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Document Colour Code Key: (refer to Page 28)

- SS Blue: Document Headers
- Black: general instructions/information applying to 7200BPI Device
- Blue: important settings to be configured on each 7200BPI

SPECIFICATIONS:

Electrical Characteristics:

External Supply Voltage	18 – 30VDC
Remote Reset Time	External monitor must be pulled low for a minimum of 100msec.
Power Reset	10 secs (FAAST 7200BPI); 1 sec (FAAST 7100X)
Average Operating Current	Fan Hi: 200mA; Fan Med: 151mA; Fan Lo: 120mA @ 24VDC
Alarm Current	Fan Hi: 230mA; Fan Med: 172mA; Fan Lo: 142mA @ 24VDC
Additional Current Requirements	LCD ON: 10mA; EtherNet Enabled: 20mA; Serial ModBus Enabled: 20mA
Average Loop Driver Operating Current:	700µA
Loop Driver Voltage Range:	15 – 32VDC
Relay Contact Ratings	3.0A @ 30VDC, 0.5A @ 125VAC

Environmental Ratings:

Operating Temperature	0°C to 38°C	(32°F to 100°F)	Factory Tested to 55°C (131°F)
Sampled Air Temperature	-20°C to 60°C	(-4°F to 140°F)	
Humidity	10 to 95% (non-condensing)		
Hazardous Environments	Suitable for use in Class I, Division 2, Groups A, B, C & D, or Non-Hazardous locations only		

IP Rating	IP30	
Coverage Area	600m ²	(6,450ft ²)
Ambient Air Movement	0 - 1,219.2m/min.	(0 - 4,000 ft/min.)

Mechanical Characteristics:

Exterior Dimensions	280 x 230 x 160	H x W x Dmm
Cable Access	3 x 25.4mm cable entry holes on top, back and left of unit.	
Wire Gauge	2.0mm (12 AWG) max to 0.5mm (24 AWG) min.	
Shipping Weight	4kg, includes packing material	
Nett Weight	3kg	
Pipe Network Size:	Up to 600m ²	
Maximum single pipe length	54.8m	
External pipe diameter	25mm	
Internal pipe diameter	15 - 21mm	

a) Introduction:

Scope of this Manual:

The purpose of this document is to provide guidance to mount, configure and connect a FAAST XS to a Pertronic panel

For full product information, which includes installation guidelines, instructions for safe use and warranty and safety information, refer to the FAAST XS Comprehensive User guide available at:

systemsensor.com/7100Xuserguide

or by scanning the QR code



b) Description:

The 7000 Series FAAST XS aspirating smoke detection system is an advanced particulate detection system for use in early warning and very early warning applications. The system continuously draws air from the controlled environment through a series of sampling holes to monitor the environment for smoke particulate.

FAAST system conditions are displayed at the user interface and at a fire alarm control panel using Loop Data (7200BPI). System conditions can also be displayed remotely in two ways through the network interface: integrated Web server or PipeIQ software. The display provides a clear indication of the system status, particulate levels, alarm levels, air flow and faults. Additionally, e-mail notification can be sent upon status changes. All conditions can be monitored at the user interface or remotely via the web.

Features:

- Clip intelligent protocol (7200BPI only)
- Advanced detection:
 - Blue LED and infra-red (IR) laser technology
 - Particle separation for increased nuisance immunity and prolonged filter life
 - Dust discrimination for reduced nuisance alarms
 - Wide Sensitivity Range: 0.00095 – 20.5% obs/m
- Monitors up to 600m² (dependant on local code and ordinances)
- Wide sensitivity range of 0.00095% to 20.5% obs/m.
- Configurable Alarm thresholds and delays
- Four (7200BPI) sets of relay contacts
- Air filtration
- User -configurable fan speed setting
- Dedicated Electronic filter life monitoring
- Independent dedicated Ultrasonic air-flow sensing per Channel
- Field service access door
- Easy access filter
- Detailed operation logs storing events, sensor trend data and service messages
- Acclimate mode operation for auto-adjustment of sensitivity
- PipeIQ2 pipe modelling software
- USB interface for simplified configuration and diagnostics
- Remote monitoring and diagnostics
 - Serial Modbus over RS485
 - Modbus/TCP via Ethernet
- Remote reset/dry contact input
- Email notification of alarm, fault or isolate conditions
- Configurable supplementary audible indicator

c) Installation:

This equipment must be installed in accordance with all local and national codes and regulations.

Pipe Installation:

The pipe layout is designed using the PipeIQ software package. Refer to the Comprehensive Instruction Manual that comes with the PipeIQ software package to design the pipe network.

The pipe network should be complete before proceeding with the physical and electrical system installation.

Physical Unit Installation:



Ensure that there are no pipes or electrical wires within the wall before drilling any mounting holes.

Securing the Mounting Bracket:

The typical mounting location for the FAAST unit is on a wall. The unit is mounted to the wall using the enclosed mounting plate. Figure 1 shows the wall mounting plate. For easier access to the FAAST unit, it is preferred to position the mounting plate in an easily accessible location.

1. Place the mounting bracket on the wall in the desired location and use it as a template to locate the necessary mounting holes.
2. Mark the hole locations and remove the bracket. It is recommended to secure the bracket using the 3 mounting holes.
3. Using a drill and the proper size bit for the mounting hardware, drill the necessary holes.
4. Use appropriate fasteners to accommodate the mounting surface and FAAST device weight.
5. Secure the bracket to the wall.

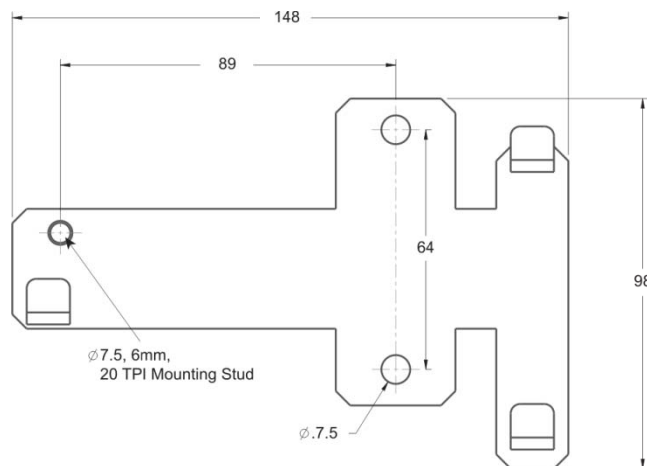


Figure 1: Wall Mounting Plate

Items Included with Unit:

- FAAST XS device
- Mounting bracket
- Mounting nuts (2) and washers (2)
- 3-pin terminal block 6 (7200BPI)
- 4-pin terminal block 2 (7200BPI)
- Installation and Maintenance Instructions
- USB Interface cable
- PipeIQ software and a comprehensive instruction manual. An advanced networking white paper may be downloaded at www.systemsensor.com/faast

Mount the Detector to the Bracket

Once the mounting plate is attached, the unit is ready to be mounted onto the plate.

1. before installing the unit onto the bracket, remove the appropriate conduit cap from the top or bottom-left side of the unit to match the orientation of the wiring.
2. line up the unit with the three (3) mounting clips and the mounting studs on the left side.
3. push the unit down onto the mounting clips and secure it with the supplied washer and nut on at least one of the two mounting studs protruding through the mounting slots shown in Figure 2.

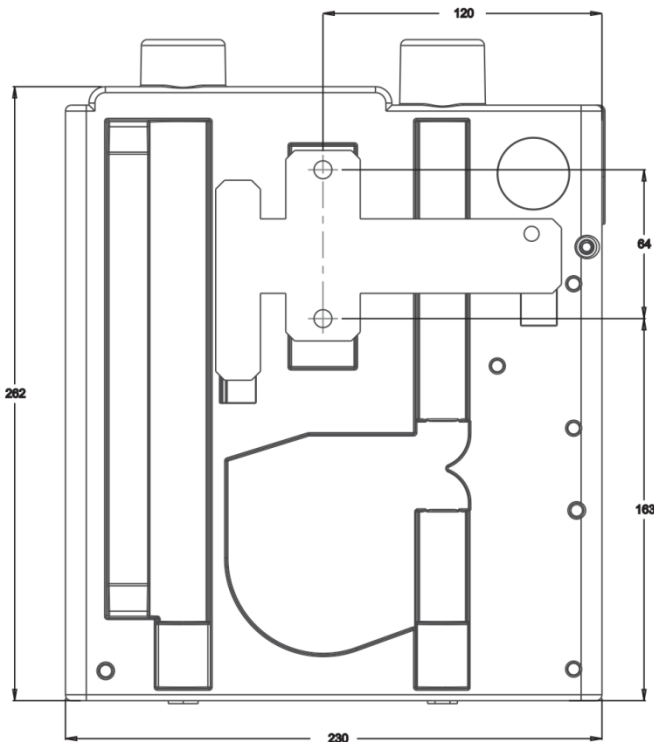


Figure 2: Mounting Slots for Mounting Studs

Connecting the Air Sampling Pipe



Detailed pipe network information and best practices can be found in the Pipe Installation Guide, available for download at systemsensor.com/faast

The input and output ports are designed to accept standard 25mm OD pipe (one inch). The input and output ports are tapered to provide fast, easy, push-fit connection of the sampling pipe to the unit.

Perform the following procedure to connect the air sampling pipe to the unit.

1. square off and de-burr the end of the sampling air pipe. Ensure that the pipe is free from any particles that might interfere with the pipe connection.
2. remove the input plug from the input port being used (either the top or bottom of the unit).
3. insert the sampling air pipe into the input port, ensuring a snug fit. DO NOT glue these pipes.

Exhaust Pipe

The device should always be exhausted into the space that it is monitoring. There are some circumstances when it may be necessary to connect a pipe to the exhaust port to divert the exhaust away from the location of the unit. The output ports are tapered the same as the input ports, to provide fast, easy, push-fit connection of an exhaust pipe to the unit. Perform the following procedure to connect the exhaust pipe to the unit.

1. square off and de-burr the end of the exhaust pipe. Ensure that the pipe is free from any particles that might interfere with the pipe connection.
2. remove the exhaust plug from the output port being used (either the top or bottom of the unit).
3. insert the exhaust pipe into the output port, ensuring a snug fit. DO NOT glue these pipes.

d) Wiring



Before working on the FAAST system, notify all required authorities that the system will be temporarily out of service. Make sure all power is removed from the system before opening the unit. All wiring must be in accordance with local codes.

Power Cables

Use the power ratings of the unit to determine the required wire sizes for each connection. Use the power ratings of the connected products to determine proper wire size.

Conduit Usage

If electrical conduit is used for system wiring, terminate the conduits at the cable entry ports on the top or bottom of the unit, using the appropriate conduit connectors.

1. run all wiring, both power and alarm, through the conduit and into the left side of the unit enclosure, as shown in Figure 3.
2. attach the appropriate wires to the supplied Euro connector. Follow appropriate local codes and electrical standards for all cabling.
3. plug the appropriate connector into the mating connector on the unit.

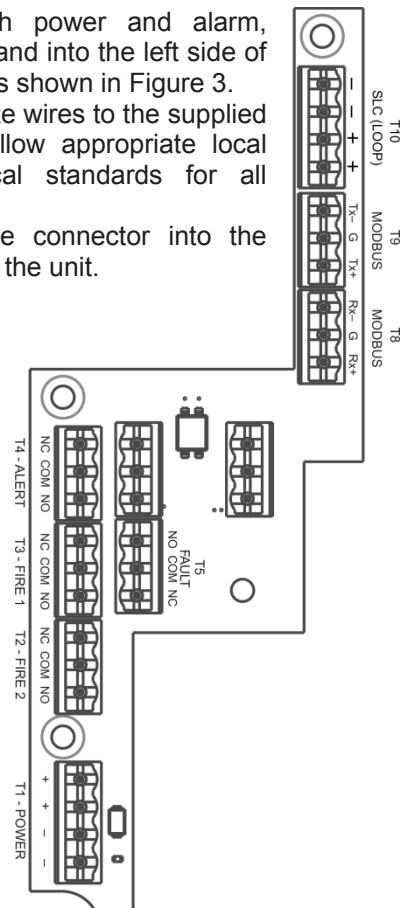


Figure 3: Power and Alarm Connections



FAAST 7200BPI Cabling Requirements

The FAAST 7200BPI provides a series of Euro style pluggable terminals, located behind the left side door of the unit.

Refer to Table 1a for the proper electrical connections to the unit and Figure 4a for typical connection for monitoring a Loop-Based FAAST system at a Fire Alarm Panel (FAP).

