

Trinity Lx

Model Numbers: Lx150-400

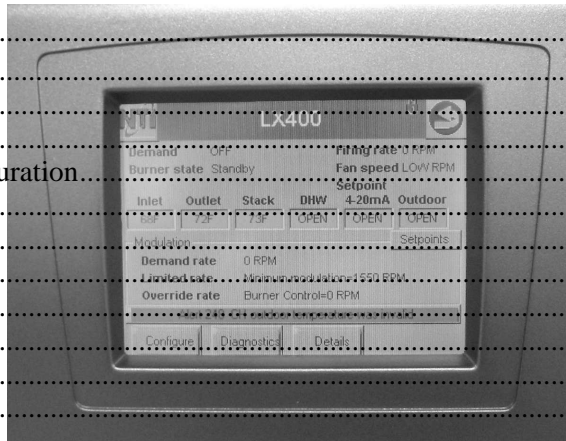
Version Date: 2009-06-29



APPENDIX A – CONTROLLER AND TOUCHSCREEN DISPLAY INSTRUCTIONS FOR TRINITY LX SERIES

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HAZARD SYMBOLS AND DEFINITIONS



Danger Sign: Indicates a hazardous situation which, if not avoided, will result in serious injury or death.



Warning Sign: Indicates a hazardous situation which, if not avoided, could result in serious injury or death.



Caution Sign plus Safety Alert Symbol: Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



Caution Sign without Safety Alert Symbol: Indicates a hazardous situation which, if not avoided, could result in property damage.



Notice Sign: Indicates a hazardous situation which, if not avoided, could result in property damage.



This appliance must be installed by a licensed and trained Heating Technician or the **Warranty is Void**. Failure to properly install this unit may result in property damage, serious injury to occupants, or possibly death.

1.0 INTRODUCTION

Although the Trinity Lx can be used as Boiler or a Water Heater, the installation, operation, and maintenance requirements of this appliance will differ depending on which application is chosen. It is important to note that controller factory settings are not configured for a particular application. Since most settings are installation dependent, parameters must be field adjusted to suit not only the application (Boiler or Water Heater), but also the system requirements. See examples below of settings to be considered or adjusted:

Boiler Example: Factory setting for CH setpoint is 180°F [82°C]. The central heat water temperature may need to be adjusted to 120°F [49°C] for central heat systems using "low temperature water" (e.g. in-floor radiant heat).

Water Heater Example: Factory setting for DHW setpoint is 180°F [82°C]. The domestic hot water temperature should be reduced to 140°F [60°C] only for applications using "low temperature water" (e.g. bathing).

It is the responsibility of the installer, a licensed qualified heating technician, to configure and commission the unit and adjust any parameters required to comply with the application and satisfy the system requirements. The Quick Reference Tables below list the minimum parameters that need to be considered and/or adjusted before putting the unit into operation. Note that each table is application-specific as setting adjustments differ depending on whether the appliance is installed as a Boiler or a Water Heater:

Boiler Application Settings

Table 1-1 : Boiler Settings Quick Reference Table

Configuration Group	Setting Considerations	Reference
Central Heat	Ensure the <u>sum</u> of the CH setpoint and the CH off hysteresis do not exceed 200°F [93°C] or a "Lockout" condition may occur.	See Figure 4-3 and Table 4-2 on page 8
Outdoor Reset	This parameter affects the Central Heat setpoint. Factory setting "enabled". If factory supplied outdoor sensor is not connected, Alert 248 will display. Settings are installation dependent and adjustments should be made accordingly.	See Figure 4-4 and Table 4-3 on page 9
DHW	Ensure the <u>sum</u> of the DHW setpoint and the DHW off hysteresis do not exceed 200°F [93°C] or a "Lockout" condition may occur.	See Figure 4-6 and Table 4-4 on page(s) 10 & 11
High Limits	If higher water temperatures are required, 190-200°F [88-93°C], adjust limit response to avoid a "Lockout" condition. Boiler Applications only.	See Figure 4-11 and Table 4-9 on page 14

Water Heater Application Settings

Table 1-2 Water Heater Settings Quick Reference Table

Configuration Group	Setting Considerations	Reference
Central Heat	Not used for Water Heater Applications. No adjustments required.	See Figure 4-3 and Table 4-2 on page 8
Outdoor Reset	Not used for Water Heater Applications. "Disable" parameter to avoid nuisance faults.	See Figure 4-4 and Table 4-3 on page 9
DHW	Ensure the <u>sum</u> of the DHW setpoint and the DHW off hysteresis do not exceed 200°F [93°C] or a "Lockout" condition will occur.	See Figure 4-6 and Table 4-4 on page(s) 10 & 11
High Limits	The "Lockout" limit response is a mandatory safety feature intended to require a manual reset on water heater units in the event that the appliance high limit temperature is exceeded. For this reason, the limit response must remain set to "Lockout".	See Figure 4-11 and Table 4-9 on page 14



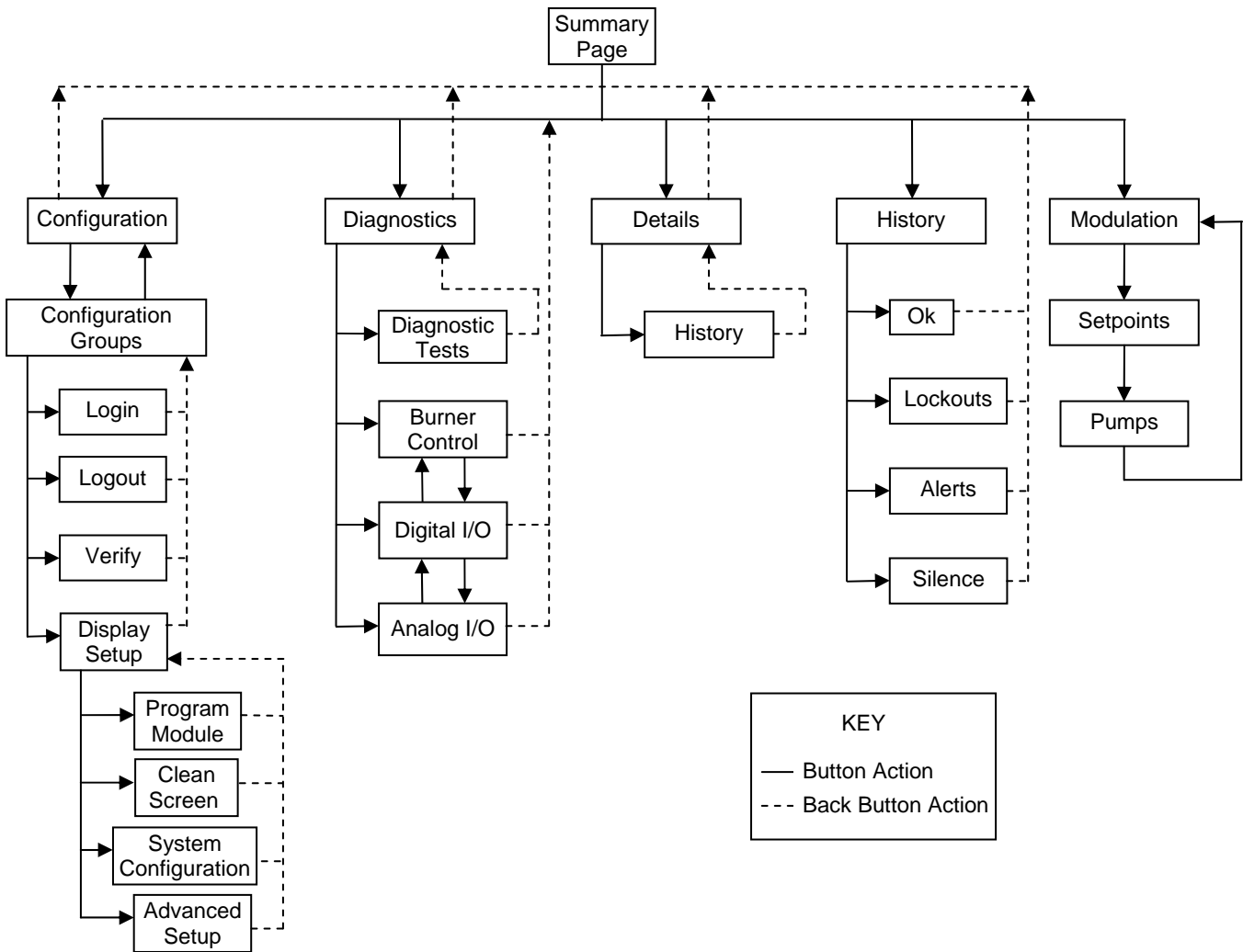
Please read the following document carefully as factory settings are not configured for a particular application and may require adjusting in order to satisfy system requirements.



2.0 MENU STRUCTURE

The Controller and Touchscreen Display, together, form the control system of the Trinity LX. All control configuration parameters are stored in non-volatile memory in the LX controller. Access to controller status and configuration is achieved with the display. Interaction with the display is performed by physically touching icons presented on the screen. Communication between the LX controller and display is via EIA-485 interface using the Modbus protocol.

Boiler and controller status information and configuration parameters are presented in a series of pages. These pages are organized in an “upside-down tree” menu structure as shown in Figure 2-1.

**Figure 2-1 All Models
Menu Structure Tree**



On each page, the "Home"  and "Back"  icons are available to assist in quickly navigating through the menu structure. These icons appear at the top left and right corners of the pages. Touching the Home icon returns to the Summary page immediately from any other page in the menu. Touching the Back icon displays the page at the next level up in the structure. A description of each page follows.

