Premium Monitoring System

Operation and Maintenance Manual

750-352

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SPECIFICATIONS

1. POWER : 24 VDC ± 10%
   200 mA min., without expansion card
   1 Amp maximum with expansion card fitted
   Must use Class 2 or SELV rated power supply.
2. COMMUNICATIONS :
   USB/PG Port : Adheres to USB specification 1.1. Device only using Type B connection.

> ⚠ WARNING - DO NOT CONNECT OR DISCONNECT CABLES WHILE POWER IS APPLIED UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS. USB PORT IS FOR SYSTEM SET-UP AND DIAGNOSTICS AND IS NOT INTENDED FOR PERMANENT CONNECTION.

   Serial Ports : Format and Baud Rates for each port are individually software programmable up to 115,200 baud.
   RS232/PG Port : RS232 port via RJ12
   COMMS Ports : RS422/485 port via RJ45, and RS232 port via RJ12
   DH485 TXEN : Transmit enable; open collector, V_{OH} = 15 VDC, V_{OL} = 0.5 V @ 25 mA max.
   Ethernet Port : 10 BASE-T / 100 BASE-TX
   RJ45 jack is wired as a NIC (Network Interface Card).
3. LEDs :
   STS – Status LED indicates condition of Data Station.
   TX/RX – Transmit/Receive LEDs show serial activity.
   Ethernet – Link and activity LEDs.
   CF – CompactFlash LED indicates card status and read/write activity
4. MEMORY :
   On-board User Memory: 4 Mbytes of non-volatile Flash memory.
   On-board SDRAM:
   833-03717: 2 Mbytes
   833-03718: 8 Mbytes
   Memory Card: CompactFlash Type II slot for Type I and Type II cards.
5. REAL-TIME CLOCK : Typical accuracy is less than one minute per month drift. CB Configurator's SNTP facility allows synchronization with external servers.
   Battery: Lithium Coin Cell. Typical lifetime of 10 years at 25 °C.
   A "Battery Low" system variable is available so that the programmer can choose specific action(s) to occur when the battery voltage drops below its nominal voltage.
6. ENVIRONMENTAL CONDITIONS :
   Operating Temperature Range: 0 to 50°C
   Storage Temperature Range: -30 to +70°C
   Operating and Storage Humidity: 80% max relative humidity, non-condensing, from 0 to 50°C
   Vibration According to IEC 68-2-6: Operational 5 to 150 Hz, in X, Y, Z direction for 1.5 hours, 2 g's.
   Shock According to IEC 68-2-27: Operational 30 g, 11 msec in 3 directions.
   Altitude: Up to 2000 meters
7. CONSTRUCTION : Case body is burgundy high impact plastic and stainless steel. Installation Category I, Pollution Degree 2.
8. POWER CONNECTION : Removable wire clamp screw terminal block.
   Wire Gage Capacity: 24 AWG to 12 AWG
   Torque: 4.45 to 5.34 in/lb (0.5 to 0.6 N-m)
9. MOUNTING : Snaps onto standard DIN style top hat (T) profile mounting rails according to EN50022 -35 x 7.5 and -35 x 15.
10. CERTIFICATIONS AND COMPLIANCES :
    SAFETY
    UL Listed, File #E302106, UL508, CSA 22.2 No. 14-M05
    LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards
    UL Listed, File #E317425, ANSI/ISA 12.12.01-2007, CSA 22.2 No. 213-M1987
    LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards
    IEC 61010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.
    ELECTROMAGNETIC COMPATIBILITY
    Emissions and Immunity to EN 61326: Electrical Equipment for Measurement, Control and Laboratory use.

    Immunity to Industrial Locations :

Electrostatic discharge	EN 61000-4-2	Criterion A [2] 4 kV contact discharge 8 kV air discharge
Electromagnetic RF fields	EN 61000-4-3	Criterion A 10 V/m
Fast transients (burst)	EN 61000-4-4	Criterion A 2 kV power 2 kV signal
Surge	EN 61000-4-5	Criterion A 1kV L-L,2 kV L&N-E power
RF conducted interference	EN 61000-4-6	Criterion A 3 V/rms
Emissions:		
Emissions	EN 55011	Class A

    Notes:
    1. Criterion A: Normal operation within specified limits.
    2. This device was designed for installation in an enclosure. To avoid electrostatic discharge to the unit in environments with static levels above 4 kV precautions should be taken when the device is mounted outside an enclosure. When working in an enclosure (ex. making adjustments, setting jumpers etc.) typical anti-static precautions should be observed before touching the unit.
11. WEIGHT : 15.1 oz (456.4 g)

> ⚠ WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR AREA IS KNOWN TO BE NON-HAZARDOUS.