Number	Name	Terminal Block
32	SLC (Loop) -	T10
31	SLC (Loop) -	
30	SLC (Loop) +	
29	SLC (Loop) +	
28	ModBus RS485 Tx-	T9
27	ModBus COM	
26	ModBus RS485 Tx+	
25	ModBus RS485 Rx-	T8
24	ModBus COM	
23	ModBus RS485 Rx+	
22	Isolate : - Unused	T7
21		
20		
19	External Monitor : - Unused	T6
18		
17		
16	Fault N/O	T5
15	Fault COM	
14	Fault N/C	
13	Alert N/C	T4
12	Alert COM	
11	Alert N/O	
10	Fire 1 N/C	T3
9	Fire 1 COM	
8	Fire 1 N/O	
7	Fire 2 N/C	T2
6	Fire 2 COM	
5	Fire 2 N/O	
4	External Power +	T1
3	External Power +	
2	External Power -	
1	External Power -	

Table 1a: FAAST 7200BPI Terminal Designations

Notes:

- a) The Terminal Blocks are numbered with T10 to the top and T1 at the bottom
- b) Terminal blocks T6 and T7 are unused

FAAST 7200BPI to FAP Wiring Diagram

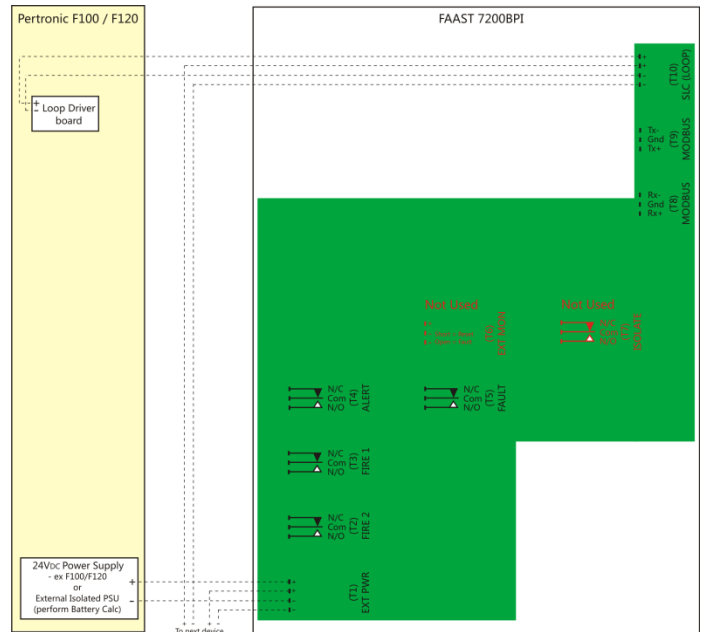


Figure 4a: 7200BPI to FAP Wiring Diagram

FAAST 7200BPI System Powering

The following procedure describes how to initially power up the FAAST system.

1. Unplug the unit's power connector to the unit before turning the power ON.
2. Turn the power ON.
3. Check the voltage at the connector - ensure it is within the required voltage range.
4. If the voltage is within the proper range, reconnect the power connector to the unit.
5. Connect a computer, with the PipelQ software installed, to the unit using either the USB or Ethernet connections located above the connectors
6. Use PipelQ to upload the configuration previously designed for the project.
7. The PC may be disconnected unless a permanent networked connection is required
8. Verify the system fan starts up and air begins to flow out of the exhaust port. The User Interface provides the device status.
9. The device establishes an AirFlow BaseLine during the first five (5) minutes of operation. After five minutes, the AirFlow display will provide the true measured AirFlow status. The device provides visual indication of the Baseline period on the LCD screen.

e) User Interface:

The user interface, shown in Figure 5, provides the following information:

- Detector status: Normal, Alarm, General Fault, Isolate Fault, Disable Fault, Voltage Fault
- Alarm Level: Alert, Fire 1, Fire 2
- Particulate Level: 1 – 10 relative to Alert
- Flow level
- LCD for device test, service, and monitoring

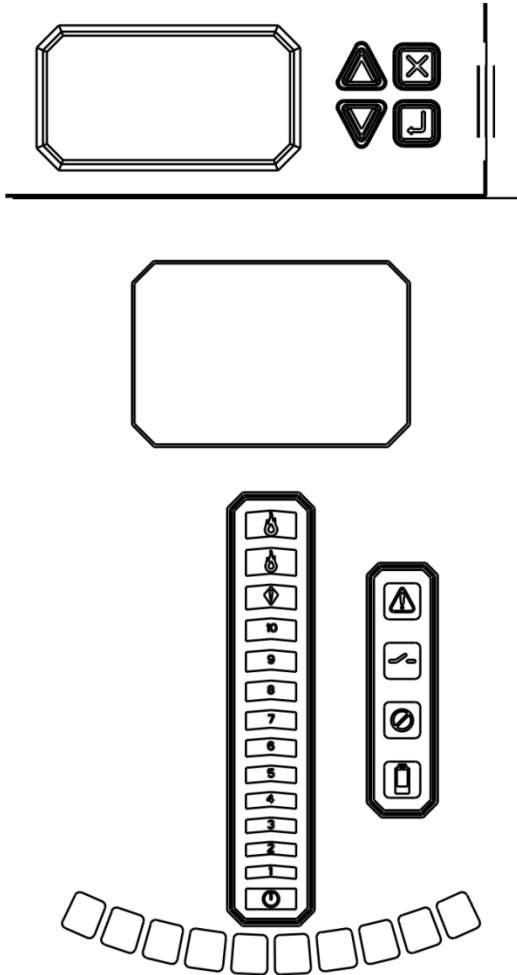
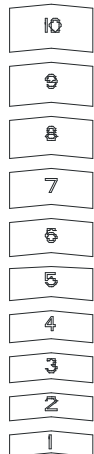


Figure 5: User Interface Display

Particulate Level Display:



The particulate level display, shown in Figure 6, consists of ten amber LEDs that correspond to the current level of the particulate level detected. The LEDs illuminate in order from Level 1 to Level 10, starting from the bottom of the display and moving up as the particulate level increases. Each LED represents a 10 percent increment in the particulate level relative to the Alert level

Display of Particulate Levels occurs with 7100X detectors, but are not available with 7200BPI detectors

Figure 6: Particulate Level Display

Alarm Level Display:

The alarm level display consists of three red LEDs whose illumination corresponds to the current alarm level, shown in Figure 7. These LEDs are located directly above the particulate level LEDs. They illuminate sequentially upward as the severity of the alarm increases. The alarm levels are configured at default levels when shipped, but may be modified using the PipeIQ software. Each alarm level controls a set of Form-C relay contacts. When an alarm level threshold has been crossed, the corresponding Alarm LED illuminates and the relay activates after the Alarm Delay period has elapsed. These alarm thresholds and associated relay outputs can be configured for either latching or non-latching operation. Each Alarm output has a configurable delay from 0 to 60 seconds



Figure 7: Alarm Level Display

AirFlow Display:

The FAAST XS system uses ultrasonic airflow sensing and displays the status in real time on the user interface. The air flow display consists of 10 green LEDs at the bottom of the device to display current flow balance as shown in Figure 8.

The green segments on the air flow pendulum indicate how close the current air flow is to a high or low fault threshold. The default threshold for a fault condition is + or – 20% from airflow baseline. This fault threshold is configurable using the PipeIQ software. During normal operation two adjacent indicators are green and correspond to the current air flow entering the detector. When air flow is balanced, these two indicators will be centred in the pendulum. As air flow increases or decreases, the indicators move to the left in the case of a low flow condition, or right in the case of a high flow condition. A flow fault occurs when the flow boundary threshold is exceeded longer than the flow fault delay period. The fault relay activates when this occurs.

Detailed air flow information can also be read by accessing the 'Air Flow' menu in the device's LCD display.



Figure 8: AirFlow Indication



Fault Display:

The FAAST XS user interface displays faults in two ways: using amber LEDs on the right side of the user interface and on the LCD screen.

The four Fault LEDs are:

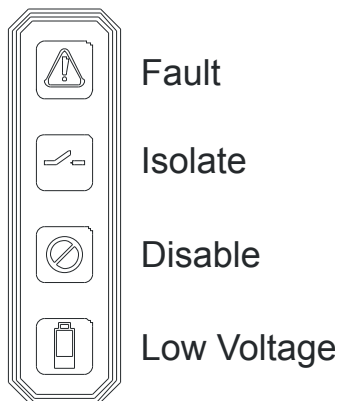


Figure 9: Fault Display

If the General Fault LED is ON, the fault condition is shown on the LCD Display under the Active Faults menu. Possible Fault conditions are:

Type	Description	Active Relay
Low Flow Fault	Device air flow below the boundary and delay programmed by the user.	Fault
Configuration	Configuration of device with configuration software has failed	Fault
	Device was interrupted with a power loss during configuration. Reset to clear this fault and device reverts to its last good configuration	Fault
	Device is new and has not been configured	Fault
	Device configuration is corrupt and is unable to operate	Fault
Drift Blue Fault	Device blue signal has reached the long term drift limit	Fault
IR Laser Drift Fault	Device IR Laser signal has reached the long term drift limit	Fault
Sensor Fault	Device sensor is not working and requires immediate replacement	Fault
External Monitor Fault	External monitor detects open	Fault
Time Fault	Internal Time needs updating	Fault
Aspirator Fault	The fan has stopped working and requires immediate attention	Fault
Filter Fault	Device filter is clogged and requires replacement	Fault
Disable Fault	Device has been put in Disable mode	Isolate
Isolation Fault	Device has been put in Isolate mode	Isolate
High Flow Fault	Device air flow above the boundary and delay programmed by the user.	Fault
Low Voltage Fault	Device Input voltage is low	Fault

LCD User Interface:

The FAAST XS has an LCD screen to provide detailed information of the device's status and configuration. The LCD typically will be in an idle state where the screen is off. Unless the LCD sleep timeout, backlight and contrast are configured through the LCD Settings menu, it will enter a sleep state if a single screen has remained unchanged for a period of 30 seconds. A single push of any button will wake the screen up and the home screen will be displayed.

Once the LCD is on, navigate through the menus with the buttons on the right hand side

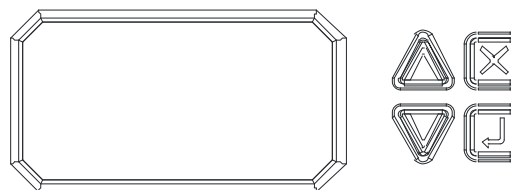


Figure 10: LCD Display

Button	Function
	Scroll up or down through the LCD menus
	Select or enter highlighted item on the LCD screen
	Cancel, Back or Escape from current menu selection

The LCD interface supports multiple languages. LCD Language display is set using PipeIQ or can be changed in the LCD Settings menu.

Home Screen:

The Home screen is the default screen, shown when the LCD is activated. The screen displays the device's current state including: Local Address, Date, Time, Current Smoke Level (percent) and the highest priority state

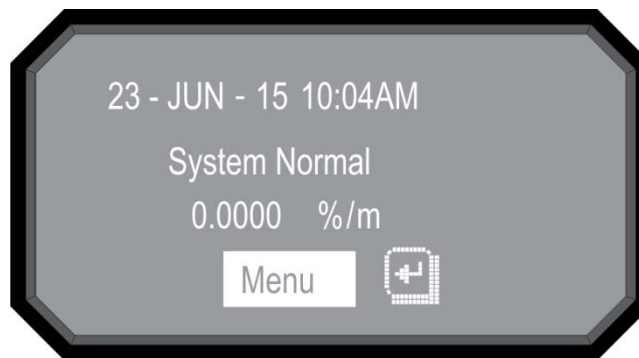


Figure 11: Home Screen

The menu option is available from the home screen. Press the Select button to enter the Main Menu screen. If the device's Sounder is active, the only selection available is Silence. Press the Select key to silence the Sounder - then the menu option will appear.

Main Menu Screen:

Use the scroll (Δ▽) keys to Increment or Decrement the number the cursor is on. To register the number, use the Select (←) key and the cursor will advance to the next digit. After the last digit has been entered the Functions menu appears if the password is entered correctly - the default LCD Password is 1111. If the password does not match, the display shows Password Invalid for 3 seconds and then returns to the home screen.

1. Active Faults:

Only the highest priority fault is shown on the home screen, but it is possible for a device to have more than one fault. These faults can be seen with the Active Faults screen. The screen displays all active faults from highest to lowest priority. The priority fault level is as follows:

Disable, Isolate, Configuration, Sensor, Aspirator, Low Voltage, High Flow, Low Flow, Filter, External Monitor, Time.

