

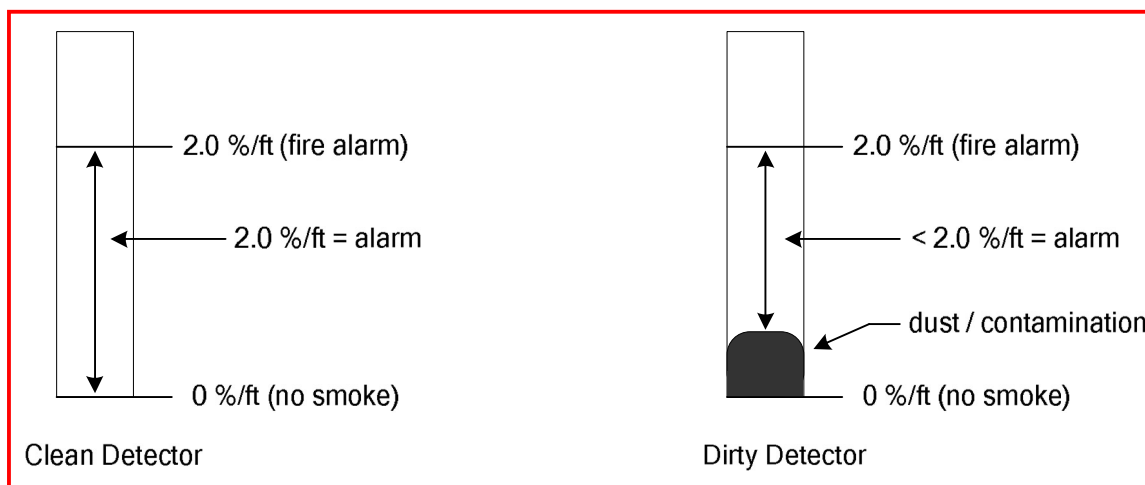
## **TECHNICAL BULLETIN**

### **Using Loop Explorer 2 to Identify Smoke Sensors That Require Maintenance**

NFPA 72 requires regular testing of smoke detector sensitivity. This may be performed in various ways. One method of confirming that smoke detectors are within their listed and marked sensitivity range is to use a 'smoke detector / fire alarm control unit arrangement whereby the detector causes a signal at the fire alarm control unit where its sensitivity is outside its listed range'. This is the method utilized by the Latitude and FireNET Plus control panels.

The smoke detectors used on Latitude and FireNET Plus control panels can be referenced as smoke *sensors*. These smoke sensors continuously communicate their status to the control panel. If there is a change of status, the sensor immediately communicates this information. The control panel then determines the appropriate response, such as a fire alarm or other event.

Over time, dust and other contaminants can build up within the sensing chamber of a smoke sensor. The result of the contamination build-up is an increased sensitivity to smoke. To illustrate the calibration operation, please reference drawings 1 and 2.