INTRODUCTION

The Cleaver-Brooks Premium Monitoring System is a communications product that provides data logging and remote monitoring functions.

This product is designed to provide a means of collecting and sharing fuel usage and run time data on boiler systems equipped with Cleaver Brooks Hawk controls.

The collected data can be used to generate reports for EPA Area Source Rule compliance.

Features

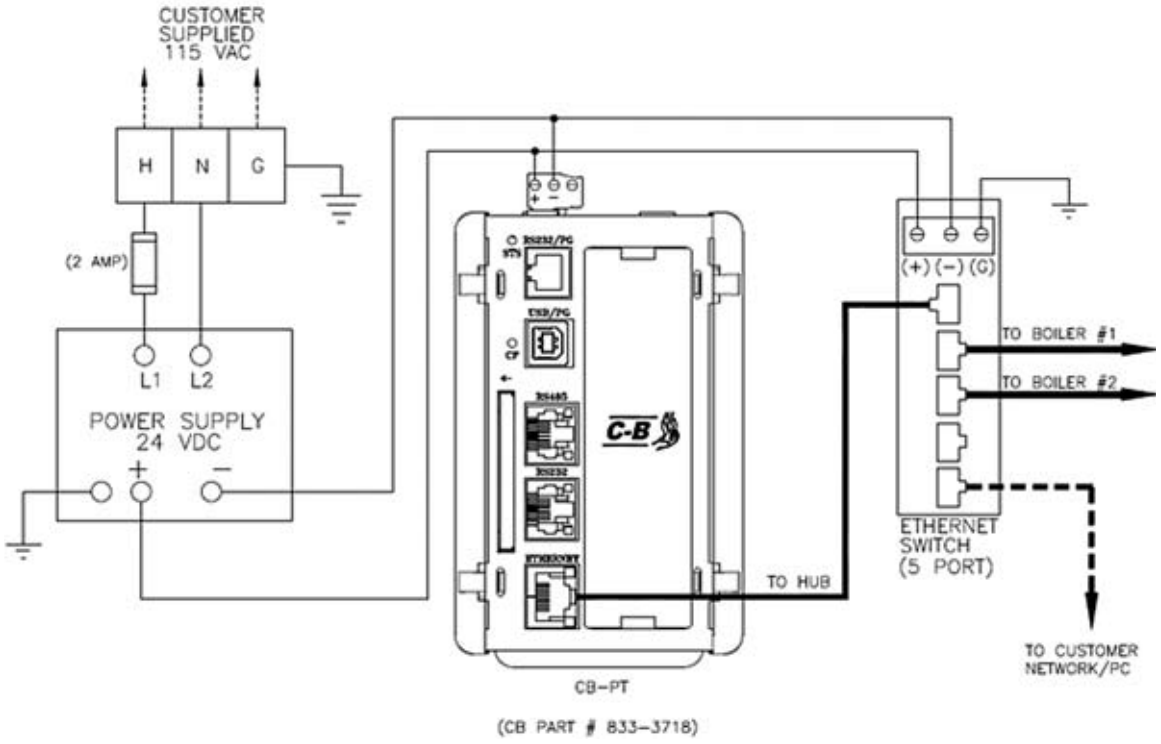
The controller has a built in web server that is used for displaying the system data, monitoring the boiler activity and transferring the data log files. Those files are stored on the SD memory card located on the front of the controller.

The controller also has a built in FTP server that can be configured to automatically transfer the data log files from the memory card to a user defined location on a customer PC or server located on the same network.

The controller collects the data from all connected Hawk-equipped boilers over an Ethernet IP connection to each boiler.

Multiple protocol conversion is available (Bacnet TCP/IP, Bacnet UDP, Bacnet MSTP, Modbus IP and Modbus RTU).