IMPORTANT Many of the configuration parameters are password protected. The required password is "sola" (less the " "). The password must be entered in lower-case letters.

3.0 SUMMARY PAGE

The Summary page is the first page displayed when the display is powered on. After a brief interval during which the display synchronizes with the LX controller, a page similar to **Error! Reference source not found.** is presented:

Figure 3-1 All Models
Display Summary Page

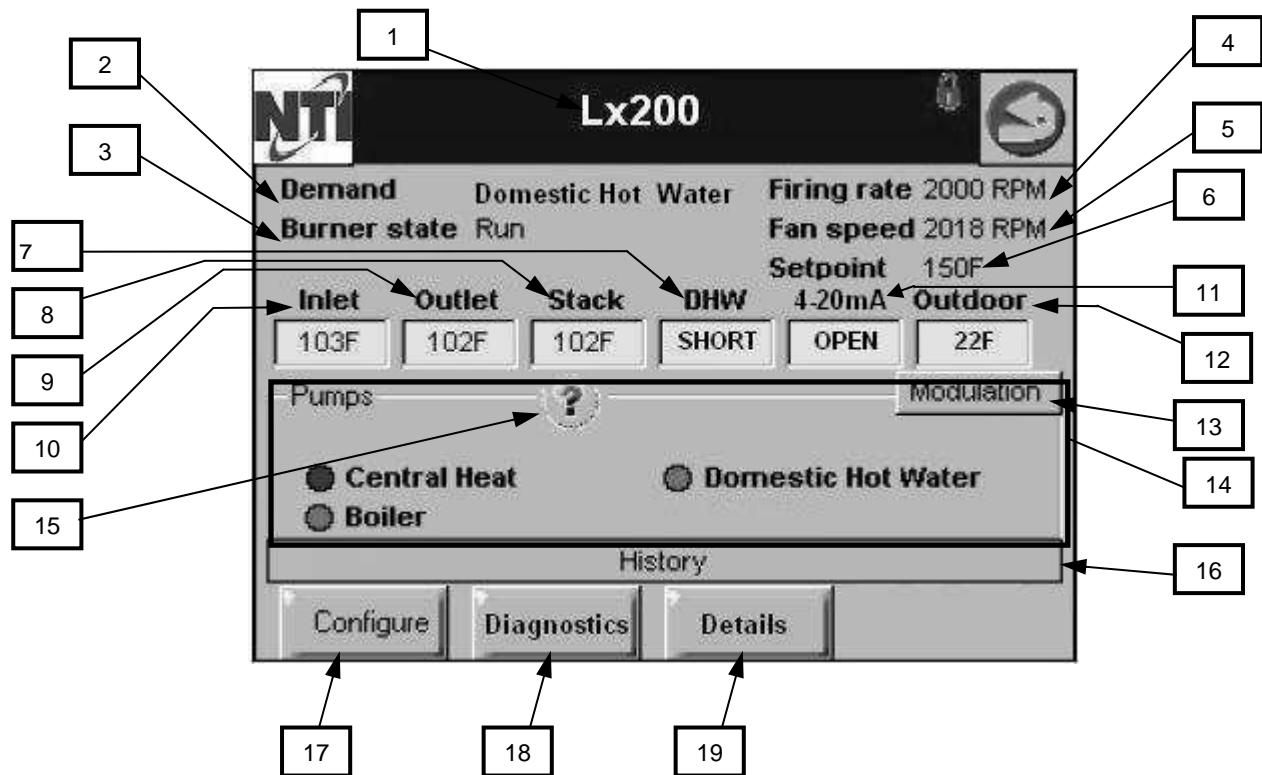


Table 3-1 Summary Page Configuration Parameters

Item	Name	Description
1	Boiler model number	Boiler model number, must agree with model number shown on boiler rating plate
2	Demand	Heat demand source: <ul style="list-style-type: none"> • OFF • Central Heat (24VAC applied to low voltage barrier “T” terminal (#5)) • Domestic Hot Water (low voltage barrier DHW terminals (#7 & #8) shorted together) • DHW (Domestic Hot Water) storage feature • CH frost protection • DHW frost protection

Item	Name	Description
3	Burner state	Current state of burner operation: <ul style="list-style-type: none"> • Initiate • Standby Delay • Standby • Safe Startup • Prepurge - Drive to Purge Rate • Prepurge - Measured Purge Time • Prepurge - Drive to Lightoff Rate • Direct Burner Ignition • Run • Postpurge • Lockout
4	Firing rate	Target blower speed in RPM
5	Fan speed	Actual blower speed in RPM
6	Setpoint	Active setpoint, in °F [or °C], that is the target water temperature the boiler maintains. Setpoint depends on the actual demand source: <ul style="list-style-type: none"> • Central Heat (CH) • Domestic Hot Water (DHW) • DHW storage
7	DHW	Status of indirect DHW aquastat: <ul style="list-style-type: none"> • SHORT – contacts closed creating heat demand • OPEN – contacts open, no demand
8	Stack	Exhaust gas temperature measured at boiler exhaust by dual thermistor sensor (input at J9 terminals 4,5,6)
9	Outlet	Water temperature measured at boiler outlet (hot supply to building) by dual thermistor sensor (input at J8 terminals 8,9,10)
10	Inlet	Water temperature at boiler inlet (cold return from building) by single thermistor sensor (input at J8 terminals 4,5)
11	4-20mA	Signal from external controller (input at J8 terminals 6,7)
12	Outdoor	Temperature measured by outdoor air sensor (input at J8 terminals 11,12)
13	Pumps, Modulation, Setpoints select button	Touch button to select information group described in Item 14
14	Pumps, Modulation, Setpoints	<ul style="list-style-type: none"> • Pumps: present status of Boiler, Central Heat, and Domestic Hot Water circulator pumps • Modulation: present Demand Rate given as blower RPM; also shown is any limit on the Demand Rate, and any rate override in effect • Setpoints: Central Heat and Domestic Hot Water setpoint temperatures with on and off hysteresis values.
15	Pumps detail	Shows the assignment of each pump output (A, B, or C) to its respective circulator pump, and present status of each pump, whether ON or OFF. Pumps are factory assigned as: <ul style="list-style-type: none"> • Domestic Hot Water = Pump A • Boiler = Pump B • Central Heat = Pump C
16	History	Details of most recent Lockouts and Alerts.
17	Configure	Access to controller settings.
18	Diagnostics	Access to controller tests, all digital and analog Input/Output (I/O) status.
19	Details	Detailed one-page summaries of certain Configuration Groups and input/output devices.

4.0 CONFIGURATION PAGE

Touching the Configure button at the bottom left of the Summary page accesses the Configuration page. The page contains a scrollable list of configuration groups, any of which may be selected by touching the name of the desired group, for example CH – Central Heat Configuration.

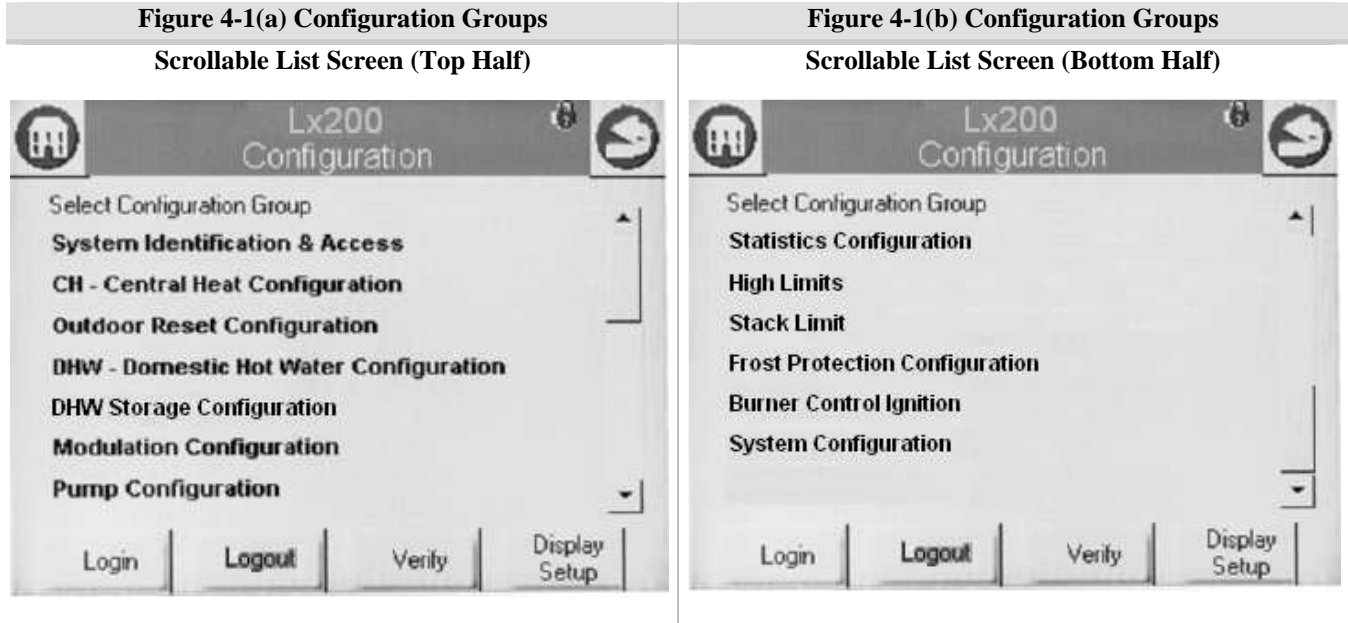


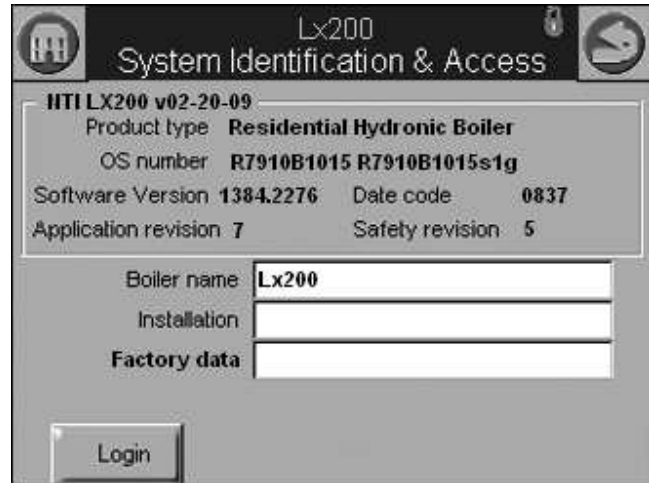
Table 4-1 Configuration Page Group Descriptions

