



Honeywell Analytics

Fire Alarm Aspiration
Sensing Technology (FAAST)

Honeywell

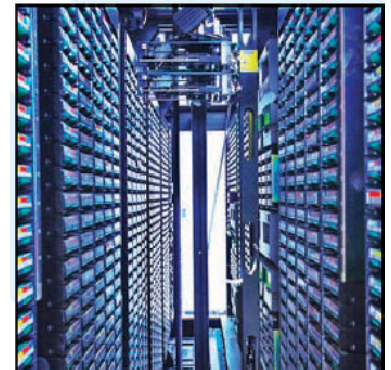
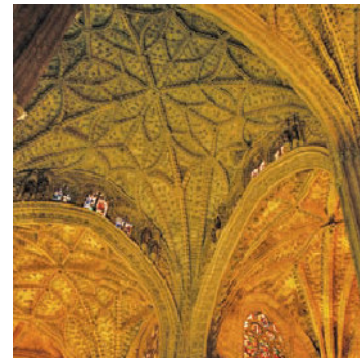
Meeting Customer Needs with FFAST

- **Best in-class early warning aspiration smoke detection**
 - Prevent data loss
 - Protect equipment
 - 5-levels of response available
- **No business disruption**
 - Prevent nuisance alarms
 - Superior nuisance alarm rejection
 - Prevent false suppression discharges
- **Reduced cost of ownership**
 - Simple installation and maintenance
 - Seamless integration with fire alarm systems
 - Ethernet connectivity – ease of monitoring



Common Aspiration Applications

- **Mission Critical**
 - Computer and Data Processing
 - Telecommunications
- **Historical/Aesthetics**
 - Museums, Churches, Mansions
- **Large Public Areas**
 - Shopping malls, stadiums
- **Difficult Environments**
 - Cold food storage, Poor air quality
- **Security Concerns**
 - Prisons, hospitals



Business Protection



- **Earliest warning: 30-60 minutes before combustion**
 - Unsurpassed sensitivity .00046%/ft (.0015%/m) obscuration
 - Competition offers .0015%/ft (.005%.m) obscuration
 - UL listing for EWFD and VEWFD ensuring rapid response times
- **Dual source optical smoke detection to improve detection decision making**
 - Blue LED covers the widest ranges of fires
 - Competition use only a single infra-red laser – prone to nuisance issues
 - Infra-red laser used to detect dust
 - Advanced algorithms to discriminate dust from smoke

Business Protection

- **Full customized detection strategy can be deployed**

- Most alarm levels
 - 5 alarm levels can be programmed
 - An extra level of detection to expand your emergency response plan
- Latching or non-latching relays for each alarm level to support your control and system interface strategy
- 0 to 60 second delay available
 - Measured combustion level must be present for entire period
 - Alarm detection verification – minimizing the potential of false alarms from transient conditions



Business Protection

- Acclimate mode of detection enhances your detection performance
 - Set Min/Max for each detection threshold
 - Continuous baseline background measurement
 - Continuously compares sensitivity setting (within range) to measured background
 - Adjusts sensitivity up or down within the range depending upon current measured conditions delivering ideal detection settings automatically
 - Faster burn-in: 24 Hours NOT 15 days
- An event log tracks up to 18,000 events including alarms, faults and user actions which can be accessed via PipeIQ software or the web server interface
- E-mail notification of events – so your always aware of a situation and in control

Business Protection

- E-Mail Notification Examples

```
From: il14.hsd1@smtp.honeywell.com
To: Klein, Jeff (IL14); Doll, David (IL14); zkarim053167@gmail.com;
Kurtz, Ed (IL14); Dauskurdas, Ed (IL14)
Subject: Message from System Sensor ASD Num 6

Return-Path: il14.hsd1@smtp.honeywell.com
Message-ID: <AZ18CN851BAyxJMXehY00004425@AZ18CN851.global.ds.honeywell.com>
X-OriginalArrivalTime: 20 Oct 2009 21:07:05.0363 (UTC)
FILETIME=[46EC0630:01CA51C9]
Date: 20 Oct 2009 14:07:05 -0700
```

```
System Sensor
St. Charles, IL
Commercial Engineering
ASD Num 6 has initiated an ALERT.
```

```
From: EngLab6@systemsensor.com
Sent: Wednesday, September 01, 2010 10:07 AM
To: Klein, Jeff (IL14)
Subject: Message from EQA73 ASD Num 6

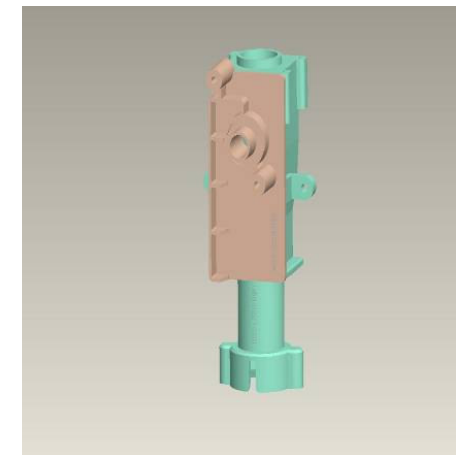
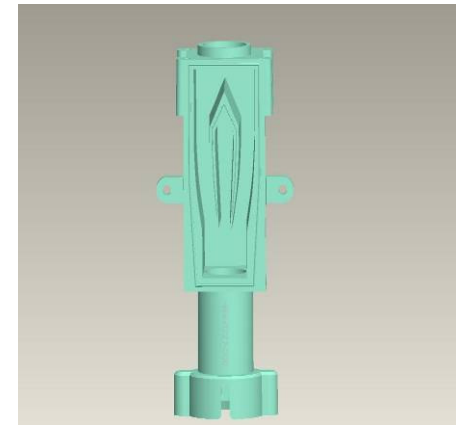
EQA73
3825 Ohio Avenue St Charles
Office
ASD Num 6 has a fault state change. FLOW FAULT HIGH
```