WIRING



INSTALLATION

Transmitters

Note that the transmitters required to capture the data are to be connected to the Hawk boiler controls. Refer to the O&M manuals for those products as to how to connect and configure those controls.

The data tags that transfer the transmitter values, totalized values and other boiler information exist in the Hawk software and are automatically picked up and displayed / logged to the web server.

Displayed Data

Typical values displayed on the boiler overview screen:

Analog Values	Eng Units	Min-Max
Flame Strength Honeywell	Volts	0-5
Combustion Air Fan Speed	RPM	0-3600
Blower Motor Kw	Kilowatts	0-100
Boiler Efficiency	%	0-100
Firing Rate	%	0-100
O2 Level	%	0-25
Set Point Steam Pressure/Water Temp	PSI or Deg F	0-1000
Water Level	Inches WC	0-6
Steam Pressure or HW Temp	PSI or Deg F	0-1000
Stack Temperature Before Econ.	Deg F	0-1000
Combustion Air Temperature	Deg F	0-1000
Water Temperature Shell/Outdoor Temp	Deg F	0-1000
Feedwater Temperature/Econ Water Out Temp	Deg F	0-1000
Stack Temp. After Econ./Return HW	Deg F	0-1000
Economizer Water In Temp	Deg F	0-1000

Data Logs

Typical values written to the data logs shown below. There are 3 log files per boiler.

All data log files are in CSV format and are time and date stamped.

BxUsrIn where x = the boiler number. It contains the values for the Analog User Inputs.		
Analog Values	**Eng Units**	**Min-Max**
AR16-Analog Input User Defined #0 Input	User Def	User Def
AR17-Analog Input User Defined #1 Input	User Def	User Def
AR18-Analog Input User Defined #2 Input	User Def	User Def
AR19-Analog Input User Defined #3 Input	User Def	User Def

BxSystem where x = the boiler number. It contains the operating values.		
Analog Values	**Eng Units**	**Min-Max**
AR0-Flame Strength Honeywell	Volts	0-5
AR4-Firing Rate	%	0-100
AR5-O2 Level	%	0-25
AR8-Steam Pressure or HW Temp	PSI or Deg F	0-1000
AR10-Stack Temperature Before Econ.	Deg F	0-1000

Totalized values for the User Analog Inputs, defined for flow are available as well.

Total Run Time for each fuel is also included You can also see these values on the RUN DATA display.

BxFlwTot where x = the boiler number.	
Analog Values	**Eng Units**
Fuel1min	Minutes
Fuel1hr	Hours
Fuel2min	Minutes
Fuel2hr	Hours
N202_12 Elapsed Time	Hours
F250_204 Analog Input User Defined #0 Input Totalized	User Defined
F250_205 Analog Input User Defined #1 Input Totalized	User Defined
F250_206 Analog Input User Defined #2 Input Totalized	User Defined
F250_207 Analog Input User Defined #3 Input Totalized	User Defined

CONFIGURATION

Prior to operation the system must be configured. The following table of data will need to be completed and entered into the Hawk boiler controller. It is automatically relayed to the web server.

Transmitter Span	Max value meter is calibrated at.
Transmitter zero	Min value meter is calibrated at.
Engineering Units	Units meter is set for eg GPM or GPH

To access the web server, and to allow the web server to gather data from the boiler controller, all the devices, the boiler controls, web server and customer PC used to access the web server must be on the same Ethernet network. The Web Server IP address can be changed by accessing the configuration screen from a connected PC or by an authorized Cleaver Brooks representative.

The default Ethernet IP addresses used by Cleaver Brooks are as follows.

