DATA SHEET
SSF-BEAM
FLASHSCAN Analog Addressable Beam Detector – Installation Guide

Features:

- Controlled and powered by addressable loop
- 5m to 100m range
- Single Ended RX, TX with reflector
- Loop Powered*
- Loop Controlled (no modules required)
- 6 User Selectable Sensitivity Levels
- Removable plug in terminal blocks
- Digital Display for fast Alignment
- Wide temperature range for various applications
- Remote Switch test feature available

Description:
FireSense SSF-BEAM is an intelligent Flashscan™ addressable projected beam smoke sensor. It is uniquely suited for protecting open areas with high ceilings where other methods of smoke detection are difficult to install and maintain. Alignment is quickly accomplished via an optical sight and a 2-digit signal strength meter incorporated into the product.

Listed for operation from -30℃ to 55℃, SSF-BEAM ca n be used in open area applications to provide early warning in environments where temperature extremes exceed the capability of other types of smoke detection.

SSF-BEAM consists of a transmitter/receiver unit at the head end and a reflector. When smoke enters the area between the unit and the reflector, it causes a reduction in the signal and when the smoke level reaches the predetermined threshold, an alarm is activated.

SSF-BEAM has four standard sensitivity selections along with two Acclimate settings. When either of the two Acclimate settings are selected the detector will automatically adjust its sensitivity using advanced software algorithms to select the optimum sensitivity for the specific environment.

Cabling Requirements:

SSF-BEAM
Controlled and powered via addressable loop.

SSF-BEAM(S) With Remote Test Facility
Controlled via Addressable Loop
External 24VDC required for testing function.

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Specifications:

Protection Range:	5m to 100m
Adjustment Angle:	+/- 10º horizontal and vertical
Sensitivity:	Level 1 – 25% total obscuration (Refer Sensitivity Chart on Page 6 of Installation Guide)
	Level 2 – 30%
	Level 3 – 40%
	Level 4 – 50%
	Acclimate Level 1 – 30-50%
	Acclimate Level 2 – 40-50%
Alarm Indicator:	Local red LED and remote alarm
Trouble Indicator:	Local yellow LED and remote trouble
Normal Indicator:	Local flashing green LED
Temperature:	-30 ºC to 55 ºC
Humidity:	10-93% Relative Humidity
	Non-condensing
Voltage:	15 to 32 VDC
Avg. Standby Current:	2mA Max (24 VDC)
Alarm Current:	8.5mA Max (24 VDC)
Fault Current:	4.5mA Max (24 VDC)
Detector Dimensions:	254mmH x 191mmW x 84mmD
Reflector Dimensions:	200mm x 230mm

Set up Procedures:

Installation/Alignment

The alignment is divided into four steps: coarse alignment, fine adjustment, final gain adjustment, and final verification. It is necessary for all four steps to be executed properly to ensure proper alignment of the product.

Pre-Alignment Checklist

- Ensure that both detector and reflector are mounted securely to stable surface.
- Ensure that all wiring is correct.
- Ensure that terminal blocks are fully seated into their receptacles on the detector.
- Ensure that the appropriate number of reflectors are used for the installed distance. Distances between 70-100m require additional reflectors (4 total).
- Ensure that the line of sight between the detector and reflector is clean and that reflective objects are not too near.
- Ensure that both the detector and reflector are mounted within operational parameters for off axis angles.
- Disable the zone or system to prevent unwanted alarms before applying power
- Ensure power to the detector is “ON”.
- Ensure that the appropriate address is set on the code wheels.

You are now ready to begin the alignment procedure.

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Step 1. Coarse Alignment

Refer to Figures 2 and 3 for this step.

1. Ensure that both of the optics lock-down screws are loosened so that the optics will move freely.

2. Looking through the alignment mirror at both the alignment sight and reflector simultaneously locate the position of the reflector in the optical sight. This step will require some practice. It is necessary to train your eyes to shift focus between the reflector and the mirror in order to locate the reflector. If the distance between the reflector and the detector is large it is helpful to place a brightly coloured object on the wall near the reflector to aide in seeing the reflector in the alignment mirror.

3. Once the reflector has been located, begin to adjust both the horizontal and vertical alignment knobs so that the reflector becomes centered in the alignment mirror. Take care in this step. If the optics are incorrectly aligned in this step, it will not be possible to proceed with the fine adjustment step.