Name	Description
System Identification & Access	View system identification
CH - Central Heat Configuration	Edit Central Heat settings
Outdoor Reset Configuration	Edit Outdoor Reset settings
DHW - Domestic Hot Water Configuration	Edit Domestic Hot Water settings
DHW Storage Configuration	Edit DHW Storage feature settings
Modulation Configuration	Edit burner modulation settings
Pump Configuration	Edit pump settings
Statistics Configuration	View equipment operating statistics
High Limits	Edit water temperature limit settings
Stack Limit	Edit flue temperature limit settings
Frost Protection Configuration	Edit settings for frost protection
Burner Control Ignition	Edit burner control settings
System Configuration	Edit temperature units, anti-short-cycle time, alarm silence time
Verify	Confirm safety parameter changes
Display Setup	View and change display settings

System Identification & Access

Figure 4-2 System Identification & Access Screen

The System Identification & Access page contains information about the LX controller. The appliance name (e.g. Lx200) and installation fields may be modified; however, login with a valid password is required to do so. Up to twenty (20) characters may be entered in each field.



CH - Central Heat Configuration

The Central Heat (CH) Configuration menu settings are only applicable to Boiler Applications and are not applicable for Water Heater Applications. The CH settings establish the demand input and water temperature operating parameters for a CH demand.

Figure 4-3 CH – Central Heat Configuration Screen



BOILER APPLICATIONS:

The sum of the CH setpoint and the CH off hysteresis should not be set to exceed 200°F [93°C] or a "Lockout" condition may result. If higher water temperatures are required, 190-200°F [88-93°C], adjust limit response to avoid a "Lockout" condition. See section on "High Limits", page 14.

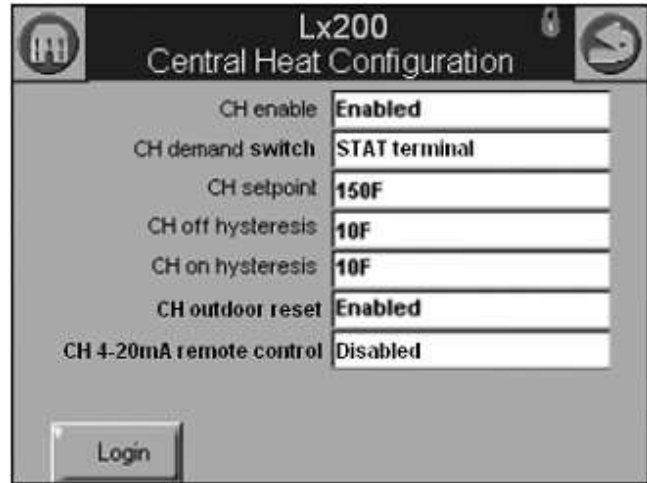


Table 4-2 Central Heat Configuration Parameters

Parameter	Description	Factory Settings	Comments
CH enable *	Enable or Disable Central Heating	Enabled	
CH demand switch *	Select which sensor provides Central Heat demand, or call: <ul style="list-style-type: none"> • Sensor only • Sensor & STAT terminal • Sensor & Remote Stat • LCI & Sensor 	Sensor & STAT terminal	
CH setpoint *	Setpoint value for CH modulation. Use of this value depends on enable/disable of Outdoor Reset. If CH outdoor reset is disabled, this is the target boiler outlet water temperature. If CH outdoor reset is enabled, this is the CH maximum water temperature. See Outdoor Reset Configuration below. Range 60°F to 200°F [15°C to 93°C].	180°F [82°C]	IMPORTANT CH setpoint + CH off hysteresis ≤ 200°F [93°C]
CH off hysteresis *	Value added to CH setpoint to determine water temperature at which the burner will shut off e.g. if CH setpoint is 150°F, and CH off hysteresis is 10 °F, the burner will be shut off at 160°F. Range 2°F to 20°F [1°C to 11°C].	10°F [6°C]	IMPORTANT CH setpoint + CH off hysteresis ≤ 200°F [93°C]
CH on hysteresis	Value subtracted from CH setpoint to determine water temperature at which the burner will fire e.g. if CH setpoint is 150°F, and CH on hysteresis is 10°F, the burner will be ignited at 140°F. Range 2 °F to 40°F [1°C to 22°C].	20°F [11°C]	
CH outdoor reset	Enables or Disables use of the outdoor air temperature sensor to calculate the CH setpoint. No effect if the outdoor sensor is not connected.	Enabled	
CH 4-20mA remote control *	Selects remote control mode: <ul style="list-style-type: none"> • Disabled • Setpoint • Modulation This enables a 4-20mA signal from an external staging controller such as tekmar® Boiler Control 265 (field supplied).	Disabled	

* = Password protected

Outdoor Reset Configuration

The Outdoor Reset Configuration menu settings are only applicable to Boiler Applications and are not applicable for Water Heater Applications.

Figure 4-4 Outdoor Reset Configuration Screen

The Outdoor Reset is effective only if an outdoor temperature sensor is connected to the LX controller, and if CH outdoor reset (in CH Configuration) is enabled. The Outdoor Reset parameters, together with the CH setpoint parameter (above), define the relationship of water temperature setpoint to outdoor temperature. Refer to Table 3-3 for a list of Outdoor Reset parameters.

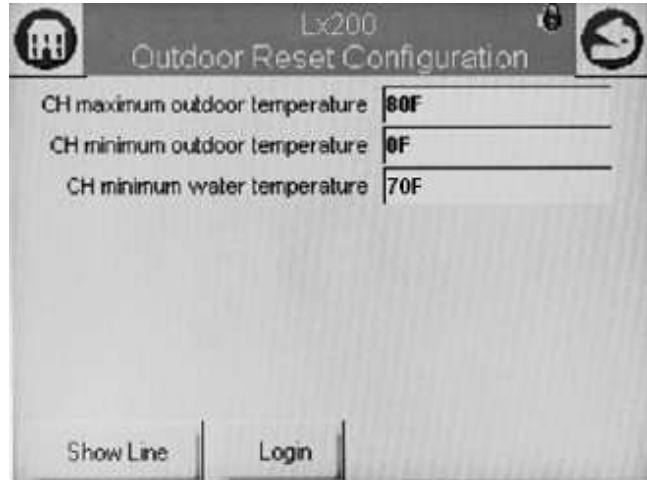


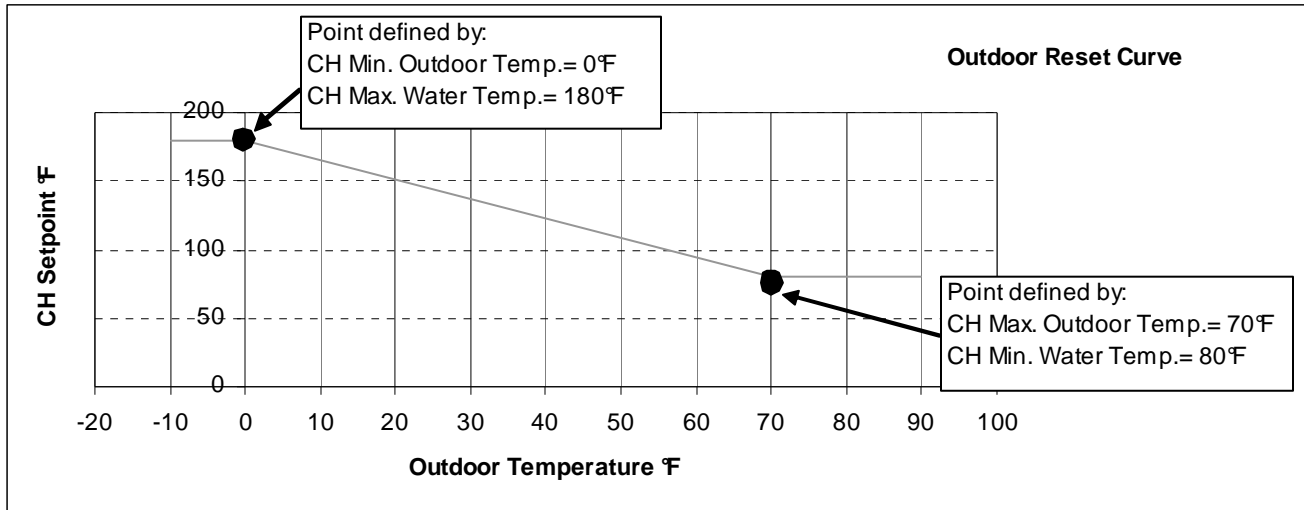
Table 4-3 Outdoor Reset Configuration Parameters

Parameter	Description	Factory Settings	Comments
CH maximum outdoor temperature	Outdoor temperature that corresponds to the CH minimum water temperature. For example, if the CH minimum water temperature is 80°F, and the CH maximum outdoor temperature setting is 70°F, the boiler water temperature setpoint will be 80°F when the outdoor temperature reaches 70°F. Range 50°F to 90°F [10°C to 32°C].	70°F [21°C]	
CH minimum outdoor temperature	Outdoor temperature that corresponds to the CH maximum water temperature. For example, if the CH maximum water temperature is 180°F (defined by CH setpoint above), and the CH minimum outdoor temperature setting is 0°F, the boiler water temperature setpoint will be 180°F when the outdoor temperature reaches 0°F. Range -40°F to 40°F [-40°C to 4°C].	0°F [-18°C]	Outdoor Design Temperature: - set higher for warmer climates - set lower for colder climates
CH minimum water temperature	CH modulation setpoint at CH maximum outdoor temperature. Range 60°F to 150°F [15°C to 65°C].	95°F [35°C]	

The Outdoor Reset Graph in Figure 4-5 illustrates the effect of varying outdoor temperature on the CH setpoint. A graph similar to Figure 4-5 is displayed if the “Show Line” button is touched.