Item	IP Address	Mask	Gateway
Computer with RSLinx and / or RSView 32	192.168.1.110	255.255.255.0	192.168.1.1
Master Panel PLC	192.168.1.100	255.255.255.0	192.168.1.1
Boiler 1 Panel PLC	192.168.1.101	255.255.255.0	192.168.1.1
Boiler 2 Panel PLC	192.168.1.102	255.255.255.0	192.168.1.1
Boiler 3 Panel PLC	192.168.1.103	255.255.255.0	192.168.1.1
Boiler 4 Panel PLC	192.168.1.104	255.255.255.0	192.168.1.1
Boiler 5 Panel PLC	192.168.1.105	255.255.255.0	192.168.1.1
Boiler 6 Panel PLC	192.168.1.106	255.255.255.0	192.168.1.1
Boiler 7 Panel PLC	192.168.1.107	255.255.255.0	192.168.1.1
Boiler 8 Panel PLC	192.168.1.108	255.255.255.0	192.168.1.1
Master Panel Ethernet Panelview Operator Interface	192.168.1.120	255.255.255.0	192.168.1.1
Boiler 1 Ethernet Panelview Operator Interface	192.168.1.121	255.255.255.0	192.168.1.1
Boiler 2 Ethernet Panelview Operator Interface	192.168.1.122	255.255.255.0	192.168.1.1
Boiler 3 Ethernet Panelview Operator Interface	192.168.1.123	255.255.255.0	192.168.1.1
Boiler 4 Ethernet Panelview Operator Interface	192.168.1.124	255.255.255.0	192.168.1.1
Boiler 5 Ethernet Panelview Operator Interface	192.168.1.125	255.255.255.0	192.168.1.1
Boiler 6 Ethernet Panelview Operator Interface	192.168.1.126	255.255.255.0	192.168.1.1
Boiler 7 Ethernet Panelview Operator Interface	192.168.1.127	255.255.255.0	192.168.1.1
Boiler 8 Ethernet Panelview Operator Interface	192.168.1.128	255.255.255.0	192.168.1.1
Remote Monitoring Panelview	192.168.1.140	255.255.255.0	192.168.1.1
ADAC DA Single Tank PLC	192.168.1.150	255.255.255.0	192.168.1.1
ADAC Surge Single Tank	192.168.1.151	255.255.255.0	192.168.1.1
ADAC Dual Tank PLC	192.168.1.150	255.255.255.0	192.168.1.1
ADAC Ethernet Panelview DA Single	192.168.1.152	255.255.255.0	192.168.1.1
ADAC Ethernet Panelview Surge	192.168.1.153	255.255.255.0	192.168.1.1
ADAC Ethernet Panelview Dual Tank	192.168.1.152	255.255.255.0	192.168.1.1
Protocol translator / Web server	192.168.1.200	255.255.255.0	192.168.1.1

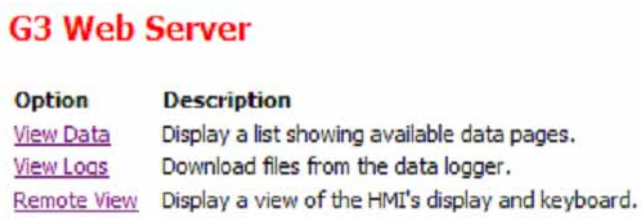
To change the IP address, use the pop up key pad to input ALL the data required then click on the "Set IP Address" button. Note you will lose communications with the web server until you have your PC set up on the same IP Address range again. Note ALL devices on a network MUST have unique IP addresses.

For email, you need to get your email server information from your IT department.

A pop up keypad will allow you to input the information into the different cells. When complete, you can use the "Test E-Mail" button to send a test email to the accounts you have set up.

Data Log Screen

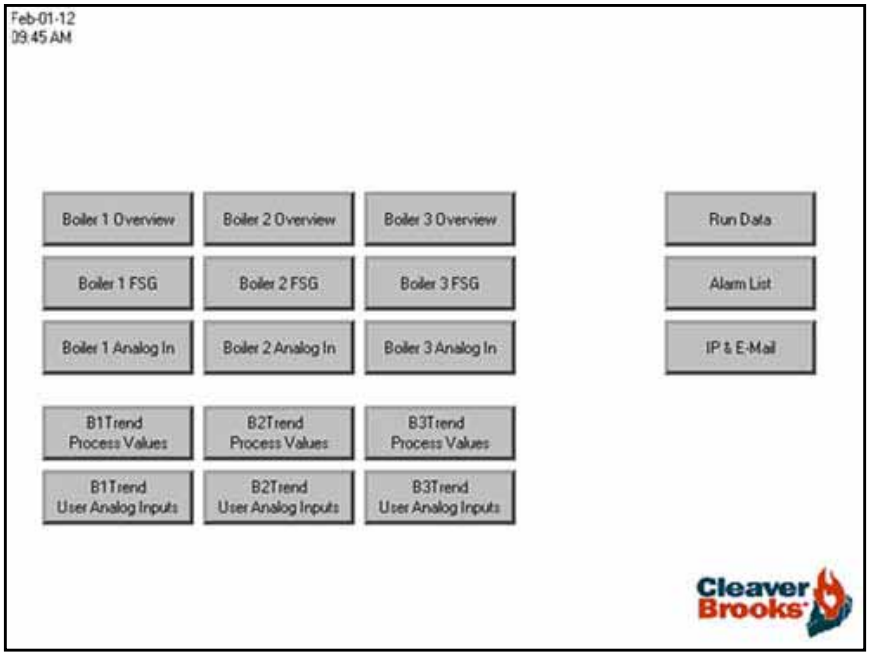
When you first access the web server, you will see this screen. To return to this screen at any time, click on the BACK button in your web browser.