No Business Disruption

- Dual light source generates data for algorithms to discriminate particulate types reducing false alarms – exclusive to FFAST
 - Additional infra-red high powered laser source
 - Particles analyzed within chamber to reject dust:
 - Size, Color, Signature
- Oversampling of particles for detection accuracy
 - Several alternating (blue/red) light emissions are measured to derive multiple mega samples that are analyzed for smoke/dust content – not a “one and done”
- Ongoing signal strength monitoring and adjustment to extend the maintenance interval of the chamber

No Business Disruption

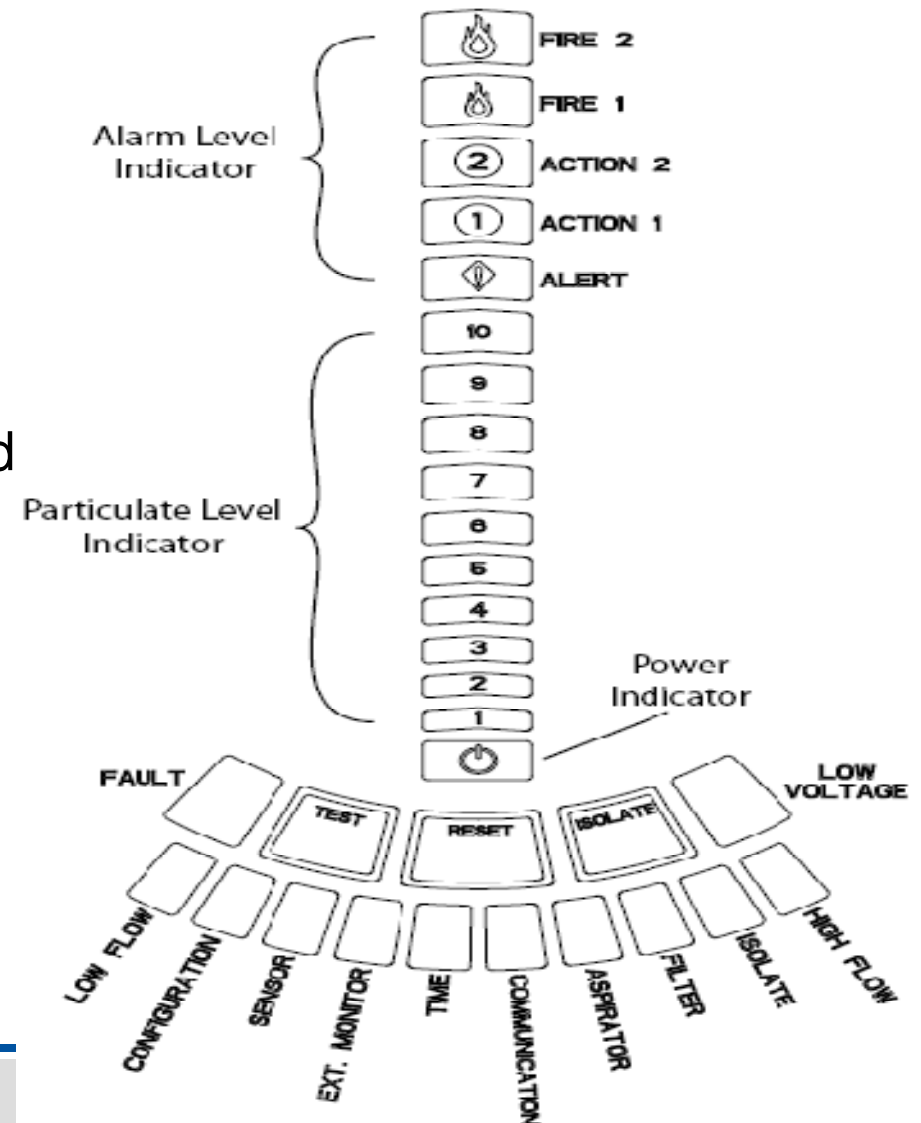
- **Multi-stage filtering to prevent dust and nuisance alarms**
 - Patented particle separator
 - Replaceable 30 micron filter
 - Electronic nuisance rejection through algorithms