Figure 4-5 Configuration Page

Outdoor Reset Graph



DHW - Domestic Hot Water Configuration

Figure 4-6 Domestic Hot Water Configuration Screen

CAUTION **BOILER APPLICATIONS:**
The sum of the DHW setpoint and the DHW off hysteresis should not be set to exceed 200°F [93°C] or a "Lockout" condition may result. If higher water temperatures are required, 190-200°F [88-93°C], adjust limit response to avoid a "Lockout" condition. See section on "High Limits", page 14. Failure to follow these instructions may result in property damage.

DANGER **WATER HEATER APPLICATIONS:**
The "Lockout" limit response is a mandatory safety feature intended to require a manual reset on water heaters; therefore, the limit response must remain set to "Lockout". Failure to follow these instructions will result in serious injury or death.



Table 4-4 DHW-Domestic Hot Water Configuration Parameters

Parameter	Description	Factory Settings	Comments
DHW enable *	Enable or Disable Domestic Hot Water	Enabled	
DHW priority override time *	Sets the time period during which a DHW demand has priority. After the time period has elapsed, if a CH demand occurs the boiler and CH pump will service the CH demand, regardless of DHW demand. A value of 0 means that a DHW demand will not be overridden.	120 minutes	
DHW setpoint *	Setpoint for DHW modulation. Range 60°F to 200°F [15°C to 93°C].	180°F [82°C]	CAUTION DHW setpoint + DHW off hysteresis < 200°F [93°C]

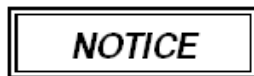
Parameter	Description	Factory Settings	Comments
DHW off hysteresis *	Value added to DHW setpoint to determine water temperature at which the burner will shut off e.g. if DHW setpoint is 150 °F, and DHW off hysteresis is 10 °F, the burner will be shut off at 160°F. Range 5 °F to 70°F [3°C to 39°C].	10°F [6°C]	CAUTION DHW setpoint + DHW off hysteresis ≤ 200°F [93°C]
DHW on hysteresis	Value subtracted from DHW setpoint to determine water temperature at which the burner will fire e.g. if DHW setpoint is 150°F, and DHW on hysteresis is 10°F, burner ignition occurs at 140°F. Range 2°F to 40°F [1°C to 22°C].	10°F [6°C]	
DHW P gain *	Gain applied to the proportional term of the DHW PID control algorithm.	30	
DHW I gain *	Gain applied to the integral term of the DHW PID control algorithm.	15	

* = Password protected

Modulation Configuration

Figure 4-7 Modulation Configuration Screen

The configuration screen sets the minimum and maximum blower speeds (RPM) for burner modulation during CH or DHW demand.



The CH maximum modulation rate is not applicable for Water Heater Applications.

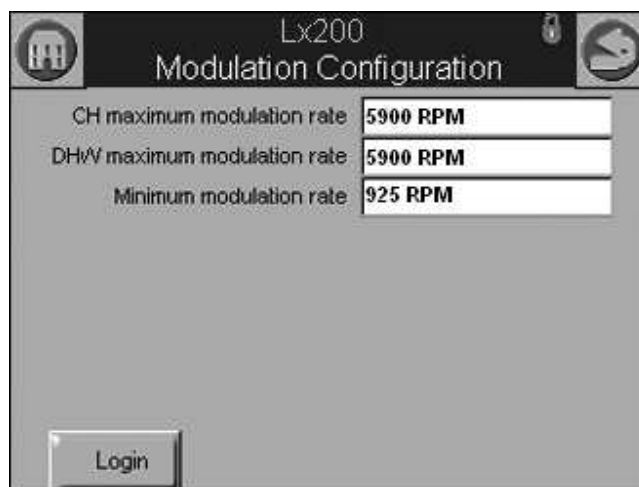


Table 4-5 Modulation Configuration Parameters

Parameter	Description	Factory Settings
CH maximum modulation rate *	Maximum permissible blower speed during CH demand. Range is model dependent.	150 = 5850 rpm, 150E = 4450 rpm, 200 = 5950 rpm, 400 = 7250 rpm.
DHW maximum modulation rate *	Maximum permissible blower speed during DHW demand. Range is model dependent.	150 = 5850 rpm, 150E = 4450 rpm, 200 = 5950 rpm, 400 = 7250 rpm.
DHW minimum modulation rate *	Minimum permissible blower speed. Range is model dependent.	150 = 1550 rpm, 150E = 1225 rpm, 200 = 1225 rpm, 400 = 1850 rpm.

* = Password protected

Pump Configuration

Figure 4-8 Pump Configuration Screen

The pump configuration screen allows adjustment of the pump overrun time after a demand call ends or on burner shutdown.

NOTICE

Water Heater Applications use only the "Boiler pump" (Pump output B); therefore, CH and DHW pump overrun time are not applicable.

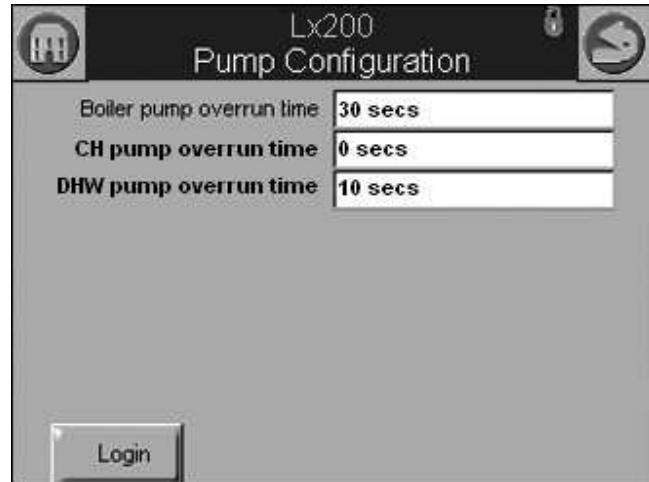


Table 4-6 Pump Configuration Parameters

Parameter	Description	Factory Settings
Boiler pump overrun time *	Amount of time the Boiler pump will continue to run after burner shutdown. Range 0 to 480 minutes.	30 seconds
CH pump overrun time *	Amount of time the CH pump will continue to run after a CH demand ends. Range 0 to 10 seconds.	0 seconds
DHW pump overrun time *	Amount of time the DHW pump will continue to run after a DHW demand ends. Range 0 to 480 minutes.	10 seconds

Statistics Configuration

Figure 4-9 Statistics Configuration Screen

The Trinity Lx controller maintains counters for events related to various devices. The counters may be set to a specific value; for example if the CH pump is replaced its counter may be reset to zero.

NOTICE Burner cycles and Burner run time counters cannot be reset in the field.

