ACCUREX™

Reference Guide for Furnace Controller

Please read and save these instructions for future reference. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with these instructions will result in voiding of the product warranty and may result in personal injury and/or property damage.

IGF v1.03/1.04
Version Date: 3/1/19 & 11/30/21

Introduction

Program Features

The furnace controller offers improved control through easy monitoring and adjustment of furnace parameters by way of a lighted graphical display and a push-button keypad.

Pre-Programmed Operating Sequences

The controller has been pre-programmed to offer multiple control sequences to provide tempered air. Factory default settings allow for easy setup and commissioning. The sequence parameters are fully adjustable. Refer to the Sequence of Operation beginning on page 2 for details.

Alarm Management

The furnace controller will monitor the furnace operations for alarm conditions. Upon detecting an alarm, the controller will record the alarm description, time, date, available temperatures, and furnace status for user review. A digital output is reserved for remote alarm indication.

WARNING
Electrical shock hazard. Can cause personal injury or equipment damage. Service must be performed only by personnel that are knowledgeable in the operation of the equipment being controlled.

Table of Contents

Sequence of Operation

The furnace controller can be configured for 4:1, 8:1, 12:1, and 8-stage furnace applications. Each application utilizes similar technologies for heat modulation. All set points, lockouts and delays are user adjustable via the keypad display.

General Operation

FURNACE START COMMAND: The furnace controller requires a digital input to enable operation. The furnace can then be commanded on or off by this digital input.
- Pre-Purge
- Combustion Fan Starts
- Ignition Controller begins trials of ignition after 15 second delay.

FURNACE STOP COMMAND (OR DE-ENERGIZED):
- Main furnace and all slave furnaces shut down.

Set Point Control

Supply air discharge temperature control set point can be configured as constant, or can be reset by outside air temperature.

- **Outdoor Air Temperature Reset Function:** The outdoor air reset function allows the controller to monitor the outdoor air temperature and reset the supply air discharge temperature set point based upon the outdoor air reset function.
- **Room Override:** The room override function allows the user to bump up the supply air discharge set point by 20 degrees (adj.) when a thermostat in the space calls for additional heat.
- **External Signal Reference:** This function allows the supply air discharge temperature to be reset from the space by using either a 2-10v signal or a 4-20mA signal. A 2v or 4mA corresponds to a 60°F discharge temp and 10v or 20mA corresponds to 100°F discharge temp.

Heating

The furnace is controlled to maintain the supply temperature set point. The heating will be locked out when the outside air temperature is above the heating lockout (60°F adj.).

- **Indirect Gas Furnace:** Furnace controller will modulate or stage the indirect gas furnace to maintain the supply temperature set point.

### Initial Start-Up/Commissioning

The controller contains a furnace commissioning sequence to assist with unit startup. This sequence can be found by going to the Commissioning screen in overrides menu.

More information can be found in the Service Menu section of this manual.

Modulating Controller Overview

24 VAC to Controller — G
G0 — J1
V bat

Inlet Air Sensor — U1
Supply Air Discharge Sensor — U2
External Reference Signal — U3
GND
Call for Heat — U4
Override Switch — U5
Main Gas Valve — U6 — J2
GND
Low Speed Fan Proving Pressure Switch — U7
High Speed Fan Proving Pressure Switch — U8
Ignition Controller Alarm — U9
Modulating Gas Valve — U10
GND

J7

ID1
ID2
GND — J8
Y1
Y2
GND
+5 VREF
GND — J9
+V dc

NFC))

CAREL
c.pco

NO1 — J10
C1/2
NO2
NO3
C3/4/5 — J11
NO4
C3/4/5
NO5

+Vterm
J3 Disp.   Tx/Rx GND
J4 FBus   Tx/Rx GND
J5 CAN   L H GND

Combustion Fan
24 VAC from HLC
Ignition Controller
Furnace 2 / Stage 1
24 VAC from HLC
Furnace 2 / Stage 1
24 VAC from HLC
Furnace 3

NO6 — J12
NC6
C6

Alarm Output
24 VAC from HLC

Staged Controller Overview

24 VAC to Controller — G
G0 — J1
V bat

Inlet Air Sensor — U1
Supply Air Discharge Sensor — U2
External Reference Signal — U3
GND
Call for Heat — U4
Override Switch — U5
Main Gas Valve — U6 — J2
GND
Main Gas Valve 2 — U7
Proving Proving Pressure Switch — U8
U9
U10
GND

J7

ID1
ID2
GND — J8
Y1
Y2
GND
+5 VREF
GND — J9
+V dc

NFC))

CAREL
c.pco

NO1 — J10
C1/2
NO2
NO3
C3/4/5 — J11
NO4
C3/4/5
NO5

+Vterm
J3 Disp.   Tx/Rx GND
J4 FBus   Tx/Rx GND
J5 CAN   L H GND

Combustion Fan
24 VAC from HLC
Small Section - Low Fire
Small Section - High Fire
24 VAC from HLC
Large Section - Low Fire
Large Section - High Fire

NO6 — J12
NC6
C6

Alarm Output
24 VAC from HLC

Display Use

The furnace controller is located on the control panel of the furnace. The face of the controller has six keys, allowing the user to view furnace conditions and alter parameters. The furnace controller is pre-programmed with easy to use menus. To change the display contrast, hold the ⏎ Enter and ↺ Escape button while pressing the ⬆ Up and ⬇ Down arrows.