2. AirFlow:

The Airflow screen shows the level of airflow change from the baseline as a bargraph and a percentage

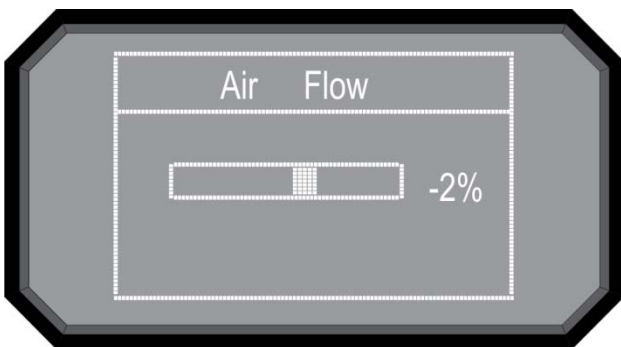


Figure 12: AirFlow Screen

3. Functions:

The Functions menu screen is used to change the device's state or activate Test mode. Because this menu allows the user to change the device out of its normal operating state there is an optional lockout feature for this menu. The lockout requires a 4-digit passcode to enter the functions menu – this passcode is set using the PipelQ software. When the Functions menu has been accessed from the Main Menu screen with the lock feature enabled, the Enter Password screen appears

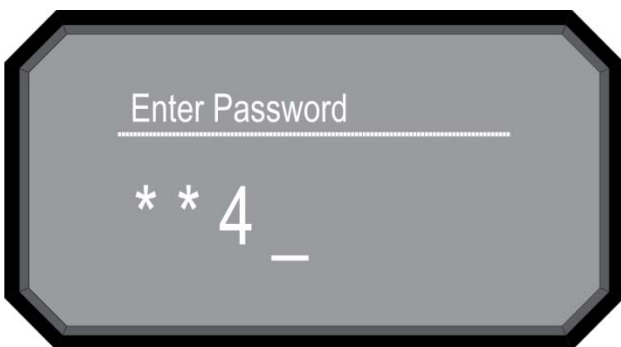


Figure 13: Functions Menu Screen

From the Functions menu the following options are available:

3.1 Isolate:

The Isolate function sets the device into Isolate mode. When selected the device requests confirmation. Use the scroll (Δ▽) keys to select Cancel or OK and then select (←) key to confirm the selection

3.2 Disable:

The Disable function sets the device into Disable mode. When selected the device requests confirmation. Use the scroll (Δ▽) keys to select Cancel or OK and then select (←) key to confirm the selection

3.3 Reset Baseline:

The Reset Baseline function sets the device into Reset Baseline mode. When selected the device requests confirmation. Use the scroll (Δ▽) keys to select Cancel or OK and then select (←) key to confirm the selection

3.4 Reset IP:

The Reset IP function sets the device into Reset IP mode. When selected the device requests confirmation. Use the scroll (Δ▽) keys to select Cancel or OK and then select (←) key to confirm the selection

3.5 Test Mode:

The Test Mode function sets the device into Test mode. When selected the device requests confirmation. Use the scroll (Δ▽) keys to select Cancel or OK and then select (←) key to confirm the selection

3.6 Sounder Test:

The Sounder Test Mode function sets the device into Sounder Test mode. When selected the device requests confirmation. Use the scroll (Δ▽) keys to select Cancel or OK and then select (←) key to confirm the selection. After confirmation the tones activate on the Sounder. Because the sounder is configurable, the screen displays which tone is currently playing (Fault or Alarm)

3.7 Reset:

The Reset function Resets the device. When selected the device requests confirmation. Use the scroll (Δ▽) keys to select Cancel or OK and then select (←) key to confirm the selection

3.8 Set Time:

The Set Time function allows the user to set the Time and Date of the device. This feature can be locked out and require the user to enter a 4 digit access code to enter the Set Time menu. When the screen is first accessed the hour time is highlighted. Use the scroll (Δ▽) keys to change the value, When the correct Hour is selected use the (←) key to set the Hour. The cursor then advances to the Minutes. As each field is set, the cursor progresses to the end. When all fields have been completed, the device requests confirmation

4. Configuration:

The Configuration menu provides access to view how the device is specifically configured from PipelQ. Because this menu contains potentially sensitive information, such as email addresses, there is an optional lockout feature on this menu. The lockout requires a user to enter a 4 digit access code to enter the Functions menu. This four digit access code is configurable through PipelQ. When a user selects the Functions menu from the main menu screen with the lock feature enabled, the enter password screen will be displayed. All configuration data is read only. From the main configuration menu the following selections are available:

Use the scroll (Δ▽) keys to select an option and then select (←) key to confirm the selection



4.1 General Settings:

The General Settings screen provides the miscellaneous settings that are configured. The following configuration settings can be seen under the General Settings:

- Fan Speed
- Flow Boundary
- AirFlow Delay
- Trend Period
- Address
- Alarm Tone
- Fault Tone
- Acclimate

4.2 Network:

- MAC
- IP Address
- Subnet Mask
- Gateway
- DNS Primary
- DNS Secondary
- DHCP Status
- Device Name

4.3 Email

The Email menu screen provides the options for a detailed look of the email settings in the device. Use the scroll ($\Delta\nabla$) keys to select an option and then select (\leftarrow) key to confirm the selection

- Device Account
- Addresses

4.4 ModBus:

- Mode
- TCP
- IP Address
- Port
- Address

4.5 Alarm Settings:

- Alarm Threshold
- Night Mode
- DST Setting

4.6 Information:

The Information screen provides the text information that is configured on the device from PipeIQ. The fields include Facility Name and Location, Device Location and Contact Person. Use the scroll ($\Delta\nabla$) keys to advance up or down the information

5. Event History:

The Event History can be viewed through the LCD screen. The Event History screen displays the event number currently being displayed, the total number of events available, and the event detail for the currently displayed event. Use the scroll ($\Delta\nabla$) keys to advance up or down the events

6. Message Log:

The Message Log history can be viewed through the LCD screen. The Message Log screen displays the message number currently being displayed, the total number of messages available, and the message. Use the scroll ($\Delta\nabla$) keys to advance up or down the messages.

7. LCD Setting:

The LCD settings menu allows the user to adjust the language, backlight and contrast settings for the LCD. This feature can be locked out and require the user to enter a 4 digit access code to enter the LCD menu. This four digit access code is configurable through PipeIQ. When a user selects the LCD Settings menu from the main menu screen with the lock feature enabled, the enter password screen will be displayed. Once in the settings menu use the scroll ($\Delta\nabla$) keys to select an option, then select (\leftarrow) key to confirm the selection

7.1 Language:

The Language screen allows the user to change the language on the LCD. 16 languages are available

7.2 BackLight:

The Backlight screen is used to adjust the brightness of the backlight. Use the scroll ($\Delta\nabla$) keys to increase or decrease the brightness, then select (\leftarrow) key to register the setting

7.3 Contrast:

The Contrast screen is used to adjust the contrast of the text. Use the scroll ($\Delta\nabla$) keys to increase or decrease the contrast

7.4 Display TimeOut:

The Time Out information set for the unit is displayed

8. Diagnostics:

Information on system diagnostics is displayed

- FW Version
 - Sensor Processor
 - Comms Processor



Modes of Operation:

Initialisation:

When the FAAST XS system is initially powered up it is not configured, a Fault indication is set with the General Fault LED and the LCD Home screen displays a Configuration Fault. This indicates that the device has not had its initial configuration loaded and remains in this fault state until a valid configuration is sent to the device. Upon configuration, the device performs an initialisation - this resets the Air-Flow and Filter clogged baselines. It is important that the system has been connected correctly to the pipe network and the Filter is installed properly when the device is initialised as these baselines are used to indicate when a Fault should occur. During the initialisation period the device operates as normal, though accurate Flow and Filter statuses will not display until the baseline is set. Establishing the baseline takes approximately five minutes.

Configuration Overview:

FAAST XS is configured using PipelQ. Data is sent via an in-built Ethernet connection or through the USB interface located inside the wiring cabinet. The device receives and validates the configuration before the configuration becomes active. After the data is validated the device performs an initialisation with the new configuration. If there is a problem with the configuration data the device indicates a Configuration Fault on the User Interface and sets the Fault relay. The device will require a new configuration before operating correctly

Fan Speed Configuration:

The device is capable of running at 3 different fan speeds. To minimize power use, the lowest fan speed that meets the requirements should be selected. The fan-speed directly affects the performance of the device. Likewise, pipe network calculations performed in PipelQ are based on the fan setting. If the fan setting is changed on the device at a later date the pipe system must be re-verified

Alarm and Relay Configuration:

Alarm thresholds are set to default levels when shipped, but are configurable. Each Alarm level has its own set of Form C relay contacts. As the particulate level crosses the threshold for the alarm level the corresponding indicator illuminates and the relay activates. The Alarm thresholds and their associated relay outputs are configurable for latching or non-latching operation. For each Alarm level, there is a configurable delay from 0 to 60 seconds.

Configurable thresholds for each alarm level are:

Alarm Level	Default Threshold (%Obs/m)	Programmable Range (%Obs/m)
Alert	0.0396	0.00095 – 20.0
Fire 1	0.825	0.00095 – 20.0
Fire 2	1.65	0.00095 – 20.0

Table 5 : Programmable Alarm Levels

Audible Indicator Configuration:

The FAAST XS has an integrated audible indicator which provides the option to include a supplementary audible indication for Alarms and Faults - the settings are configurable using PipelQ software.

The sounder is capable of generating a pulsed or continuous tone. The Alarm and Fault can be selected to do either tone.

Note: these tones are not NZS4512 compliant, so an Alarm tone should be used with caution

Power Glitch During Configuration:

During an upload of configuration data, the device retains the last known valid configuration in memory until a complete validation is done on the new configuration data - this prevents device corruption in the event of a power loss or network failure. After power has been restored the device initialises with the last known good configuration. The device also indicates a Configuration Fault on the user interface and sets the Fault Relay. This occurs just once - after the next Reset or Power-on-Reset the device continues to use the last known good configuration

Normal:

During Normal operating mode the FAAST XS displays the Airflow and current Particulate Levels on the user display. The Time, Date, Address and current Obscuration is shown on the LCD. The Particulate Level is compared to the Threshold Levels programmed into the device and activates the appropriate Alarm as the particulate exceeds that threshold. If a fault occurs it activates the Fault LED, displays the type on the LCD and sets the corresponding relay

Test:

Test mode is initiated through the PipelQ Live View tab or through the LCD interface. Test mode simulates a Fire condition by activating all ten segments in the Particulate Level display and each segment in the Alarm display. Each corresponding Alarm relay activates after any programmed delay associated with that relay. To remove the device from Test, a RESET must be performed

Sounder Test:

The Sounder Test function can be accessed from the LCD user interface. When initiated, the device activates the selected sounder tones for Fault and Alarm conditions. The sounder may be configured to give continuous or pulsed tones for Alarm and Fault conditions. Tones may be selected using PipelQ

Reset:

Reset mode is initiated through the PipelQ mimic view or through the LCD interface. When RESET is activated all relays are reset. It then enters Normal mode operation. If any Fault or Alarm states remain, the device reactivates the state automatically



Reset AirFlow Baselines:

The AirFlow baselines may be reset through the LCD screen. The FAAST XS unit enters a five minute baseline period and resets its current airflow baselines - this is displayed on the LCD interface,



If an AirFlow condition exists, perform a visual inspection of the pipe network to ensure the integrity of the pipe network and that the flow condition is not caused by breakages or blockages

Isolate Mode:

From Normal Mode, Isolate mode is initiated through PipeIQ mimic tab or through the LCD interface. The device sets the Isolate relay and Isolate mode is indicated on the user interface. The Alarm and Fault relays reset and subsequently do not change state. In all other respects, the unit continues to operate normally. Any smoke exceeding Alarm thresholds causes Alarm conditions to appear on the detector's user interface, but the Alarm relays do not activate

Disable Mode:

The user can initiate Disable Mode through the LCD interface only. When Disable Mode is activated, the device sets the Isolate relay and the user interface displays the Disable fault. In Disable Mode, the fan ceases operation and the Particulate, Alarm and AirFlow displays on the user interface will not illuminate. The Alarm and Fault relays reset and subsequently not change state. This mode should only be used when the system needs to be taken offline.

Disable mode remains active indefinitely until the user removes the device from Disable mode.

All communication interfaces remain active when the device operates in Disable mode

Day, Night, Weekend Mode:

Day, Night, Weekend mode is the default setting which may be used if Acclimate mode is not desired. This allows the device to have separate threshold levels for simple Day, Night and Weekend mode. Times can be configured, if desired, for entering and exiting the Day and Night time operation. It transitions to Weekend mode on Saturday and Sunday. The device has an internal time reference (clock) that maintains the time whether power is applied or removed. Daylight savings time may be enabled in the configuration to account for time changes

Acclimate Mode:

The FAAST XS system includes an Acclimate mode. By allowing the device to operate in Acclimate mode, a device's susceptibility to nuisance alarms can be reduced. This provides maximum protection for a device located in changing environments. The sensitivity of the unit continuously adjusts over time, within user defined limits, as the environment changes. Acclimate mode must be activated and configured with the PipeIQ software. In Acclimate mode the device automatically adjusts the Alarm point between a specified minimum and maximum sensitivity, programmed by the user. For the first 24 hours of operation the device monitors the environment. After the initial 24 hour period, the device adjusts the Alarm point based on the particulate levels over a rolling 1 hour period. It then adjusts the Alarm level starting from the insensitive boundary, based on the stability of the environment being monitored

Setting Acclimate Mode:

The user chooses the boundaries for each alarm level in the Acclimate mode The FAAST XS system starts from the insensitive boundary and adjusts itself to stay within the sensitive boundary. It is also possible to have static alarm levels by adjusting the high and low boundary to the same level. This allows the flexibility to maintain acclimating levels for some alarms and static levels for others. Table 6 shows the various levels that are available. Each Acclimate level is also able to be monitored in PipeIQ. This allows the user to read the current Acclimated alarm level for each Alarm

Alarm Level	Threshold High Sensitivity	Threshold Low Sensitivity	Current Level
Alert	Alert High	Alert Low	Acclimate Alert Level
Fire 1	Fire 1 High	Fire 1 Low	Acclimate Fire 1 Level
Fire 2	Fire 2 High	Fire 2 Low	Acclimate Fire 2 Level

Table 6 : Acclimate Levels



Logs:

Event Log:

The FAAST XS system has internal memory that can be configured to log detector events. Up to 18,000 events can be stored. Events that are tracked include Alarms, Faults, and User actions. Event tracking may be accessed via the network through the PipelQ software or the web server interface. Configuration and management of the log are done using PipelQ.