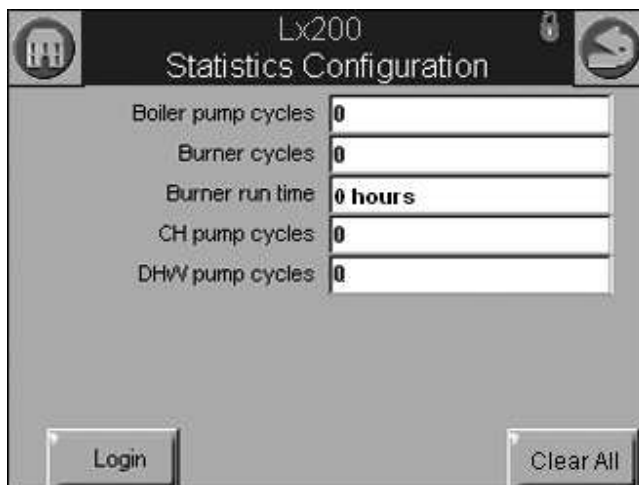


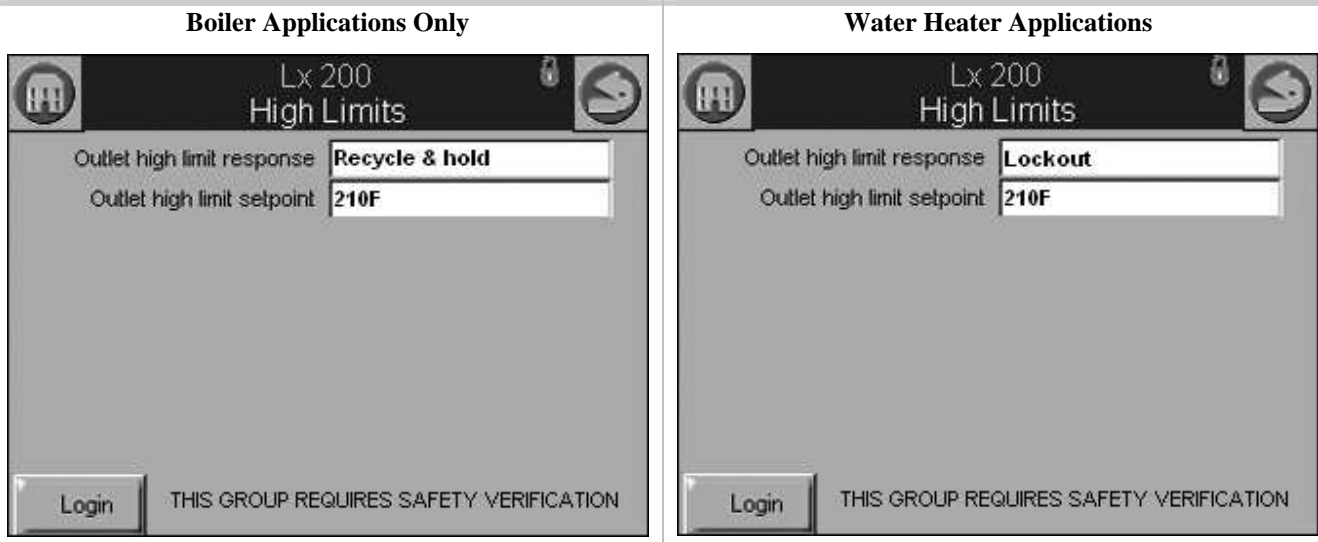
Table 4-7 Statistics Configuration Parameters

Parameter	Description	Factory Settings
Boiler pump cycles *	Number of boiler pump cycles since last reset. Range 0 to 999,999.	n/a
Burner cycles *	Number of burner cycles since last reset. This includes the blower and ignition components. Range 0 to 999,999.	n/a
Burner run time*	Total number of hours of burner operation. Range 0 to 999,999 hours.	n/a
CH pump cycles *	Number of CH pump cycles since last reset. Range 0 to 999,999.	n/a
DHW pump cycles *	Number of DHW pump cycles since last reset. Range 0 to 999,999.	n/a

* = Password protected

High Limits

Figure 4-10 High Limits Screens



An Outlet High Limit "Lockout" will occur if the outlet temperature from the appliance exceeds the "Outlet High Limit Setpoint" (i.e. 210°F [99°C]). To avoid a lockout condition, ensure the sum of CH setpoint and CH off hysteresis is less than 200°F [93°C] and that the sum of the DHW setpoint and DHW off hysteresis is less than 200°F [93°C].

BOILER APPLICATIONS ONLY:

To completely avoid an Outlet High Limit Response "Lockout", set the limit response to "Recycle & Hold".

WATER HEATER APPLICATIONS:




The Outlet High Limit Response "Lockout" is a mandatory safety feature intended to require a manual reset on water heater units in the event that the appliance high limit temperature is exceeded. For this reason, the limit response must remain set to "Lockout". Failure to follow these instructions will result in serious injury or death.

Clearing a Lockout - The following are two methods to clear a "lockout" condition and perform a manual reset of the auto gas shut-off control:

- 1- Switch - Cycle power to the appliance by toggling the electrical disconnect switch OFF and ON.
- 2- Display - Clear the lockout from the touchscreen display menu. See Figures 7-1 and 7-2 on page 25.

Table 4-8 High Limits Parameters

Parameter	Description	Factory Settings	Comments
Outlet high limit response *	Select controller action in the event outlet temperature exceeds setpoint <ul style="list-style-type: none"> • Recycle & hold (Boiler Applications) • Lockout (Water Heater Applications) 	Lockout	 "Lockout" parameter is a required safety feature for Water Heater Applications.
Outlet high limit setpoint *	Outlet water temperature high limit. Range 100°F to 210°F [38°C to 99°C].	210°F [99°C]	

* = Password protected

Stack Limit

Figure 4-11 Stack Limit Screen



Table 4-9 Stack Limit Parameters

Parameter	Description	Factory Settings
Stack limit setpoint *	Stack exhaust gas high limit. Range 145°F to 220°F [63°C to 104°C]	220°F [104°C]

* = Password protected

Frost Protection Configuration

Figure 4-12 Frost Protection Screen

CH Frost Protection - Operates CH and Boiler Circulators (Pump Outputs C and B) if outlet temperature drops below 45°F [7°C]. Operates burner at minimum modulation rate if outlet temperature drops below 38°F [3°C].

DHW Frost Protection - Operates DHW and Boiler Circulators (Pump Outputs A and B) if inlet temperature drops below 45°F [7°C]. Operates burner at minimum modulation rate if inlet temperature drops below 38°F [3°C].



Table 4-10 Frost Protection Configuration Parameters

Parameter	Description	Factory Settings	Comments
CH frost protection enable *	<ul style="list-style-type: none"> Enabled Disabled 	Enabled	
DHW frost protection enable *	<ul style="list-style-type: none"> Enabled Disabled 	Disabled	Enable for Water Heater Applications or Boiler Applications with only Indirect Fired Water Heaters.

* = Password protected

Burner Control Ignition

Figure 4-13 Burner Control Ignition Screen

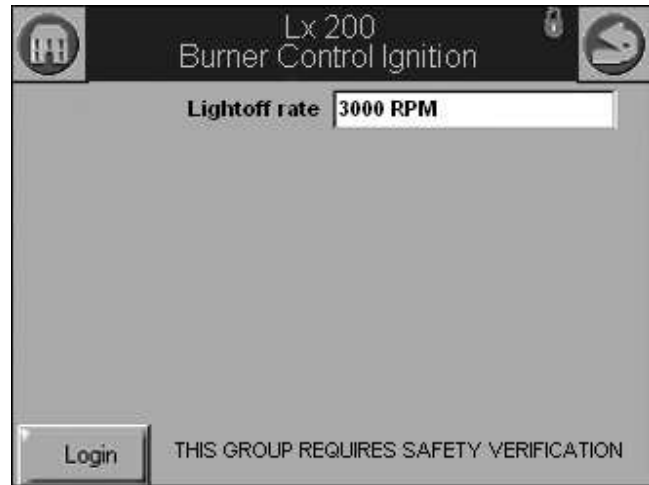


Table 4-11 Burner Control Ignition Parameters

Parameter	Description	Factory Settings
Lightoff rate *	Blower speed for burner ignition. Range 2000 RPM to 3500 RPM.	3000 RPM

* = Password protected

System Configuration

Figure 4-14 System Configuration Screen

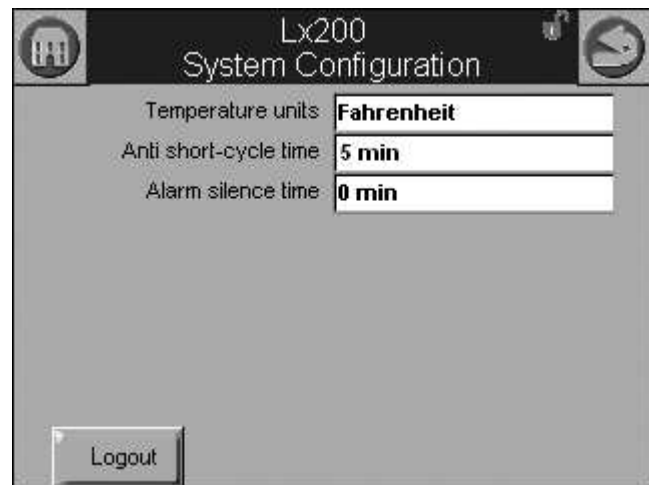


Table 4-12 System Configuration Parameters

Parameter	Description	Factory Settings
Temperature units cycles *	<ul style="list-style-type: none"> Fahrenheit Celsius 	Fahrenheit
Anti short-cycle time *	Whenever the burner is turned off due to no demand the anti-short-cycle timer is started and the burner remains in a Standby Delay condition waiting for this time to expire. Does not apply, however, to recycle events or DHW demand. Range 0 to 480 minutes (8 hours).	5 minutes
Alarm silence time	Alarms may be silenced for this amount of time. Range 0 to 600 minutes (10 hours).	0 minutes

* = Password protected

Verify (Safety Parameter Verification)

Figure 4-15 Modifying Safety Parameters

When any safety parameter is modified the Trinity Lx controller requires that the parameter(s) be verified before burner control operation is allowed to resume. Login with password is required to access the safety parameters. After any safety parameter is changed, the controller enters a Lockout 2 “waiting for safety data verification” state: burner control is suspended, the Alarm LED on the Trinity Lx controller is illuminated, Alarm contacts (J6 7&8) close.