Keypad Description

⚠	Alarm	Button will blink red, indicating an alarm condition. Press to review current alarms. To review previous alarms, access the DATA LOGGER through the main menu.
⬇	Down Arrow	The arrow keys allow the user to scroll through different screens and adjust parameters.
⬆	Up Arrow	
⏎	Enter	A. In screens with adjustable parameters, pressing the Enter key moves the cursor from the upper left corner of the screen to the parameter. The arrow keys can then be used to adjust the parameter. B. To move to the next parameter on the same screen, press the Enter button. C. To save the change, press the Enter button until the cursor moves back to the upper left corner of the screen.
↺	Escape	Allows the user to exit the current menu, jumping to the Main Menu.
◎	Program	Pressing the Prg (Program) button allows the user to enter the Main Program Menu. Refer to pages 10 and 11 for Main Program Menu description.

Example of Parameter Adjustment

Supply air low limit
Alarm when supply is below: 35.0° F Alarm delay: 300s
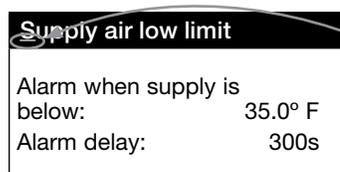
The cursor always begins in the upper left corner of the display and will be blinking. Press the ⏎ key to move the cursor down for parameter adjustment.

Supply air low limit
Alarm when supply is below: 32.0° F Alarm delay: 300s
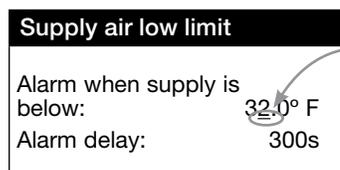
Once the cursor has reached the desired parameter, press the ⬇ ⬆ keys to adjust the value.

Supply air low limit
Alarm when supply is below: 32.0° F Alarm delay: 300s
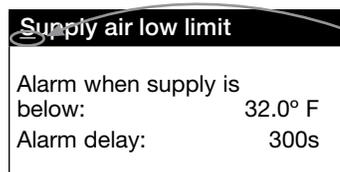
When satisfied with the adjustment, press the ⏎ key to save the parameter. When finished, make certain the cursor is in the upper left corner. If the cursor is not in the upper left corner, the changes will not be saved. The cursor must be in the upper left corner to enable screen advancement.

If an alarm occurs, the ⚠ button will glow red on the controller and the remote display (if installed).

```
Alarms
Press DOWN to review
current alarm(s).
          Press Alarm for 3s
          to reset all alarms
Press ENTER for Log.
```

To view alarm, press the ⚠ button once. This will display the most recent alarm. Press the ⚠ button again to reset the alarm. If the alarm cannot be reset, the cause of the alarm has not been fixed. Press the ⬇ ⬆ buttons to view any additional occurring alarms.

```
Alarms               01/01
AL*12s        15:06 07/08/15
                    13:37:45
Comb Fan Not Proved
Furnace Status:        0.00
Detail Status:         0.00
```

```
NO ALARMS

   📄        Press ENTER
             to DATA LOGGER
```

To view all saved alarms, press the ⏎ button to enter the DATA LOGGER. For more information, see the Data Logger menu.

```
Data logger      Record:01
AL*12s              07/08/15
                    13:37:45
Comb Fan Not Proved
Event:           Start
Furnace Status:        0.00
Detail Status:         0.00
```

```
Data logger      Record:01
AL*12s              10/07/15
Start               13:37:45
Supply Temp:        66.5°F
Inlet Temp:         61.4°F
Heat%:               0.0%
```

This screen shows additional operating points the furnace was experiencing at the time of each alarm. This can be very beneficial when trying to troubleshoot the furnace.

Any previous alarms and additional alarm details can be viewed in the data logger menu. While any alarm is on the screen in the data logger menu, press the ⏎ button to see the additional data that was logged at the time of the alarm.

General Alarms		
Furn Alarm - Check Log	Furnace Alarm - Check Alarm Log	Alarm Only
Furn Error - No Feedback	No feedback from main gas valve or pressure switches	Alarm & Shutdown
High Temp. Alarm	Pressure switches have dropped out and a relay monitoring the high limit has grounded the Inlet Air Sensor. Check for high limit trip.	Alarm & Shutdown
IG Furnace Max Retry	Furnace has reached maximum number of automatic error resets.	Alarm & 1 Hour (adj.) Lockout
Supply Air Low Temp	Supply Air Low Temperature Alarm	Alarm Only
Inlet Sensor (U1) Err	Inlet Temperature Sensor (U1) Failure	Alarm & Lockout
Supply Sensor (U2) Err	Supply Temperature Sensor (U2) Failure	Alarm & Lockout
Modulating Furnace Alarms		
High PSW with no call	High pressure switch closed without call for combustion fan	Alarm & Shutdown
High Speed PSW Fault	High speed pressure switch not proved	Alarm & Shutdown
Low PSW with no call	Low pressure switch closed without call for combustion fan	Alarm & Shutdown
Combustion Fan not Proved	Combustion fan not proved	Alarm & Shutdown
Combustion Fan Error	Possible fan thermal overload. Both pressure switches dropped out when the call for heat was maintained.	Alarm & Shutdown
No Flame 3 Tries	No flame after 3 trials for ignition - Also counts towards the IG Furnace Max Retry Alarm	Alarm & Shutdown
IC Alarm	Ignition controller alarm - Also counts towards the IG Furnace Max Retry Alarm	Alarm & Shutdown
8 Stage Furnace Alarms		
PSW with no call	Pressure switch closed without call for combustion fan	Alarm & Shutdown
Comb Fan not Proved	Combustion fan not proved	Alarm & Shutdown
No Flame 3 Tries SmMan	Small Manifold - no flame after 3 trials for ignition - Also counts towards the IG Furnace Max Retry Alarm	Alarm & Shutdown
No Flame 3 Tries LgMan	Large Manifold - no flame after 3 trials for ignition - Also counts towards the IG Furnace Max Retry Alarm	Alarm & Shutdown