Reliability and Peace of Mind

- 5-levels of alarm level indication
- 10-levels of particulate indication
- Fault indicators exhibit a broad spectrum of events
 - Major and Minor event notification
 - Filter change pre-warning
- Ultrasonic flow detection for high and low flow events
- Multi-level security – access codes prevent unwanted changes to the system
- No hidden costs with add-on accessories – No extra charges for displays, relays, programmer, that could add up and cost you the project

USER INTERFACE DISPLAY

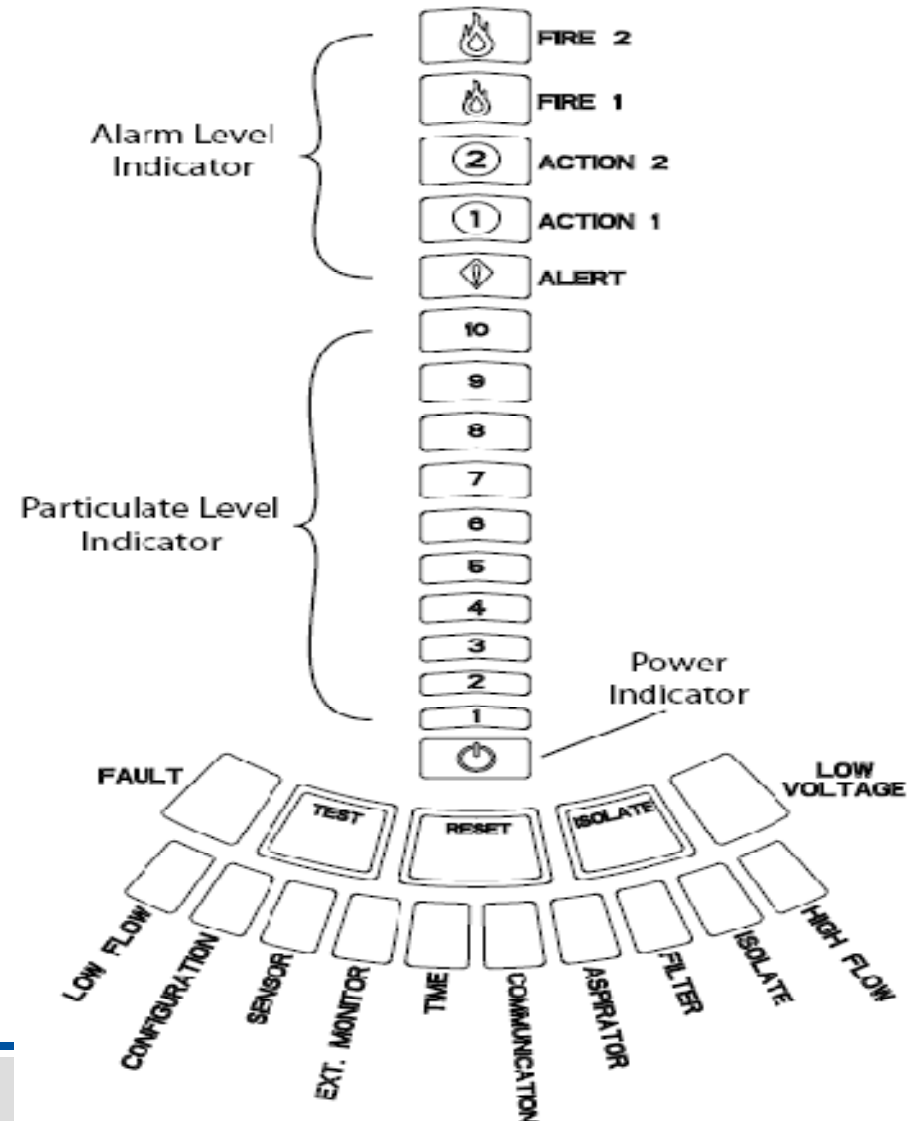


Reliability and Peace of Mind

Dual Flow Monitoring Verification

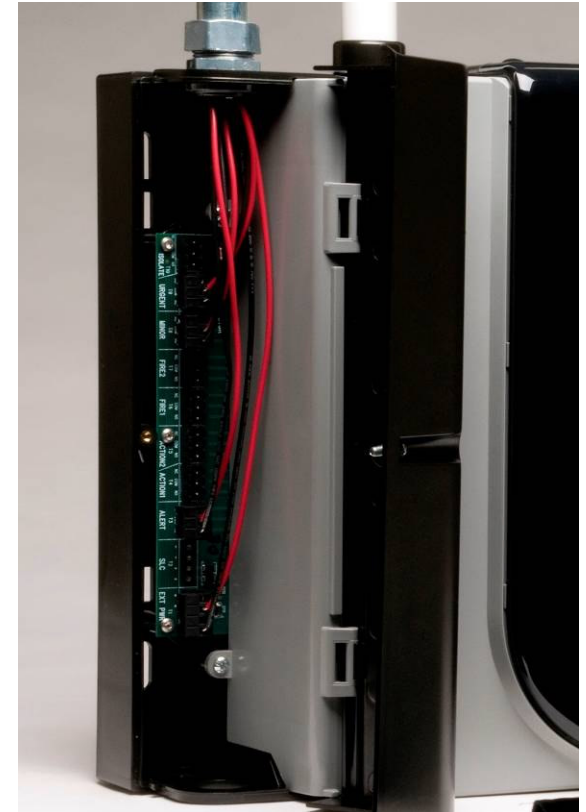
- Pipe Network
 - Ultrasonic
 - Ensures that air is reaching detector
 - Verifies that network has not been compromised
- Across Sensors