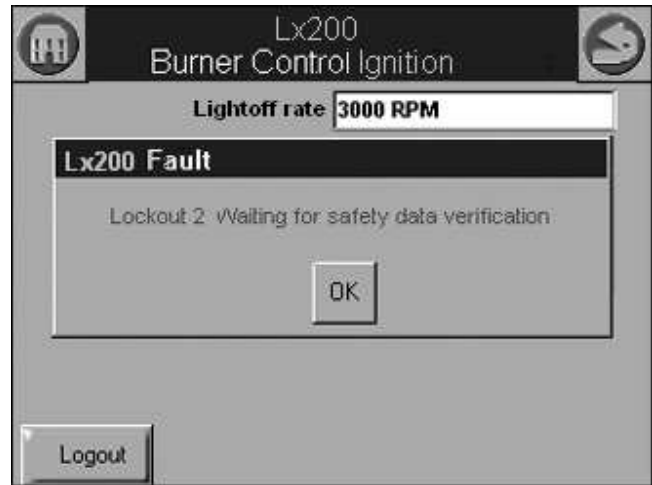


Figure 4-16 Verification ID

To verify the changed parameter(s), it is necessary to navigate to the Configuration page and touch the Verify button at the page bottom. If more than 10 minutes elapse following parameter change(s), a new login is required. Once login is accomplished, a page similar to Figure 3-17 is displayed.

Touching the BEGIN button starts the verification at the page with the lowest numbered Safety Parameter group ID.



Figure 4-17 Group Confirmation

Confirmation of the displayed parameter values is required within 30 seconds, otherwise the verification times out and the BEGIN button must be touched again. After the first group is confirmed, subsequent groups (if any) are displayed and must be confirmed. When all groups have been confirmed, the Reset button on the Trinity Lx controller must be pressed within 30 seconds.



Figure 4-18 Controller Reset

When the controller RESET button is pressed the controller clears the Alarm LED, opens the Alarm contacts and resumes burner control.



Display Setup

Figure 4-19 Display Setup Screen

When the display SETUP button is touched, a page like Figure 4-19 is displayed.

On the left side is a slider control to adjust the screen contrast. Immediately to the right of the contrast control is a volume adjustment slider that may be used to set the volume of the tone emitted by the display. The tone is audible feedback to indicate that an icon on the screen is touched.

Touching the drop-down list beneath the “Blank Display After” caption displays the screen-blanking interval options of: Never, 30 seconds, 1 minute, 2 minutes, 5 minutes, 10 minutes.

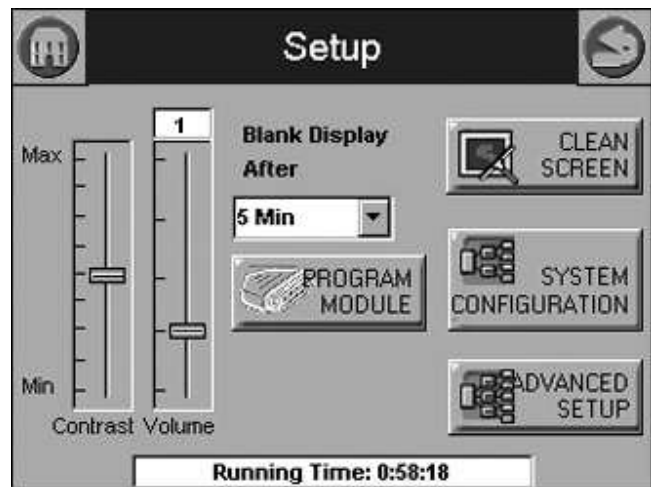


Figure 4-20 Clean Screen

Touching the CLEAN SCREEN button displays a page similar to Figure 4-20.

Touching Continue starts a 30-second timer during which the touch screen is disabled to permit cleaning of the screen.

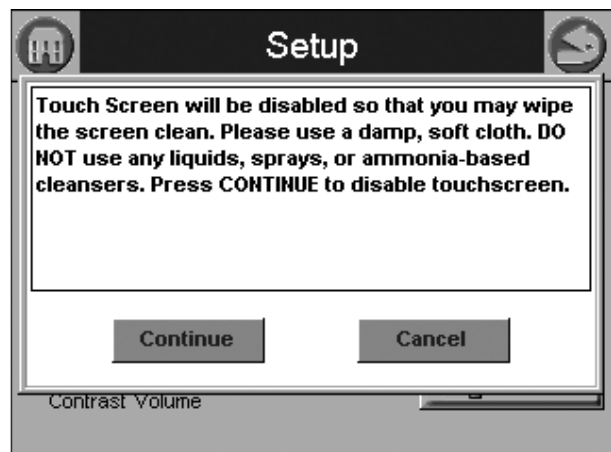


Figure 4-21 System Configuration

Touching SYSTEM CONFIGURATION displays a page similar to Figure 4-21.

The REFRESH button causes the display to scan for a connected controller at Modbus Address 1. If a controller is detected its name will be displayed in the list as shown. Touching the SYNCHRONIZE button will initiate transfer of configuration parameters from the controller to the display.

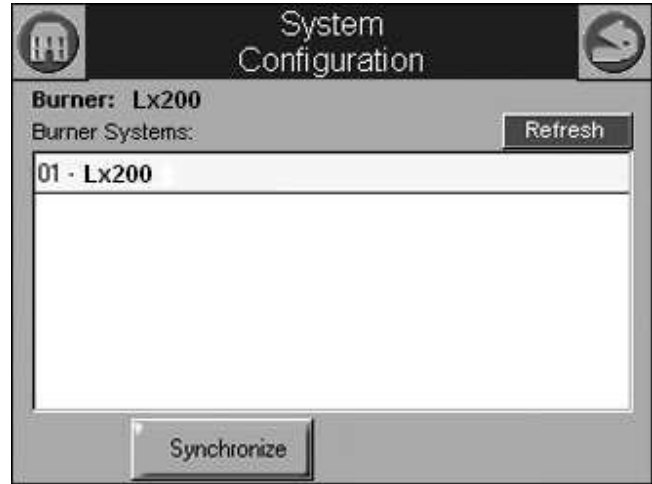


Figure 4-22 Advanced Set-up

Touching Advanced Setup displays a page similar to Figure 4-22 with additional buttons for customized setup and user reference information.

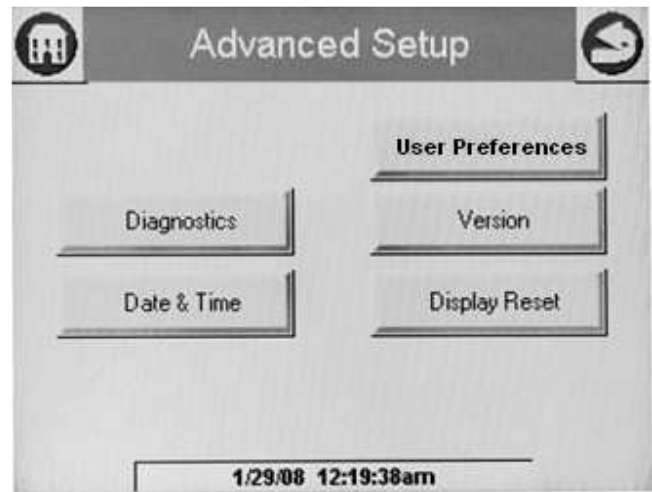


Figure 4-23 Diagnostics

The Diagnostics page is used to test display functions. Touching the TEST button adjacent to any of the items initiates a test of that function of the display. If any malfunction of the display is suspected it may be detected in this manner.

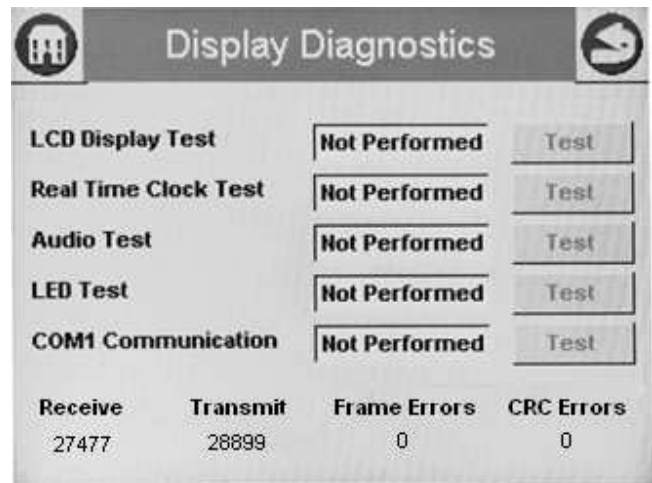


Figure 4-24 Time & Date

The Date & Time page is used to set the date and time so that any lockout or alert events may be properly time-stamped.

IMPORTANT The date & time are reset to internally stored values whenever the display is reset or power to the display is cycled. The date & time must be re-entered after either of these events.

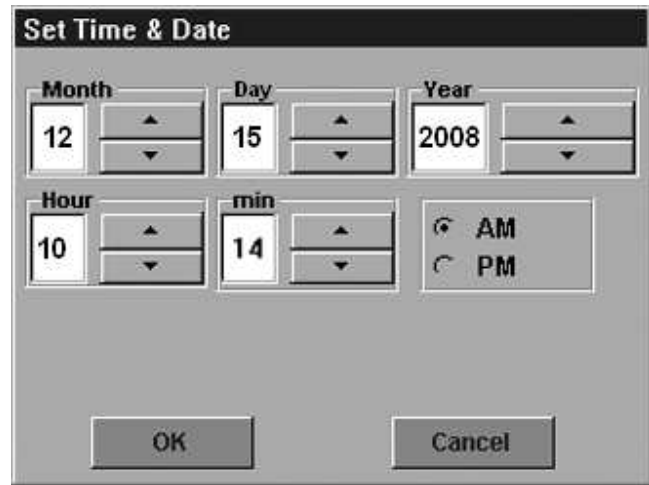


Figure 4-25 User Preferences

Touching User Preferences shows the following page. Checking either of the checkboxes enables the respective feature of the display; clearing disables the feature.