Furnace Status	
0.00	Furnace Off
0.10	Pre-Purge
0.20	High Fire Start
0.30	Quick Comp Act
0.40	Furnace On
0.50	Override Active
0.60	Lockout Alarm
0.70	Off by Keypad
0.80	Off by Inlet Air Sensor
0.90	Off - Initial Powerup
Detail Status	
0.00	Furnace Off
0.10	Modulating Furnace Active
0.20	Stage Furnace Active
0.30	Modulation furnace w/slave stage 1
0.40	Modulation furnace w/slave stage 2
0.50	Modulation furnace w/slave stage 3
0.60	Modulation furnace w/slave stage 4

Menu Overview

Press ◎ to enter menus.

Quick Menu
- → Monitor
- → Setpoint
- → Information
- → On/Off

⏻ On/Off
- → Furnace On/Off

🔍 Monitor
- → Active Temps
- → Heating Status

Setpoint
- → Supply Temp Setpoint
- → Heating Lockout
- → Supply Low Limit
- → Room Temp Override

ℹ Information
- → Version Info
- → System Info
- → Work Hours
- → Blackout Info

🕐 Date/Time
- → Date/Time Change
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Input/Output
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- → Digital Inputs
- → Digital Outputs

🔧 Service
Settings
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- → Heater Control
- → G Heater Setup
- → G Forced Start
- → Slave Furnace Settings
- → Override Setup
- → Heat Delay
- → Properties
Initialization
- → Change Password
- → Initialization

📄 Alarms Logs
- → Alarm Logs

🚪 Logout
- → Logout

Main Menu Overview

The furnace controller will revert to the default main menu screen. This screen includes basic information on the configuration of the controller as well as a series of shortcuts in the bottom right corner. The shortcuts include Monitoring Menu "Monitor", Setpoint menu "Set", Info Menu "Info" and Furnace On/Off "On/Off". Scroll through the shortcuts by using the ⊕ ⊕ Up and Down keys. Enter the menu by pressing the ↵ Enter key.

Date	Day	Time

ACCUREX®

IGFv1.04 GM8VXX
STATUS LINE
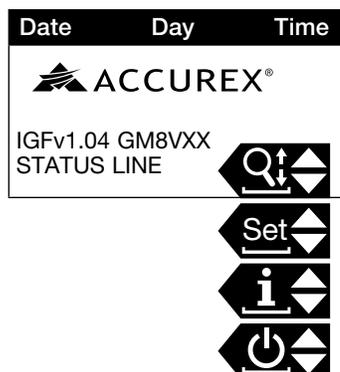
THE INITIAL MENU SCREEN DISPLAYS THE PROGRAM VERSION, CONFIGURATION CODE AND STATUS LINE. THE STATUS LINE DISPLAYS WHICH MODE THE FURNACE IS IN.

Possible modes include:
- Off by Keypad
- Off by IAS
- Furnace Off
- Pre-Purge

- High Fire Start
- Quick Comp Act
- Furnace On
- Override Enabled

Note: Scroll up and down on the main menu to access quick menu options. Options include: monitoring, set point, information and on/off.

Login

Insert password: 0000

Enter 0000 for USER

To enter the program menu, press the ◎ Program key at any time. To enter the menu at the User Level, enter 0000 as the password. For Service and Manufacturer passwords see those sections below. Once you are in the program menu, press the ↵ Enter key to enter the desired menu.

A. ⏻ On/Off

The **On/Off** menu allows the user to view the detailed On/Off status of the controller.

Furnace On/Off

ON
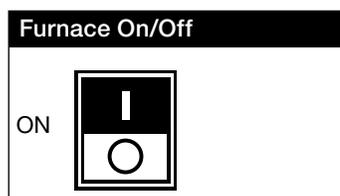
The furnace ships from the factory in a disabled state. To allow the furnace to operate, the controller must receive a call for heat command to the Universal Input U4.

Actual State: The controller may be in following On/Off states:
- a. Furnace On
- b. Furnace Off
- c. Off by IAS
- d. Off by Keypad

Change to (Switch Off/Switch On): Enables the user manually turn the furnace On/Off via display.

Note: Unit terminal **G and W1** must have 24 VAC power to enable the furnace.

B. 🔍 Monitor

The **On/Off** menu allows the user to view the detailed On/Off status of the controller.

Date	Day	Time
Supply Air:		70.0°F
Outside Air:		50.0°F
STATUS LINE		

THE SENSOR STATUS SCREEN DISPLAYS REAL TIME CONDITIONS FROM THE SENSORS LOCATED IN THE UNIT AND THE ROOM (IF INSTALLED).

