



TSD-4001
September 10, 2020



NXTSD507HD, NXTSD512HD Touchscreen Interface Installation and Operation



DESCRIPTION

This bulletin describes the installation and operation of the NXTSD507HD (7”) and NXTSD512HD (12.1”) touchscreen interfaces. An overview of navigation through the available data as well as device-specific information is covered.

These optional devices allow for enhanced and expanded connectivity to the NXF4000 and PPC4000 parallel-positioning systems. This bulletin is intended to be a supplement to bulletins NXF-4001 and PPC-4001, which covers the installation and operation of the NXF4000 and PPC4000 controls, respectively. Please refer to those bulletins for any specific information on installation, features, commissioning or operation of the connected controls.



WARNING: Failure to properly install, operate, or commission the equipment in this manual could result in significant property damage, severe injury, or death. It is the responsibility of the owner or user to ensure that the equipment described is installed, operated and commissioned in compliance with this manual and other system component manuals, as well with all applicable national and local codes.



WARNING: Boiler operation, maintenance, and troubleshooting shall only be conducted by trained personnel. Persons troubleshooting lockouts or resetting the control must respond properly to troubleshooting error codes as described in this product bulletin. Jumpers being used to perform static test on the system must only be used in a controlled manner and must be removed prior to the operation of the control. Such tests may verify the external controllers, limits, interlocks, actuators, valves, transformers, motors and other devices are operating properly. Such tests must be conducted with manual fuel valves in the closed position only. Replace all limits and interlocks not operating properly, and do not bypass limits in interlocks. Failure to follow these guidelines may result in an unsafe condition hazardous to life and property.



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SYSTEM INFORMATION

The NXTSD507HD and NXTSD512HD are designed to allow for monitoring, setup or commissioning of an NXF4000 or PPC4000 parallel-positioning system. These interfaces can be used in conjunction with or in place of an NXD410 or NXD410TS.

The NXTSD507HD and NXTSD512HD connect to the NXF4000 or PPC4000 using Modbus RTU via RS-485 and can receive 24VDC from either the connected control base unit or an external power supply. This allows for either local or remote mounting of these interfaces within sight and sound of the connected burner.

The NXTSD507HD and NXTSD512HD provide a Modbus TCP server for connection to building automation or SCADA using the provided Ethernet port.

Before attempting to install, commission or operate this equipment all relevant sections of this document must be read and fully understood, failure to follow them could damage the product or cause a hazardous condition. If in doubt about any requirements consult the supplier.

Check the ratings in the following instructions to ensure the product is suitable for your application.

Installation, commissioning or adjustment of this product **MUST** be carried out by personnel qualified by local, state, regional or national requirements.

After installation is complete, check the product operation is as described in these instructions.



TECHNICAL DATA NXTSD507HD

Screen type:	TFT (a-Si), capacitive
Resolution:	800 x 480
Diagonal screen area:	177.8mm (7 in.)
Active area:	152.4mm x 91.44mm (6 in. x 3.6 in.)
Color depth:	18-bit
Interface method:	Modbus RTU via RS-485
Nominal voltage	24 VDC \pm 20%
Nominal power consumption:	0.45A @ 24VDC (10.8W)
Operating temperature range:	-20°C to +50°C (-4°F to +122°F)
Storage temperature range:	-30°C to +80°C (-22°F to +176°F)
Degree of protection:	Indoor use only, IP67 face, IP40 rear
Installation orientation:	Landscape (horizontal)
Unit dimensions faceplate:	201mm x 140mm (7.91 in. x 5.51 in.)
Unit dimensions depth:	40mm (1.57 in.)
Panel cutout dimensions:	See mounting section for diagram
Weight:	1.1 kg. (2.5 lb.)



TECHNICAL DATA NXTSD512HD

Screen type:	TFT (a-Si), capacitive
Resolution:	1280 x 800
Diagonal screen area:	307.4mm (12.1 in.)
Active area:	261.12mm x 163.2mm (10.28 in. x 6.43 in.)
Color depth:	24-bit
Interface method:	Modbus RTU via RS-485
Nominal voltage	24 VDC \pm 20%
Nominal power consumption:	0.9A @ 24VDC (21.6W)
Operating temperature range:	-20°C to +50°C (-4°F to +122°F)
Storage temperature range:	-30°C to +80°C (-22°F to +176°F)
Degree of protection:	Indoor use only, IP67 face, IP40 rear
Installation orientation:	Landscape (horizontal)
Unit dimensions faceplate:	313.4mm x 215.5mm (12.3 in. x 8.48 in.)
Unit dimensions depth:	50mm (1.97 in.)
Panel cutout dimensions:	300mm x 192mm (11.81 in. x 7.55 in.)
Weight:	2.5 kg. (5.5 lb.)



ORDERING INFORMATION

Touchscreen Interfaces	
NXTSD507HD	Touchscreen interface, 7-inch diagonal screen size, 24VDC, for use with NXF4000 or PPC4000 parallel positioning system
NXTSD512HD	Touchscreen interface, 12.1-inch diagonal screen size, 24VDC, for use with NXF4000 or PPC4000 parallel positioning system
Accessories	
59-565	Cable to connect NXTSD5xxHD to NXF4000 or PPC4000, separate power and communication, sold by the foot.



WARNING: Use of third-party power supply is permitted, provided the power supply meets NEC CLASS 2 to protect against fire and electrical shock.



MOUNTING NXTSD507HD

Method

The NXTSD507HD requires a non-symmetrical cutout and is secured using eight knurled-head thumb nuts. Refer to the figure below for the layout of these thumb nuts.



Rear of NXTSD507HD showing placement of the knurled-head thumb nuts

The thumb nuts attach to threaded posts which are threaded into inserts around the bezel of the screen. See the figure to the right for a diagram of the thumb nut attached to the post. The post and thumb nuts use M4x0.7 thread and the posts are 25mm long. If a post and thumb nut are lost and need replacement, an M4x0.7 screw that is 10mm long can be used in combination with a washer.



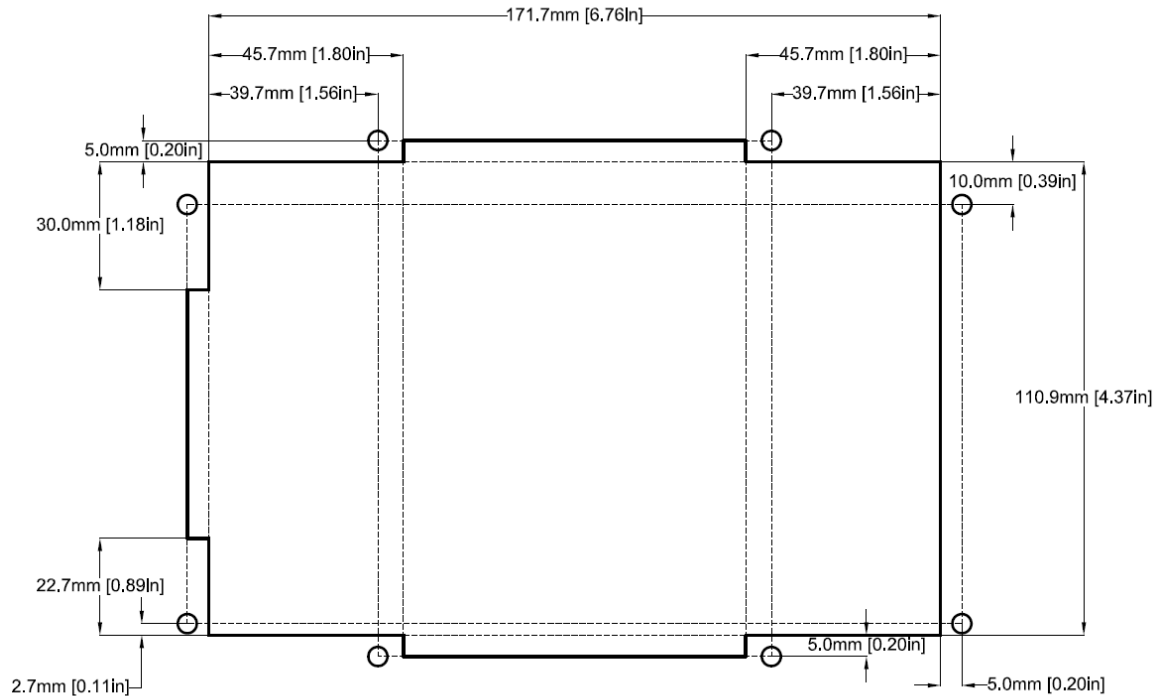
Post with knurled-head thumb nut



Cutout

Use the following dimensions to mark the necessary cutout and holes to mount the screen. The orientation of the diagram is from the face of the panel where the cutout is being made. A template is also provided on the following page that may be printed at 100% scale and used to provide a guide.

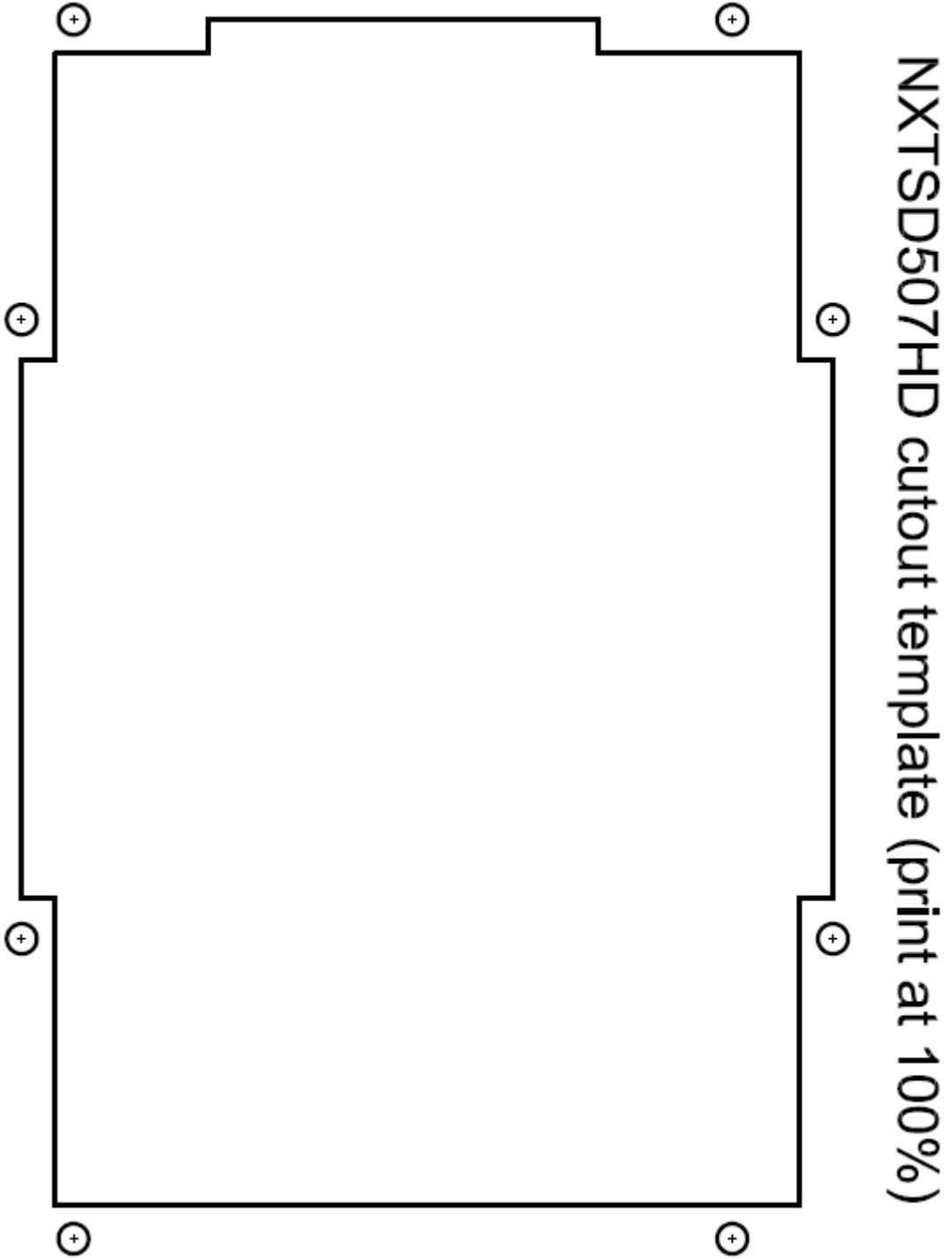
NXTSD507HD non-symmetrical cutout (shown from panel face)