Data Trend Log:

The FAAST system can track data from its sensors in the Trend Log. Using PipelQ the frequency which the data is recorded can be selected to allow higher resolution. The rate is limited to a range of 1 to 60 minute or 1 to 24 hour periods. Depending on the rate chosen, data can be collected for 72 hours up to 11.8 years

Message Log:

The Message Log allows the user to enter generic text messages into the device's storage memory. Messages may be retrieved for viewing later. The messages may be used to track service history, configuration changes, etc. A maximum of 300 messages may be stored

Connections

Ethernet Connection:

The FAAST XS system is a network capable device that is compatible with standard Ethernet networking equipment. Connectivity is provided by an on-board RJ45 connector located inside the wiring cabinet. Once initial setup is complete, the Ethernet connection provides optional remote access, monitoring and email notification through the unit's Web server and SMTP client

USB Connection:

A USB port located in the wiring cabinet allows configuration and monitoring through PipelQ or the retrieval of data from the device

Web Server

The FAAST system contains an integrated Web server which is used to observe detector configuration and may be used to remotely monitor the unit.

The Web server features include:

- Intuitive interface for remote monitoring of faults, relays, particulate level, air flow, and power supply
- Facility location and contact information
- Configuration settings display
- Multi-Lingual support
- Event log viewer

Email Notification

The FAAST system has the ability to send e-mail notifications to an individual or organization. Up to 6 different email addresses may be stored for notification. Each email address can be configured to be notified of a specific Alarm level, Fault level or Isolate condition through the PipelQ software. E-mails from the device indicate a device's ID, location and Alarm or Fault type. A comprehensive networking guide may be downloaded at: www.systemsensor.com/faast.

Pipe Network:

The unit can monitor up to 600m² with a properly designed pipe network. The pipe network must be configured using the PipelQ software. The pipe network accommodates a maximum single pipe length of 80m. The device is capable of both metric 25mm and IPS 1.05in. pipe outside diameters without the use of an adaptor. The internal pipe diameter can range from 15-21mm. The pipe must be installed such that only the top or bottom air inlet port is used - mixed sampling from the top and bottom ports is not recommended. Pipe networks may be constructed of various materials such as uPVC, cPVC, PVC, ABS, copper or stainless steel pipe. Travel time from the furthest hole depends on the application of the device, but is limited to a maximum of 120 seconds by the PipelQ software. NZS4512 limits the Maximum Transport Time to 90 seconds.

Smoke Tests

All FAAST systems must be tested after installation and periodically thereafter.

Test methods must satisfy the (AHJ) authority having jurisdiction. Systems offer maximum performance when tested and maintained in compliance with NFPA 72.

Pertronic Industries recommends the use of Smoke Pens (PN: SMOKEPEN) however tested and approved aerosol smoke products are listed in Table 7.

UL Listing	Company	Aerosol
UL	Home Safeguard	25S
UL	SDI LLC	CHEK02, CHEK06
		SOLOA3
		SMOKE SABRE-01

Table 7 : Canned Smoke Testing

Maintenance

The only periodic maintenance required is to replace the filter assembly when the Filter light is illuminated. Perform the following procedure to replace the filter assembly.

1. Remove power from the system.
2. Open the door on the right side of the device that covers the LED system indicators.
3. Remove the plastic name card over the LEDs.
4. Remove the two screws holding the filter assembly into the device.
5. Remove the filter assembly and replace it with a new assembly.
6. Torque the two Philips head screws to 0.7N-M or ¼ turn past "lightly snug."
PLEASE DO NOT OVERTIGHTEN.
7. Replace the plastic name card over the LEDs.
8. Close the door and return power to the system.

Other system checks may need to be performed in accordance with local or national codes and regulations.



SECTION B : CONNECTION TO FAAST XS USING PIPEIQ

Connection to the FAAST XS detector is available using either the in-built USB 'B' or RJ45 Ethernet sockets located in the wiring cabinet. These interfaces allow access to a range of additional options, via the **PipeIQ** application software, when connected to a PC. The connecting cables should be removed during normal operation.

PipeIQ™ QUICK START INSTRUCTIONS

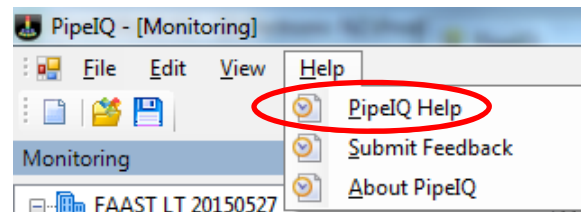
Overview: the PipeIQ software program is a convenient and powerful Windows® based application used to quickly and accurately design pipe networks, generate configuration parameters for correct set-up and operation and facilitate commissioning and monitoring of the performance of FAAST XM Aspiration devices.

PipeIQ provides a graphical interface on a PC to:

- design and verify the performance of pipe network solutions.
- draw and view pipe designs in 3D
- configure the design parameters to suit local fire codes and standards.
- generate Pipe Layouts, BOMs, Configuration and Event Log Reports.
- test relays and alarms, perform smoke test, and fans speed test
- retrieve and view logs in graph and tabular form
- control, test and monitor FAAST aspirating detectors.

A comprehensive **Help** Menu is available from the Menu Bar to guide the user through the different windows and options : **Help****PipeIQ Help**.

The contents have a detailed index and a versatile search facility to locate relevant topics.

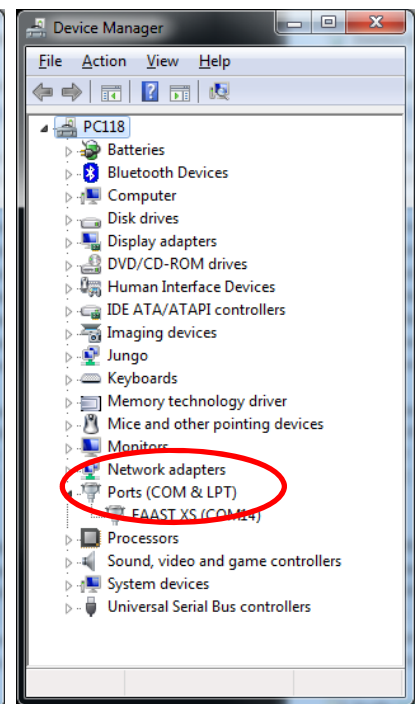
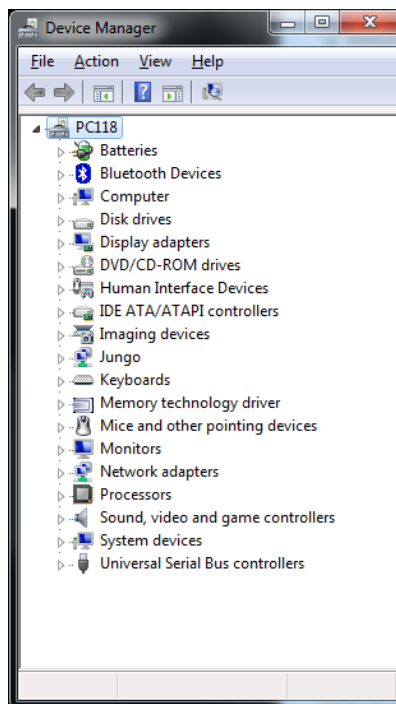
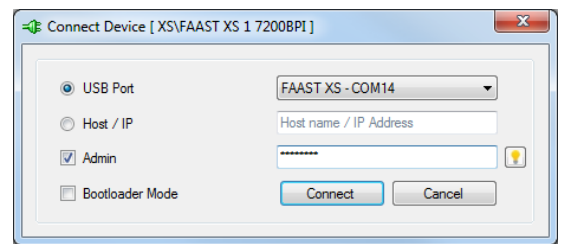


QUIK-START GUIDE

USB Connection: equipment required -

USB 'A' – USB 'B' connector: this cable is provided with the FAAST XS detector

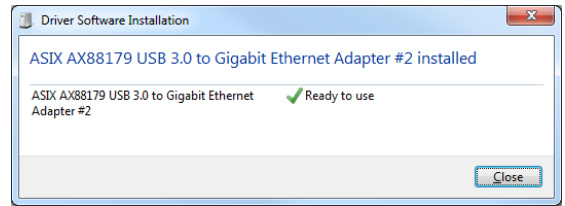
- a) the USB Driver software for the FAAST detector is installed with PipeIQ v2,
- b) select USB Port: the detector and Com Port number will self-populate. If it does not, open Device Manager and monitor Ports (COM & LPT) as the USB cable is connected and disconnected to identify which Com Port the PC is using.
- c) Select Admin: enter the password – default is *'password'*
- d) Connect



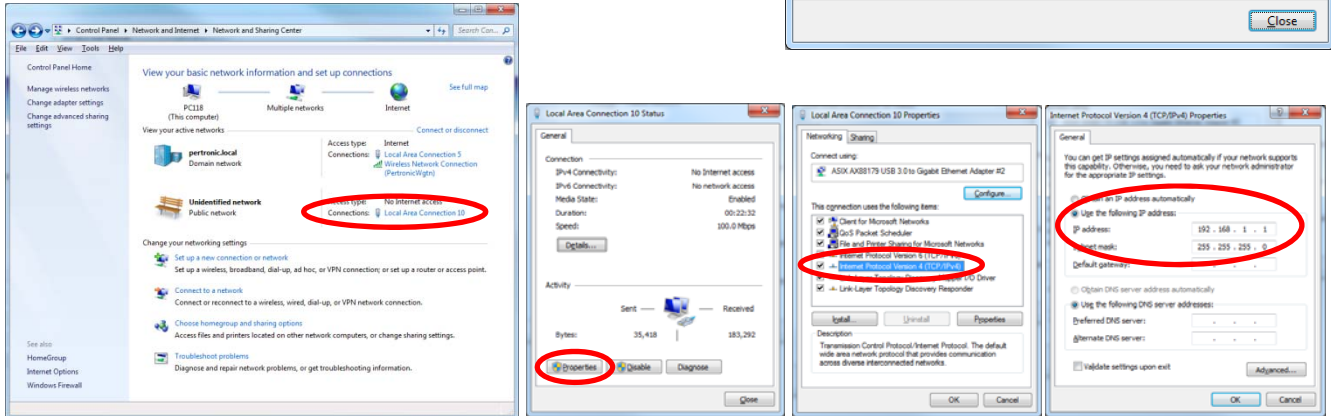
Ethernet Connection: equipment required -

- a) RJ45 EtherNet connector: the FAAST XS series detectors have an RJ45 socket sockets located in the wiring cabinet
- b) USB – EtherNet Adaptor : this sequence is based upon configuration of a Digitus DB-3023 USB 3.0 EtherNet Adapter

(i) Install the Digitus Driver software – may be required for initial use



(ii) Configure the USB-EtherNet Adapter



i. Control Panel\Network and Internet\ Network and Sharing Center

ii. Local Area Connection - Properties

iii. Internet Protocol Version 4

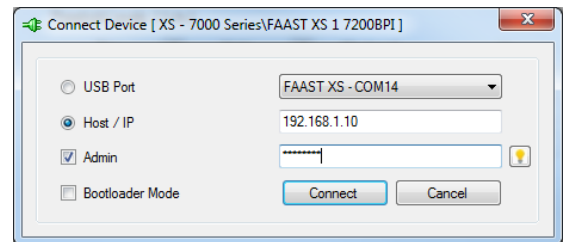
iv. IP Address

- c) PC with PipelQ v2 or greater installed. PipelQ software is available for download from: <https://www.systemsensor.com/en-us/Pages/PipelQ.aspx>

You will be requested to register and login to the site to gain access to the software.