Heating Status
Heater Control: 0%
Furnace Off
By Inlet air Sensor

HEAT AND REHEAT OPERATION IS DISPLAYED.

Heater Control displays the proportional percentage of the heater analog output.

Indirect Gas: The Heater Control % is proportional to the 0-10 VDC signal being sent to the indirect gas furnace controller, located in the indirect gas control center. The first stage is on at 1% Heater Control. The furnace will then modulate proportionally from minimum to maximum capacity.

    0% = 0 VDC – OFF
    1% = 0 VDC – MINIMUM TURNDOWN ENABLED
    1 - 100% = 0 - 10 VDC = FURNACE MODULATION

Possible Detailed Statuses Include:
    -Modulating Furnace
    -Staged Furnace
    -Mod Furn w-Slve Stge1
    -Mod Furn w-Slve Stge2
    -Mod Furn w-Slve Stge3
    -Mod Furn w-Slve Stge4

C. ⬚ Setpoint

The **Setpoint** menu allows the user to view and adjust temperature related parameters.

| Supply Temp Set Point	
Active Setpt:	70.0°F
Supply Temp:	70.0°F
Source: Local	70.0°F
Max:	100.0°F
Min:	60.0°F

THIS SCREEN DISPLAYS THE SUPPLY AIR TEMPERATURE SET POINT SCREEN PARAMETERS.

When operating, the furnace will control the heating to maintain the active supply temperature set point. The active set point will be determined by the set point source selection.

Possible Set Point Sources:

Local – The supply air discharge set point will be a constant value set from screen (default 70°F adj.).

Supply Temp Set Point	
Active Setpt:	55.0°F
Supply Temp:	55.0°F
Source: OA Reset	
Outside	Supply
55.0°F - - ->	70.0°F
65.0°F - - ->	55.0°F

OA-Reset -The controller monitors the outdoor air temperature and adjusts the desired supply temperature set point accordingly. For example, when the outdoor air is below 55°F, the controller will change the supply set point to 70°F. If the outdoor air is above 65°F, the controller will change the supply set point to 55°F. If the outdoor air temperature is between 55°F and 65°F, the supply set point changes according to the outdoor air reset function. A visual representation of the outdoor air reset function is shown below.

Outdoor Air Reset Function
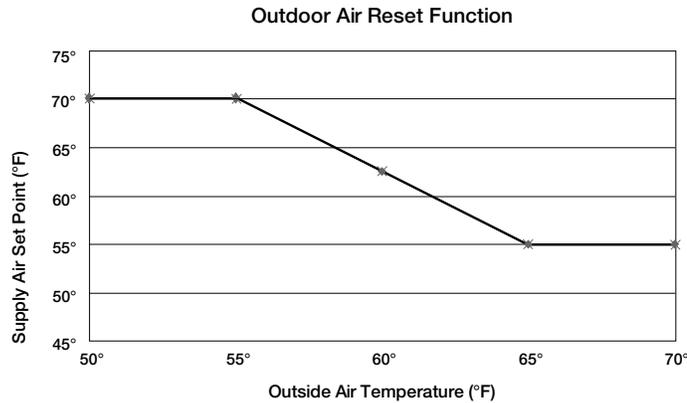
Supply Temp Set Point	
Active Setpt:	60.0°F
Supply Temp:	60.0°F
Source: External	
Max:	100.0°F
Min:	60.0°F

THIS SCREEN DISPLAYS THE EXTERNAL SIGNAL REFERENCE

This screen only appears if the External Signal Reference function is enabled in the controller.

The controller receives a 2-10vdc or a 4-20mA signal which changes the supply set point temperature. From factory the default is set to 60°F at 2vdc or 4mA, and changes proportionally up to 100°F at 10vdc or 20mA.

Supply Temp Set Point	
Active Setpt:	90.0°F
Supply Temp:	90.0°F
Source: Local	70.0°F
Max:	100.0°F
Min:	60.0°F

THIS SCREEN DISPLAYS THE ROOM TEMP OVERRIDE.

This screen only appears if the Room Override function is enabled in the controller.

The override will adjust the supply air discharge temp set point up by the set differential until the override is disabled. (ie.: Setpoint = 70°F. When Room Override is enabled with a 20°F override, the discharge setpoint becomes 90°F).

Room Temp Override	
Room Temp Diff	20.0°F

Heating Lockout

Lockout heating when outside
above: 60.0°F
Differential: 2.0°F

THIS SCREEN DISPLAYS THE HEATING LOCKOUT.

There is a built in hysteresis of 2°F which prevents the heating from short cycling. The hysteresis is similar to a dead-band above and below the lockout set point. (Example: If Lockout = 60°F, heating is locked out above 60°F and enabled below 58°F outside air temperature.)

Supply Air Low Limit

Alarm when supply is
below: 35.0°F
Alarm delay: 300s

THIS SCREEN DISPLAYS THE LOW SUPPLY AIR TEMPERATURE LIMIT.

If the unit supply air temperature falls below Supply Air Low Limit for a period of Alarm Delay, an alarm will be signaled. The purpose of the supply low limit is to protect the building and contents from cold supply air. It is NOT designed to protect the air handling furnace.

If the unit does not have chilled water (CW) or hot water (HW) coils, it should not need additional protection from freezing. If the unit does have CW or HW coils, field provided coil freeze protection may be necessary.

D. ℹ Information

The **Information** menu allows the user to view the current program in the controller.