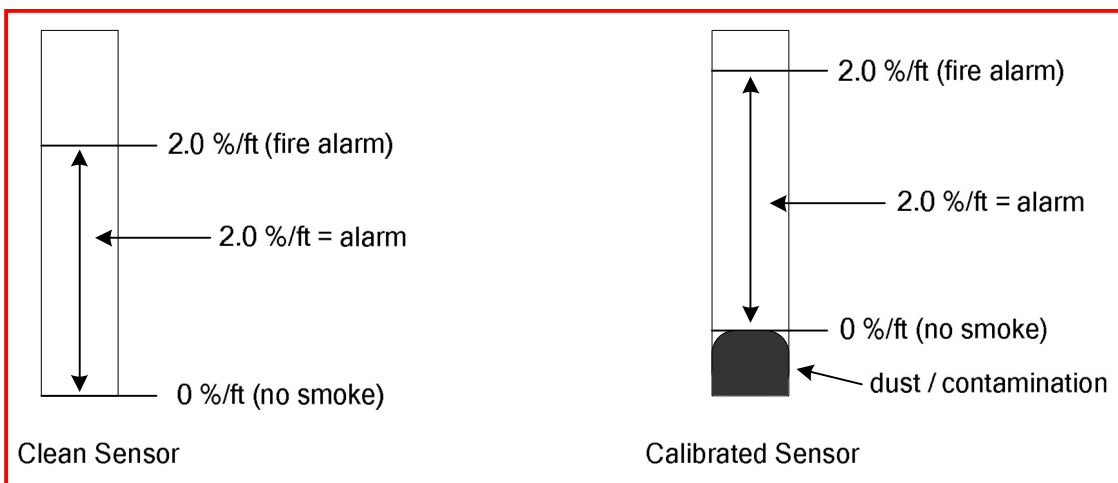
Drawing 1

The smoke detector chamber illustrated on the left is clean. It will indicate an alarm when the smoke level reaches 2.0 percent per foot.



The smoke detector illustrated on the right has some contamination present in the chamber. Even when no smoke is present, the detector's sensitivity is affected. The result is that less smoke is required to reach the alarm threshold setting of 2.0 %/ft. The detector has become more sensitive to unwanted alarms because it is unable to compensate for the contamination. Eventually this detector will no longer be within its UL listed sensitivity range.

The Latitude and FireNET Plus control panels can compensate for contamination build-up in the smoke sensors. Each day the panel calibrates all smoke sensors at a user-selectable time. The calibration will offset any contamination that may be present in the sensors. This ensures that each smoke sensor will remain within its UL listed sensitivity range.



Drawing 2

When the panel can no longer compensate for the contamination it will indicate a trouble condition, showing the location text, loop and address of the affected sensor. The sensor can then be serviced or replaced.

Note that the 0 %/ft reference has changed in the calibrated sensor. The Latitude and FireNET Plus control panels indicate this 0 %/ft reference as a number, called the *Zero Point*. The actual %/ft value returned from a smoke sensor at any given time is called the *Analog Value*. These numbers can be viewed and saved by using Loop Explorer 2.



To begin, open Loop Explorer 2, select a file or 'Create New File'.

- Go to the 'Tools' tab, go to Edit Preferences', verify your com-port settings.
- Next, press the 'Loop Analogue Values' icon; the 'Get Loop Analog Values' window will open, see below. (Note: there will be no sensor data shown until it is retrieved from the control panel)
- Press the 'Connect to Panel' button, select a panel address and an SCL loop.
- Press the "Fetch" button to retrieve the data from the control panel.

Once completed, your 'Get Loop Analog Values' window will display data, as shown below:

The screenshot shows a window titled "Get Loop Analog Values". At the top, there are buttons for "Connect to Panel", a dropdown menu showing "1", a "Fetch" button, a "Save" button, and another dropdown menu showing "Loop 1". Below these is a table with the following columns: Type, Node, Loop, Address, Zone, value, Zero Point, and Fire Point. The table contains 18 rows of sensor data. A scrollbar is visible on the right side of the table, and a "Close" button is at the bottom right.

Type	Node	Loop	Address	Zone	value	Zero Point	Fire Point
ACD-V Multi-Criteria Sensor	1	1	1	0001	8	0	0
ATG-EA Heat Sensor	1	1	3	0001	81	79	240
ACC-V Multi-Sensor	1	1	7	0001	63	63	193
ACA-V Multi-Sensor	1	1	8	0001	61	61	188
DH-99A/-99AR/-100A Analog Duct Sensor	1	1	10	0001	60	60	190
ATJ-EA FT/RoR Heat Sensor	1	1	12	0001	81	79	240
ALN-V Photo Sensor	1	1	14	0001	61	62	192
ACC-V Multi-Sensor	1	1	15	0001	63	62	192
ACD-V Multi-Criteria Sensor	1	1	17	0001	8	0	0
ATJ-EA FT/RoR Heat Sensor	1	1	30	0001	81	80	240
ALO-V Analog Photo Electric Sensor	1	1	31	0001	0	63	193
ALO-V Analog Photo Electric Sensor	1	1	52	0001	0	60	190
ALO-V Analog Photo Electric Sensor	1	1	53	0001	0	59	189
ALO-V Analog Photo Electric Sensor	1	1	54	0001	0	59	189
ALO-V Analog Photo Electric Sensor	1	1	55	0001	0	61	191
ALO-V Analog Photo Electric Sensor	1	1	57	0001	0	59	189
ALO-V Analog Photo Electric Sensor	1	1	58	0001	0	60	190
ALO-V Analog Photo Electric Sensor	1	1	59	0001	0	60	190