Figure 1: Switch Locations

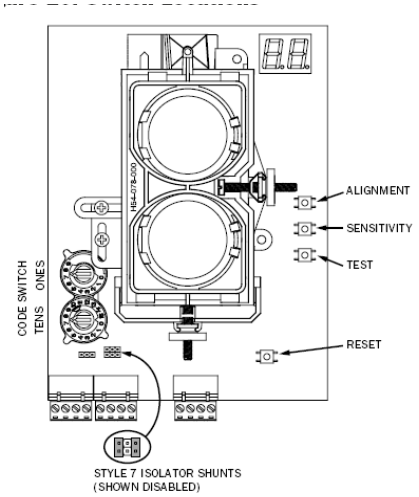


Figure 2: Alignment Adjustment Locations

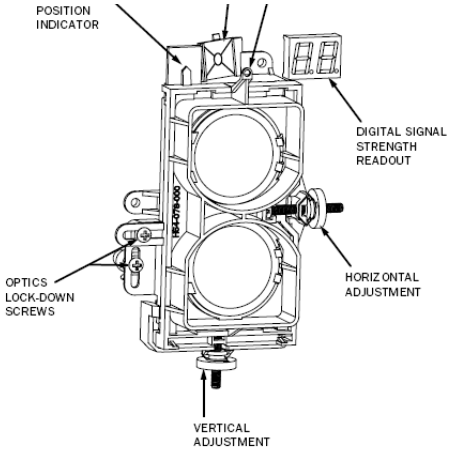
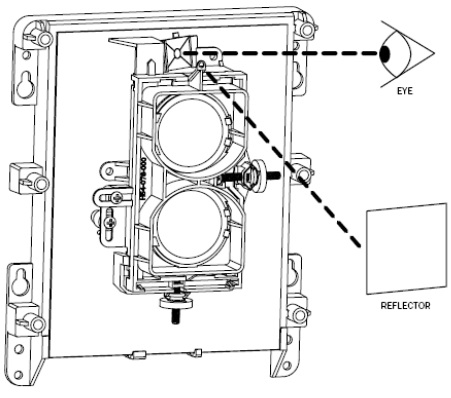


Figure 3: Coarse Alignment Procedure



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Step 2. Fine Adjustment
Refer to Figures 1 and 2 for this step.

In this step you will be fine-tuning the optics to the reflectors. To provide feedback of the signal level coming from the reflector the dual digital display readout will be used. Due to the large distance range that the detector can operate over it is necessary that the detector operate with many different settings of "electronic amplifier gain". The detector is capable of determining the appropriate gain setting and then setting it itself via on-board processing algorithms. There are no external gain settings on the detector that must be set by the operator. Periodically throughout the fine adjustment step the detector will need to re-adjust its "electronic amplifier gain" setting. When this occurs it will be indicated by the dual digital readout as "- -". When this occurs, ease any further adjustment until the display again reads a number value.

1. Ensure that neither you nor any other objects are in the line of sight between the detector and the reflector.

2. Depress the Alignment switch once. Both the digital display and the yellow LED should turn on indicating that alignment mode has been entered. The display should begin reading "- -" signifying an electronic gain adjustment. After a few moments the display will indicate a number value near 20. If the display reads "Lo" then the detector is not receiving enough light from the reflector. Go back and repeat the course alignment step and verify that the proper number of reflectors is used for the installed distance.

Note: The display will continue to read "Lo" until the detector receives enough light from the reflector to continue with the fine adjustment step.

Note: In the alignment mode (indicated by the yellow LED and the numeric display) the sensitivity select and test switches are disabled.

3. With the display reading a numeric value, begin adjusting the horizontal and vertical alignment knobs on at a time in the direction that increases the numeric signal level on the display. Continue adjusting each axis one at a time going back and for the between them until a peak value is indicated. If a value of 90 is achieved, the detector will re-adjust the electronic gain once again. This will be indicated by a "- -" reading on the display. When this happens, halt any further adjustment until the display again reads a numeric value. This process may occur more than once during the fine adjustment step.

Note: Each time the display reads a value of 90 or greater the detector will reduce the electronic gain. Each time the display reads a value of 10 or less the detector will increase the electronic gain.

4. Once satisfied that it is not possible to achieve a higher reading on the display depress the alignment switch to complete the fine adjustment step. The digital display readout will turn 'OFF" and the yellow LED will remain "ON".