Info

Accurex, LLC
Code: GSFXXX
SW Ver: 1.04   MM/DD/YY
OS: 4.8.003
Manual/IOM: 483844

THE INFORMATION MENU ALLOWS THE USER TO VIEW ALL PERTINENT INFORMATION ON THE CURRENT PROGRAM THAT IS IN THE CONTROLLER.

Code: The controller setup code determines functionality of program. When contacting the factory, please reference this code.

Ver: Displays the current program version and data code of the current program.

Manual: The manufacturer part number for the corresponding Installation, Operation and Maintenance (IOM) Manual.

OS: Indicates to the user which Operating System/Firmware has been installed on the controller.

Info

System Info
Board type: c.p CO mini
Board size: Basic
Board temp: 0°C
Ret mem writers: 81533
Main task:
    15 ms   66.7cycle/s

Info

Furnace Run Hours
Hours: 000000h

Info

Blackout info
Current time:
27/08/15   13:46:39
PowerOff time: 2.5.01
27/08/15   13:03:13
Length last time off:
   0Days   0Hrs   0min

E. ⊙ Date/Time

The **Clock/Scheduler** menu allows the user to view and alter the time and date.

ALLOWS THE USER TO ADJUST THE TIME AND DATE.

Set Date & Time

Day:	Monday
Date:	MM/DD/YY
Hour:	15:30

Timezone

GMT

Update timezone: NO

Setting the time zone gives the controller information allowing it to adjust the time for daylight savings time If you set the timezone, it will reset the time. So, be sure to go back and set it after setting the timezone.

F. ⇅ Input/Output

The **Input/Output** menu allows the user to quickly view the status of the controller inputs and outputs.

Analog Input

Inlet Air Temperature
Input U001:   74.9
Status: 10

To manually control I/O values, go to the **Service menu > Overrides**.

Similar screens appear for all controller inputs and outputs.

Your controller may not utilize all equipped of the inputs and outputs shown. See furnace wiring diagram for your specific configuration.

Probe Status Definitions	
Values	Definitions
10	No Error
0	Probe not in use
-1	Probe not connected*
-2	Probe short-circuited*
-3	Overflow**
-4	Underflow**
-5	Channel configuration error ie: number of channels out of range, channel direction or type out of range
-6	Channel busy, this error will occur when configuring the second channel of PT100 probe
-8	Internal error, this error will occur when the calculated scaling factor of the probes are not correct, usually happens when probe type is linked to variable, the fields Min and Max are left empty and the selected probe needs them
-9	Invalid probe, the error will occur when a channel does not support the configuration applied, usually happens when the probe type is linked to variable

Note: This field appears in every channel
  * Managed only by passive probes
 ** Managed only by active probes

G. ⚒ Service

The **Service** menu allows the user to access several sub-menus regarding controller information, controller overrides, operating hours, BMS configuration, I/O manual management and Probe Adjustment. To access the **Service Settings** menu, enter the service password (Default=1000) at the login screen.

G. ⚒ Service
a. Setting
a. Unit of Measure
b. Probe Adjustment
c. Change Password

The **Service Settings** menu allows the user to change the default Service Password (1000), save and restore default parameters, and adjust probe values.

Info
Unit of Measure
USA

The Unit of Measure selection allows the user to easily change the units of temperature and pressure values that are used in the program. The different pre-determined locations yield the following settings:

Canada:	Deg. C
UK:	Deg. F
USA:	Deg. F
SI:	Deg. C

Analog Input
Inlet Air Temperature
Input U1
Offset: 0.0°F
Value: 75.2°F

THE PROBE ADJUSTMENT MENU ALLOWS THE USER TO CALIBRATE SENSOR PROBES WITH AN OFFSET VALUE.

Similar screens are available for remaining sensor probes.

Change Password
🔑   User: 0000
Service: 1000

THIS SCREEN ALLOWS THE USER TO CHANGE THE SERVICE LEVEL PASSWORD (PW1)

G. ⚒ Service
b. Commissioning
a. Furnace Commissioning

The **Commissioning** menu allows the user to go through a pre-programmed step-by-step process to set up different unit functions in the field. To successfully commission the unit, additional tools will be required to make adjustments. To access the Commissioning sub-menu, enter the service password **(Default = 1000)**.

Furnace Commissioning
Enter Furnace
Commissioning?
No

THIS SCREEN ALLOWS THE USER TO ENTER IG FURNACE COMMISSIONING

Entering the furnace commissioning menu will step the user through the furnace start-up.

G. ⚙ Service

c. Override
  a. Analog Inputs
  b. Digital Inputs
  c. Relay Outputs
  d. Analog Outputs
  e. Control Loops

The **Overrides** menu is for start-up, commissioning and troubleshooting. This menu allows the user to override the control loops and specific inputs and outputs. *Caution:* Overriding components and I/O can be dangerous to the equipment. Always cycle power to the furnace when finished with the override.

Analog Input

Inlet Air Temperature	
Input U001:	74.9
Manual Control:	OFF
Manual Position:	0.0

THIS SCREEN IS AN EXAMPLE OF A MANUALLY MANAGED TEMPERATURE ANALOG INPUT.

To manually control an analog input, change Manual Control to ON. Move cursor to Manual position and alter value. The altered value will be displayed below.

Similar screens exist for the remaining I/O. To resume normal operation, simply cycle power to the furnace. Contact the factory for more details.