WARNING Caution: DO NOT use PipelQ v1

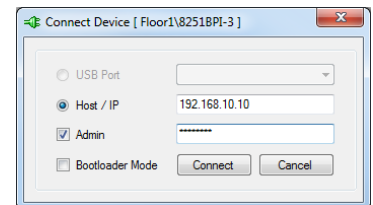
- d) Select Host / IP
- e) Enter the IP Address – default IP Address is 192.168.1.10
- f) Select Admin: enter the password
- default is 'password'
- g) Connect



Connection to the FAAST XS:

- a) Open PipelQ (v2 or greater) on the PC – by default, PipelQ opens in **Configuration** mode
- b) Open a project file (*.mdf) to continue – use one of the following methods:
 - i. open an existing project configuration (*.mdf) file for the FAAST XS or
 - ii. start a New Config and add a FAAST detector of the type to be installed or being maintained
 - save this Config file : use a filename which will readily relate to the detector under test
eg. 7200BPI-3 20160218 for the third Analogue Addressable FAAST XS detector on the site
- c) Power the FAAST XS on - wait until the FAAST has completed initialisation (the Power LED turns green):

- d) Select **View \ Configuration** from the Menu bar, right click the detector configured in line b) above and then select **Connect Device**
- e) Select the detector at the appropriate **USB Port** or **Host / IP**. select **Admin** and enter the password (default – *password*), then **Connect**:



- f) Align the detector and PC Configurations by either:
 - i. b) i. above. Right click the device and select Send Configuration to a new detector or a detector which is being updated
 - ii. b) ii. above. Right click the device and select Get Configuration for an existing detector being maintained



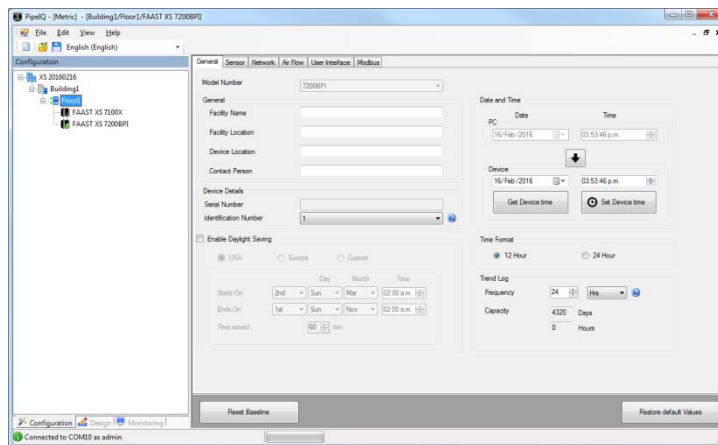
SECTION C : CONFIGURING FAAST XS (7000 SERIES) IN PIPEIQ

A. Configuration:

The following screen shots identify the parameters which are configurable on the 7000 Series FAAST XS devices. Review all parameters to ensure they are appropriate, taking particular care to ensure the **coloured** parameters are correct

a) General:

- (i) Model Number:** select 7200BPI
- (ii) General:** complete the details for identifying the Name and Location of the detector and the Contact Person

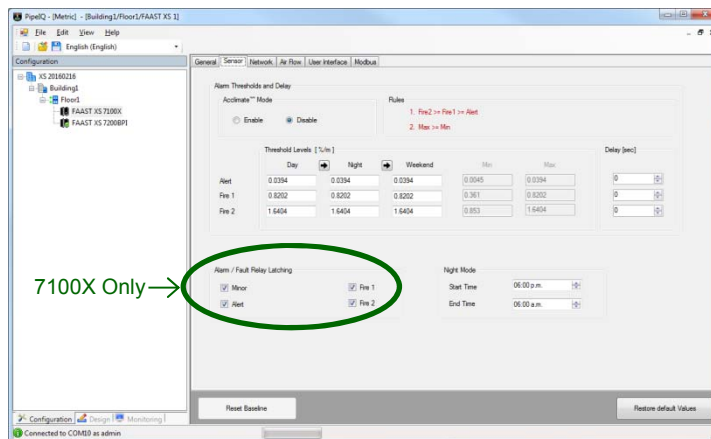


(iii) Device Details:

- **Serial Number:** this will self-complete after connection to the detector
- **Identification Number:** enter the detector's Loop Address
- **Enable DayLight Saving:** if required, select Custom, then:
 - Starts On: Last Sunday September 02:00
 - Ends On: 1st Sunday April 03:00
 - Time Saved: 60 min
- **Date and Time:** should **ONLY** be updated when connected to the FAAST detector.
 - Either complete the actual time at Device or if the PC time is correct, simply select the arrow to download the PC time to the detector
- **Time Format:** select either 12 Hour or 24 Hour format
- **Trend Log:** select the Frequency for logging the detector functions to the Trend Log – note that as the frequency increases, the duration of the Log reduces ($Capacity/Frequency=Duration\ of\ Log$)
 - the rate is limited to a range of 1 to 60 minute or 1 to 24 hour periods
 - depending on the rate chosen, data can be collected for 72 hours up to 11.8 years

b) Sensor:

- (i) Alarm Thresholds and Delay:**
 - Enable or Disable Acclimate Mode:**
 - Acclimate Mode:**
 - **Enable :** enter the **Min and Max** Sensitivity Level for each activation level
 - **Disable :** enables **Threshold Mode**
 - Threshold Levels (%/m):**
 - enter the required **Day, Night and Weekend** Sensitivity Level for each activation level
 - Note: the Threshold Levels may alternatively be set during Design – refer to **Design**



Delay (sec): introduces a specified delay and verifies if the Alarm condition still exists before triggering the Alarm

- (ii) Night Mode:** select **Start Time** and **End Time**



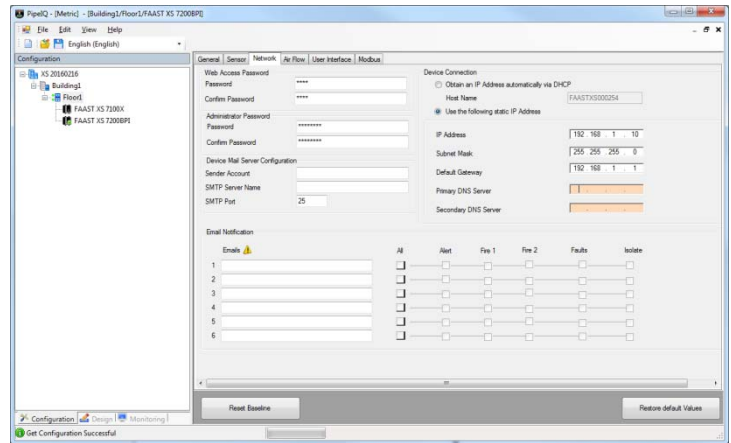
c) Network:

(i) Passwords:

FAAST XS devices have two types of password:

- **Web Access Password:** required to access remote monitoring available via a web browser
 - the default **Password** is 1234
- **Administrator Password** - required to reconfigure FAAST devices using PipeIQ software
 - the default **Password** is *password*

Caution: if a Default Password is changed and then lost, there may be a delay before Pertronic can identify the password so that it can be accessed or changed



(ii) Device Mail Server Configuration:

- **Sender Account:** enter the email ID for the **Sender Account**
- **SMTP Server Name:** enter the **SMTP Server Name** to use for email communication
- **SMTP Port:** default Port = 25 - contact the site IT department to confirm the correct Port

(iii) Device Connection: select an IP Address automatically via DHCP or use a Static IP Address:

- Obtain an IP Address automatically via DHCP
 - contact the site IT department to obtain the information required to connect to the site's ethernet
- Use a Static IP Address:
 - IP Address: Default = 192.168.1.10
 - Subnet Mask: Default = 255.255.255.0
 - Default Gateway: Default = 192.168.1.1
 - DNS Server: Primary and Secondary - contact the site IT department to obtain the information required

(iv) Email Notification:

- enter the Email addresses of the Users to whom to send the Alarm notifications. Email addresses may be a Group of addresses
- select the notifications each user should receive using the check boxes

d) AirFlow

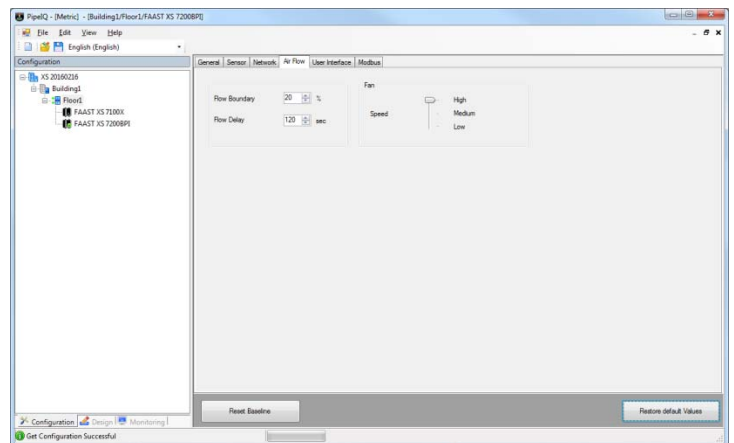
(i) Flow Boundary: specifies the set limit for the AirFlow

- applicable settings are 0 to +/-50%
- Default setting is +/-20%
- Note:

(ii) Flow Delay: specifies the time set for the Air Flow Defect

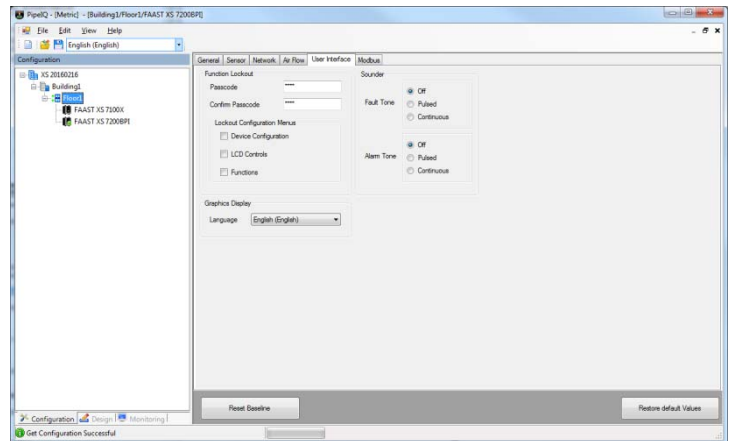
- applicable settings are 0 to 255 seconds
- default setting is 120 seconds

(iii) Fan Speed: select the required fan speed : High, Medium or Low as configured in Design



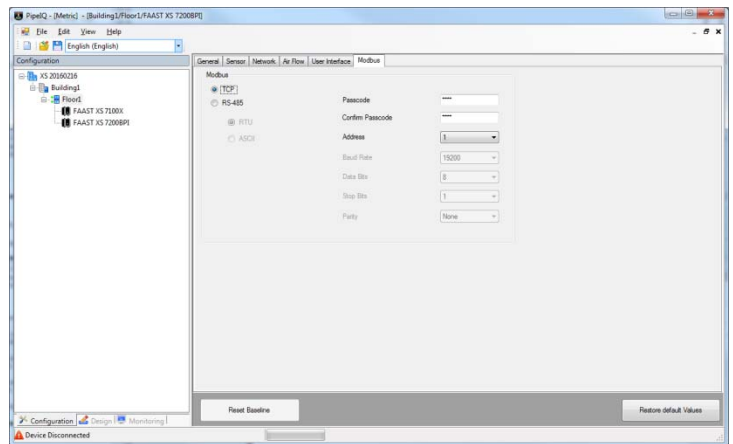
e) User Interface:

- (i) Function Lockout:** sets the Passcode to make the buttons available at the user interface
 - default Passcode is 1111
- (ii) Lockout Configuration Menus:**
 - **Device Configuration:** controls the ability to select **4 Configuration** options at the LCD Display
 - **LCD Controls:** controls the ability to select **7 LCD Setting** options at the LCD Display
 - **Functions:** controls the ability to select **3 Functions** options at the LCD Display
- (iii) Graphics Display:**
 - **Language:** 16 languages are available for the graphics display – default is English (English)
- (iv) Sounder:**
 - **Fault Tone:** select Off, Pulsed or Continuous
 - **Alarm Tone:** select Off, Pulsed or Continuous

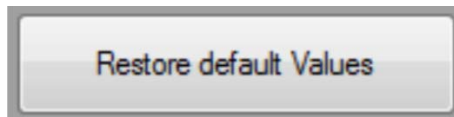


f) ModBus

- (i) ModBus:** determines the ModBus operating mode
 - TCP: ethernet based
 - RS485: serial based, RTU or ASCII based as required
- (ii) Passcode:** sets the Passcode to unlock the buttons on the device user interface
 - default Passcode is 1111
- (iii) Address:** sets the address for the TCP port
 - default Address is 1
- (iv) Baud Rate, Data Bits, Stop Bits, Parity**
 - define RS485 Serial port settings for the ModBus client



- g) Restore Default Values:** select to restore all configuration parameters with Default values



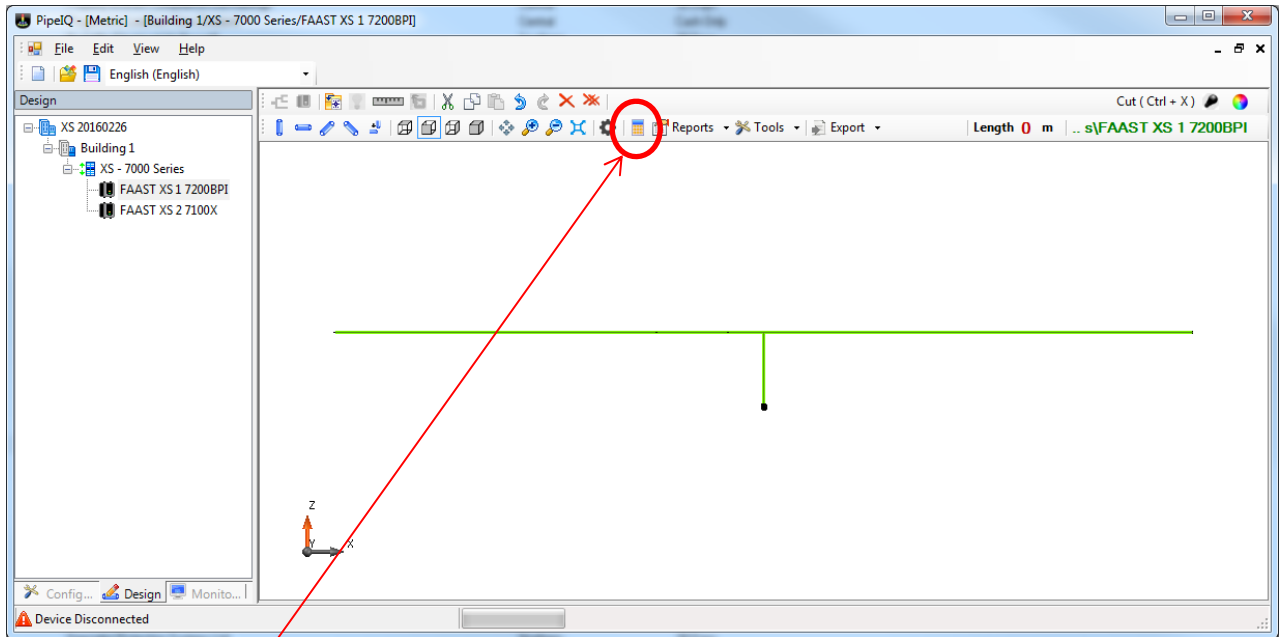
- h) Reset Baseline:** establishes an Air-Flow baseline for the detector, displaying the true measured Air-Flow status.