Holes are for M4x0.7 threaded posts with knurled-head thumb nuts (minimum clearance shown)



Template

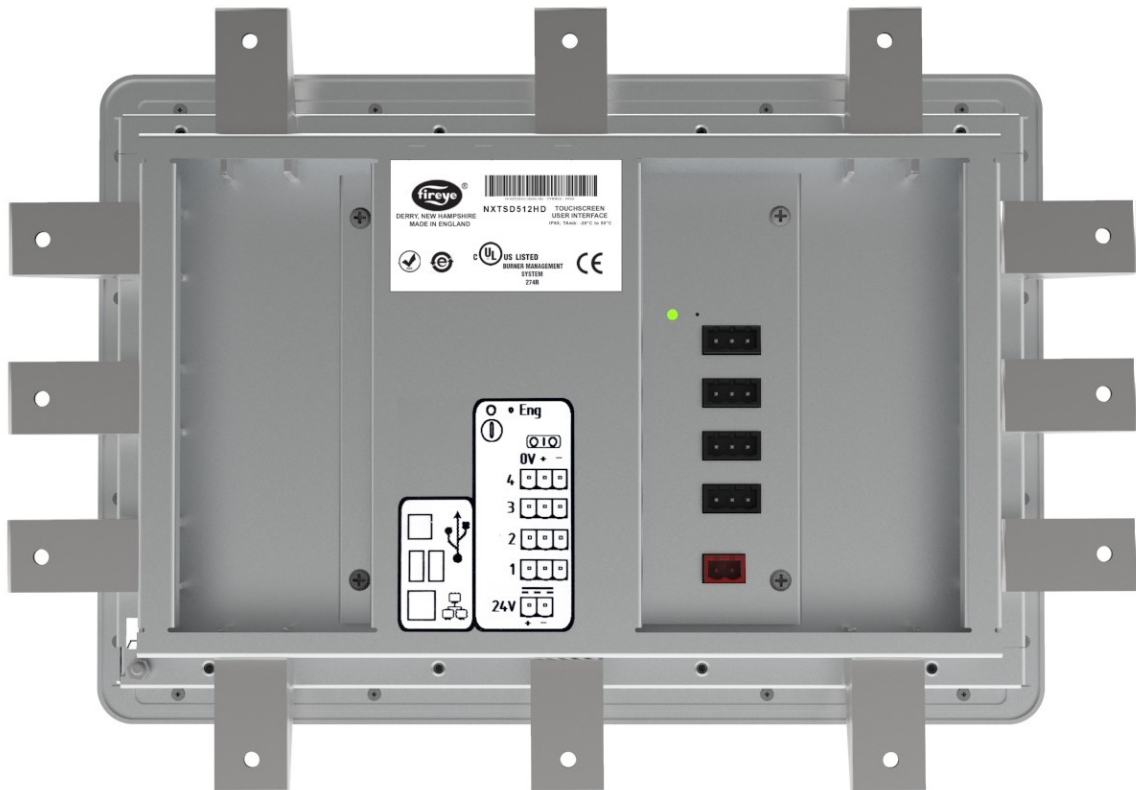




MOUNTING NXTSD512HD

Method

The NXTSD512HD requires a rectangular cutout and is secured using up to 12 retaining clips with securing screws. Refer to the figure below for the layout of these clips. Note that it may not be necessary to use all of the clips to achieve a proper fit.



NXTSD512HD showing placement of the retaining clips

The retaining clips accept an M4x0.7 threaded screw (40mm length provided). The figure below shows the retaining clip. The clips first latch into the perimeter of the screen from the rear using hooks. As the screws are tightened, they push against the back of the panel. As this happens, pressure is applied to the retaining clips to secure the screen. Tighten the screws evenly and only to a sufficient pressure to ensure that they remain in position. A medium strength thread-locking compound (commonly referred to as “blue”) may be used to prevent loosening of the screws if the equipment is subject to vibration or will be in transit.



Post with knurled-head thumb nut



Cutout

Use the following dimensions to mark the necessary cutout to mount the screen. The orientation of the screen is with the widest dimension horizontal.

NXTSD512HD symmetrical cutout



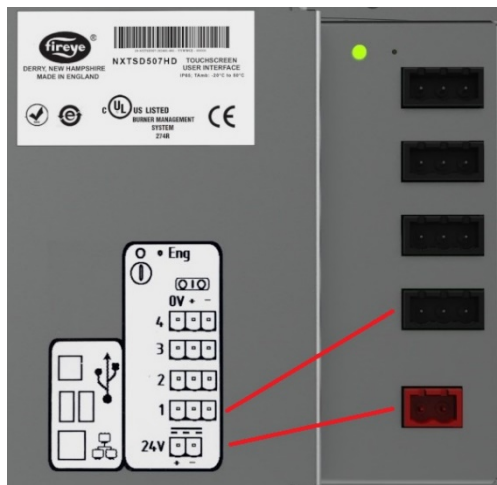


WIRING

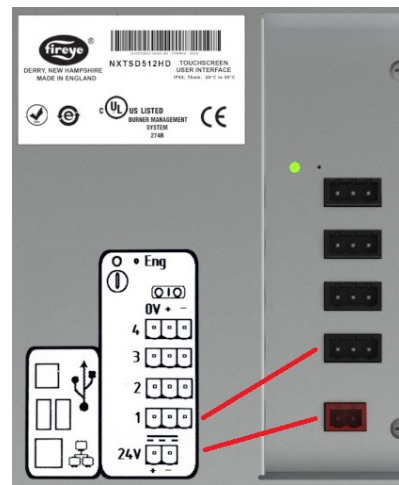
Terminals

The recommended cable (59-565) contains four wires: two power wires (18AWG) and two communication wires (22AWG) in a twisted pair. There is also a drain wire and the cable is available by the foot.

The figures below show the connectors for both power and communications.



NXTSD507HD



NXTSD512HD

The connector labeled 24V supplies the 24VDC power to the unit. The connection is polarity sensitive and is designated on the legend. It is recommended to use wire between 16AWG and 18AWG for this connection. The connector is a two-position 5.08mm pluggable terminal block with screw terminals.

The connector labeled 1 is the RS-485 serial port used for Modbus RTU communication to the NXF4000 or PPC4000. The connection is polarity sensitive and is designated on the legend. It is recommended to use a twisted pair wire between 18AWG and 22AWG for this connection. The connector is a three-position 5.08mm pluggable terminal block with screw terminals.

The connections to the NXF4000 or PPC4000 are to the connectors P2 for power and P12 for communications. Refer to bulletin NXF-4001 or PPC-4001 for further clarification on terminal ratings, power supply considerations and any other issues that may not be covered in this bulletin. Refer to the table below for the required wiring connections between the connected control and the screen.



NXF4000/PPC4000 terminal blocks



Wiring

The wiring between the devices is shown in the table below:

59-565 wire color	Wire gauge	NXF4000/PPC4000 terminal	NXTSD5xxHD terminal
Red	18AWG	P2-1	24V(+)
Black	18AWG	P2-4	24V(-)
Brown	22AWG	P12-1	1(+)
Orange	22AWG	P12-2	1(-)

In the event of electrical noise in the cabling, the drain wire inside the 59-565 cable can be connected to earth ground on one end of the cable. Normally this is not required as the twisted pair used for the communication wiring handles the noise rejection.

If either a third-party power supply or a different cable than the one recommended above is used, connect NXTSD5xxHD terminal 1(0V) to the 24VDC common of the NXF4000 or PPC4000 (P2.4). This will ensure that the Modbus connection and the power supply have the same earth potential.



WARNING: Use of third-party power supply is permitted, provided the power supply meets NEC CLASS 2 to protect against fire and electrical shock.

Ethernet/USB

The figures below show the connectors for Ethernet and USB. There is one Ethernet port for connecting to a network and two type-A USB ports for connecting to a keyboard, mouse or USB drive. A USB hub can be connected if needed to increase the capacity or accessibility of these ports.



NXTSD507HD



NXTSD512HD



ESTABLISHING COMMUNICATION

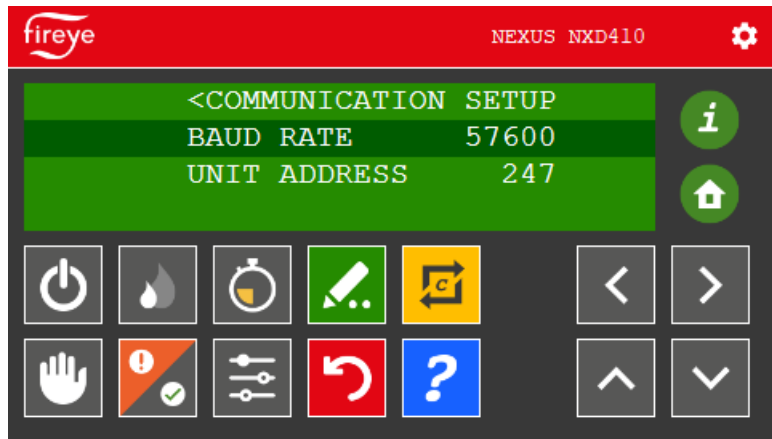
The NXTSD507HD and NXTSD512HD screens both use Modbus RTU via RS-485 to connect to the NXF4000 or PPC4000. The screen is the master device (client) and the NXF4000 is the slave device (server). There can be only one master device on a Modbus RTU network so if additional Modbus connectivity is needed (for building management, etc.), this can be done using the Modbus TCP/IP server function from the screen. See section *MODBUS TCP/IP SERVER* for additional information on this.

The baud rate is fixed at 57600 and the default node address to communicate to is 247. This baud rate and node address are also the default settings of the NXF4000. Normally, no changes will have to be made to these settings in order to establish communication.

If there is no communication, first check the communication settings of the NXF4000 or PPC4000. This is done using the NXD410 or NXD410TS interface. See Fireeye bulletin *NXF-4001* or *PPC-4001* for additional information on NXF4000 or PPC4000 configuration and functionality. Go to the menu **COMMUNICATION SETUP**, then pressing the right arrow key.