Sample Screens

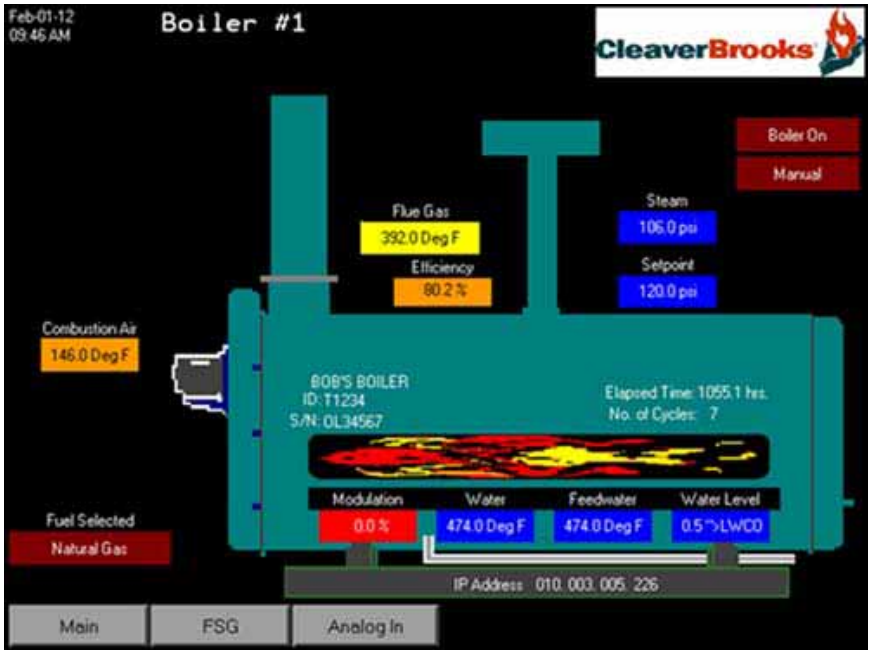
Display Screen Menu

This screen allows you to navigate to the various displays.



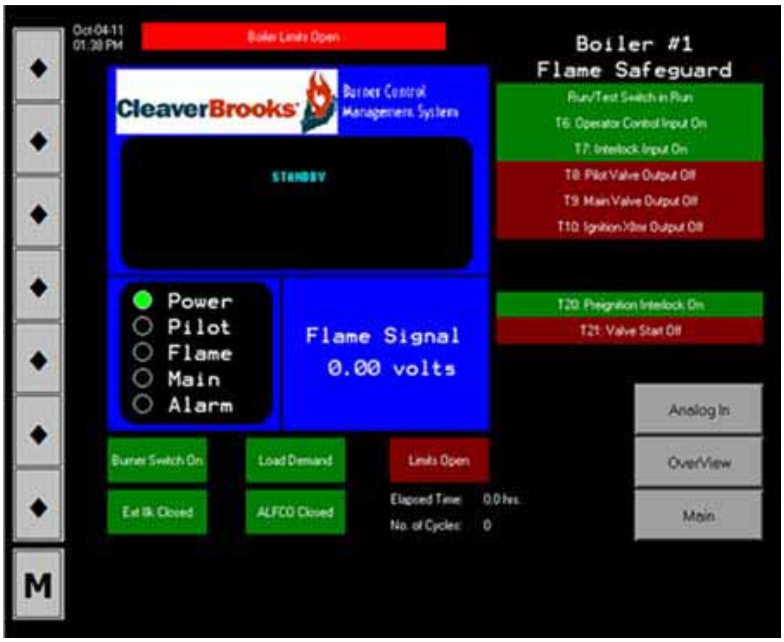
Boiler Overview Screen

This display provides an overview of the boiler data and status.