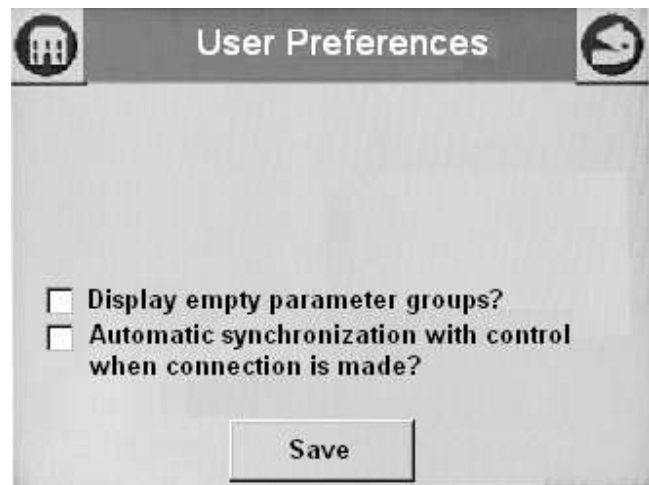


Table 4-13 User Preferences Parameters

Parameter	Description
Display empty parameter groups	May be used to force the display of all possible configuration pages even if there are no configurable parameters associated with a given page. Its use is not recommended.
Automatic synchronization with control when connection is made	Causes the display to automatically transfer all configuration and operating data when it detects connection to a controller. This occurs at any power-on or display reset regardless of this setting. Also note that the state of each input and output, and the burner operating state, is monitored and displayed continuously irrespective of the setting of this checkbox.

Figure 4-26 Version Page

Touching the VERSION button displays a page containing information pertaining to the version of the display:

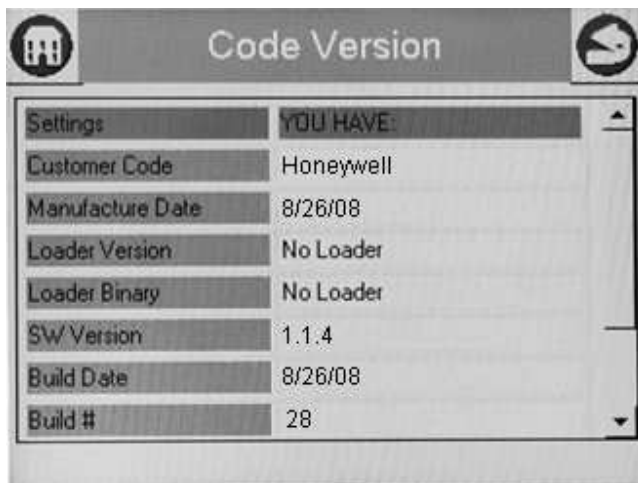
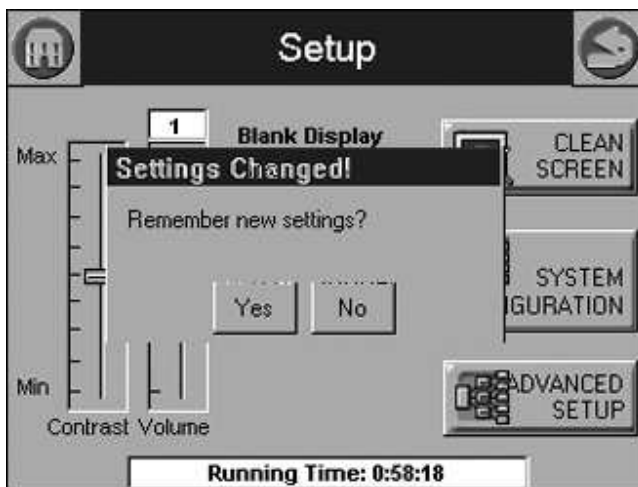


Figure 4-27 Save Setup

Touching the Display RESET button will perform a re-boot of the display and re-synchronization of the display with the controller.

When the Back or Home icon is touched to exit Display Setup, you are prompted to save or discard changes to the contrast or volume settings.



5.0 DIAGNOSTICS PAGE

Figure 5-1 Input/Output Screen

The Diagnostics page initially presents a display of digital Input/Output (I/O) status. Touching the BURNER CONTROL button displays a subset of digital I/O related specifically to burner operation.



Figure 5-2 Analog I/O Status

The two right-most buttons at the page bottom are used to toggle between I/O status pages. Each input or output status is depicted by a simulated LED with green representing ON, or active, and red representing OFF or inactive.

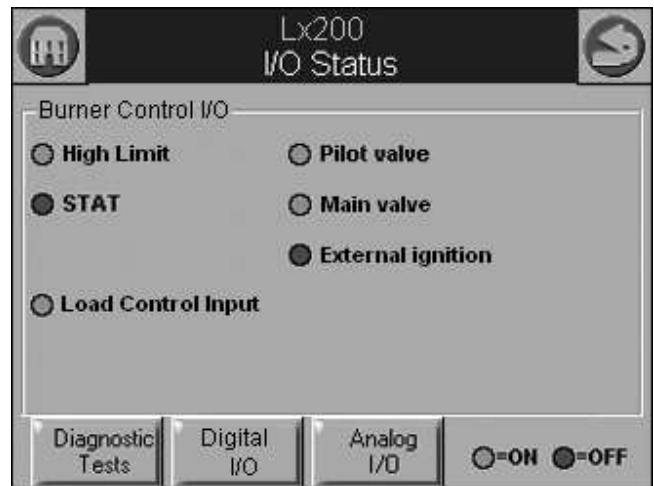


Figure 5-3 Analog I/O Graphs

Touching the ANALOG I/O button displays a scrollable group of bar graphs depicting the current value of each analog input and output.

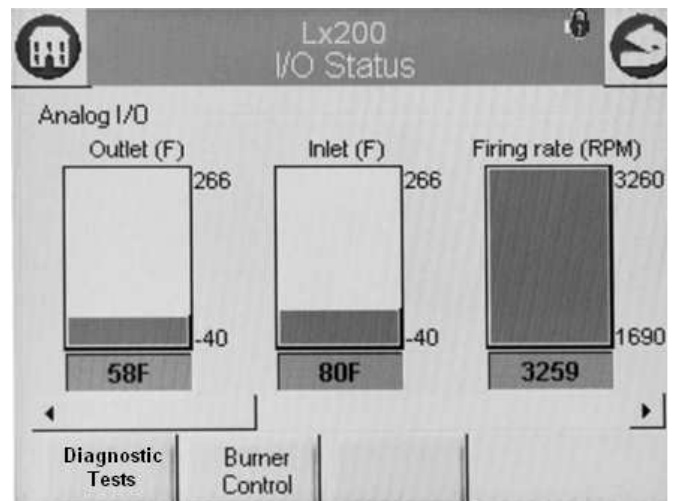


Figure 5-4 Modulation Test

Selecting the DIAGNOSTIC TESTS button brings up one of two pages for performing tests with the burner and pumps. The initial page displayed is the Modulation Test page.

Touching the START TEST button initiates the Modulation Test. The test will run for a maximum of 4 minutes. It may be stopped and restarted during that interval.

IMPORTANT The burner MUST be firing for the Modulation Test.

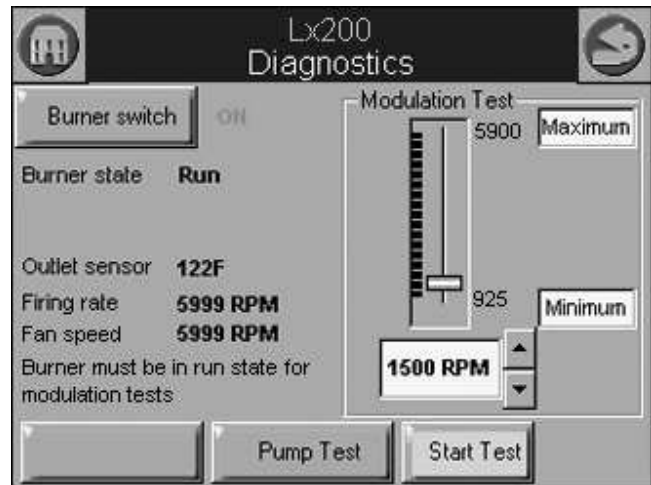
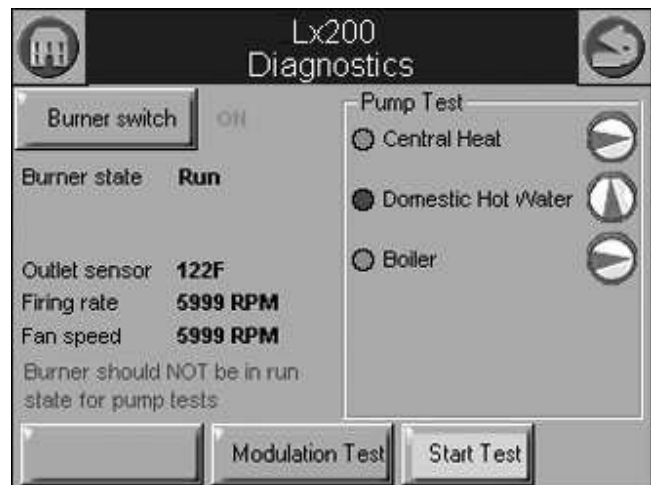


Figure 5-5 Pump Test

Touching the PUMP TEST button displays the Pump Test page. Touch the pump icons on the right side of the page to manually start and stop each respective pump.

On each of the two test pages there is a Burner switch button that may be used to manually shut off the burner. The burner cannot be ignited manually unless there is an active demand such as CH or DHW.