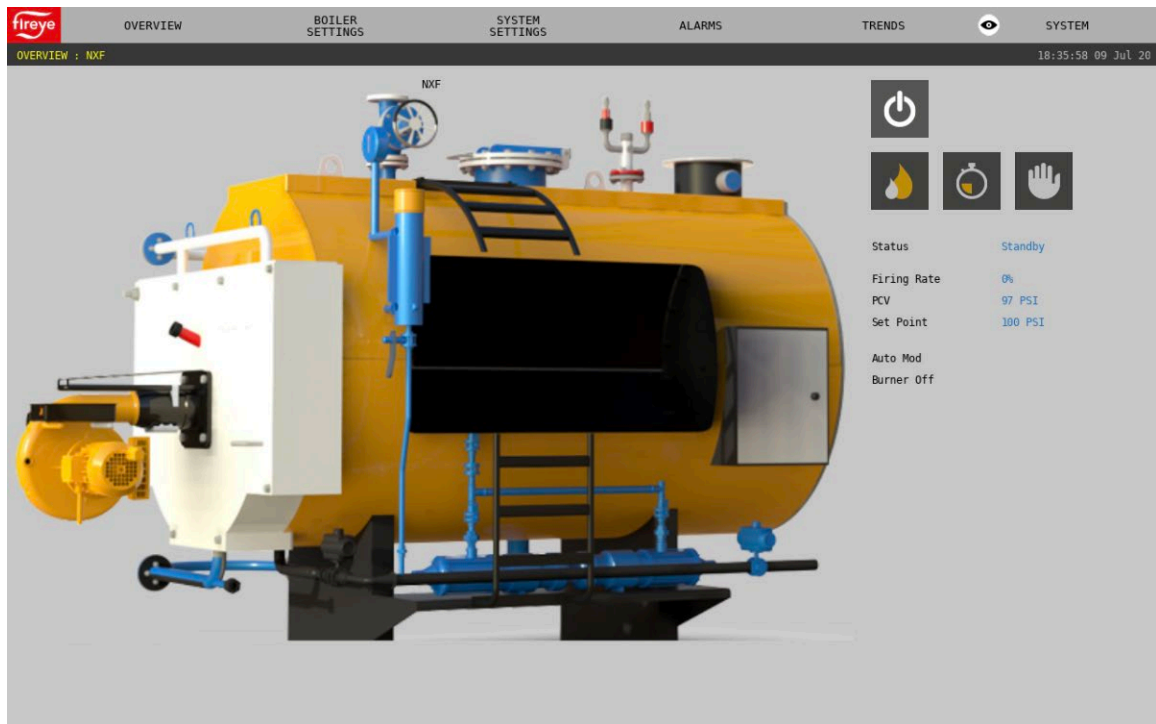
Use the arrow keys and the **MODIFY/SAVE** icon to set the baud rate to 57600 and the node address to 247 (see section *SYSTEM* → *Miscellaneous* → *Device Configuration* if the screen should be configured to communicate to a different node address).





HOME SCREEN

The home screen contains the most relevant information for an overall view of the system status. Additional menus are positioned at the top of all screens to allow navigation to detail and configuration pages. Pressing the button on the far left of this menu banner (the **Fireeye logo**) will return the display to the home screen.





OVERVIEW SCREEN

Pressing the **OVERVIEW** button on the menu banner will display the overview screen. All of the same information from the home screen is available, but there are also additional tabs for additional status information. See Fireeye bulletin *NXF-4001* or *PPC-4001* for additional information on NXF4000 or PPC4000 configuration and functionality.

Overview screen for NXF boiler. The screen displays a 3D model of the boiler, a power button, and various status indicators. The status indicators include:

- Auto Mod
- Flame Strength: 100
- Status: Auto
- Firing Rate: 20%
- PCV: 98 PSI
- Set Point: 100 PSI

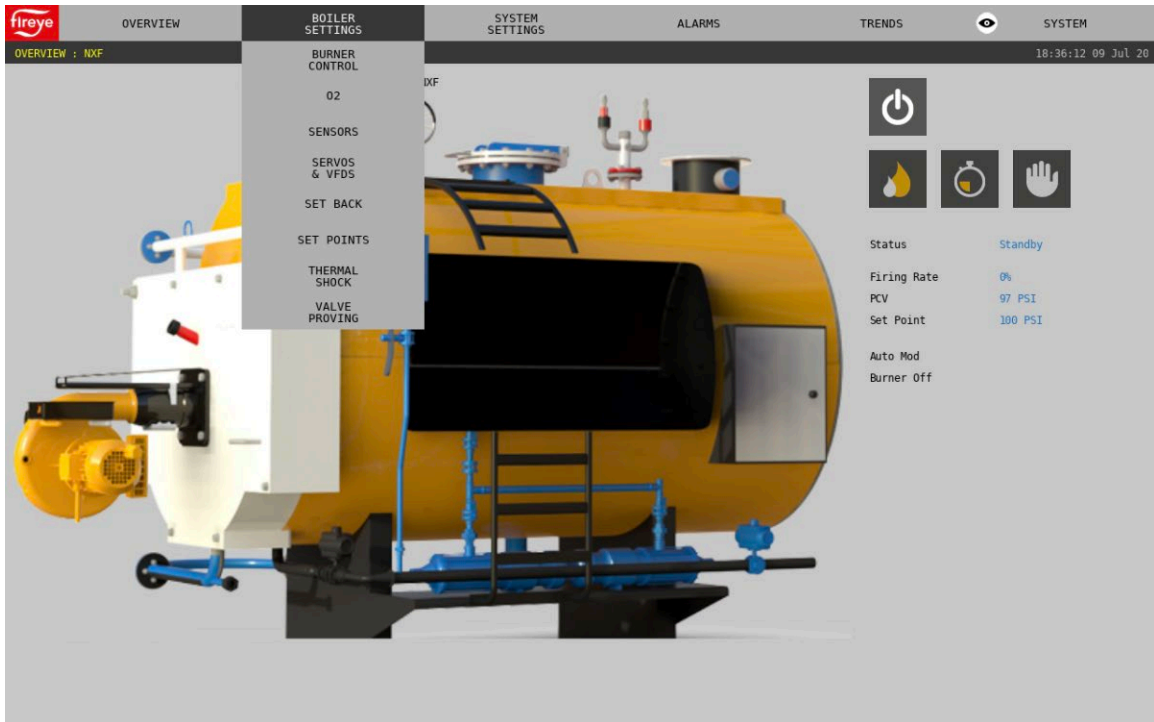
The screen also features a table with the following data:

General	Sensors	Servos and VFDs	Digital Inputs	Outputs	FSG Board	O2	Version
Profile	1	Points	13	Current Point	4-5		
Mod Input	Primary Sensor	Internal Temp	23.38°C				
System Hours	344	Burner Hours	74	Burner Cycles	112		



BOILER SETTINGS

Pressing the **BOILER SETTINGS** button on the menu banner will display the boiler settings submenu. Each of these submenu options will display a screen dedicated to a specific setting function. See Fireeye bulletin *NXF-4001* or *PPC-4001* for additional information on NXF4000 or PPC4000 configuration and functionality.



Changing values

Changing a value requires entering the appropriate user level passcode. If this is needed, a “Security Control” popup will prompt for this. See Fireeye bulletin *NXF-4001* or *PPC-4001* for additional information on NXF4000 or PPC4000 configuration and functionality.

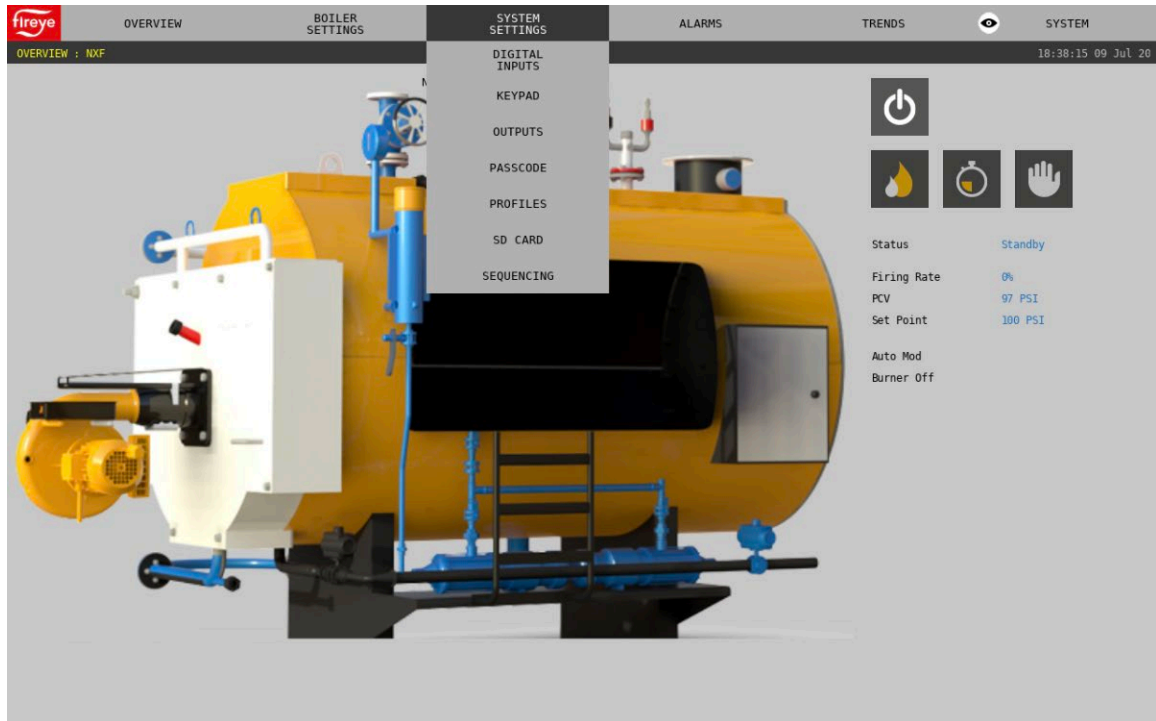


Security control popup



SYSTEM SETTINGS

Pressing the **SYSTEM SETTINGS** button on the menu banner will display the system settings submenu. Each of these submenu options will display a screen dedicated to a specific setting function. See Fireeye bulletin *NXF-4001* or *PPC-4001* for additional information on NXF4000 or PPC4000 configuration and functionality.





ALARMS

Pressing the **ALARMS** button on the menu banner will display the alarms submenu.

The screenshot shows the Fireeye control interface with the **ALARMS** submenu open. The main menu banner includes **OVERVIEW**, **BOILER SETTINGS**, **SYSTEM SETTINGS**, **ALARMS**, **TRENDS**, and **SYSTEM**. The **ALARMS** submenu contains **ACTIVE**, **LOG**, and **FAULT HISTORY**. The main display area shows a boiler image, a power button, and system parameters: **Status: Auto**, **Firing Rate: 4%**, **PCV: 99 PSI**, and **Set Point: 100 PSI**. Below this is a navigation bar with **General**, **Sensors**, **Servos and VFDs**, **Digital Inputs**, **Outputs**, **FSG Board**, **02**, and **Version**. The **General** tab is active, displaying a table of system metrics.

General	Sensors	Servos and VFDs	Digital Inputs	Outputs	FSG Board	02	Version
Profile	1	Points	6	Current Point	3-4		
Mod Input	Primary Sensor	Internal Temp	38.88°C				
System Hours	322	Burner Hours	68	Burner Cycles	118		



Active

Active alarms will appear on any screen as a red banner with a button to dismiss the alarm banner. The active alarm page accessible here will list any active alarms. Dismissing the alarm banner will not remove an active alarm from this list.

The screenshot shows the Fireeye interface with the 'ALARMS' tab selected. A red banner at the top of the main content area displays two active alarms:

Tag	Description
NXF_A_Incompatible	Connected NXF is incompatible. Upgrade firmware.
NXF_A_Lockout	SERVO 2 LOST @ Move To Purge

At the bottom of the red banner, the text '07/09/2020 18:42:12 SERVO 2 LOST @ Move To Purge' is displayed on the left, and an 'Okay' button is on the right.



Log

The alarm log screen will show the list of alarms sorted by date. The date show is at the top of the screen and can be adjusted using the left and right arrows. Each entry is date and time stamped. Alarms for the past 30 days are stored.