 - Thermal Sensor, Transistors
 - Ensures that air is traveling across sensor
 - Verifies that air is passing through filter and across sensors

USER INTERFACE DISPLAY



Reduced Lifetime Cost of Ownership

- Acclimate mode allows the device to adapt to its environment within 24 hours – not up to 15 days
- Retrofit installations with existing pipe networks are possible eliminating the expense of starting over
- Superior wiring access
- Only 1 filter to change through the front panel door – **changing every 4 years, twice as long as the market leader**
- Particle separator removes larger contaminants before they enter the detection chamber extending the life of the device
- One fan with a >7 year fan life



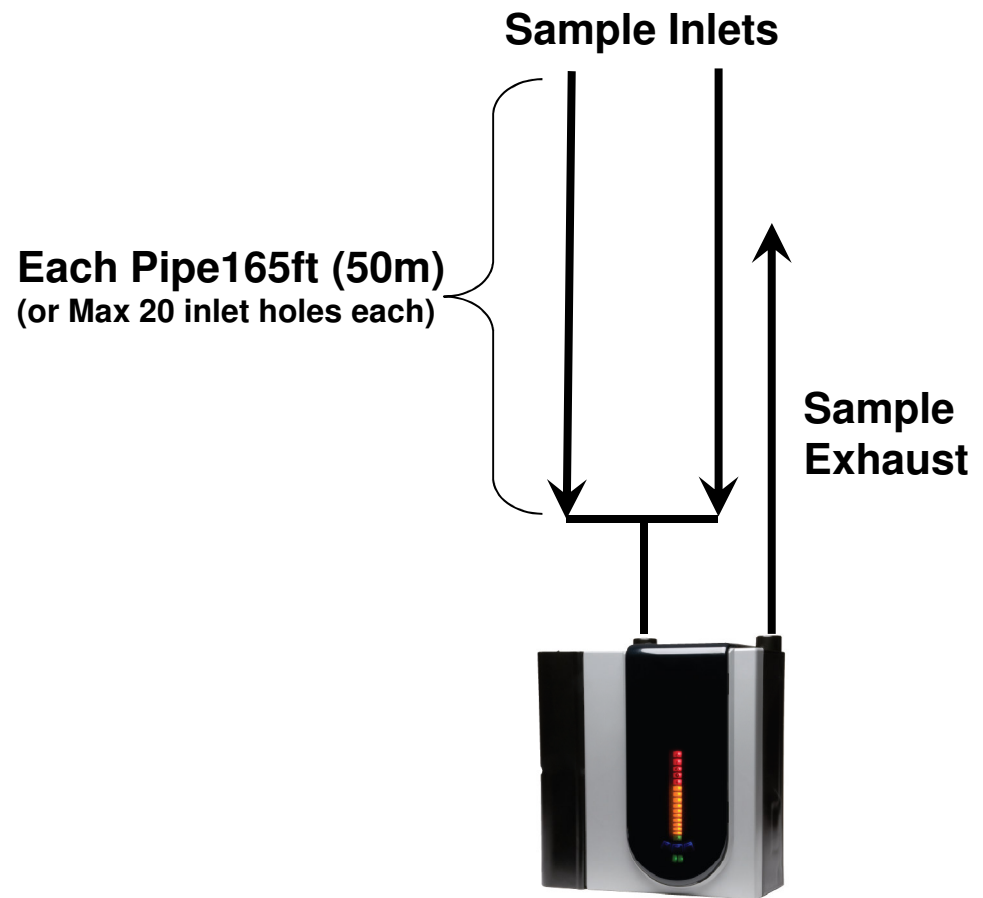
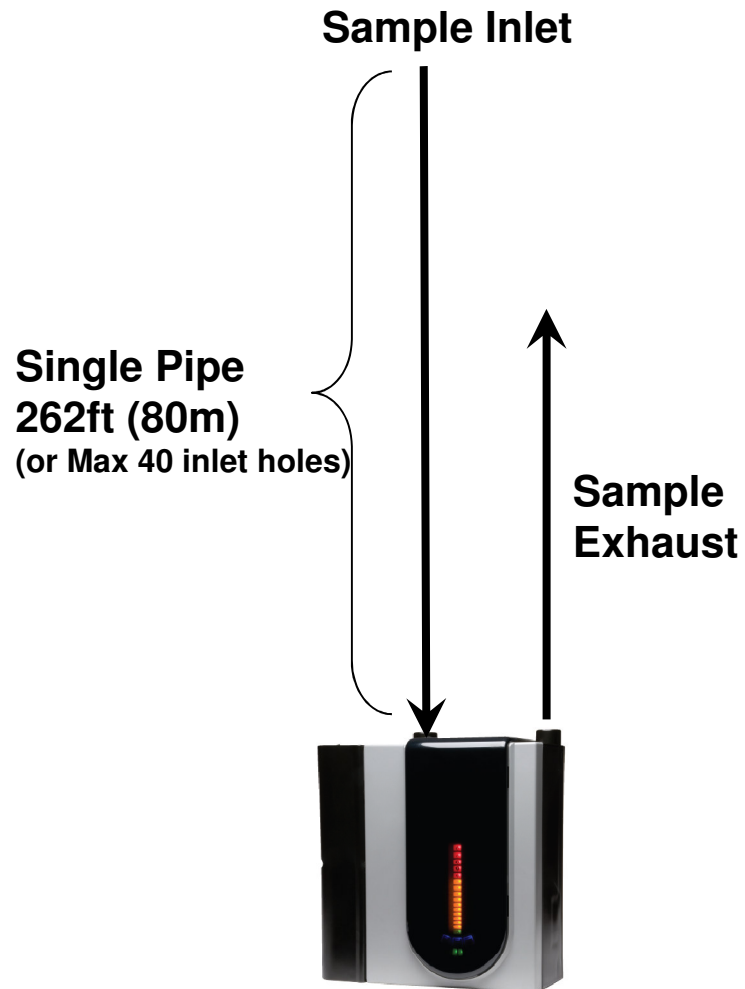
Installation Ease