Control Loop Overrides

Unit must be on and Call for Heat must be enabled.
To resume normal operation, cycle unit power.

To manually override a control loop, the furnace must be ON. In each respective screen, change the control from AUTO to MANUAL.

To resume normal operation after overriding the controller, simply cycle power to the furnace.

** On startup, user may need jumper R to W1 to allow the Call for Heat connection to be made.

Heating Override

Heating Control:	Auto
Heating %:	0.0
Furnace Status:	
Furnace off	

THIS SCREEN ALLOWS THE USER TO OVERRIDE THE HEATING OPERATION.

When the Heating Control is in the MANUAL mode, use the arrow buttons to vary the heating output.

Indirect Gas: The Heater Control % is proportional to the 0-10 VDC signal being sent to the indirect gas furnace controller, located in the indirect gas control center. The first stage is on at 1% Heater Control. The furnace will then modulate proportionally from minimum to maximum capacity. The furnace is subject to minimum On/Off times and Heating Lockouts.
  0% = 0 VDC – OFF
  1% = 0 VDC – MINIMUM TURNDOWN ENABLED
  1 - 100% = 0 - 10 VDC = FURNACE MODULATION

G. ⚙ Service

d. Import/Export
  a. Parameter
  b. Alarm

Import/Export

Params Import/Export
Import/Export:
EXPORT
Memory type:
USB
| File name: | EXPORT_01 |
| Confirm: | NO |

The Import/Export parameters menu allows users to export all adjustable parameters from the controller to a file. This file can be saved and used as a backup if the controller would ever need replacing.

S Logs

Log Export
Memory type:

INTERNAL FLASH MEMORY

| Export Logs: | NO |

Running this log export will generate three separate logs in the controller: "General Operation Log", "Alarm Log", and "Controller Info." To access these logs after exporting them, a laptop and USB to Micro USB cable is required. Simply connect the laptop to the USB port on the front of the controller and copy the log files to your laptop.

H. 🏭 Manufacturer
a. Configuration

The configuration code menu allows the user to change the setup code for the furnace. However, code changes are to be done under factory advice only! To access the **Manufacturer** menu, enter the service password (Default=1000) at the login screen.

Furnace Config Code

Select DDC configuration code here.
Code: GS8XXX
Save Config: No

THIS SCREEN DISPLAYS AND ALLOWS ADJUSTMENT OF THE CONFIGURATION CODE.

This code is set from the factory to operate the components selected with the furnace. When troubleshooting, refer to the wiring diagram sent with the furnace (located on the control center door) to verify the Configuration Code is correct. The code will be listed on the wiring diagram. If changes to the setup code are required, save the configuration by changing Save Config to YES.

H. 🏭 Manufacturer
b. I/O Configuration

The **I/O Configuration** menu allows adjustment of some controller inputs and outputs. This menu is similar to the **Probe Adjustment** menu, except that it additionally allows adjustment of the factory default 'normal' states of the digital inputs and the direction of the analog outputs.

Universal I/O

Manual	Ch: 01
Variable:	0.0
Direction:	Input
Type:	0-1v
Status:	10
Min: 0.0	Max: 100.0

This is an example of an analog input configuration screen.

Similar configuration screens appear for the remaining I/O.

H. 🏭 Manufacturer
c. Factory Settings

The **Factory Settings** menu allows adjustment of parameters that are critical for proper furnace operation. Adjustment of these parameters is only recommended with factory guidance.

Heater Control

Band:	60.0°F
Derivative:	0s
Integral:	300s
Off Delay:	60s
Deadband:	3.0°F

THIS SCREEN ALLOWS ADJUSTMENT OF THE HEATING PI CONTROL LOOP.

This screen only appears if standalone furnace control is being provided from the controller.

The controller utilizes a PI loop control for heating. This allows for less sporadic changes in supply temperature, resulting in a smooth reaction to changing conditions. To speed up reaction time, decrease the integration time. For slower reaction time, increase the integration time. When making adjustments, make them in small increments and test the system to determine if the new setting is adequate prior to further adjustment. The band is the range that the integration will occur between. The off delay allows the heating output to temporarily overshoot the set point without dropping the call for heat to prevent unwanted cycling. The dead band prevents the PID loop from shutting off the heat until the supply air discharge temp is outside the specified temp range.

IG Heater Setup

High Speed StPt:	42.0%
High Speed Diff:	5.0%
Mod Valve Out:	Linear
High Max Temp:	125°F
High Diff Temp:	40°F

THIS SCREEN ALLOWS ADJUSTMENT OF THE INDIRECT GAS FURNACE.

High speed set point is the heating percentage which sends the combustion fan to high speed. High speed differential is the heating percentage below the high speed set point which switches the combustion fan back to low speed. Mod Valve Out is linear or scaled based on the modulating gas value used. High max temperature is the temperature the supply discharge must exceed before the high discharge temperature alarm is generated. High differential temperature is the temperature the supply discharge must be reduced to for the high discharge temperature alarm to reset.

Caution: Adjusting these settings incorrectly can significantly impair heater performance and reduce heater life. Consult factory before adjusting.

IG Quick Comp	
Quick Comp:	On
Temp Diff:	3.0F
Diff Time:	60s
Max QC time:	600s

THIS SCREEN ALLOWS ADJUSTMENT OF THE INDIRECT GAS FURNACE.

This screen only appears if standalone furnace control is provided from the controller.