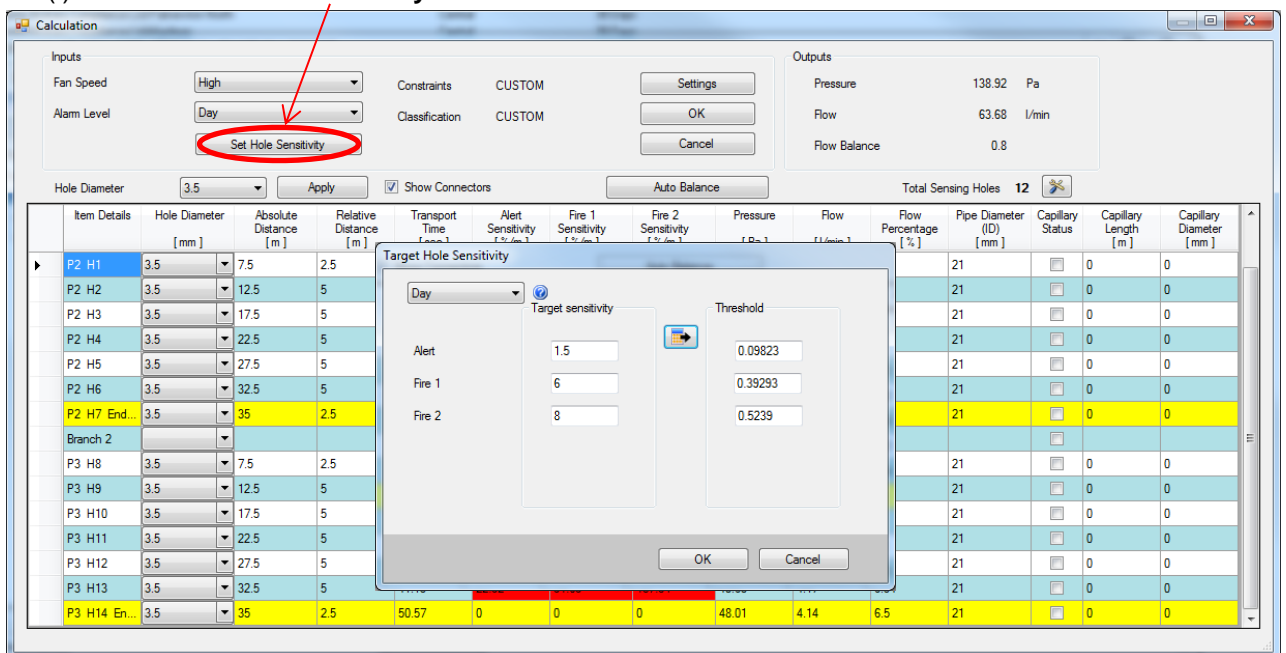
B. Design:

The following screen shots illustrate how to set the Hole Sensitivity from the Calculation window in Design
Setting Hole Sensitivity: design the required pipe layout to meet the system layout requirements



select the **Calculation** icon

(i) select **Set Hole Sensitivity**



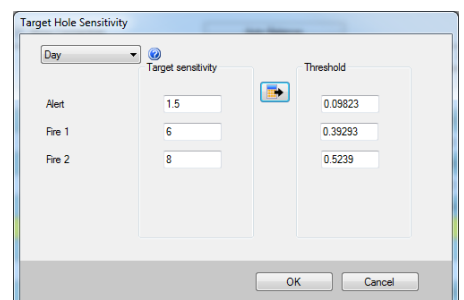
(ii) set the Target Sensitivity for each of the activation levels: Alert; Fire 1 and Fire2

- the Target Sensitivity represents the sensitivity at the Sampling Point and equates to the sensitivity of a point detector, eg. an OPT detector
- typical **Target Sensitivity** levels may be:

Activation Level	VEWFD	EWFD	SFD
Alert	0.1	0.3	1.5
Fire 1	2.5	3	6
Fire 2	3	4.5	8

press the arrow to convert each **Target Sensitivity** to **Threshold**, then **OK** to accept

- this is the value used by **Threshold Values (%/m)** in **Configuration \ Sensor**





(iii) identify cells which do not meet the system constraints – highlighted in red

Item Details	Hole Diameter [mm]	Absolute Distance [m]	Relative Distance [m]	Transport Time [sec]	Alert Sensitivity [%/m]	Fire 1 Sensitivity [%/m]	Fire 2 Sensitivity [%/m]	Pressure [Pa]	Flow [l/min]	Flow Percentage [%]	Pipe Diameter (ID) [mm]	Capillary Status	Capillary Length [m]	Capillary Diameter [mm]
P2 H1	3.5	7.5	2.5	14.48	18.29	73.15	109.72	76.48	5.22	8.2	21	<input type="checkbox"/>	0	0
P2 H2	3.5	12.5	5	17.41	19.41	77.63	116.45	67.9	4.92	7.73	21	<input type="checkbox"/>	0	0
P2 H3	3.5	17.5	5	21	20.49	81.97	122.96	60.91	4.66	7.32	21	<input type="checkbox"/>	0	0
P2 H4	3.5	22.5	5	25.57	21.48	85.94	128.91	55.41	4.45	6.98	21	<input type="checkbox"/>	0	0
P2 H5	3.5	27.5	5	31.77	22.32	89.27	133.9	51.36	4.28	6.72	21	<input type="checkbox"/>	0	0
P2 H6	3.5	32.5	5	41.15	22.92	91.69	137.54	48.68	4.17	6.54	21	<input type="checkbox"/>	0	0
P2 H7 End...	3.5	35	2.5	50.57	0	0	0	48.01	4.14	6.5	21	<input type="checkbox"/>	0	0
Branch 2												<input type="checkbox"/>		
P3 H8	3.5	7.5	2.5	14.48	18.29	73.15	109.72	76.48	5.22	8.2	21	<input type="checkbox"/>	0	0
P3 H9	3.5	12.5	5	17.41	19.41	77.63	116.45	67.9	4.92	7.73	21	<input type="checkbox"/>	0	0
P3 H10	3.5	17.5	5	21	20.49	81.97	122.96	60.91	4.66	7.32	21	<input type="checkbox"/>	0	0
P3 H11	3.5	22.5	5	25.57	21.48	85.94	128.91	55.41	4.45	6.98	21	<input type="checkbox"/>	0	0
P3 H12	3.5	27.5	5	31.77	22.32	89.27	133.9	51.36	4.28	6.72	21	<input type="checkbox"/>	0	0
P3 H13	3.5	32.5	5	41.15	22.92	91.69	137.54	48.68	4.17	6.54	21	<input type="checkbox"/>	0	0
P3 H14 En...	3.5	35	2.5	50.57	0	0	0	48.01	4.14	6.5	21	<input type="checkbox"/>	0	0

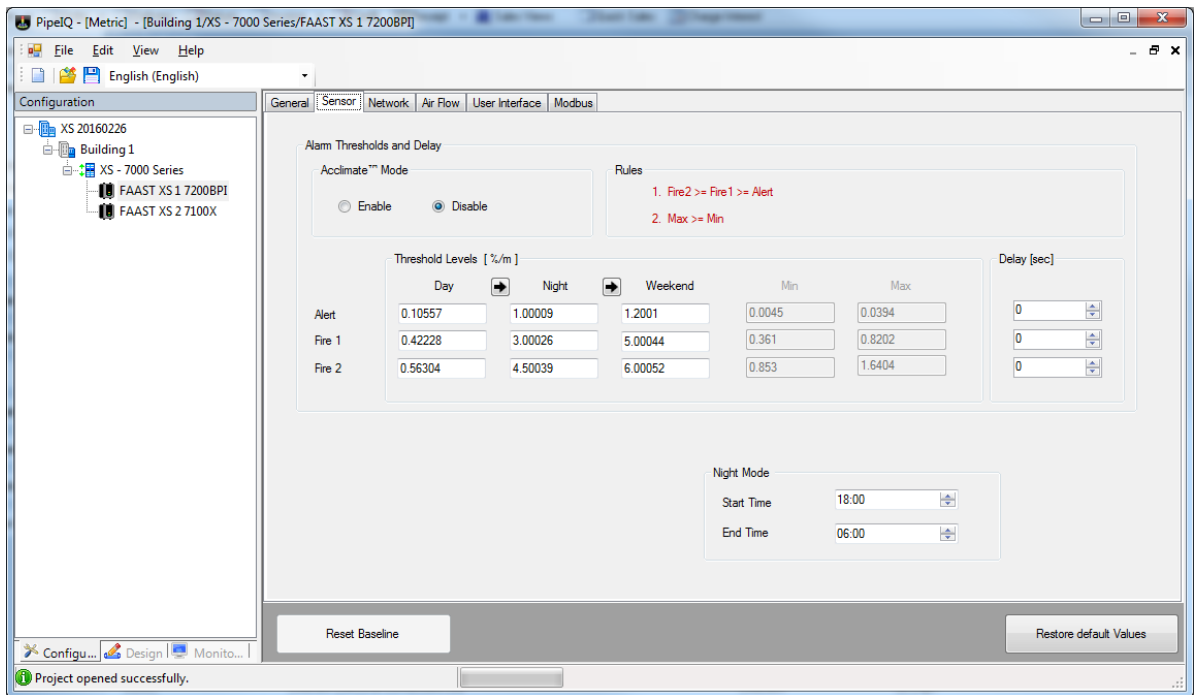
(iv) select **Settings \ Constraints**, then **CUSTOM**
 - first review the **Sensitivity** settings used by **VEWFD**, **EWFD** or **SFD** to identify appropriate settings for the system being configured, then apply settings suitable to the **CUSTOM** constraints

(v) acknowledge any advisory notices, then verify all Settings meet the Constraints
 - verify **Flow Balance**: should be ≥ 0.70
 - select **Auto Balance** to maximise **Flow Balance** and manually adjust **Hole Diameters** if required to achieve **Flow Balance** ≥ 0.70

