the operation of the POC switch and activation mechanism.
Loc 22	Safety loop open	High or low gas pressure switch is open	Check the high and low gas pressure switches. Inspect and reset as needed.
		High temperature limit exceeded	Turn off the burner and allow the oven to cool. Then complete Step 1 to reset the alarms on the HMI and flame safety controller.
Loc 60	Analog power source 4...20 mA, I <4 mA	Wire breakage	Check parameter setting and reset if needed.
Loc 83	Faulty PWM fan	<ul style="list-style-type: none"> • PWM fan does not reach the target speed within the preset period of time • After reaching the target speed, the PWM fan leaves the tolerance band again (parameter 650) for a time exceeding the tolerance time speed deviation (parameter 660) 	<ol style="list-style-type: none"> 1. Check wiring between the flame safety controller and the burner. 2. Make sure wiring is not routed near an electrical noise source. 3. Check for loose or open wiring. 4. Review and adjust the parameters in the flame safety controller.
Loc 139	No program module detected	No program module plugged in	Check the program module of the flame safety controller is seated correctly in the main controller base. If the error persists, the program module is either damaged or defective. Consult the Siemens LME7 burner control manual and call GFS Technical Service for assistance (800-848-8738).
Loc 206	AZL2... incompatible	Use the latest version	The program module of the flame safety controller has been replaced with an incompatible module. Consult the Siemens LME7 burner control manual and call GFS Technical Service for assistance (800-848-8738).
Loc 225	Faulty PWM fan	<ul style="list-style-type: none"> • Fan speed dropped below the minimum prepurge PWM (parameter 675.00) after reaching the prepurge speed • After reaching the ignition load speed, the maximum ignition load PWM (parameter 675.01) was exceeded 	<ol style="list-style-type: none"> 1. Check wiring between the flame safety controller and the burner. 2. Make sure wiring is not routed near an electrical noise source. 3. Check for loose or open wiring. 4. Check to make sure the PWM motor operates smoothly.

HMI alarms

Table 7. Troubleshooting alarm codes on the Converge HMI

Error Code	Fault & Warning	Remedy
#40	"tagname" A to D converter failure	Indicates that the analog to digital converter in the loop or limit control indicated by "tagname" has failed. Return to factory for repair or replace. NOTE If the Converge control panel is running a ramp/soak program when this alarm occurs, the program will be terminated if it occurs on either loop 1 or loop 2. If the alarm occurs on loop 3, the program will continue operation.
#26	Auto tune failed for "tagname".	Indicates that auto tune was unable to execute properly for the loop control indicated by "tagname". Verify that PB >0 and TI>0 before starting auto tune. Try manual tuning instead of auto tuning if the process has a very slow response.
#30	"tagname" cold junction failure	Indicates that the cold junction compensation in the loop or limit control indicated by "tagname" has failed. Return to factory for repair or replace.
	Communications error with "tagname". Check cable.	Communication error occurred between the Converge base unit and installed PCM/HLM indicated by "tagname". Verify that the PCM/HLM is properly installed in the base unit. Replace PCM/HLM card.
	Data file error. SD card full or missing.	Indicates that data logging could not be started or has been stopped due to an issue in accessing the SD memory card. This will occur if the memory card does not have any remaining memory space available or the maximum number of files has been reached in the data log directory. Use the USB file utilities or FTP to backup (copy) and delete data files from the Converge control panel in order to free up memory. Verify that an SD card is properly inserted into the Converge control panel. Replace SD card.
#29	"tagname" EEPROM failure	Indicates that the memory in the loop or limit control indicated by "tagname" has failed. Return to factory for repair or replace.
	Email Error! Check cable or server down.	Indicates that the Converge control panel was unable to send an alarm message through the mail server. Verify that the control panel is properly connected to the network and that the email settings and addresses are valid.
	FTP! Check cable or server down.	Indicates that the FTP back-up attempt of the data files failed. Verify that the Converge control panel is properly connected to the network and that the FTP settings are valid. NOTE If the control panel is not connected to a network, disable the FTP data back-up to prevent this alarm from occurring.
	Memory Error Please check SD card.	Indicates that the SD card cannot be accessed when checking available memory space. Verify that an SD card is properly inserted into the Converge control panel. Replace SD card.
	NTP Ping Failed. Check Cable.	Indicates that the control panel was unable to synchronize its clock with the selected time server. Verify that the Converge control panel is properly connected to the network and the selected time server is accessible. NOTE If the control panel is not connected to a network, disable the NTS clock to prevent this alarm from occurring.

Error Code	Fault & Warning	Remedy
#4	"tagname" outputs 1 and 2 incorrectly configured.	Indicates that the control loop configuration for the loop control indicated by "tagname" is not valid and must be corrected to clear the alarm. Check and correct setup values of output 2, PB, TI and output 1. If output 2 is required for cooling control, the control should use PID mode (PB > 0, TI > 0) and output 1 should use reverse mode (heat action), otherwise, don't use output 2 for cooling control.
	Program run error. "Loop 1" and "Loop 2" are not synchronized.	<p>Alarm applies to dual and triple loop Converge systems only and indicates that the running program (in each loop control) is operating with a difference of more than 1 minute between the programmed steps.</p> <p>NOTE This alarm does not affect program operation. In order to clear the alarm, the program will have to be stopped. If the alarm will not clear, but the program indicates it is off, select "Stop" from the Program menu and then try to clear the alarm again.</p> <p>The timing accuracy of the Converge loop controls is +30 seconds per month. This may cause one loop control to execute the program slightly faster than the other. For programs with long term operation, weeks or months, one loop may get significantly ahead of the other causing it to begin its next ramp or soak step ahead of the other affecting product or test results. Verify that the program end set point configuration for each loop is set to the same function.</p> <p>Verify that the event input functions (if used) are configured for the same function when program control functions are used.</p>
	SD card damaged or missing.	Indicates that the SD card cannot be accessed for USB file transfer. Verify that an SD card is properly inserted into the control panel. Replace SD card.
	SD card filled. Please use USB file transfer.	Indicates that a file was unable to be written due to lack of available free space on the memory card. Use the USB file utilities or FTP to backup (copy) and delete alarm, audit and data files from the Converge control panel in order to free up memory. Can also occur if the SD card is missing/not properly inserted.
	"tagname" sensor break	<p>Check sensor wiring for the loop or limit control indicated by "tagname". Verify lead connections. If sensor requires power, verify power to sensor.</p> <p>NOTE If the Converge control panel is running a ramp/soak program when this alarm occurs, the program will be terminated if it occurs on either loop 1 or loop 2. If the alarm occurs on loop 3, the program will continue operation.</p>