- **Mounting bracket**
 - Provides simply, secure wall mounting provisions
 - Save time and money
- **Internal Manifold Design**
 - Enables pipe connection from top or bottom of the unit
 - Simplifies under the floor pipe networks
 - One product for above ceiling, below ceiling & below floor applications
- **Easy Access Plug-in wiring terminals and various conduit openings**
 - Reduces time spent wiring
- **24 Hour vs. typical 15 day burn in time**
 - Enables the system to be up and operational in a fraction of the time

Pipe Network

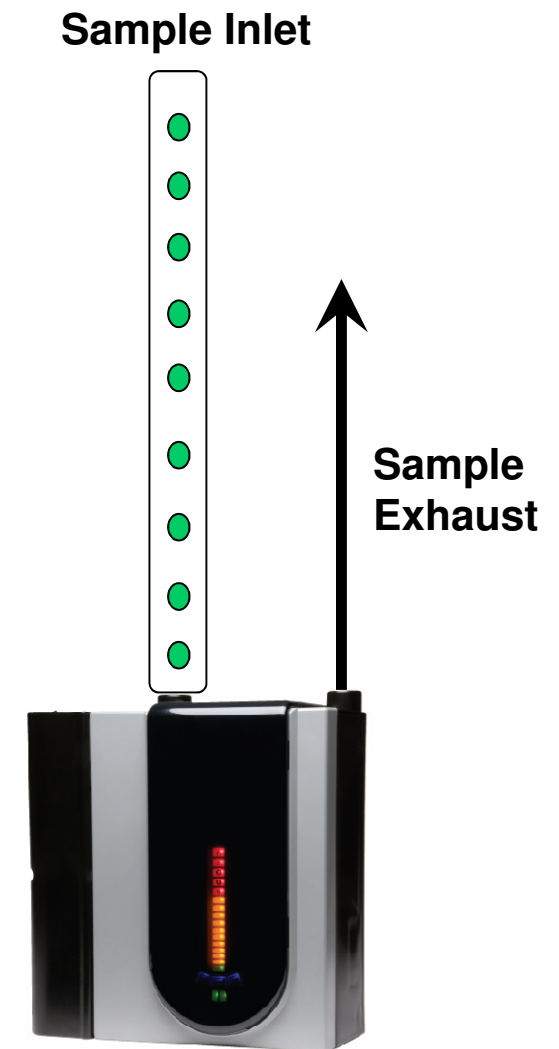
- Large coverage area with a single chamber device: 8000 sq. ft. (800m²)
- Maximum single length of pipe 262ft (80m)
- Maximum amount of inlet sample holes – 40 holes
- Maximum length of each pipe in a two pipe network – 165ft (50m)
- External pipe diameter - standard $\frac{3}{4}$ " inch pipe
- Internal pipe diameters may vary
 - .591-.827 inches (15-21mm)
- Pipe network materials of construction may vary
 - PVC, CPVC, ABS, Copper, Stainless, etc.