DateTime	Tag	Event
07/09/2020 18:42:12	NXF.A_Lockout	SERVO 2 LOST @ Move To Purge



Fault History

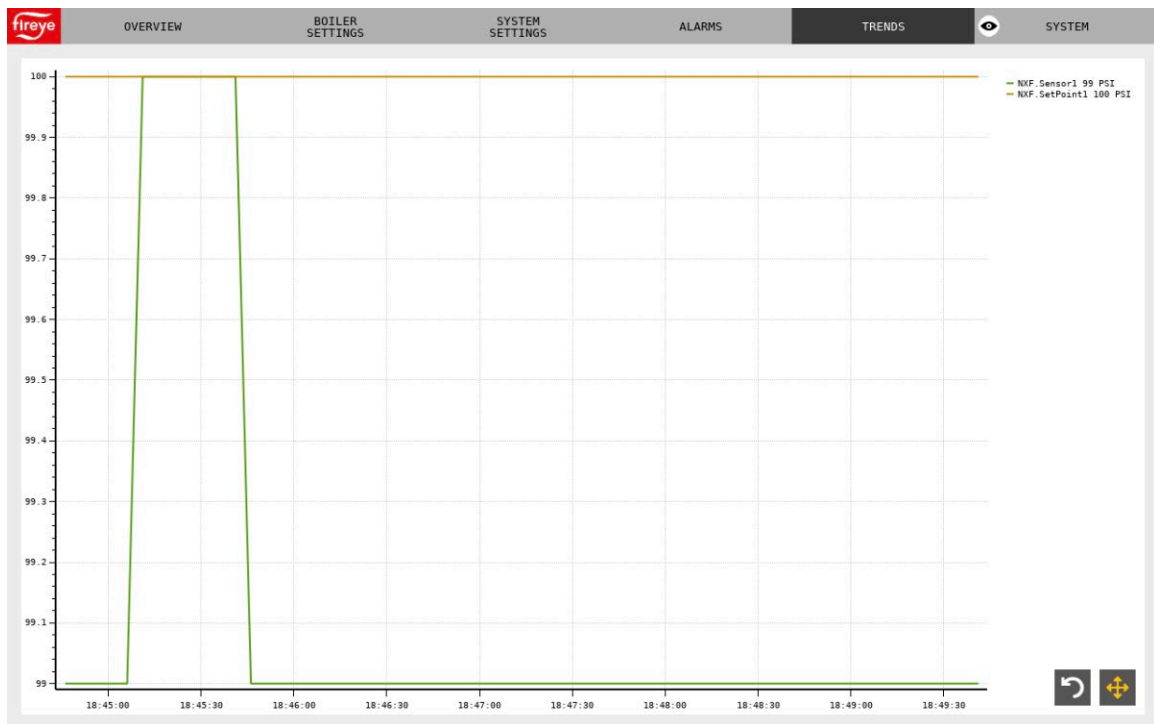
The complete fault history from the NXF4000 or PPC4000 memory is accessible here.

#	Error Code	Description	State	Position	Date MM/DD/YYYY	Time	Fault Repeat 0
142	3	Z BOARD FAULT	Standby	0	01/01/2017	00:00:29	
141	35	SENSOR1 UNDER RNG	Post Purge	4	06/24/2020	05:53:09	
140	3	Z BOARD FAULT	Move To Purge	1	06/24/2020	05:39:12	
139	3	Z BOARD FAULT	Standby	0	06/24/2020	00:22:46	
138	462	LOST P INPUT	Purge	1	06/22/2020	03:58:27	
137	444	FVES OPEN I15	MFRO	2	06/22/2020	03:56:45	
136	499	FORCED I07	MTFI	2	06/22/2020	02:02:19	
135	126	SERVO 5 LOST	Move To Purge	1	06/22/2020	01:59:33	
134	253	SENSOR4 UNDER RNG	Standby	0	06/22/2020	01:55:19	
133	444	FVES OPEN I15	Standby	0	06/22/2020	01:37:12	



TRENDS

The submenu option **NXF PCV&SP** will display a trend graph that tracks the actual process value against the setpoint. The trend graph will automatically scale based upon the values and can be moved by date/time and zoomed in to increase the detail as needed.





SYSTEM

Pressing the **SYSTEM** button on the menu banner will display the system submenu. This is mostly the configuration data for the screen itself. The only exception is for the **COMMISSIONING** option, which is used to commission the NXF4000 or PPC4000 in commissioning mode or adjust ration mode.

The **SHUTDOWN** menu option will perform a soft shutdown on the screen. If this is done, power will have to be recycled to power the screen back on.





Help

Pressing the **HELP** button on the **SYSTEM** submenu will display the icon legend. This will help to identify what the icons designate if that is not known. See Fireeye bulletin *NXF-4001* or *PPC-4001* for additional information on NXF4000 or PPC4000 configuration and functionality.

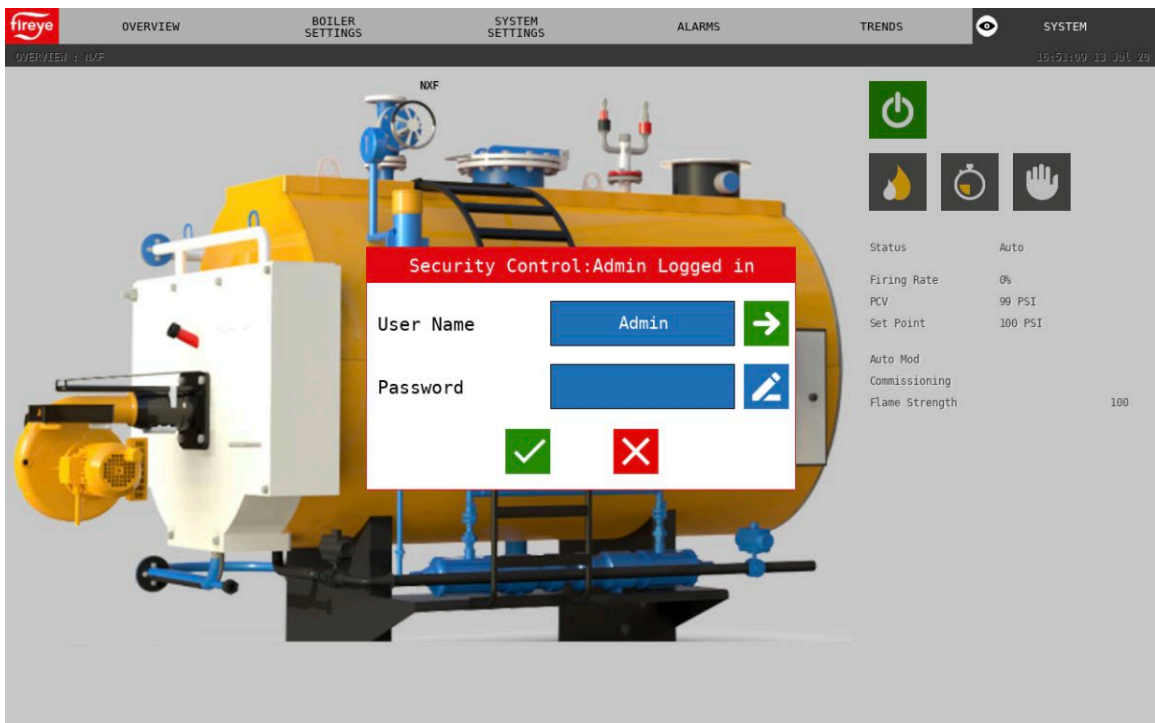




Security

The **SECURITY** menu option allows the user to log in with the proper level of access. There are three different levels available with different privileges, shown in the table below:

User	Password	View screen	Change settings	Screen options	Shutdown screen
Default	<none>	X	---	---	---
Eng	Eng	X	X	---	---
Admin	Admin	X	X	X	X



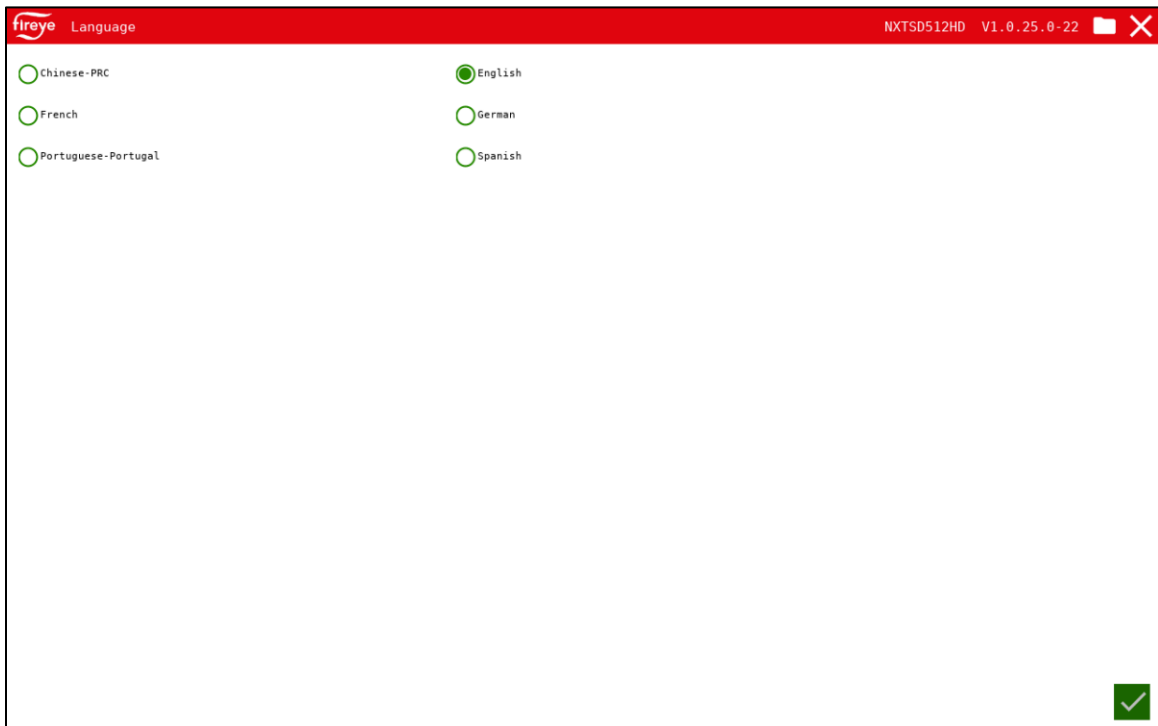


Options

Pressing the **OPTIONS** button on the **SYSTEM** submenu will allow the user to change screen options. There are five pages within the options: Language, Date/Time, Screen Saver, Data Server and Miscellaneous. Pressing the **folder icon** at the upper right corner will move between options pages.

Language

The screen language can be selected here. After confirming the change with the checkmark icon on the lower right, the new language will load – no reboot is necessary.





Date/Time

The date and time can be set here. Note that the date and time shown here will not update on screen while this menu is show but can still be set as needed. After confirming the change with the checkmark icon on the lower right, the new date and time will apply – no reboot is necessary.