The number shown in the *Zero Point* column can be used to determine the contamination state of a smoke sensor\*. This information can be saved for each loop. Then a report can then be created to show the status of the sensors. The information shown on the next page can be added to the report as a key to interpreting the Zero Point data obtained from the control panel.

\*The number shown in the *Value* column indicates the real-time analog value of a sensor when the data was copied from the panel. The number shown in the *Fire Point* column is a design parameter used to calculate sensitivity.

Use the information shown below to determine the status of the smoke sensors connected to the control panel.

A sensor is within its UL listed sensitivity if the *Zero Point* is within the *Normal* range.

ALG-V and ALG-DH	
Status	Zero Point
Normal	55 - 80
Early Warning <sup>1</sup>	36 - 40, 83 - 87
Maintenance Required <sup>2</sup>	29 - 35, 88 - 94
Internal Trouble <sup>3</sup>	≤ 28 or ≥ 95

ALK-V / ALK-D	
Status	Zero Point
Normal	50 - 80
Early Warning <sup>1</sup>	46 - 48, 83 - 87
Maintenance Required <sup>2</sup>	42 - 45, 88 - 94
Internal Trouble <sup>3</sup>	≤ 41 or ≥ 95

ALN-V / ALN-DH	
Status	Zero Point
Normal	50 - 80
Early Warning <sup>1</sup>	46 - 48, 83 - 87
Maintenance Required <sup>2</sup>	42 - 45, 88 - 94
Internal Trouble <sup>3</sup>	≤ 41 or ≥ 95

ACA-V / ACC-V	
Status	Zero Point
Normal	50 - 80
Early Warning <sup>1</sup>	46 - 48, 83 - 87
Maintenance Required <sup>2</sup>	42 - 45, 88 - 94
Internal Trouble <sup>3</sup>	≤ 41 or ≥ 95

ACD-V	
Status	Zero Point
Normal	50 - 80
Early Warning <sup>1</sup>	46 - 48, 83 - 87
Maintenance Required <sup>2</sup>	42 - 45, 88 - 94
Internal Trouble <sup>3</sup>	≤ 41 or ≥ 95

ALO-V / ACE-V	
Status	Zero Point
Normal	50 - 80
Early Warning <sup>1</sup>	46 - 48, 83 - 87
Maintenance Required <sup>2</sup>	42 - 45, 88 - 94
Internal Trouble <sup>3</sup>	≤ 41 or ≥ 95



Notes:

- 1 The FireNET Plus control panel has a "Sensor Maintenance Early Warning" menu. The purpose of this menu is to identify sensors that are approaching a contaminated state, allowing action to be taken before a trouble condition occurs. If the Zero Point of a sensor falls within the ranges shown for Early Warning, the sensor should be serviced as soon as possible.  
The Latitude panel will display a trouble for sensors requiring maintenance.
- 2 If the Zero Point of a sensor falls within the ranges shown for "Maintenance Required" it must be serviced immediately.
- 3 If the Zero Point of a sensor falls within the ranges shown for "Internal Trouble" it must be serviced immediately. If cleaning does not eliminate the problem the sensor should be replaced.

For information on cleaning analog smoke sensors, refer to Hochiki America Technical Bulletin HA-96-003. This document is available at [www.hochikiamerica.com](http://www.hochikiamerica.com)

If you have any questions regarding Sensor Health, please contact Hochiki Technical Support.

Technical Support

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