Example Pipe Network



Pipe Inlet Holes

- On a single pipe network there may be a maximum of 262 feet or 26 inlet sample holes
- Inlet sample hole sizes may vary in size
 - Range from 5/64" – 1/4" (2-6mm)
- Travel time from the furthest hole will vary depending on application
 - Limited to a maximum of 120 seconds by PipeIQ software
- PipeIQ software will guide the user through a proper installation of inlet holes and pipe layout for each application



Integrated Communication Advantage

- Ethernet connection allows you to monitor your system from almost any location worldwide via the internet!!
- E-mail notification from the device of a specific alarm level, fault level, or isolate condition can be sent to up to 6 e-mail addresses
- PipeIQ software can configure, design pipe layouts and monitor the system
- 8 form C relays communicate alarm levels, urgent and minor faults and isolate; uses 3AMP programmable relays for latching and non-latching – the device controls the relays
- An event log tracks up to 18,000 events including alarms, faults and user actions which can be accessed via PipeIQ software or the webserver interface

PipeIQ Software – General Tab

- General facility information tab
- Set detection category between very early warning to non-early warning

The screenshot shows the PipeIQ software configuration window for a device. The window title is "PipeIQ - [Building1\Floor1\Next View Device1\Configuration]". The menu bar includes File, Edit, View, Settings, Tool, and Help. The "General" tab is selected, with other tabs being "Relays and Thresholds" and "Network".

The configuration is divided into several sections:

- General:**
 - Facility Name: [Text Field]
 - Facility Location: [Text Field]
 - Device Location: [Text Field]
 - Contact Person: [Text Field]
 - Altitude[Ft]: [Text Field, value: 0]
 - Pressure [Pa]: [Text Field, value: 101325]
 - Temperature[F]: [Text Field, value: 72]
- Device Date and Time:**
 - Device Date: [Date Picker, value: Wednesday, May 19, 2010]
 - Device Time: [Time Picker, value: 2:09:06 PM]
- Other:**
 - Detection Category:**
 - VEWFD
 - EWFD
 - Non-EWFD
 - Button Lock-Out:**
 - Test
 - Reset
 - Disable
 - Button Activation:**
 - Passcode: [Text Field, value: ****]
 - Confirm Passcode: [Text Field, value: ****]

PipeIQ Software – Relays and Thresholds

- Set Alarm Thresholds or enable Acclimate Mode to set automatically
- Set Latching or Non-Latching relays
- Set alarm delay from 0-60 seconds

The screenshot shows the 'Relays and Thresholds' configuration window in the PipeIQ software. The window title is 'PipeIQ - [Building1\Floor1\Next View Device1\Configuration]'. The menu bar includes File, Edit, View, Settings, Tool, and Help. The 'Relays and Thresholds' tab is selected, showing the following settings:

Alarm/Fault Relay Latching: Alert , Action 1 , Action 2 , Fire 1 , Fire 2 , Minor .

Acclimate Mode: Enable, Disable.

Night Mode: Start Time: 2:09:06 PM, End Time: 2:09:06 PM.

Alarm Delay and Threshold:

| | Threshold Levels | | | | | Delay [Secs] |
|----------|------------------|-------------|---------------|------------|-----------|--------------|
| | Day[%/Ft] | Night[%/Ft] | Weekend[%/Ft] | Min [%/Ft] | Max[%/Ft] | |
| Alert | 0.012 | 0.012 | 0.012 | 0.00138 | 0.012 | 0 |
| Action 1 | 0.05 | 0.05 | 0.05 | 0.0028 | 0.05 | 0 |
| Action 2 | 0.1 | 0.1 | 0.1 | 0.0075 | 0.1 | 0 |
| Fire 1 | 0.25 | 0.25 | 0.25 | 0.01 | 0.25 | 0 |
| Fire 2 | 0.5 | 0.5 | 0.5 | 0.1 | 0.5 | 0 |

A 'Rules' button is located at the bottom right of the configuration area.