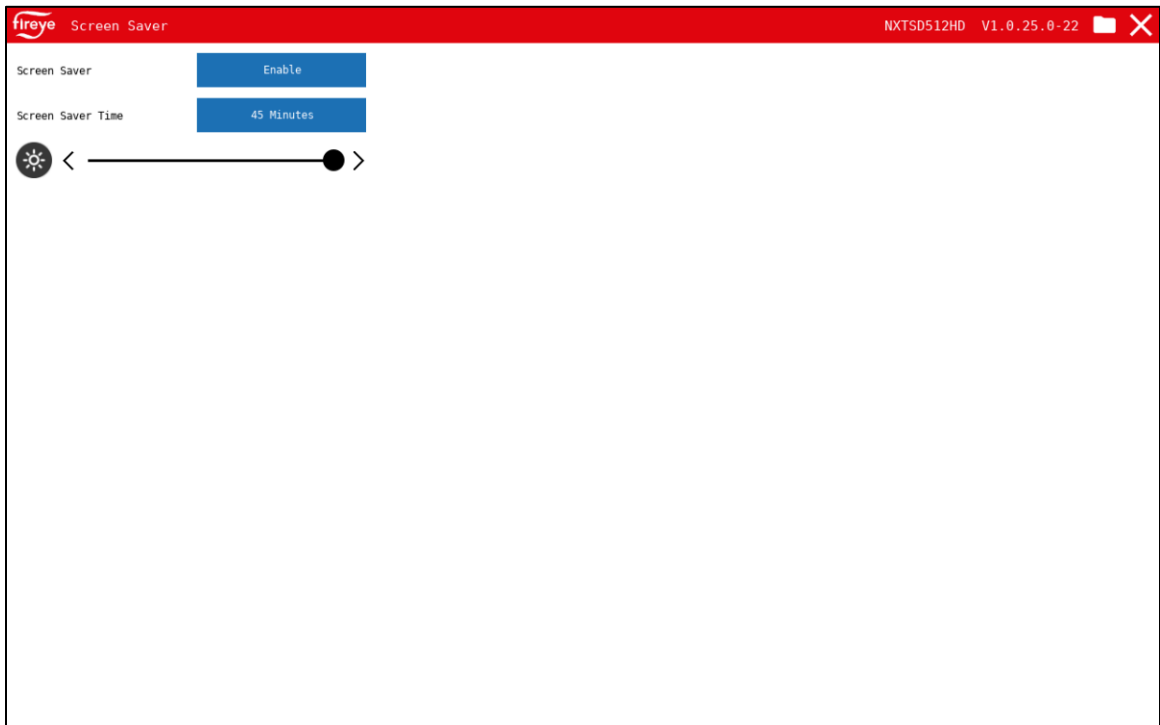
Changing the date and time here only sets the date and time for the NXTSD507HD or NXTSD512HD screen. Any connected NXF4000 or PPC4000 will automatically have the date and time synchronized intermittently. Additionally, if there is an active Internet connection, the date and time will automatically sync with the time server ntp.ubuntu.com.

Field	Value 1	Value 2	Value 3
Date	2020	7	13
Time	17	17	20



Screen Saver

The screen saver can be enabled or disabled from this page. Additionally, the amount of time required before screen saver activates (only if enabled) can be set here. There is also a slider to set the screen brightness.





Data Server

The data server is a Modbus TCP/IP server that can be connected to building management, SCADA or to a PLC for data collection. See the section **MODBUS TCP/IP SERVER** for additional information on the mapping of this data.

The first option allows for the data server function to be enabled or disabled. The “Export Tags” function will write two files to a USB drive: ServerMap.csv (contains the mapping information as contained in this bulletin) and EnumMap.csv (contains the descriptions of enumerated data such as operating state, also as contained in this bulletin). These files will be written into a folder named “Export” that is within a folder on at the base level of the drive named “Fireyehmi”. These folders will be created automatically if they do not exist.

The Modbus node address and the device IP address, subnet mask and gateway can be set here. The Modbus TCP/IP port number can also be changed from the default (standard) port 502.

After confirming the change with the checkmark icon on the lower right, the new settings will apply following a reboot of the screen. See the section **SYSTEM → SHUTDOWN** to perform a system shutdown, then cycle power to restart.

Field	Value
Data Server	Enable Export Tags
Device Address	1
IP Address	192 168 1 205
Port No	502
Subnet Mask	255 255 255 0
Default Gateway	192 168 1 1

Miscellaneous

This page is the catch-all for any additional screen settings that don't fit into other sections.

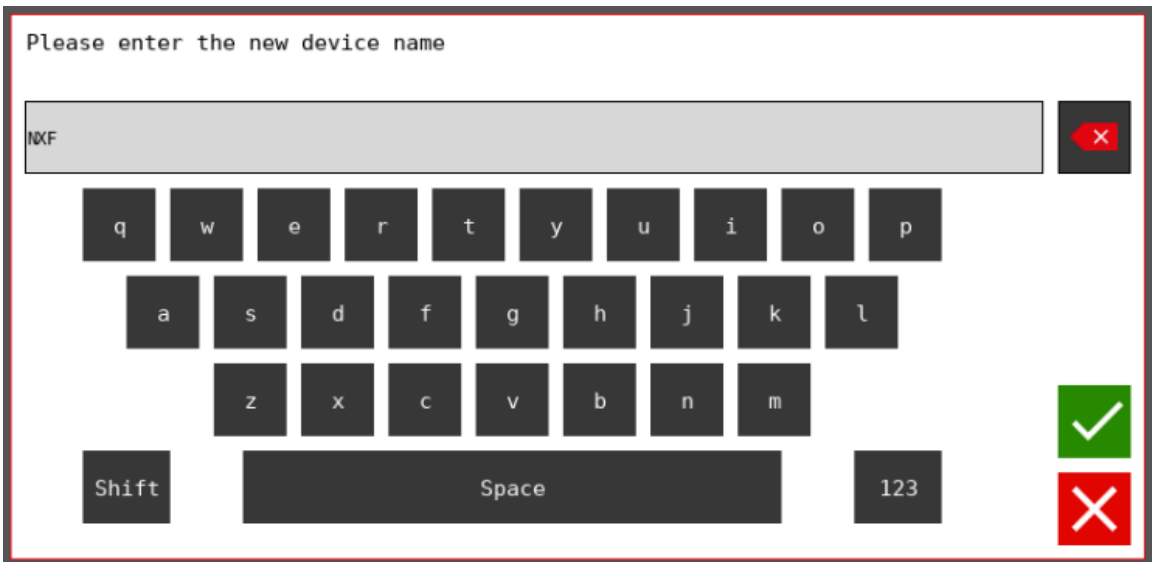
Historical Data Export will write two data files for each day to a USB drive. There will be a file for the alarms in the format *XXXXMMDD.alm*, and another for events in the format *XXXXMMDD.evt*. These files are in a CSV format for viewing with a text editor or Microsoft Excel. They contain information that may be useful for troubleshooting or informational purposes. These files will be written into a folder named "Export" that is within a folder on at the base level of the drive named "FireeyeHMI". These folders will be created automatically if they do not exist.



Device Configuration takes the screen offline to allow making changes to the node address of the NXF4000 or PPC4000 that is connected. After confirming the change of the node address, the screen will reboot.



The first icon will allow the name of the device to be changed. The main purpose of changing the device name is for entries in the alarm or event logs.





The second icon will allow the node address of the device being connected to be changed. This will also change the node address at the device configuration if communication is active and the firmware is v4.3 or higher. If communication is not active or if the firmware revision is less than v4.3, the node address at the NXF4000 or PPC4000 may have to be verified after making this change. See section **ESTABLISHING COMMUNICATION** for more information.

New Address

Min: 1 Max: 247

247 #

1 2 3 4 5 .

6 7 8 9 0 +-

⬅️ X ✓ X

Lastly, **Backup Configuration** allows the device configuration to be backed up to a file. This includes node addresses, names, device types, communication ports, etc. This file is written into a folder on at the base level of the drive named “FireyeHMI”. This folder will be created automatically if it does not exist. To restore, simply place a USB drive with a backup configuration file in the proper location into the screen upon power-up. It will be detected and applied automatically.



REMOTE VIEWING VIA VNC PROTOCOL

The screen can be remotely viewed and controlled using any standard VNC viewing software. VNC software allows remote viewing as if the user was at the screen and any interaction between a user at the actual screen or at one of the remote connections will show the same display. Multiple remote users can connect simultaneously using VNC.

This software can run on any smartphone, tablet or PC with the only prerequisite being that the screen is connected to the same network as the device connecting. The port used by VNC is the standard port 5900. To connect, simply enter the screen's IP address into the VNC viewer software and then connect. When prompted for a password, use the VNC password "fireeye" (all lowercase). If the eyeball icon appears on the upper right corner to the left of the SYSTEM submenu, that indicates that a connection is active.

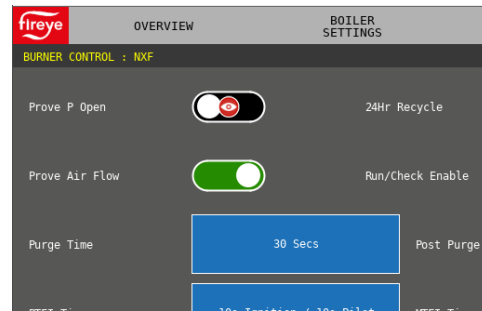


VNC connection is active

VNC can be connected either as a view-only connection or with remote control capability. If connected with remote control capability, most features that allow changing settings are disabled. Either an eyeball icon (indicating view-only) or a pop-up message will indicate that the change is not allowed. Moving between screens is the primary function allowed with remote control. Note that since a VNC connection is the same at the actual screen or at a remote connection, control at the actual screen will also be disabled while a VNC viewer is connected.



Changes disabled popup



Individual change disabled



MODBUS TCP/IP SERVER

A Modbus TCP/IP server is available and is enabled by default using node address 1 and port 502. These settings as well as the IP address settings can be changed. See the section *SYSTEM → OPTIONS → Data Server* for how to change these settings.

The Modbus server uses function code 3 for all reads and function code 6 for all writes. The address format shown here begins with address 0 – this would correspond to 40001 using 4x-style addressing. See Fireeye bulletin *MOD-4001* for additional information each data point by referencing the NXF4000 or PPC4000 address shown.

Gain describes how much to multiply the data. A gain of x1 means no manipulation is possible while a gain of x10 means that the Modbus representation of the data will be x10 (i.e. 900 indicates 90.0). The format shows the data type:

- S16/U16 – signed or unsigned 16-bit integer (signed if value could be negative)
- U16 bits – the bits of the 16-bit unsigned integer represent binary data
- U32 – unsigned 32-bit integer, spans two words (for values that may exceed 65535)
- Float – IEEE 754 single-precision float, spans two words
- String – Two ASCII characters per word, total number of characters shown

The last column indicates whether the point is read-only (R) or read/write (RW). Note that the writable points with “keypad” in the description will write to the keypad button or percent (manual modulation) with the same function. This means that if a keypad button is commanded via Modbus, it can be toggled back manually on the keypad. If the Modbus write is continuous, changing the command on the keypad will be quickly overridden. Button commands are also retentive through a power cycle.

If a register is only applicable to a specific firmware revision, that will be indicated by the firmware required in bold after the description.

^ -- A carat after the description indicates that the register is not applicable to the PPC4000.

* -- An asterisk after the description indicates that more information can be found in the *Enumerations* section that follows the mapping.