Burner Management Screen

This display provides an overview of the data from the boiler burner management control as well as additional status information



Analog Input Screen

This display provides instantaneous and totalized values of any configured user analog inputs if available on your Hawk boiler control.

Alarm History Screen

This display provides a history of all the alarms with time and date stamps and an English text description of the alarm itself. The <Clear> button permanently erases the alarm history. The <Next> and <Previous> buttons allow you to move forward and backward through the alarm history one page at a time.

IP Address and Email Set up Display

This display is password protected and is used in the initial set up of the system to define the IP address, Subnet Mask, and Gateway, as well as setting up the email addresses that you wish to send the alarm messages to (optional).

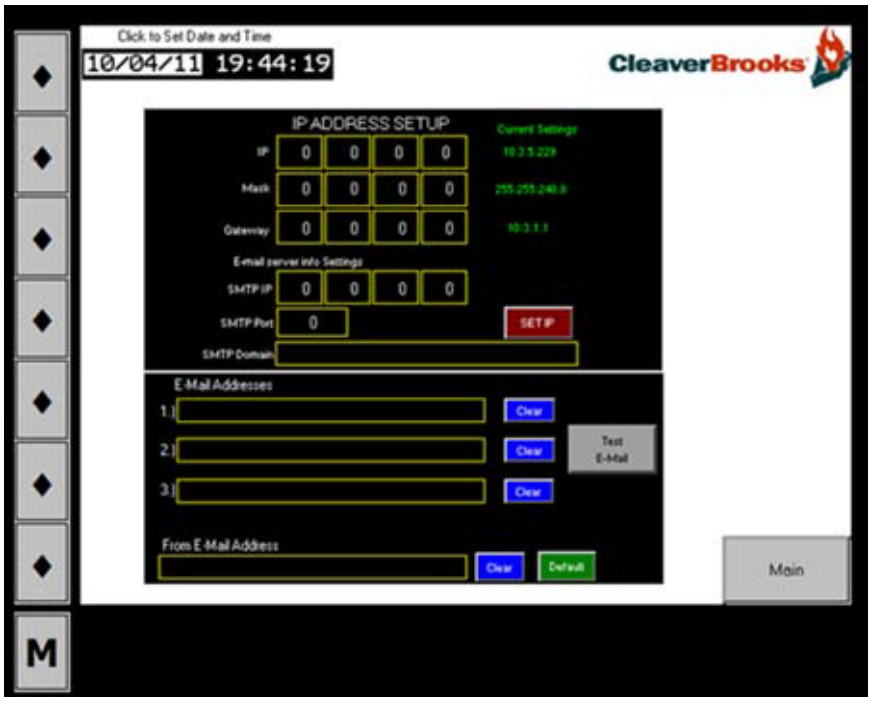
To set the date and time, click on the item you wish to change. A pop up will appear allowing you to select the item to change; the up and down arrows increment or decrement the value

The user ID and password are available from your local Cleaver Brooks representative.

To change the IP address, use the pop up key pad to input ALL the data required then click on the "Set IP Address" button. **Note:** you will lose communications with the web server until you have your PC set up on the same IP Address range again. ALL devices on a network MUST have unique IP addresses.

For email, you need to get your email server information from your IT department.

A pop up keypad will allow you to input the information into the different cells. When finished, you can use the "Test E-Mail" button to send a test email to the accounts you have set up.