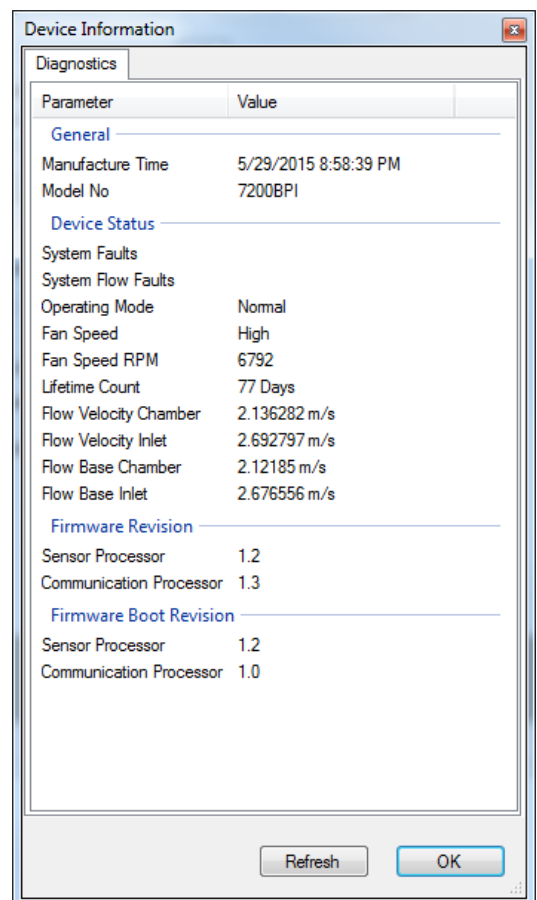
Item Details	Hole Diameter [mm]	Absolute Distance [m]	Relative Distance [m]	Transport Time [sec]	Alert Sensitivity [%/m]	Action 1 Sensitivity [%/m]	Action 2 Sensitivity [%/m]	Fire 1 Sensitivity [%/m]	Fire 2 Sensitivity [%/m]	Pressure [Pa]	Flow [l/min]	Flow Percentage [%]	Pipe Diameter (ID) [mm]	Capillary Status	Capillary Length [m]	Capillary Diameter [mm]
Tee Joint		5	5											<input type="checkbox"/>		
Branch 1														<input type="checkbox"/>		
P2 H1	3.5	7.5	2.5	5.39	0.52	1.31	2.18	4.36	6.55	100.64	5.99	9.08	21	<input type="checkbox"/>	0	0
P2 H2	3.5	12.5	5	8.28	0.55	1.37	2.28	4.57	6.85	91.93	5.73	8.68	21	<input type="checkbox"/>	0	0
P2 H3	3.5	17.5	5	11.94	0.57	1.42	2.37	4.75	7.12	85.07	5.51	8.35	21	<input type="checkbox"/>	0	0
P2 H4	3.5	22.5	5	16.88	0.59	1.47	2.45	4.9	7.34	79.98	5.34	8.09	21	<input type="checkbox"/>	0	0
P2 H5	3.5	27.5	5	24.36	0.6	1.5	2.5	5	7.5	76.62	5.23	7.92	21	<input type="checkbox"/>	0	0
P2 H6 End...	3.5	30	2.5	31.85	0	0	0	0	0	75.78	5.2	7.88	21	<input type="checkbox"/>	0	0
Branch 2														<input type="checkbox"/>		
P3 H7	3.5	7.5	2.5	5.39	0.52	1.31	2.18	4.36	6.55	100.64	5.99	9.08	21	<input type="checkbox"/>	0	0
P3 H8	3.5	12.5	5	8.28	0.55	1.37	2.28	4.57	6.85	91.93	5.73	8.68	21	<input type="checkbox"/>	0	0
P3 H9	3.5	17.5	5	11.94	0.57	1.42	2.37	4.75	7.12	85.07	5.51	8.35	21	<input type="checkbox"/>	0	0
P3 H10	3.5	22.5	5	16.88	0.59	1.47	2.45	4.9	7.34	79.98	5.34	8.09	21	<input type="checkbox"/>	0	0
P3 H11	3.5	27.5	5	24.36	0.6	1.5	2.5	5	7.5	76.62	5.23	7.92	21	<input type="checkbox"/>	0	0
P3 H12 En...	3.5	30	2.5	31.85	0	0	0	0	0	75.78	5.2	7.88	21	<input type="checkbox"/>	0	0



- (vi) the amended Sensitivity settings will be reflected in the Sensor settings in Configuration – refer to **Threshold Levels (%/m)** under **Alarm Threshold and Delay in Configuration \ Sensor**
- in the screenshot below, the **Day Threshold Levels** reflect the fact the **Day Sensitivity** has been amended, while **Night** and **Weekend** are default values
 - **Night** and **Weekend** Threshold Levels can be sequentially updated to match the **Day** values simply by pressing the arrow or alternately **Night** and **Weekend** settings can be customised



- (vii) Select the device from the tree, right click and select Device Information.
- record the following details in Section H : FAAST XS System Validation Form:
 - a. Fan Speed RPM
 - b. Flow Velocity Chamber
 - c. Flow Velocity Inlet
 - d. Flow Base Chamber
 - e. Flow Base Inlet
 - Flow Velocity values represent the current flow rate through the Chamber and Inlet
 - Flow Base values represent the flow rates as measured during the BaseLining process
- Flows are measured in m/s, while PipeIQ calculates flow rates in l/min - a Flow Rate Conversion Table is available at Section G





Section D : CONFIGURING Pertronic Fire Alarm Panels

A. Analogue Addressable F100 / F120:

7200BPI Loop-Addressable

- Type: the Loop Address set by the FAAST detector address wheels is configured as **TYPE = FAST**
- since only the Base Address can activate the Fire (F100) or Brigade (F120) relay, this address will generally be configured for **FIRE 1** activation, though the Base Address may be configured for **FIRE 2** activation
 - more sensitive activation levels are configured as **TYPE = vFAST**
 - three virtual addresses are available, so one or two of these will typically be **Alert** and **Fire 1**, if **Fire 2** is configured for the Global Alarm.

Sensitivity: the FAAST 7200BPI detector Threshold Levels are configured at the detector:

Configuration \ Sensor

- the **Threshold Levels** are converted to three **Activations Levels** in the panel: **ALERT, FIRE 1** and **FIRE2**. Set the Sensitivity for each Activation Level per the Table below.
- **DO NOT USE** the following Sensitivities
 - **F100** : Sensitivity 2 or 3
 - **F120** : Sensitivity 0 or -1

Activation Level	Type	PW4	F100	F120
			Day = Night	Day = Night
Alert	vFAST	≥1280	1	+1
NOT APPLICABLE - DO NOT USE			2	0
NOT APPLICABLE - DO NOT USE			3	-1
Fire 1	FAST	≥2400	4	-2
Fire 2		≥2800	5	-3

Flags and Outputs: the remaining Flags and Outputs should be configured as required for each activation level

- Each Activation Level provides individual Threshold Levels (sensitivity) for **Day, Night** and **Weekend** use
 - the F100 / F120 may also have Day/Night mode active to provide different Sensitivity levels for Point detectors and other functions on site, however these should not be applied to FAAST detectors – set DAY sensitivity = NIGHT sensitivity.
- The F100 / F120 simply recognise the state (Activation Level) of the FAAST detector - the various Sensitivity levels are provided by the FAAST detector as configured in PipeIQ



SECTION E : MONITORING FAAST XS USING PIPEIQ

This section identifies options for testing the FAAST XS and monitoring its environment:

Views:

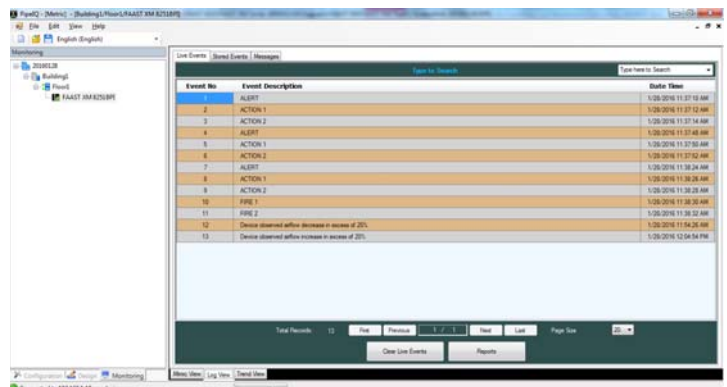
The PipeIQ™ **Actions** tab enables:

Mimic View: replicates the FAAST XS front panel interface to provide remote monitoring and control



Log View:

- Live Events:
 - Monitor Live Events as they occur
 - Search for Live Events
 - Produce Reports in pdf, doc or xls format
 - Clear Live Events
- Stored Events:
 - Retrieve Stored Events
 - Search for Stored Events
 - produce Reports in pdf, doc or xls format
 - Clear Stored Events
- Messages: facility to add notes for future reference and/or advice to colleagues regarding issues or tasks performed or required
 - Add Messages
 - Send Messages
 - Retrieve Messages
 - Search Messages
 - Clear Messages



Trend View:

- Trend Mode
 - Live
 - Start
 - Stop
 - Settings
 - Stored
 - Retrieve
 - Settings
- Trend Scale
 - X Axis: Time
 - Y Axis: Obscuration (%/m)





SECTION F : SYSTEM TEST AND COMMISSIONING:

F1. Required Items: ensure the following items are available:

- a) FAAST System Pipe Layout Report:- allows the measured values to be referenced to the values calculated in PipeIQ.
- b) FAAST System Bill of Materials Report
- c) As-built Installation Drawings
- d) Smoke Pen or other source of smoke with a particulate life cycle of greater than 120 seconds
- e) Timer or stop-watch - to measure the maximum Transport Time
- f) Blue-Tak or similar to block holes during Flow tests
- g) Locally Required Forms

F2. Commissioning and Handover (reference: FIA Code of Practice for ASDs, Issue 3, Feb 2012)

F2a Commission Testing

The Commissioning Tests to be performed depend on the ASD system application but should be carried out only when the building is in its normal, intended running state. Appropriate commissioning tests should also be performed after modifications and/or additions to the ASD system.

Commissioning

The commissioning process has several stages which should be performed, recorded and checked as necessary:

- Inspection of Installation – verify conformity to design, definition of system including mechanical and electrical installation.
- Power Up/Configuration – required checks and configuration
- Commissioning Tests – include mechanical, functional and performance testing.
- Signalling - verify the connections between the ASD and other connected systems (e.g. FAP, BMS).
- System Check - verify the detector settings are appropriate for the site, as suggested in Table 7 : Sensitivity Class vs Detection Requirements (refer P24)
- System Handover – include relevant documentation and recorded drawings.

F2b Inspection of Installation

Inspect the installation to confirm that it has been designed and installed correctly for the application and conforms to the design documentation - in particular;

- ASD used to replace point-type detectors (Class C) - ensure the installation (particularly Sample Point spacing) conforms to the relevant standard (eg. NZS4512:2010) and the ASD Sensitivity/Alarm thresholds are correctly set to ensure that the sensitivity of individual holes meets the minimum performance requirements for individual points. Note that this may require reference to the approval compliance notes for the particular ASD system and should also take into account any potential automatic adjustments of the Sensitivity/Threshold settings, which may occur after commissioning.
- ASD used for high and enhanced sensitivity (Class A/B) - ensure that the installation conforms to the design specification - if necessary, measure the air velocities in the protected area to ensure that the design spacing is appropriate.
- ASD used as a Primary Sampling System - ensure the pipe and sample points are installed correctly at the Air Handling Unit (AHU) within the airflow. If monitoring more than one AHU, it is important to ensure different running speeds do not cause an unbalanced airflow in the pipe, which may affect ASD performance.
- ASD used for other installations (cabinet, duct work or other specialist protection) - confirm that the ASD system is in accordance with the design.

Perform a thorough inspection of the mechanical and electrical installation - include;

- pipe network including correct supports.
- clear identification of Sampling Points.
- no obstructions to Sampling Points or remote capillaries.
- all internal and external electrical wiring has been installed correctly.
- power supplies are correctly rated and provide the correct emergency battery standby period.
- correct hole position and sizes.

Before the ASD is powered up, it is very important to check that the pipe is clear of any foreign articles eg. swarf, dust, etc that will impede or stop the ASD performance.

F2c Power Up/Configuration

It is very important that the ASD manufacturer's technical documentation is followed during system set-up. If there is any doubt refer back to the manufacturer for clarification.

The system should be powered up in accordance with the manufacturer's recommendations. Prior to carrying out any functional and performance tests the ASD equipment should be configured for:

- Fire signal Alarm thresholds and detector sensitivity settings to give required sampling point sensitivity.
- Alarm and Fault delay periods.
- Airflow parameters.
- any other defined parameters.



F2d. Commissioning Tests

Before performing these tests ensure the area being protected is in its fully operational state – both in terms of airflows and cleanliness. For example, any air handling units (AHUs) should be running, all floor and ceiling tiles should be installed and any equipment producing a heat load should be in its normal operational mode. Results from all tests, particularly details of the test positions, should be recorded so that they can be repeated during Maintenance.

- (i) Prescribed Standard** : for ASD systems designed to prescribed standards, commissioning tests should include but are not limited to: -
- Maximum Smoke Transport Time from last sampling hole in system.
 - Fault detection, including blockage and rupture of the pipe.
 - Tests to confirm that Sampling Points are functioning.

- (ii) Performance Based** : for ASD systems designed to a performance requirement additional performance tests should be performed. They should be conducted in accordance with the design requirements.

a) Transport Time Measurement

Maximum Transport Time is measured by introducing smoke into the furthest Sample Point (or a dedicated test point) and measuring the time between first introducing the smoke and observing a “reaction” at the detector.

b) Smoke Test:

The system Alarm response MUST be tested for functionality using smoke

- the choice of smoke source is dependent on the installation - Pertronic Industries recommends the use of a Smoke Pen (PN: SMOKEPEN). Aerosol smoke is not recommended as it may leave residue inside the pipe

Loop-Based:

- (i) at the F100 or F120 panel, access Menu \ Status (\ Device) : Loop Address of the FAAST detector
- Note the PW4 value
- (ii) on each Pipe of a multiple branch system, introduce smoke into the Sampling Point furthest from the detector –if the End Cap is configured as a Non-Sensing Point, use the penultimate Sampling Point
- (iii) start the Timer as the smoke enters the Sampling Point, then move to the panel and note the PW4 value. - the smoke must be present for the duration of the test
- (iv) stop the Timer as the PW4 value begins to rise indicating smoke has been detected – this is the Transport Time for this Sample Point.
- the Maximum Transport Time shall be less than the maximum time specified within the design documentation/ engineering specifications but must not exceed 90 seconds (NZS4512:2010).