Mapping

Server Address	NXF4000 Address	Description	Gain	Format	Type
0	0	current operational state*	x1	S16/U16	R
1	1	flame signal value^	x1	S16/U16	R
2	2	operational hour counter	x1	U32	R
4	4	burner running hours counter	x1	U32	R
6	6	burner cycle counter	x1	U32	R
8	8	current modulation rate	x1	S16/U16	R
9	9	current modulation reason mode*	x1	S16/U16	R
10	10	current internal temperature Celsius	x10	S16/U16	R



Server Address	NXF4000 Address	Description	Gain	Format	Type
11	11	current profile commission point	x1	S16/U16	R
12	12	current calculated CO2 value	x1	S16/U16	R
13	13	controller type (0 = PPC4000, 1 = NXF4000)	x1	S16/U16	R
14	14	current profile	x1	S16/U16	R
15	14	burner control (Bit 8 = low fire, Bit 9 = high fire, Bit 10 = auto)	x1	U16 bits	R
16	15	total number of commissioned points in current profile	x1	S16/U16	R
17	16	current profile commissioned points range	x1	S16/U16	R
18	17	current digital input values*	x1	U16 bits	R
19	21	current VFD 1 position	x1	S16/U16	R
20	22	commanded VFD 1 position	x1	S16/U16	R
21	23	current VFD 2 position	x1	S16/U16	R
22	24	commanded VFD 2 position	x1	S16/U16	R
23	25	current running efficiency	x10	S16/U16	R
24	26	O2 trim process control variable value	x10	S16/U16	R
25	29	current running combustion efficiency	x10	S16/U16	R
26	35	O2 probe status (see bulletin NXCESO2-1001)	x1	S16/U16	R
27	36	O2 probe stack temperature	x10	S16/U16	R
28	37	O2 probe ambient temperature	x10	S16/U16	R
29	38	O2 probe O2 level	x100	S16/U16	R
30	51	ADC calibration constant for PCV/aux1/aux2	x1	S16/U16	R
32	56	Z processor firmware major revision (hex)	x1	S16/U16	R
33	57	Z processor firmware minor revision (hex)	x1	S16/U16	R
34	57	hold off reason*	x1	S16/U16	R
35	59	raw A2D measurement of the primary sensor	x1	S16/U16	R
36	60	raw A2D measurement of the aux 1 sensor	x1	S16/U16	R
37	61	raw A2D measurement of the aux 2 sensor	x1	S16/U16	R
38	65	raw A2D measurement of sensor 4	x1	S16/U16	R
39	66	raw A2D measurement of sensor 5	x1	S16/U16	R
40	75	servo 1 command	x1	S16/U16	R



Server Address	NXF4000 Address	Description	Gain	Format	Type
41	75	servo 1 data length	x1	S16/U16	R
42	76	servo 1 speed	x1	S16/U16	R
43	77	servo 1 position	x1	S16/U16	R
44	79	servo 1 current position	x1	S16/U16	R
51	84	servo 2 command	x1	S16/U16	R
52	84	servo 2 data length	x1	S16/U16	R
53	85	servo 2 speed	x1	S16/U16	R
54	86	servo 2 position	x1	S16/U16	R
55	87	servo 2 commanded position	x1	S16/U16	R
56	88	servo 2 current position	x1	S16/U16	R
63	93	servo 3 command	x1	S16/U16	R
64	93	servo 3 data length	x1	S16/U16	R
65	94	servo 3 speed	x1	S16/U16	R
66	95	servo 3 position	x1	S16/U16	R
67	96	servo 3 commanded position	x1	S16/U16	R
68	97	servo 3 current position	x1	S16/U16	R
75	102	servo 4 command	x1	S16/U16	R
76	102	servo 4 data length	x1	S16/U16	R
77	103	servo 4 speed	x1	S16/U16	R
78	104	servo 4 position	x1	S16/U16	R
79	105	servo 4 commanded position	x1	S16/U16	R
80	106	servo 4 current position	x1	S16/U16	R
87	111	servo 5 command	x1	S16/U16	R
88	111	servo 5 data length	x1	S16/U16	R
89	112	servo 5 speed	x1	S16/U16	R
90	113	servo 5 position	x1	S16/U16	R
91	114	servo 5 commanded position	x1	S16/U16	R
92	115	servo 5 current position	x1	S16/U16	R
99	120	servo 6 command	x1	S16/U16	R



Server Address	NXF4000 Address	Description	Gain	Format	Type
100	120	servo 6 data length	x1	S16/U16	R
101	121	servo 6 speed	x1	S16/U16	R
102	122	servo 6 position	x1	S16/U16	R
103	123	servo 6 commanded position	x1	S16/U16	R
104	124	servo 6 current position	x1	S16/U16	R
111	129	servo 7 command	x1	S16/U16	R
112	129	servo 7 data length	x1	S16/U16	R
113	130	servo 7 speed	x1	S16/U16	R
114	131	servo 7 position	x1	S16/U16	R
115	132	servo 7 commanded position	x1	S16/U16	R
116	133	servo 7 current position	x1	S16/U16	R
123	138	servo 8 command	x1	S16/U16	R
124	138	servo 8 data length	x1	S16/U16	R
125	139	servo 8 speed	x1	S16/U16	R
126	140	servo 8 position	x1	S16/U16	R
127	141	servo 8 commanded position	x1	S16/U16	R
128	142	servo 8 current position	x1	S16/U16	R
135	147	servo 9 command	x1	S16/U16	R
136	147	servo 9 data length	x1	S16/U16	R
137	148	servo 9 speed	x1	S16/U16	R
138	149	servo 9 position	x1	S16/U16	R
139	150	servo 9 commanded position	x1	S16/U16	R
140	151	servo 9 current position	x1	S16/U16	R
147	156	servo 10 command	x1	S16/U16	R
148	156	servo 10 data length	x1	S16/U16	R
149	157	servo 10 speed	x1	S16/U16	R
150	158	servo 10 position	x1	S16/U16	R
151	159	servo 10 commanded position	x1	S16/U16	R
152	160	servo 10 current position	x1	S16/U16	R
153	170	FSG board type*^	x1	S16/U16	R



Server Address	NXF4000 Address	Description	Gain	Format	Type
154	172	profile 1 minimum modulation	x1	S16/U16	R
155	172	profile 2 minimum modulation	x1	S16/U16	R
156	173	profile 3 minimum modulation	x1	S16/U16	R
157	173	profile 4 minimum modulation	x1	S16/U16	R
158	180	controller revision string	x1	String (8)	R
162	184	helper CPU major revision number (hex)	x1	S16/U16	R
163	185	helper CPU minor revision number (hex)	x1	S16/U16	R
164	186	VFD CPU minor revision number (hex)	x1	S16/U16	R
165	186	VFD CPU major revision number (hex)	x1	S16/U16	R
166	187	FSG CPU minor revision number (hex)	x1	S16/U16	R
167	187	FSG CPU major revision number (hex)	x1	S16/U16	R
168	190	next index	x1	S16/U16	R
169	190	lockout history	x1	S16/U16	R
170	191	current active error number	x1	S16/U16	R
171	192	total number of errors detected	x1	S16/U16	R
172	193	lockout history 1 operation state*	x1	S16/U16	R
173	193	lockout history 1 profile position	x1	S16/U16	R
174	194	lockout history 1 error code*	x1	S16/U16	R
175	195	lockout history 1 sec	x1	S16/U16	R
176	195	lockout history 1 min	x1	S16/U16	R
177	196	lockout history 1 hour	x1	S16/U16	R
178	196	lockout history 1 date	x1	S16/U16	R
179	197	lockout history 1 month	x1	S16/U16	R
180	197	lockout history 1 day	x1	S16/U16	R
181	198	lockout history 1 year	x1	S16/U16	R
182	199	lockout history 2 operation state*	x1	S16/U16	R
183	199	lockout history 2 profile position	x1	S16/U16	R
184	200	lockout history 2 error code*	x1	S16/U16	R
185	201	lockout history 2 sec	x1	S16/U16	R



Server Address	NXF4000 Address	Description	Gain	Format	Type
186	201	lockout history 2 min	x1	S16/U16	R
187	202	lockout history 2 hour	x1	S16/U16	R
188	202	lockout history 2 date	x1	S16/U16	R
189	203	lockout history 2 month	x1	S16/U16	R
190	203	lockout history 2 day	x1	S16/U16	R
191	204	lockout history 2 year	x1	S16/U16	R
192	205	lockout history 3 operation state*	x1	S16/U16	R
193	205	lockout history 3 profile position	x1	S16/U16	R
194	206	lockout history 3 error code*	x1	S16/U16	R
195	207	lockout history 3 sec	x1	S16/U16	R
196	207	lockout history 3 min	x1	S16/U16	R
197	208	lockout history 3 hour	x1	S16/U16	R
198	208	lockout history 3 date	x1	S16/U16	R
199	209	lockout history 3 month	x1	S16/U16	R
200	209	lockout history 3 day	x1	S16/U16	R
201	210	lockout history 3 year	x1	S16/U16	R
202	211	lockout history 4 operation state*	x1	S16/U16	R
203	211	lockout history 4 profile position	x1	S16/U16	R
204	212	lockout history 2 error code*	x1	S16/U16	R
205	213	lockout history 4 sec	x1	S16/U16	R
206	213	lockout history 4 min	x1	S16/U16	R
207	214	lockout history 4 hour	x1	S16/U16	R
208	214	lockout history 4 date	x1	S16/U16	R
209	215	lockout history 4 month	x1	S16/U16	R
210	215	lockout history 4 day	x1	S16/U16	R
211	216	lockout history 4 year	x1	S16/U16	R
212	217	lockout history 5 operation state*	x1	S16/U16	R
213	217	lockout history 5 profile position	x1	S16/U16	R
214	218	lockout history 5 error code*	x1	S16/U16	R
215	219	lockout history 5 sec	x1	S16/U16	R



Server Address	NXF4000 Address	Description	Gain	Format	Type
216	219	lockout history 5 min	x1	S16/U16	R
217	220	lockout history 5 hour	x1	S16/U16	R
218	220	lockout history 5 date	x1	S16/U16	R
219	221	lockout history 5 month	x1	S16/U16	R
220	221	lockout history 5 day	x1	S16/U16	R
221	222	lockout history 5 year	x1	S16/U16	R
222	223	lockout history 6 operation state*	x1	S16/U16	R
223	223	lockout history 6 profile position	x1	S16/U16	R
224	224	lockout history 6 error code*	x1	S16/U16	R
225	225	lockout history 6 sec	x1	S16/U16	R
226	225	lockout history 6 min	x1	S16/U16	R
227	226	lockout history 6 hour	x1	S16/U16	R
228	226	lockout history 6 date	x1	S16/U16	R
229	227	lockout history 6 month	x1	S16/U16	R
230	227	lockout history 6 day	x1	S16/U16	R
231	228	lockout history 6 year	x1	S16/U16	R
232	229	lockout history 7 operation state*	x1	S16/U16	R
233	229	lockout history 7 profile position	x1	S16/U16	R
234	230	lockout history 7 error code*	x1	S16/U16	R
235	231	lockout history 7 sec	x1	S16/U16	R
236	231	lockout history 7 min	x1	S16/U16	R
237	232	lockout history 7 hour	x1	S16/U16	R
238	232	lockout history 7 date	x1	S16/U16	R
239	233	lockout history 7 month	x1	S16/U16	R
240	233	lockout history 7 day	x1	S16/U16	R
241	234	lockout history 7 year	x1	S16/U16	R
242	235	lockout history 8 operation state*	x1	S16/U16	R
243	235	lockout history 8 profile position	x1	S16/U16	R
244	236	lockout history 8 error code*	x1	S16/U16	R



Server Address	NXF4000 Address	Description	Gain	Format	Type
245	237	lockout history 8 sec	x1	S16/U16	R
246	237	lockout history 8 min	x1	S16/U16	R
247	238	lockout history 8 hour	x1	S16/U16	R
248	238	lockout history 8 date	x1	S16/U16	R
249	239	lockout history 8 month	x1	S16/U16	R
250	239	lockout history 8 day	x1	S16/U16	R
251	240	lockout history 8 year	x1	S16/U16	R
252	241	lockout history 9 operation state*	x1	S16/U16	R
253	241	lockout history 9 profile position	x1	S16/U16	R
254	242	lockout history 9 error code*	x1	S16/U16	R
255	243	lockout history 9 sec	x1	S16/U16	R
256	243	lockout history 9 min	x1	S16/U16	R
257	244	lockout history 9 hour	x1	S16/U16	R
258	244	lockout history 9 date	x1	S16/U16	R
259	245	lockout history 9 month	x1	S16/U16	R
260	245	lockout history 9 day	x1	S16/U16	R
261	246	lockout history 9 year	x1	S16/U16	R
262	247	lockout history 10 operation state*	x1	S16/U16	R
263	247	lockout history 10 profile position	x1	S16/U16	R
264	248	lockout history 10 error code*	x1	S16/U16	R
265	249	lockout history 10 sec	x1	S16/U16	R
266	249	lockout history 10 min	x1	S16/U16	R
267	250	lockout history 10 hour	x1	S16/U16	R
268	250	lockout history 10 date	x1	S16/U16	R
269	251	lockout history 10 month	x1	S16/U16	R
270	251	lockout history 10 day	x1	S16/U16	R
271	252	lockout history 10 year	x1	S16/U16	R
272	255	engineering units (0 = English, 1 = metric)	x1	S16/U16	R
273	255	spare	x1	S16/U16	R
274	257	sensor 1 type*	x1	S16/U16	R