Quick compensation (Quick Comp) allows a separate control loop to quickly and accurately ramp the furnace up to the desired discharge temp without overshooting. Once the furnace tubes are warmed up and the discharge temperature has stabilized, the control switches back to the normal furnace control loop. Adjustable parameters include control loop temp differential, required time in temp differential and max run time of quick Quick Comp.

IG Quick Comp	
QC Heat Band:	40.0°F
QC Integration:	210s
QC Derivative:	10s
QC Deadband:	5°F
QC ReturnDiff:	2.0°F
QC ReturnTime:	45s

THIS SCREEN ALLOWS ADJUSTMENT OF THE INDIRECT GAS FURNACE.

This screen only appears if standalone furnace control is being provided from the controller and Quick Comp is enabled.

The Quick Comp uses a PID control loop. The heat band is the proportional characteristic of the loop. The greater the heat band, the less time that the furnace is at 100% heating in order to achieve the temperature set point. Decreasing the heat band may result in the furnace overshooting the discharge set point on initial start up. The integration and derivative adjust the proportional band with respect to time and temperature. To decrease the reaction time of the loop, increase the integration and/or derivative time. To increase the reaction time of the loop, decrease the integration and/or derivative time. The dead band prevents the PID loop from shutting off the heat until the supply air discharge temp is outside the specified temp range.

IG Staged Furnaces 1	
Stage Up Setpts	
Stge up heat%:	95%
Diff below setpt:	3°F
Stage up delay:	30s
Heat % reset lo:	50%

IG Staged Furnaces 2	
Stage Up Setpts	
Stge dn heat%:	20%
Diff above setpt:	3°F
Stage dn delay:	20s
Heat % reset hi:	50%

THIS SCREEN ALLOWS ADJUSTMENT OF THE STAGED INDIRECT GAS FURNACE.

This screen only appears if a staged indirect gas furnace was provided with the unit.

Stge up/dn heat% is the percentage at which the furnace must be firing at in order for the next stage of the staged furnace(s) to turn on. Differential above/below set point is the amount the furnace must be away from setpt before the next stage can turn on.

Stage up/dn delay is the amount of time the furnace remains at the current state before a stage is started/shut off. Heat percent reset hi/lo is the modulation percent that the furnace is reset to after turning a stage on or off.

Caution: Adjusting these settings incorrectly can significantly impair heater performance and reduce heater life. Consult factory before adjusting.

Override Setup	
OI_05 Switch Config	
Override Type:	
IAS OVR	

THIS SCREEN ALLOWS ADJUSTMENT OF UNIVERSAL INPUT 5.

This screen only appears if standalone control is being provided from the controller

The Override type can be selected to be Inlet Air Sensor Override (IAS OVR), Room Override (RM OVR), or IAS and RM Override. IAS Override allows the unit to operate when the outdoor intake air temperature is above the Inlet Air temp setting 60°F (adj). The RM Override bumps the supply air discharge set point by the present differential 20°F (adj).allowed to stage down.

Heat Delay	
Time delay between heat cycles.	
Delay:	60s

THIS SCREEN ALLOWS ADJUSTMENT OF FURNACE DELAY.

The time delay between heat cycles helps reduce furnace cycling on mild weather days as well as ensures the ignition controller has adequate time to reset between heat cycles.

```
┌─────────────────────────────┐
│        Alarm Output         │
├─────────────────────────────┤
│ Alarm output NO6            │
│ energized for:              │
│                             │
│ ALL ALARMS                  │
│                             │
│                             │
└─────────────────────────────┘
```

THIS SCREEN ALLOWS ADJUSTMENT OF THE SUPPLY AIR LOW LIMIT ALARM PARAMETERS.

Allows the user to set the alarm temperature, delay, and hysteresis.

```
┌─────────────────────────────┐
│    Supply Temp Low Limit    │
├─────────────────────────────┤
│ Alarm when supply is        │
│ below:              35.0°F   │
│                             │
│ Alarm Delay:          300s   │
│ Hysteresis:          1.0°F   │
└─────────────────────────────┘
```

THIS SCREEN ALLOWS ADJUSTMENT OF THE ALARM OUTPUT.

Allows the alarm output to close for all alarms or for the supply air low limit alarm only.

H. [icon] Manufacturer
d. Initialization

The Initialization Menu allows the user to save and restore the controllers default parameters. The controller can be restored with either the Manufacturer's default parameters from shipment, or an unconfigured factory default.

Change Password

[key icon]

User:	0000
Service:	1000
Manufact:	1000

THIS SCREEN ALLOWS THE USER TO CHANGE THE USER, SERVICE, OR MANUFACTURER PASSWORDS.

Initialization

Alarm initialization

Delete alarm logs?:	No
Reset counter?:	No
Enable Button Beep?	Yes

THIS SCREEN ALLOWS THE USER TO ERASE ALL PREVIOUSLY LOGGED ALARMS.

Deleting the alarm log will result in no alarm history on the controller. The user should not erase these alarms unless instructed by the factory.

Initialization

DEFAULT INSTALLATION
Wipe retain mem:	No
Wipe NVRAM mem:	No
Wipe both mem:	No

THIS SCREEN INSTRUCTS THE USER HOW TO RESTORE THE CONTROLLER BACK TO FACTORY DEFAULT PARAMETERS.