Where an Alarm indication is used it does not generally include any Alarm delays, which are temporarily set to zero for the measurement of Transport Time.

Measured Transport Time should be compared to the predicted design Transport Time.

c) Fault Detection

Simulate the following faults on the detector and check that the fault is signalled at both FAAST detector and at the Fire Panel.

- (i) Pipe Flow** : for each sampling pipe connected to the FAAST unit, record Flow Velocity and Flow Base readings from the device System Information for later reference during Maintenance – refer to Page 20, Section (vii). Flow Base (BaseLine) should remain consistent, Flow Velocity should vary with each test
- block the pipe and ensure a Low Flow Defect is reported
 - remove the Endcap and ensure a High Flow Defect is reported
 - block a single Sampling Point and confirm the Air-Flow indicator responds
 - block a series of Sampling Points and record the identity of each hole and number (quantity) required to produce a Low Flow Defect – identifying the holes individually allows replication later for Maintenance
- Note: A 20% reduction in volumetric flow (EN54-20) is considered an appropriate Defect condition.

Sampling Points do not usually block individually but all become contaminated at similar rates.

- (ii) Power Supply** :

- disconnect the battery and verify that a fault is reported at the Fire Alarm Panel
- disconnect the Mains supply and verify that a fault is reported at the Fire Alarm Panel

d) Functional Tests

Commissioning must include sufficient testing to verify that Sampling Points are fully functional. Careful inspection/validation of the sampling holes to confirm that they are correctly drilled and comparison of measured transport times to predicted transport times is often considered sufficient validation, particularly where performance tests are specified.

- identify and inspect a sample of Sampling Points and verify they are drilled to the correct size and spacing
- measure the actual current drawn from the power supply – record this and use the Battery Calculator (http://www.pertronic.co.nz/engineering/battery_calc/welcome.php) to ensure the PSU and Battery are appropriate to achieve the required Standby period



F2e Signalling

All signalling between the ASD system and Fire Alarm Panel/CIE should be verified in accordance with the design. In particular the signalling and response to each Alarm level and Fault conditions should be checked and verified. Where an ASD system provides local Disablement or Isolation it should be verified that this condition is signalled to the Fire Alarm Panel/CIE

Any “cause and effect” requirements, particularly in relation to the integration with automatic suppression systems should be verified

F2f System Check

After initial commissioning, it is prudent to monitor detector performance by turning Trend Log ON for an appropriate period, then review the log to verify the settings are suitable for the site (refer to Section C, Device Details)

F2g System Handover

During the commissioning all results shall be recorded. These along with all configuration data shall be submitted as part of the commissioning certificate.

All relevant drawings shall be submitted to include the pipe layout, hole sizes, sampling point positions and detector locations, and shall be deemed part of the system handover.

All the collated documentation along with a signed certificate should be issued to the customer.

Sensitivity Class vs Detection Requirements:

Class (EN54-20)	Class A	Class B	Class C
	Very High Sensitivity	Enhanced Sensitivity	Normal Sensitivity
TF2x End of Test Condition	1.15% obs/m (0.05dB/m)	3.4% obs/m (0.15dB/m)	36.9% obs/m (2dB/m)
Description:	Smoke is not visible due to low quantity and/or high dilution due to air movement	Smoke is visible but insufficient to be detected by Point or Beam detectors	Smoke is visible and sufficient to be detected by Point or Beam detectors
ASD Sampling Type			
Primary Detection: sampling where smoke is likely to travel	Best	Small Areas Only	Not Appropriate
Secondary Detection: sampling holes positioned according to Point detector code	Early Warning	Challenging Applications	Appropriate (prescriptive design may be used)
Localised Sampling: customised protection of specific equipment	High Risk	Low Risk	Not Appropriate
In-Cabinet Sampling: localised sampling	High Risk	Low Risk	Not Appropriate
Duct Sampling:	High Risk	Low Risk	Not Appropriate
Other Motivators: <ul style="list-style-type: none"> • extreme environments • restricted/difficult access • exceptional ceiling height • heat barriers • aesthetics • risk of mechanical damage • anti-vandal systems • hazardous environment 			

Table 7 : Sensitivity Class vs Detection Requirements



SECTION G: FLOW RATE CONVERSION TABLE

This Flow Rate Conversion Table is valid for Pipes of 21mm Internal Diameter (ID) only.
- for Pipes other than 21mm ID, use the formulae at the end of the Table

Inside Diameter (ID)	Velocity (Vel)	Flow Rate (Flow)
(mm)	(metre/sec)	(litre/min)
21	0.90	18.7
	0.95	19.7
	1.00	20.8
	1.05	21.8
	1.10	22.9
	1.15	23.9
	1.20	24.9
	1.25	26.0
	1.30	27.0
	1.35	28.1
	1.40	29.1
	1.45	30.1
	1.50	31.2
	1.55	32.2
	1.60	33.3
	1.65	34.3
	1.70	35.3
	1.75	36.4
	1.80	37.4
	1.85	38.4
	1.90	39.5
	1.95	40.5
	2.00	41.6
	2.05	42.6
	2.10	43.6
	2.15	44.7
	2.20	45.7
	2.25	46.8
	2.30	47.8
	2.35	48.8
	2.40	49.9
	2.45	50.9
	2.50	52.0
	2.55	53.0
	2.60	54.0
	2.65	55.1
	2.70	56.1
	2.75	57.1
	2.80	58.2
	2.85	59.2
	2.90	60.3
	2.95	61.3
	3.00	62.3
	3.05	63.4
	3.10	64.4
	3.15	65.5
	3.20	66.5
	3.25	67.5
	3.30	68.6
	3.35	69.6
	3.40	70.7
	3.45	71.7
	3.50	72.7
	3.55	73.8
	3.60	74.8
	3.65	75.9

Flow Rate (Flow)	Velocity (Vel)
(litre/min)	(metre/sec)
20	0.96
21	1.01
22	1.06
23	1.11
24	1.15
25	1.20
26	1.25
27	1.30
28	1.35
29	1.40
30	1.44
31	1.49
32	1.54
33	1.59
34	1.64
35	1.68
36	1.73
37	1.78
38	1.83
39	1.88
40	1.92
41	1.97
42	2.02
43	2.07
44	2.12
45	2.17
46	2.21
47	2.26
48	2.31
49	2.36
50	2.41
51	2.45
52	2.50
53	2.55
54	2.60
55	2.65
56	2.69
57	2.74
58	2.79
59	2.84
60	2.89
61	2.94
62	2.98
63	3.03
64	3.08
65	3.13
66	3.18
67	3.22
68	3.27
69	3.32
70	3.37
71	3.42
72	3.46
73	3.51
74	3.56
75	3.61

Formulae:
$$\text{Flow Rate} = 0.25 \times \text{Pi} \times \text{ID}^2 \times \text{Vel} \times 0.001 \times 60$$

$$\text{Velocity} = (4 \times \text{Flow}) / \text{Pi} \times \text{ID}^2 \times 0.001 \times 60$$



GLOSSARY:

Key Terms:

Configure:

To set up a program or computer system for a particular application.

FAAST Fire Alarm Aspirating Sensing Technology®:

High sensitivity aspirating smoke detection system.

IP Address:

An Internet Protocol (IP) address is a numerical label that is assigned to devices participating in a computer network utilizing the Internet Protocol for communication between its nodes.

PipeIQ®:

A software program designed to work with the FAAST unit for system configuration, monitoring and pipe design.

Web server:

A Web server is a computer program that delivers (serves) content. The device contains an integrated Web server which is used to observe detector configuration and may be used to remotely monitor the system.

Document Colour Code Key:

When using this manual, apply the information which applies to the particular FAAST XS model being installed

SS Blue: Document Headers

Black: applies to both 7200BPI and 7100X FAAST XS Series detector

Blue: important settings to be configured on each 7200BPI Device

LASER SAFETY INFORMATION

This aspiration detector does not produce any hazardous laser radiation and is certified as a Class 1 laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. Any radiation emitted inside the smoke detector is completely within the protective housings and external covers.

The laser beam cannot escape from the detector during any phase of operation. The Center of Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured after August 1, 1976. Compliance is mandatory for products marketed in the United States.

WARRANTY

System Sensor warrants its enclosed smoke detector to be free from defects in materials and workmanship under normal use and service for a period of three years from date of manufacture. System Sensor makes no other express warranty for this smoke detector. No agent, representative, dealer, or employee of the Company has the authority to increase or alter the obligations or limitations of this Warranty. The Company's obligation of this Warranty shall be limited to the repair or replacement of any part of the smoke detector which is found to be defective in materials or workmanship under normal use and service during the three year period commencing with the date of manufacture.

After phoning System Sensor's toll free number 800-SENSOR2 (736-7672) for a Return Authorization number, send defective units postage prepaid to: System Sensor, Returns Department, RA # _____, 3825 Ohio Avenue, St. Charles, IL 60174.

Please include a note describing the malfunction and suspected cause of failure. The Company shall not be obligated to repair or replace units which are found to be defective because of damage, unreasonable use, modifications, or alterations occurring after the date of manufacture.

In no case shall the Company be liable for any consequential or incidental damages for breach of this or any other warranty, expressed or implied whatsoever, even if the loss or damage is caused by the Company's negligence or fault. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

FCC STATEMENT

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



Section H : FAAST XS System Validation Form:

Name	Contact Information	Date
Installer:		
Commissioning Agent:		
Client Representative:		
Witness:		
Required Documents		
Commissioning Form for Each System (this document):		Yes / No
FAAST System Pipe Layout Report		Yes / No
FAAST System Bill of Materials Report		Yes / No
As-Built Installation Drawings:		Yes / No
Smoke Test Results (optional):		Yes / No
Locally Required Forms		Yes / No
Air Handling Units:	Yes / No	In-Cabinet Sampling: Yes / No
Number of Sample Points:		Number of Capillary Points:
Conditions:		
Temperature:	Humidity:	Other:
Power Supply Installed correctly?		Yes / No
Pipe Network Installed in Accordance with the PipeIQ design (per Pipe Layout Report)?		Yes / No
Pipe Network Labelled correctly?		Yes / No
Describe Any Variations?		
Wiring Checked:		Yes / No
Detector Settings Checked:		Yes / No
Relays Tested:		Yes / No

Device Information:			
Fan Speed:		Flow Velocity Chamber:	m/s
Fan Speed RPM:		Flow Base Chamber:	m/s
		Flow Velocity Inlet:	m/s
		Flow Base Inlet:	m/s

General:					
Model Number:	7200BPI	Serial Number:			
		Identification Number (Loop Address)			
Contact Person:					
Customer Name:					
Facility Name:					
Facility Location:					
Device Location:					
Site Address:					
Daylight Saving:	Starts On	Last Sunday September 02:00	Ends On	First Sunday April 03:00	
Time Format	12 Hour	24 Hour	Time Saved:	60	min
Trend Log	Frequency:		Mins / Hrs		

Sensor:						
Threshold Levels:	Day	Night	Weekend	Acclimate		Delay (sec)
				Min	Max	
Alert:						
Fire 1:						
Fire 2:						
Night Mode:	Start Time:		End Time:			



Section H : FAAST XS System Validation Form (continued):

Network:							
Web Access Password:			Administrator Password:				
Device Mail Server Configuration:							
Sender Account:		SMTP Server Name:			SMTP Port: 25		
Device Connection:							
DHCP Generated IP Address:			Host Name:				
Static IP Address:			DNS Server:				
IP Address:			Primary:		. . .		
Subnet Mask:			Secondary:		. . .		
Default Gateway:			. . .				
Email Notification:							
Email Address:		All	Alert	Fire 1	Fire 2	Faults	Isolate
1							
2							
3							
4							
5							
6							
AirFlow:							
Flow Boundary (%):			Flow Delay Sec):				
Fan Speed			High		Medium Low		
User Interface:							
Button Activation:			Passcode:				
Lock-Out Configuration Menus:			Device Configuration:		LCD Controls:		Functions:
Sounder:	Fault Tone:	Off		Pulsed		Continuous	
	Alarm Tone:	Off		Pulsed		Continuous	
Graphics Display:		Language:			English		
ModBus:							
TCP:		Passcode:			Address:		
RS485:		RTU		ASCII			
Baud Rate:		Data Bits:		Stop Bits:		Parity:	
System Tests:							
Transport Time:			Actual:		Predicted		
Air-Flow:							
Block the Exhaust Pipe:			• Lo Flow Defect Indicated?		Yes / No		
Remove End-Cap:			• Hi Flow Defect Indicated?		Yes / No		
Block a Single Sampling Point:			• reduced Flow Indicated?		Yes / No		
Block Sampling Points to produce Defect:			• list the Holes Blocked				
Outputs:							
Alarm Outputs Verified:			Yes / No				
Fault Outputs Verified			Yes / No				
Isolate Function Verified			Yes / No				
Comments:							
Signatures:							
Customer:				Commissioning Agent:			
Date:				Date:			