Server Address	NXF4000 Address	Description	Gain	Format	Type
275	257	sensor 1 range*	x1	S16/U16	R
276	258	sensor 2 type*	x1	S16/U16	R
277	258	sensor 2 range*	x1	S16/U16	R
278	259	sensor 3 type*	x1	S16/U16	R
279	259	sensor 3 range*	x1	S16/U16	R
280	260	sensor 4 type*	x1	S16/U16	R
281	260	sensor 4 range*	x1	S16/U16	R
282	261	sensor 5 type*	x1	S16/U16	R
283	261	sensor 5 range*	x1	S16/U16	R
284	262	setpoint 1 use (<i>0 = unused, 1 = sensor 1</i>)	x1	S16/U16	R
285	262	setpoint 1 limit type (<i>0 = deviation, 1 = absolute</i>)	x1	S16/U16	R
286	263	setpoint 1 integral	x1	S16/U16	R
287	263	setpoint 1 derivative	x1	S16/U16	R
288	264	setpoint 1 value	x1	S16/U16	R
289	265	setpoint 1 cut in	x1	S16/U16	R
290	266	setpoint 1 cut out	x1	S16/U16	R
291	268	setpoint 1 high margin limit	x1	S16/U16	R
292	269	setpoint 1 high alarm limit	x1	S16/U16	R
293	270	setpoint 2 use (<i>0 = unused, 1 = sensor 1, 2 = sensor 2</i>)	x1	S16/U16	R
294	270	setpoint 2 limit type (<i>0 = deviation, 1 = absolute</i>)	x1	S16/U16	R
295	271	setpoint 2 integral	x1	S16/U16	R
296	271	setpoint 2 derivative	x1	S16/U16	R
297	272	setpoint 2 value	x1	S16/U16	R
298	273	setpoint 2 cut in	x1	S16/U16	R
299	274	setpoint 2 cut out	x1	S16/U16	R
300	276	setpoint 2 high margin limit	x1	S16/U16	R
301	277	setpoint 2 high alarm limit	x1	S16/U16	R
302	278	setpoint 3 use (<i>0 = unused, 3 = sensor 3</i>)	x1	S16/U16	R
303	278	setpoint 3 limit type (<i>0 = deviation, 1 = absolute</i>)	x1	S16/U16	R



Server Address	NXF4000 Address	Description	Gain	Format	Type
304	279	setpoint 3 integral	x1	S16/U16	R
305	279	setpoint 3 derivative	x1	S16/U16	R
306	280	setpoint 3 value	x1	S16/U16	R
307	281	setpoint 3 cut in	x1	S16/U16	R
308	282	setpoint 3 cut out	x1	S16/U16	R
309	284	setpoint 3 high margin limit	x1	S16/U16	R
310	285	setpoint 3 high alarm limit	x1	S16/U16	R
329	335	valve proving test time 1^	x5	S16/U16	R
330	335	valve proving test time 2^	x5	S16/U16	R
331	336	valve proving test duration^ (0 = prepurge, 1 = postpurge)	x1	S16/U16	R
332	336	valve proving test method^ (0 = 2-valve, 1 = 3-valve NO, 2 = 3-valve NC)	x1	S16/U16	R
333	346	PCV sensor value	x1	String (22)	R
344	357	measured value	x1	String (22)	R
355	480	profile 1 name*	x1	S16/U16	R
356	480	profile 1 max modulation	x1	S16/U16	R
357	481	profile 2 name*	x1	S16/U16	R
358	481	profile 2 max modulation	x1	S16/U16	R
359	482	profile 3 name*	x1	S16/U16	R
360	482	profile 3 max modulation	x1	S16/U16	R
361	483	profile 4 name*	x1	S16/U16	R
362	483	profile 4 max modulation	x1	S16/U16	R
364	903	FSG prove air flow^ (0 = no, 1 = yes)	x1	S16/U16	R
365	900	recycle^ (0 = no, 1 = yes)	x1	S16/U16	R
366	900	PTFI time*^	x1	S16/U16	R
367	901	MTFI time*^	x1	S16/U16	R
368	901	intermittent pilot^ (0 = no, 1 = yes)	x1	S16/U16	R
369	902	FFRT time^ (0 = 1s, 1 = 2s, 2 = 3s, 3 = 4s)	x1	S16/U16	R
370	902	profile select (0 = digital input, 1-4 = profile 1-4 via keypad)	x1	S16/U16	R
371	905	post purge time^	x1	S16/U16	R



Server Address	NXF4000 Address	Description	Gain	Format	Type
372	n/a	sensor 1 value	x1	Float	R
374	n/a	sensor 2 value	x1	Float	R
376	n/a	sensor 3 value	x1	Float	R
378	n/a	sensor 4 value	x1	Float	R
380	n/a	sensor 5 value	x1	Float	R
382	1000	reset command	x1	S16/U16	R
383	1001	keypad control off/on (0 = off, 1 = on)	x1	S16/U16	RW
384	1002	keypad control low fire (0 = off, 1 = on)	x1	S16/U16	RW
385	1003	keypad control lead/lag (0 = off, 1 = on)	x1	S16/U16	RW
386	1004	keypad control auto/manual (0 = off, 1 = on)	x1	S16/U16	RW
387	1017	keypad manual modulation rate	x1	S16/U16	RW
388	1009	force analog 0 output [^] (40-200 = 4.0-20.0mA) v4.4+	x1	S16/U16	RW
389	1010	force VFD 1 output [^] (40-200 = 4.0-20.0mA) v4.4+	x1	S16/U16	RW
390	1011	force VFD 2 output [^] (40-200 = 4.0-20.0mA) v4.4+	x1	S16/U16	RW
391	1012	force user output 1 [^] (0 = off, 1 = on) v4.4+	x1	S16/U16	RW
392	1013	force user output 2 [^] (0 = off, 1 = on) v4.4+	x1	S16/U16	RW
393	1014	force user output 3 [^] (0 = off, 1 = on) v4.4+	x1	S16/U16	RW



Enumerations

Address 0: current operational state

Address 172: lockout history 1 operation state

Address 182: lockout history 2 operation state

Address 192: lockout history 3 operation state

Address 202: lockout history 4 operation state

Address 212: lockout history 5 operation state

Address 222: lockout history 6 operation state

Address 232: lockout history 7 operation state

Address 242: lockout history 8 operation state

Address 252: lockout history 9 operation state

Address 262: lockout history 10 operation state

0 = SYSTEM STARTUP

1 = STANDBY

2 = WAIT FOR PROFILE

3 = GAS VALVE PROVE1

4 = GAS VALVE PROVE2

5 = GAS VALVE PROVE3

6 = GAS VALVE PROVE4

7 = MOVE TO PURGE

8 = PURGE

9 = MOVE TO IGNITION

10 = IGNITION

11 = PTFI

12 = PILOT

13 = MTFI

14 = MFEP

15 = MOVE TO LOW FIRE

16 = AUTO

17 = POST PURGE

18 = LOCKOUT

Address 9: current modulation reason mode

0 = Main Sensor

1 = Digital Input for Auto/Man (manual modulation)

2 = Keypad Auto/Man (manual modulation)

3 = Sequencing Slave

4 = Low Fire Hold

5 = Standby Water

6 = Thermal Shock

7 = Low Stack

8 = High Fire Hold

9 = Track Modulation



Address 18: current digital input values

- Bit 0 = digital input 1
- Bit 1 = digital input 2
- Bit 2 = digital input 3
- Bit 3 = digital input 4
- Bit 4 = digital input 5
- Bit 5 = digital input 6
- Bit 6 = digital input 7
- Bit 7 = digital input 8
- Bit 8 = digital input 9
- Bit 9 = digital input 10
- Bit 10 = digital input 11 (NXF4000 only)
- Bit 11 = digital input 12 (NXF4000 only)
- Bit 12 = digital input 13 (NXF4000 only)
- Bit 13 = digital input 14 (NXF4000 only)
- Bit 14 = digital input 15 (NXF4000 only)
- Bit 15 = input P15.4 operating control (NXF4000 only)

Address 34: hold off reason

- 0 = No Hold Off
- 1 = Outdoor Temperature High
- 2 = Thermal Shock

Address 153: FSG board type

- 0 = FSG SCANNER NONE
- 1 = FSG SCANNER IR HIGH
- 2 = FSG SCANNER DC
- 3 = FSG SCANNER UV
- 6 = FSG SCANNER IR LOW



Address 174: lockout history 1 error code
Address 184: lockout history 2 error code
Address 194: lockout history 3 error code
Address 204: lockout history 4 error code
Address 214: lockout history 5 error code
Address 224: lockout history 6 error code
Address 234: lockout history 7 error code
Address 244: lockout history 8 error code
Address 254: lockout history 9 error code
Address 264: lockout history 10 error code

1-2 = NXF4000 FAULT
3 = Z BOARD FAULT
4 = SAFETY RELAY ON
5 = SAFETY RELAY OFF
6 = RELAY 8 ON
7 = RELAY 8 OFF
8 = RELAY D ON
9 = RELAY D OFF
10 = NXF4000 FAULT
11 = INVALID PROFILE
12 = HIGH TEMPERATURE
13 -14 = CHECK WIRING
15 = NO AIR SERVO
16 = NO FUEL SERVO
17 = INVALID SETPOINT
18 = NXF4000 FAULT
19-20 = SENSOR 1 MARGINAL
21-23 = SENSOR 2 MARGINAL
24-26 = SENSOR 3 MARGINAL
27-28 = SENSOR1 HIGH LIMIT
29-31 = SENSOR2 HIGH LIMIT
32-34 = SENSOR3 HIGH LIMIT
35 = SENSOR1 UNDER RNG
36 = SENSOR1 OVER RNG
37 = SENSOR2 UNDER RNG
38 = SENSOR2 OVER RNG
39 = SENSOR3 UNDER RNG
40 = SENSOR3 OVER RNG
41-42 = Z BOARD INTERNAL FAULT
43-45 = NXF4000 FAULT
46-86= O2 FAULT
87-88 = NXF4000 FAULT
89 = NOT COMMISSIONED
90-121 = NXF4000 FAULT



122 = SERVO 1 LOST
123 = SERVO 2 LOST
124 = SERVO 3 LOST
125 = SERVO 4 LOST
126 = SERVO 5 LOST
127 = SERVO 6 LOST
128 = SERVO 7 LOST
129 = SERVO 8 LOST
130 = SERVO 9 LOST
131 = SERVO 10 LOST
132-141 = NXF4000 FAULT
142 = SERVO 1 STUCK
143 = SERVO 2 STUCK
144 = SERVO 3 STUCK
145 = SERVO 4 STUCK
146 = SERVO 5 STUCK
147 = SERVO 6 STUCK
148 = SERVO 7 STUCK
149 = SERVO 8 STUCK
150 = SERVO 9 STUCK
151 = SERVO 10 STUCK
152-161 = NXF4000 FAULT
162 = SERVO 1 ERROR
163 = SERVO 2 ERROR
164 = SERVO 3 ERROR
165 = SERVO 4 ERROR
166 = SERVO 5 ERROR
167 = SERVO 6 ERROR
168 = SERVO 7 ERROR
169 = SERVO 8 ERROR
170 = SERVO 9 ERROR
171 = SERVO 10 ERROR
172-181 = NXF4000 FAULT
182 = SERVO 1 VOLTAGE
183 = SERVO 2 VOLTAGE
184 = SERVO 3 VOLTAGE
185 = SERVO 4 VOLTAGE
186 = SERVO 5 VOLTAGE
187 = SERVO 6 VOLTAGE
188 = SERVO 7 VOLTAGE
189 = SERVO 8 VOLTAGE
190 = SERVO 9 VOLTAGE
191 = SERVO 10 VOLTAGE