PipeIQ Software – Network Tab

- Set various passwords to protect access to the system
- Set network information for Ethernet access to view on the Internet
- Program 6 email addresses & choose when they will receive notifications

Device Details

Serial Number:

Identification Number: 1

Web Access Password

Password:

Confirm Password:

Administrator Password

Password:

Confirm Password:

Device Mail Server Configuration

Sender Account:

SMTP Server Name:

Device Connection

Obtain an IP Address automatically via DHCP

Use the following static IP Address

IP Address:

Subnet Mask:

Default Gateway:

Primary DNS Server:

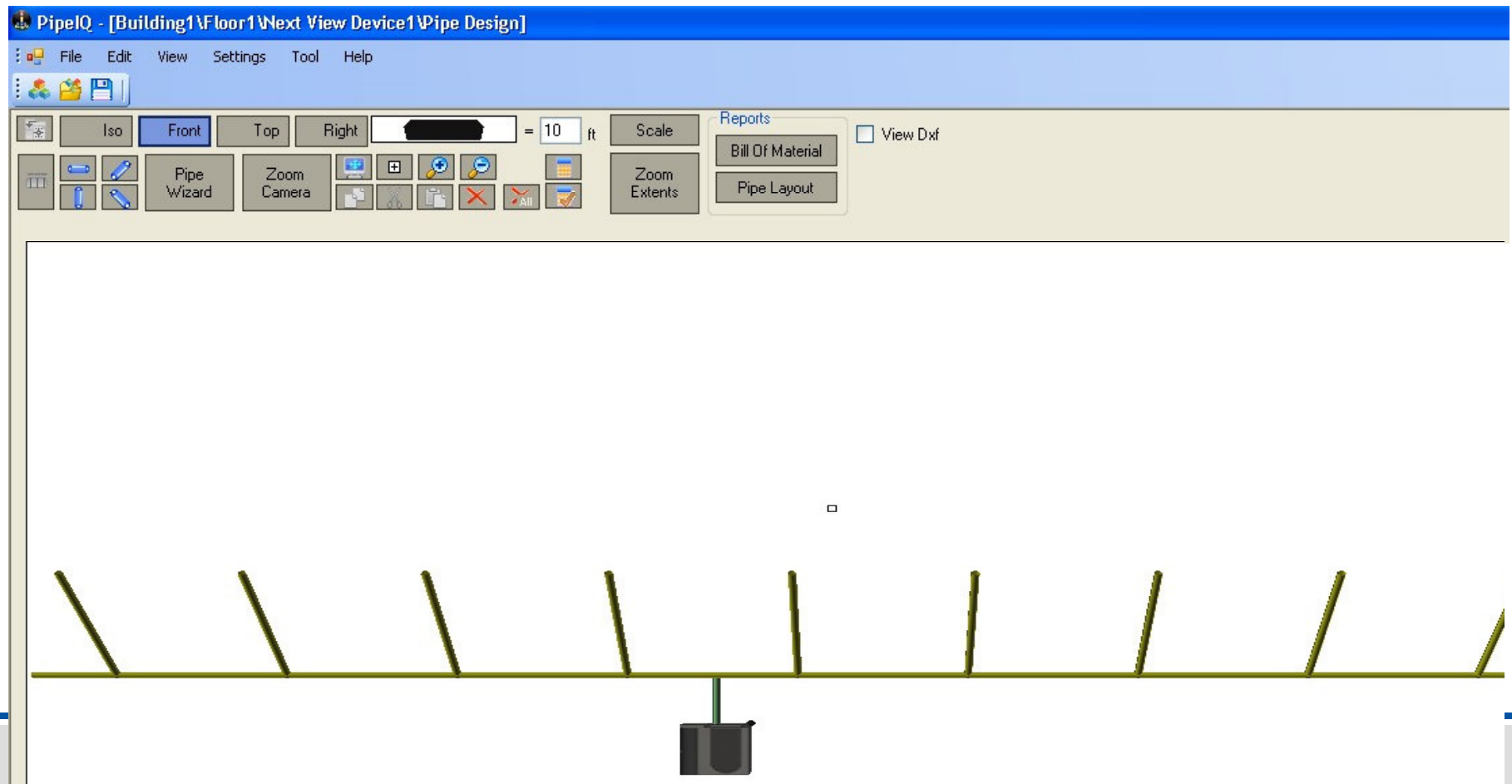
Secondary DNS Server:

Email Notification

| | Alert | Action1 | Action2 | Fire1 | Fire2 | Minor | Urgent | Isolate |
|-------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Email 1. <input type="text"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Email 2. <input type="text"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Email 3. <input type="text"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Email 4. <input type="text"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Email 5. <input type="text"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Email 6. <input type="text"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