Restoring to the original default parameters will result in a non-customized controller. The user should not restore to these settings unless instructed by the factory.

I. [icon] Alarms Log

The **Alarms Log** menu allows the user to view additional operating points the furnace was experiencing at the time of the alarm.

Data logger   Record:01

AL*21	10/15/15
	13:25:47
Inlet Sensor (U1) Err	
Event:	Stop
Furnace Status:	0.00
Detail Status:	0.00

THIS SCREEN ALLOW THE USER TO VIEW ALARMS THAT HAVE BEEN LOGGED.

In the Data Logger menu, there is additional alarm data available for viewing.

While any alarm is on the screen in the data logger menu, press the [enter] button to see the additional data that was logged at the time of the alarm. This can be very beneficial when trying to troubleshoot a furnace problem.

J. [icon] Logout

The **Logout** menu allows the user to exit of the current level of access and return to main menu.


Logout

You are logged as manufacturer.

Press ENTER to log out.

Troubleshooting

Display is hard to read.	Furnace Controller Display: Hold ⟲ ESC and ↵ ENTER at the same time, while pressing ⬇ DOWN or ⬆ UP to adjust display contrast. Remote Display: Hold ⚠ ALARM, ◎ PRG, and ⟲ ESC at the same time, while pressing ⬇ DOWN or ⬆ UP to adjust display contrast.
Remote display panel displays "NO LINK" or is blank.	Hold ⬇ DOWN, ⬆ UP and ↵ ENTER for 4 seconds. Set the display address to 32. The display requires a standard 24 AWG six conductor phone cable connected to the furnace controller.
Red alarm button is flashing.	Press the ⚠ ALARM button to review and clear furnace alarms. Enter the DATA LOGGER menu to view previous alarms.
Controller resets itself or is not on.	Check the supply voltage to the controller at terminals G-G0. The board requires 24VAC. Check the 24VAC transformer in the furnace control center.
Menus are locked with a password.	The factory default Manufacturer Password = 1000. The factory default Service Password = 1000.
Temperature sensor failure.	Check the analog input terminal block (labeled terminals U1, U2, U3, etc) for loose wires. Disconnect temperature sensors to check sensor resistance.

NTC Temperature Sensor Chart
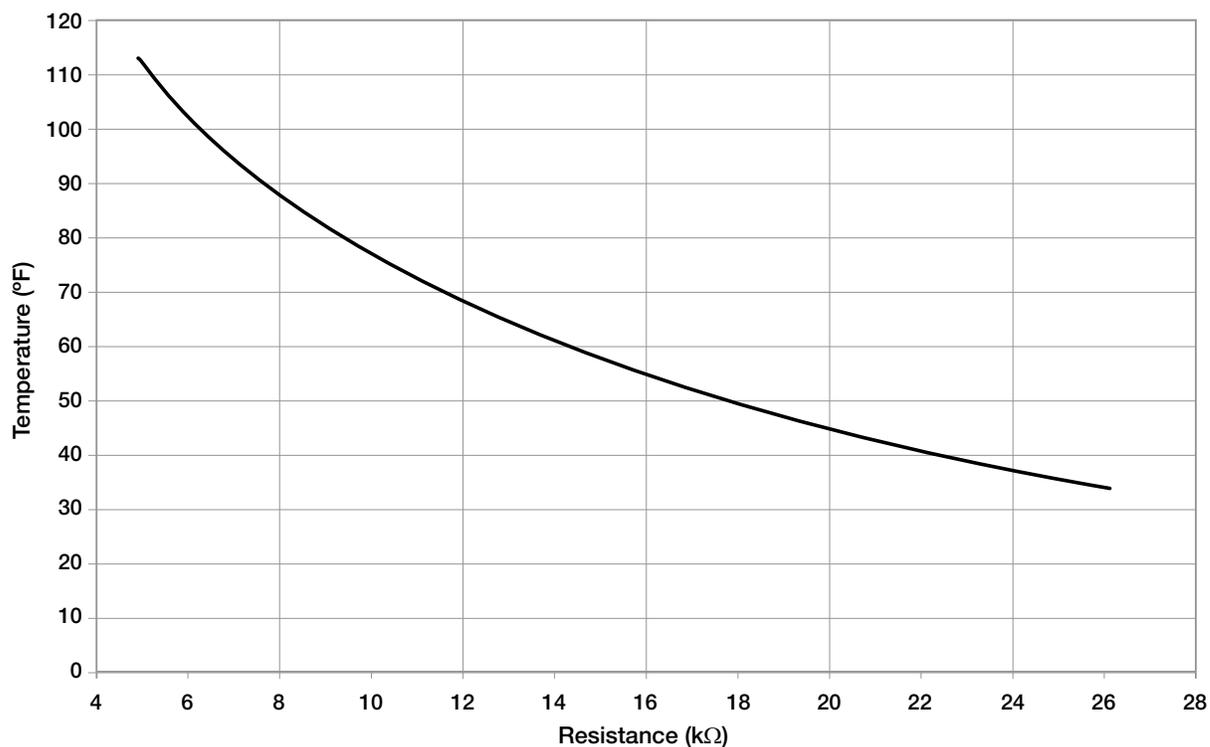
Maintenance Log

Date _____Time _____ AM/PM

Notes:_____

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Date _____Time _____ AM/PM

Notes:_____

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Date _____Time _____ AM/PM

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Date _____Time _____ AM/PM

Notes:_____

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