Trending

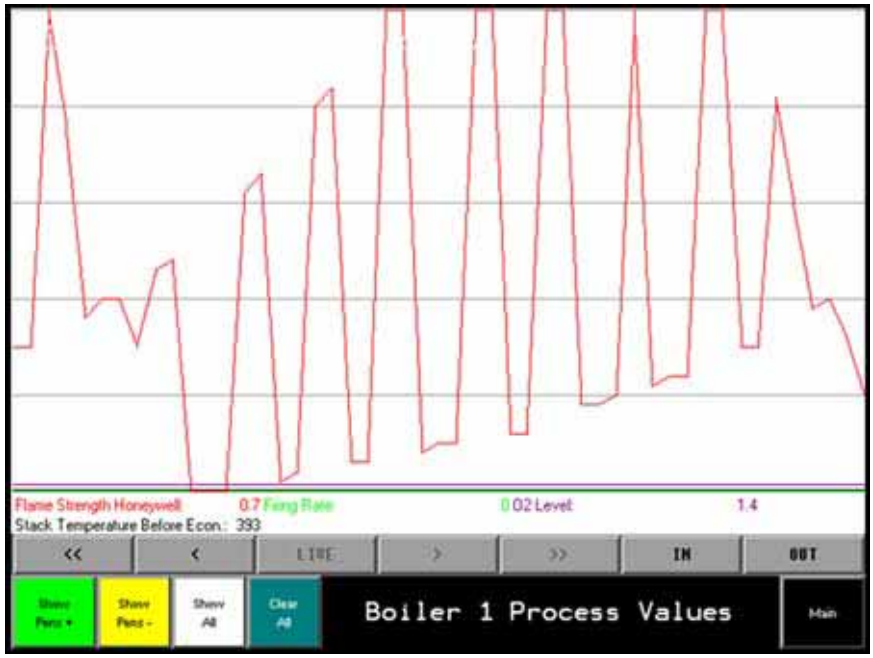
There are two trend screens per boiler - the first one is for process values.

The second one is for the user analog inputs (if Hawk is so equipped).

On this screen, the four buttons in the bottom left allow you to toggle through all the possible combinations of pens, show all the pens, or clear all the pens.

The arrow buttons above that allow you to move forward or backward in time to view available data in the current active file only.

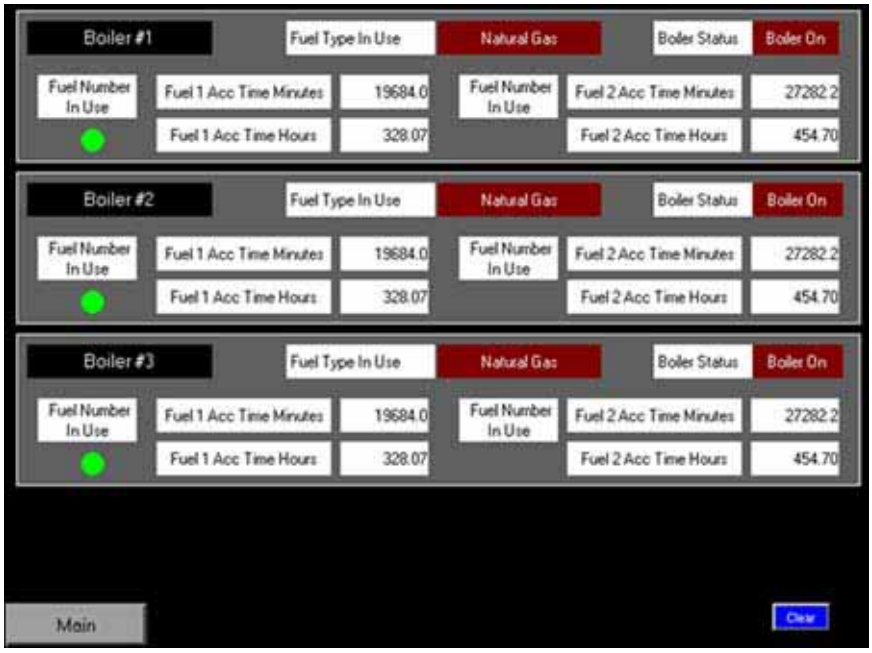
Clicking on the LIVE button brings you back to the current time and data.



The IN and OUT buttons change the span of the X axis (time) allowing you to zoom in or out on a particular data screen. The Y axis is fixed.

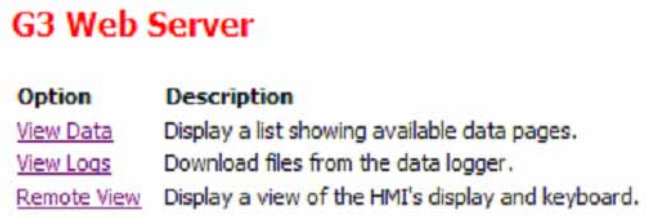
Run Data

From the main screen, selecting the <Run Data> button brings you to a quick summary of the boiler activity and status. The green indicator shows up next to the active fuel, where you will see the accumulative time for that fuel.