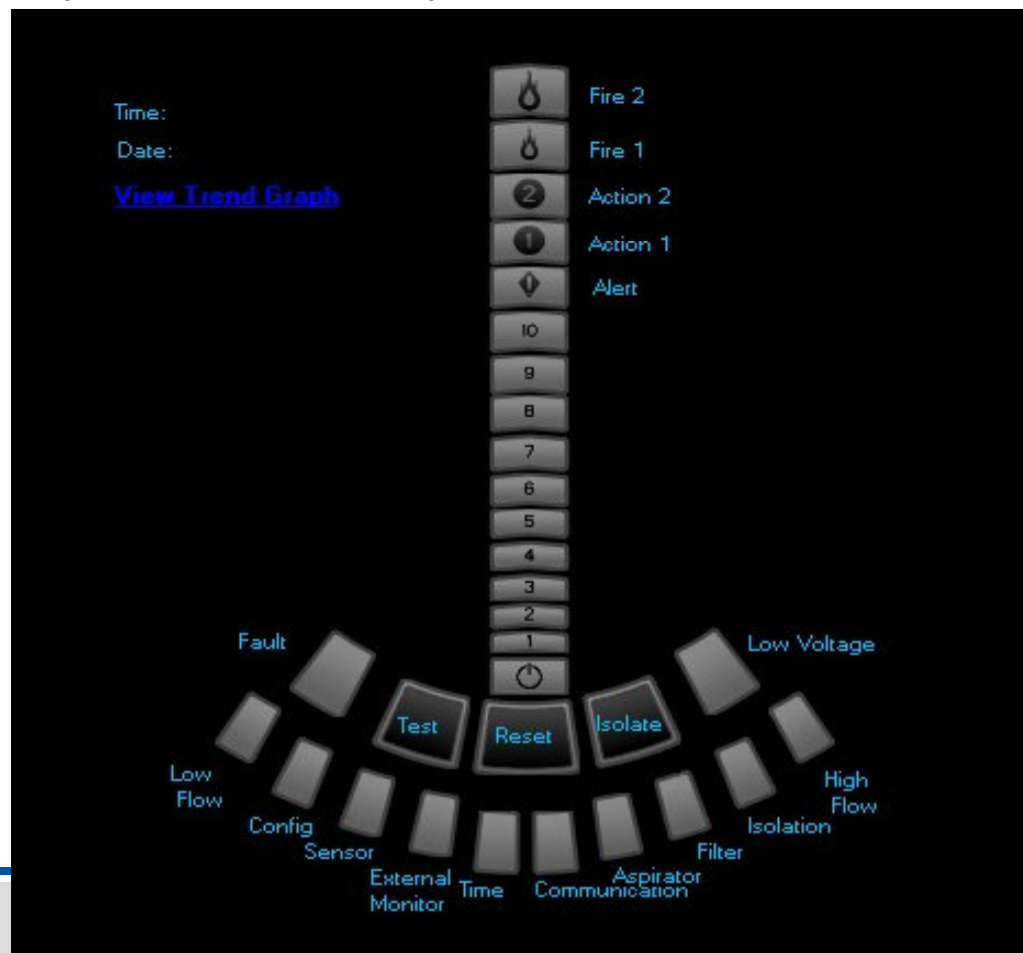
PipeIQ Software – Pipe Layout

- Design and layout entire pipe network using PipeIQ
- Import CAD drawings to aid in the design
- Software will tailor inlet hole layout and proper hole sizing



Ethernet Monitoring

- Ethernet web-page system status monitoring – view only, no control
- Monitor all FAAST systems from one computer terminal – limit install costs
- Monitor FAAST systems from any location with Internet connection



Competitive Comparison Testing

Packer Engineering (Third Party) conducted side by side comparison test of the FAAST unit vs. the competition

- **Fire test results**
 - Units alarmed within 2 to 4 seconds of each other
- **Dust test results**
 - Competition false alarmed 9 out of 9 times
 - FAAST immune to dust 6 out of 9 times
- **Dust and Fire**
 - Competition false alarmed 9 out of 9 times – **Never Detected Smoke**
 - FAAST immune to dust 6 of 9 times – **Then Detected Smoke**

FAAST is 67% more immune to dust related false alarms

Agency Listings

- UL 268 Device – Air Sampling Detector
 - Includes DI (In-Duct) listing for 300-4000 ft/min air velocity
- FM 3230 – Smoke Detector Standard
 - Also tested in-duct applications
 - Report Number 3038722
- CSFM – California State Fire Marshall
- MSFM – Maryland State Fire Marshall
- ULC – Approval expected in September

Additional Agencies in process

- VdS (European)
- Australia (CSIRO), China (CNTC), Korea, Singapore

Single device with International listings for Multi-National customer installations

Additional Resources

System Sensor landing page www.systemsensor.com/faast

- Brochure
- Data Sheet
- Engineering Specifications
- Competitive Matrix
- Video Vignettes
- PipeIQ Software Download
- Accessories

FAAST Summary

- FAAST offers truly best-in-class very early warning aspiration smoke detection
 - Widest range of sensitivity (0.00046% to 6.25%/ft obscuration)
- Dual light sources plus advanced algorithms and patented particle separator ensure the system can discriminate between nuisance dust particles and real smoke
- Acclimate mode allows system to baseline facility background and continuously monitor for changes
- PipeIQ software easily assists in set-up and installation of a new system
- Design and layout entire sample pipe network using PipeIQ Software
- Limit install costs and monitor the system via the Internet from any location

Thank You