192-201 = NXF4000 FAULT
202 = SERVO 1 VOLTAGE
203 = SERVO 2 VOLTAGE
204 = SERVO 3 VOLTAGE
205 = SERVO 4 VOLTAGE
206 = SERVO 5 VOLTAGE
207 = SERVO 6 VOLTAGE
208 = SERVO 7 VOLTAGE
209 = SERVO 8 VOLTAGE
210 = SERVO 9 VOLTAGE
211 = SERVO 10 VOLTAGE
212-221 = NXF4000 FAULT
222 = SERVO 1 OFF RATIO
223 = SERVO 2 OFF RATIO
224 = SERVO 3 OFF RATIO
225 = SERVO 4 OFF RATIO
226 = SERVO 5 OFF RATIO
227 = SERVO 6 OFF RATIO
228 = SERVO 7 OFF RATIO
229 = SERVO 8 OFF RATIO
230 = SERVO 9 OFF RATIO
231 = SERVO 10 OFF RATIO
232-250 = NXF4000 FAULT
251 = SENSOR4 UNDER RNG
252 = SENSOR4 OVER RNG
253 = SENSOR4 UNDER RNG
254 = SENSOR4 OVER RNG
255 = NOT COMMISSIONED
256 = VFD1 OFF RATIO
257 = VFD2 OFF RATIO
258 = VFD COMM FAULT 1
259 = VFD COMM FAULT 2
260 = VFD1 MISSING
261 = VFD2 MISSING
262-265 = NXF4000 FAULT
266-271 = VFD BOARD FAULT
272 = VFD1 INPUT BELOW 4mA
273-277 = VFD BOARD FAULT
278 = VFD2 INPUT BELOW 4mA
279-280 = VFD BOARD FAULT
281 = CHECK VFD1 INPUT
282 = CHECK VFD2 INPUT
283 = P0 NOT COMMISSIONED
284 = MAIN CPU FAULT 1



285 = MAIN CPU FAULT 2
286 = MAIN CPU FAULT 3
287 = MAIN CPU FAULT 4
288 = MAIN CPU FAULT 5
289 = MAIN CPU FAULT 6
290 = MAIN CPU FAULT 7
291 = LESS THAN 2 SERVOS
292 = UNIT TEMP SENSORS
293 = NOT COMMISSIONED
294 = INVALID PRPROFILE NAME
295 = LGP/FUEL SUPPLY
296-318 = NXF4000 FAULT
319 = NO SENSOR-SETPT DATA
320 = NO SERVO SETUP DATA
321 = NO DIG I/P DATA
322 = NO PASSCODE DATA
323 = NO P0 DATA
324 = NO PROFILE1 DATA
325 = NO PROFILE2 DATA
326 = NO PROFILE3 DATA
327 = NO PROFILE4 DATA
328 = NO PROFL SETUP DATA
329 = NO KEYPAD SETUP DATA
330 = NO KEY STATES DATA
331 = NO THERML SHOCK DATA
332 = NO FAULT HISTRY DATA
333 = NO SETBACK DATA
334 = NO COMM SETUP DATA
335 = NO SEQUENCING DATA
336 = NO O2 SETUP DATA
337 = NO ADJUSTED O2 DATA
338 = NO ANALOG OUT DATA
339 = NO VFD SETUP DATA
340 = NO VFD PROFILE1 DATA
341 = NO VFD PROFILE2 DATA
342 = NO VFD PROFILE3 DATA
343 = NO VFD PROFILE4 DATA
344 = NO BURNER DATA
345 = NO FSG SETUP DATA
346 = NO FSG DI DATA
347 = NO VALVE PROV DATA
348 = NO USER OUTPUT DATA
349 = NO CO SETUP DATA



350-418 = NXF4000 FAULT
419 = CANNOT MOVE TO PURGE
420-429 = NXF4000 FAULT
430 = FVES OPEN i01
431 = FVES OPEN i02
432 = FVES OPEN i03
433 = FVES OPEN i04
434 = FVES OPEN i05
435 = FVES OPEN i06
436 = FVES OPEN i07
437 = FVES OPEN i08
438 = FVES OPEN i09
439 = FVES OPEN i10
440 = FVES OPEN i11
441 = FVES OPEN i12
442 = FVES OPEN i13
443 = FVES OPEN i14
444 = FVES OPEN i15
445 = FVES OPEN i16
446 = FVES CLOSED i01
447 = FVES CLOSED i02
448 = FVES CLOSED i03
449 = FVES CLOSED i04
450 = FVES CLOSED i05
451 = FVES CLOSED i06
452 = FVES CLOSED i07
453 = FVES CLOSED i08
454 = FVES CLOSED i09
455 = FVES CLOSED i10
456 = FVES CLOSED i11
457 = FVES CLOSED i12
458 = FVES CLOSED i13
459 = FVES CLOSED i14
460 = FVES CLOSED i15
461 = FVES CLOSED i16
462 = LOST P INPUT
463 = NXF4000 FAULT
464 = PILOT RELAY ON
465 = IGNITE RELAY ON
466 = OIL RELAY ON
467 = GV1 RELAY ON
468 = GV2 RELAY ON
469 = GV3 RELAY ON
470 = USER RELAY 1 ON



471 = USER RELAY 2 ON
472 = USER RELAY 3 ON
473 = PILOT RELAY OFF
474 = IGNITE RELAY OFF
475 = OIL RELAY OFF
476 = GV1 RELAY OFF
477 = GV2 RELAY OFF
478 = GV3 RELAY OFF
479 = USER RELAY 1 OFF
480 = USER RELAY 2 OFF
481 = USER RELAY 3 OFF
482 = FSG BOARD COMMS
483 = FSG BOARD INCORRECT
484 = FSG SELF-CHECK1
485 = FSG SELF-CHECK2
486 = FSG SELF-CHECK3
487 = FSG ROM CRC
488 = FSG DC WIRING LOOP
489 = UV SELF CHECK FAIL
490 = read FLAME
491 = FLAME FAIL OIL FOG
492 = FLAME FAIL
493 = FORCED i01
494 = FORCED i02
495 = FORCED i03
496 = FORCED i04
497 = FORCED i05
498 = FORCED i06
499 = FORCED i07
500 = FORCED i08
501 = FORCED i09
502 = FORCED i10
503 = FORCED i11
504 = FORCED i12
505 = FORCED i13
506 = FORCED i14
507 = FORCED i15
508 = FORCED i16
509 = INVALID SENSOR DATA
510 = INVALID SERVO DATA
511 = INVALID DIG IP DATA
512 = INVALID PCODE DATA
513 = INVALID P0 DATA



514 = INVALID PROF 1 DATA
515 = INVALID PROF 2 DATA
516 = INVALID PROF 3 DATA
517 = INVALID PROF 4 DATA
518 = INVALID PROFILE DATA
519 = INVALID KEYPAD DATA
520 = INVALID KEY ST DATA
521 = INVALID TH SHK DATA
522 = INVALID FAULT DATA
523 = INVALID SETBACK DATA
524 = INVALID COMM DATA
525 = INVALID SEQ DATA
526 = INVALID O2 DATA
527 = INVALID ADJ O2 DATA
528 = INVALID ANALOG DATA
529 = INVALID VFD DATA
530 = INVALID VPROF 1 DATA
531 = INVALID VPROF 2 DATA
532 = INVALID VPROF 3 DATA
533 = INVALID VPROF 4 DATA
534 = INVALID BURNER DATA
535 = INVALID FSG DATA
536 = INVALID FSG DI DATA
537 = INVALID V-PROV DATA
538 = INVALID USER OP DATA
539-557 = NXF4000 FAULT
558 = VALVE PROVING TEST 2
559 = VALVE PROVING TEST 4
560 = AIRFLOW ON
561 = AIRFLOW OFF
562 = OBSOLETE SEQ DATA
563 = RUN CHECK TIMEOUT
564 = SERVO 1 NOT CW
565 = SERVO 2 NOT CW
566 = SERVO 3 NOT CW
567 = SERVO 4 NOT CW
568 = SERVO 5 NOT CW
569 = SERVO 6 NOT CW
570 = SERVO 7 NOT CW
571 = SERVO 8 NOT CW
572 = SERVO 9 NOT CW
573 = SERVO 10 NOT CW
574 = SERVO 1 NOT CCW
575 = SERVO 2 NOT CCW



576 = SERVO 3 NOT CCW
577 = SERVO 4 NOT CCW
578 = SERVO 5 NOT CCW
579 = SERVO 6 NOT CCW
580 = SERVO 7 NOT CCW
581 = SERVO 8 NOT CCW
582 = SERVO 9 NOT CCW
583 = SERVO 10 NOT CCW

Address 274: sensor 1 type

0 = UNUSED
1 = WATER
2 = STEAM
3 = TRACK

Address 276: sensor 2 type

0 = UNUSED
1 = WATER
2 = STEAM
4 = STANDBY

Address 278: sensor 3 type

0 = UNUSED
1 = WATER
2 = STEAM
3 = INLET
4 = OUTDOOR
5 = STACK

Address 280: sensor 4 type

0 = UNUSED
1 = INLET
2 = FLAME SIGNAL

Address 282: sensor 5 type

0 = UNUSED
1 = INLET
2 = FLAME SIGNAL



Address 275: sensor 1 range

Address 277: sensor 2 range

Address 279: sensor 3 range

Address 281: sensor 4 range

Address 283: sensor 5 range

Sensor type STEAM

0 = Unused

1 = 0 to 15 PSI // 0 to 1030 mBar

2 = 0 to 30 PSI // 0 to 2070 mBar

3 = 0 to 200 PSI // 0 to 13.8 Bar

4 = 0 to 300 PSI // 0 to 20.7 Bar

5 = -14.7 to 25 PSI // -1013 - 1720mBar

Sensor type WATER, STANDBY, OUTDOOR, STACK, INLET (SENSOR 3)

0 = Unused

1 = 32 to 350F // 0 to 176C

2 = 32 to 752F // 0 to 400C

Sensor type INLET (SENSORS 4 OR 5)

0 = Unused

1 = -50 to 300 // -45 to 149C

2 = -40 to 140 // -40 to 60C

3 = 32 to 350F // 0 to 176C

Address 355: profile 1 name

Address 357: profile 2 name

Address 359: profile 3 name

Address 361: profile 4 name

0 = NONE

1 = GAS

2 = WAS

3 = FUE

4 = COG

5 = SOL

6 = OIL

7 = HVY

8 = GAS1

9 = GAS2

10 = OIL1

11 = OIL2



Address 366: PTFI time

- 0 = Ignition = 5 seconds, Pilot = 5 seconds
- 1 = Ignition = 5 seconds, Pilot = 15 seconds
- 2 = Ignition = 10 seconds, Pilot = 10 seconds
- 3 = Ignition = 3 seconds, Pilot = 6 seconds
- 4 = Ignition = 3 seconds, Pilot = 8 seconds
- 5 = Ignition = 3 seconds, Pilot = 13 seconds
- 6 = Ignition = 5 seconds, Pilot = 10 seconds

Address 367: MTFI time

- 0 = Ignition = 0 seconds, Pilot = 5 seconds
- 1 = Ignition = 0 seconds, Pilot = 10 seconds
- 2 = Ignition = 0 seconds, Pilot = 15 seconds
- 3 = Ignition = 3 seconds, Pilot = 5 seconds
- 4 = Ignition = 10 seconds, Pilot = 10 seconds
- 5 = Ignition = 10 seconds, Pilot = 15 seconds
- 6 = Ignition = 0 seconds, Pilot = 3 seconds



CERTIFICATIONS NXTSD507HD AND NXTSD512HD

UL: MP1537

CE



NOTICE

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