Data Log Screen

When you first access the web server, you will see this screen. To return to this screen at any time, click on the BACK button in your web browser.



View Logs

This display allows you to select and download a log file as a CSV file that can be reviewed and modified in a program like Microsoft Excel. The directory provides a listing of all the available types of logs. The available data logs that have been set up for each boiler are User Analog inputs, System Data, and Flow Total Data.

Once you click on a folder in that directory, you will see all the available files for that type of log. Note they are all identified by time and date. For example 12020100 means 12th year, second month, first day starting at midnight.

Directory of B1USRIN

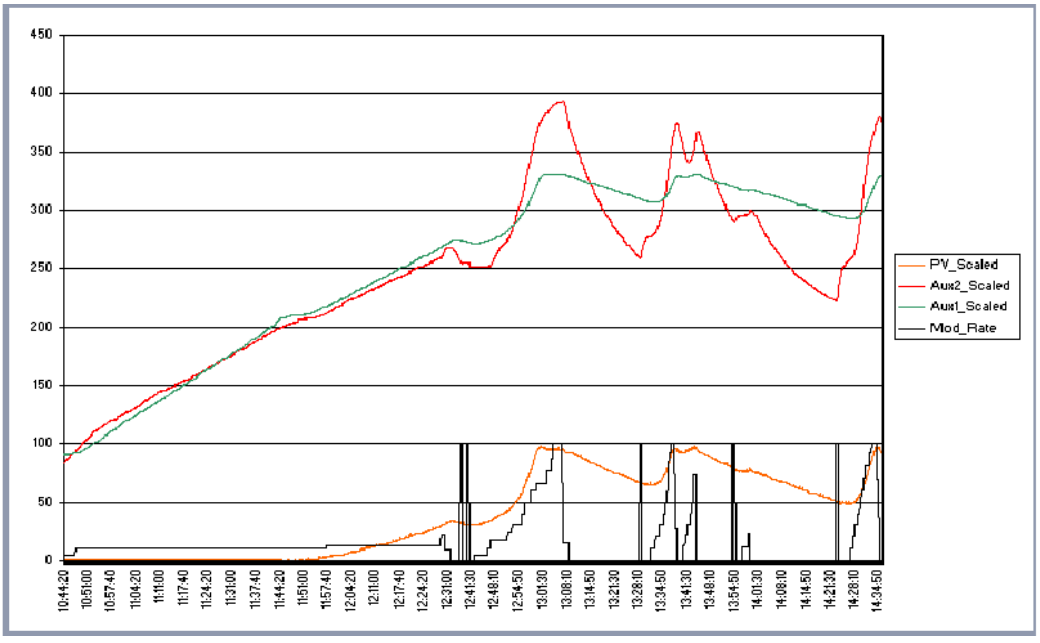
File	Size
12020100.CSV	319836
12013100.CSV	777711
12013000.CSV	777711
12012900.CSV	777711
12012800.CSV	777711
12012700.CSV	764571
12012600.CSV	765876
12012500.CSV	777711

All the log files are CSV files and can be opened in spreadsheet or database programs such as Microsoft Excel or Access.

11100400.CSV [Read-Only]

	A	B	C	D	E	F	G	H	I	J
1	Date	Time	Flame Strength Honeywell	Firing Rate	O2 Level	Steam Pressure or HW Temp	(Analog Input Channel 0)	(Analog Input Channel 1)	(Analog Input Channel 2)	(Analog Input Channel 3)
2	10/4/2011	15:29:55	0	0	3	79	27443	0	0	0
3	10/4/2011	15:30:00	0	0	3	79	27443	0	0	0

Using the Chart Wizard in a program like Microsoft Excel you can create trends for the data range you are looking at. See example below.



PARTS

CB-PTWS 833-05000-000

Qty	Part Description	CB PN
2	Terminal Block,	832-02247-000
2	Terminal Block, End Anchor,	832-02248-000
1	Enclosure, 20"x20"x6"	848-00482-000
1	24V DC Power Supply	832-02037-000
1	Use this hub for 2-3 Boilers (4 port)	833-02862-000
0	Use this hub if 4 or more boilers are used. (8 port)	833-02857-000
1	CB Web Server	833-03718-000