IMPORTANT The burner MUST NOT be firing during the Pump Test.



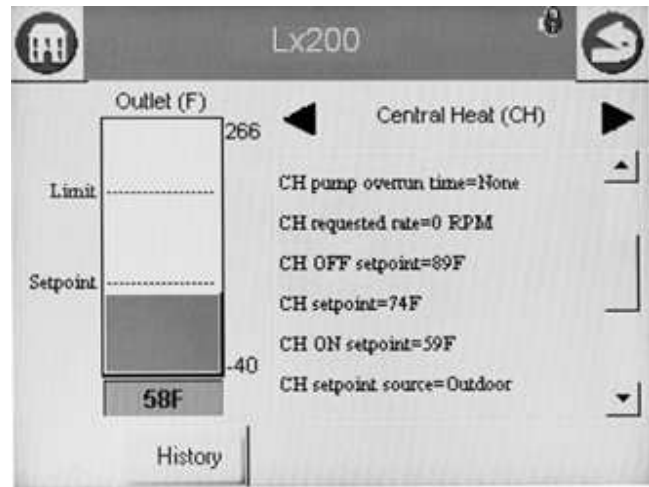
6.0 DETAILS PAGE

Figure 6-1 Details Page Navigation

Touching the DETAILS button enters a series of pages, each presenting a detailed summary of configuration and operational data that roughly corresponds to one of the configuration groups.

Use the left  and right  horizontal scroll buttons to navigation between these pages as shown in this sample Central Heat (CH) details page.

If all the data pertaining to the selected item cannot fit on a single screen, the vertical scroll bar may be used to scroll through the complete list.



7.0 HISTORY PAGE

The LX controller identifies and records two kinds of faults and categorizes them as either Lockouts or Alerts. The bulleted lists below indicate the significance of each type of fault:

Lockouts:

- Cause the burner to shutdown and require manual intervention to clear the condition causing the Lockout
- Always cause the Alarm contacts to close
- Are logged in the Lockout History

Alerts:

- Events reported by the controller
- For informational purposes only

For more details on specific Lockout and Alert conditions, refer to the "Troubleshooting" section in the **Installation and Operation Instructions For Trinity LX Series**.

Figure 7-1 History Page

The Trinity Lx controller maintains in its non-volatile memory a record of the most recent Lockout and Alert events. There is capacity in memory for fifteen (15) of each. Access to the history is achieved either by touching the History button icon on the Summary page, or by touching the History button at the bottom of any of the Details pages.

Touching the History button on the Summary page presents a dialog. If no button is touched within 30 seconds the dialog is automatically cancelled. Touching OK simply returns to the Summary page.

The text on the history button automatically updates if a Lockout or Alert occurs (e.g. Alert 32).

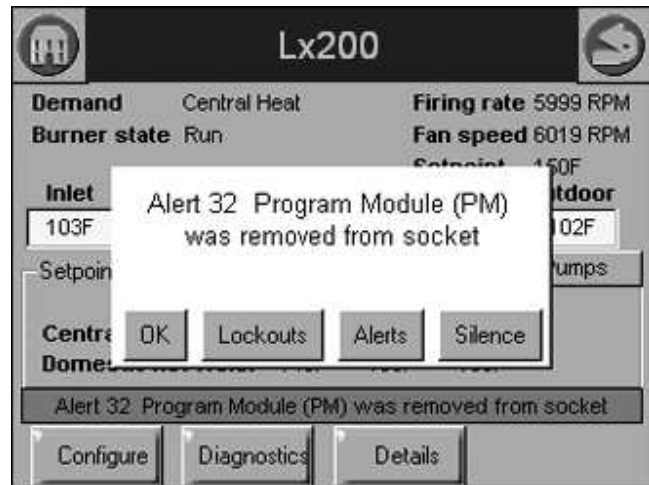


Figure 7-2 Lockout History Screen

Touching Lockouts displays the Lockout History page which contains a scrollable list of events. See Figure 7-4 for description of Alert button icon. The Clear Lockout button may be used to clear a Lockout, similar to pressing the Reset button on the Trinity Lx controller.

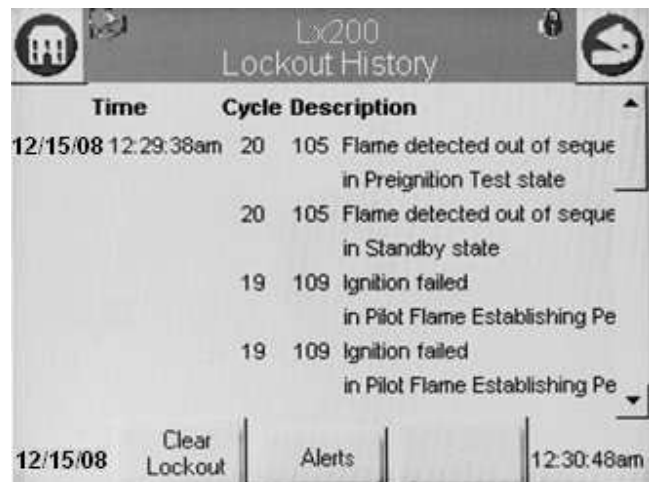


Figure 7-3 Control State at Lockout

Lockout events can be viewed by scrolling down the Lockout History page. Touching an individual item of the list displays a detailed description of the control state at the time of the Lockout.

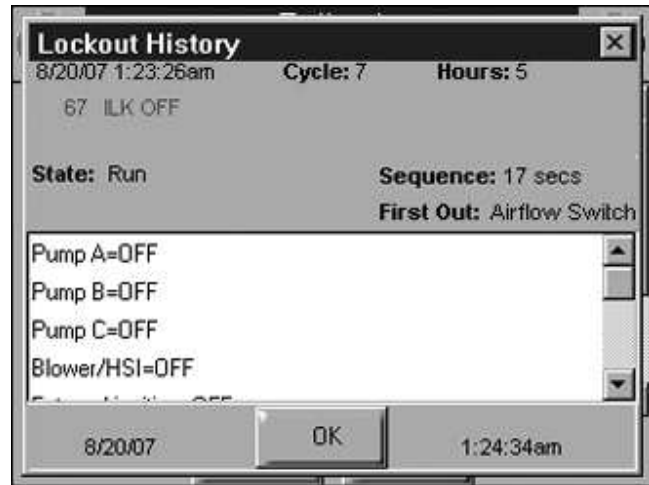


Table 7-1 Control States Displayed

Data	Comment
Lockout time	Set by display
Fault code	Unique code defining which lockout occurred
Annunciator first out	First interlock that resulted in shutdown
Description	Fault description
Burner Lockout/Hold	Source or reason for lockout/hold
Burner Control State	Burner operating state at the time of lockout
Sequence time	Burner control state timer at time of fault
Cycle	Burner control cycle
Run Hours	Burner control hours
I/O	All digital I/O status at time of fault
Annunciator 1-8 states	All Annunciator I/O status at time of fault
Fault data	Fault dependent data

Figure 7-4 Alert Log and Events

Similarly the Alert Log page contains a list of Alert events. Touching an individual item displays detailed information about the event. See also Figure 7-5.

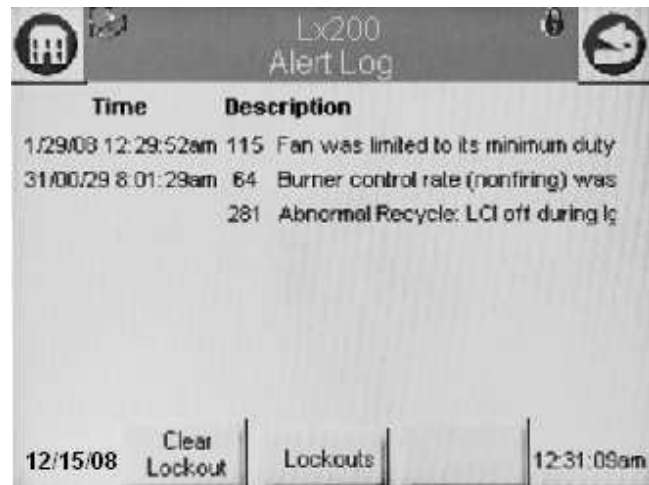
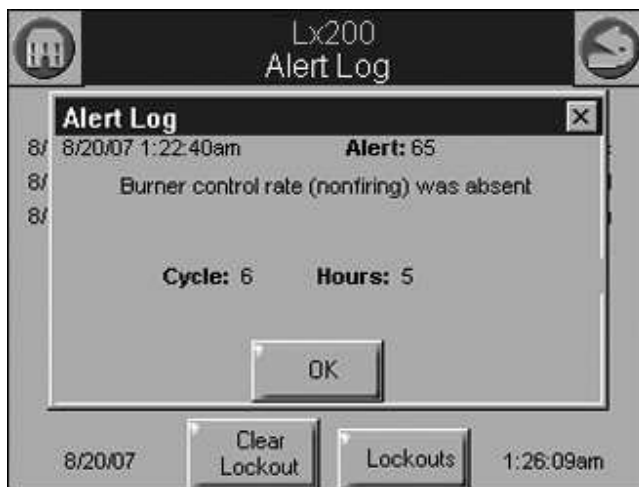


Figure 7-5 Timestamp Display



The Trinity Lx controller contains no internal system time. The timestamp for each Lockout and Alert is assigned by the display when it learns of the event from the controller. Therefore, the event history transferred from the controller to the display following a power interruption does not have valid timestamps. New events will be given correct timestamps only if the current time is entered into the display via the Display Setup page (see Figure 4-24).



NOTES

Lined area for notes



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