Note: It may not be possible to achieve a value near 90 on the display during the last adjustment iteration. The final value of the display will not likely be near 90. This is normal. It is due to the detector reducing is electronic gain each time a value of 90 is achieved. When this occurs, the detector resumes with less electronic gain than previously when 90 was achieved. Less gain make it more difficult to achieve higher values. Final values anywhere between 20 and 90 are acceptable if no further increase can be achieved.

Note: The alignment procedure is not complete yet.

At this time it is possible to set the sensitivity of the detector using the sensitivity switch and digital display. See the Sensitivity Selection section of this datasheet for further details.

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Step 3. Final Gain Adjustment

In this step, the detector will electronically adjust its internal gain one final time. It is necessary to complete this step with the outer housing installed since the housing will change the amount of light received from the reflector.

1. Tighten the optics lock down screws so the optics are secure.
2. Install the outer housing of the detector. The housing is installed by tightening four screws, one in each corner of the housing. The screws are captivated in the plastic of the housing and cannot fall out during assembly.

Note: The housing contains a gasket seal that protects the detector circuitry from corrosion and moisture sources. To ensure that the gasket seal performs correctly it is necessary to fully tighten all four of the screws that hold the outer housing in place.

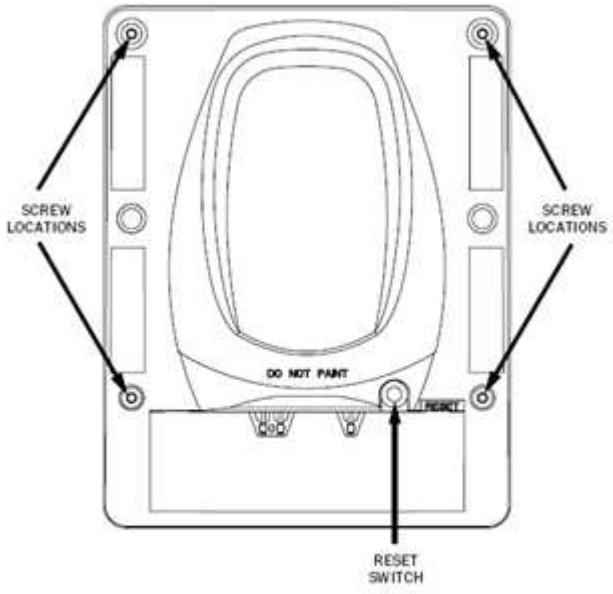
3. Remove the protective film from the front surface of the outer housing.
4. To initiate the final electronic gain adjustment, the reset switch must be depressed. Once depressed the yellow LED will begin to blink. This indicates that the detector is adjusting the electronic gain setting. Once complete, the yellow LED will stop blinking and the green LED will begin blinking. This indicates that the gain adjustment was successful.

Note: Use caution not to block the line of sight between the detector and reflector in this step.

5. Install the outer aesthetic ring by snapping it onto the outer housing.

Note: If the outer aesthetic ring has been painted ensure that the paint is completely dry before proceeding with this step.

Figure 13. Housing Screw Locations



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Short Circuit Isolation

The detector includes an in-board circuit isolator that allows for NFPA72 style 7 operation. In cases where style 7 operation is not desired the isolator can be disabled suing the two shunts on the circuit board. See Figure 10 for jumper locations. When the jumpers are present the isolator is disabled. This is the default state.

Sensitivity Selection

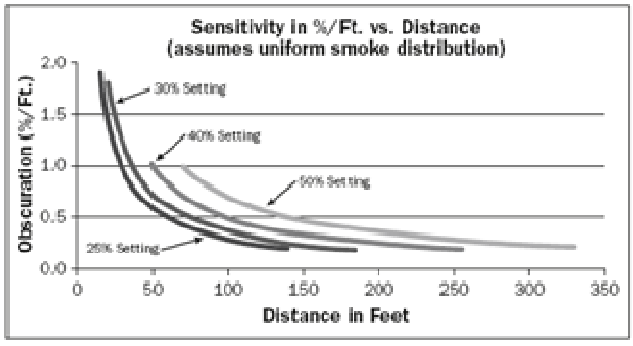
The detector has six sensitivity selections. Each of these selections is only acceptable over a specific distance separation between the detector and the reflector per UL268. The chart below is used to determine which selections are acceptable for your installed distance. The sensitivity of the detector can be set only when the housing is removed and the detector is not in the fine adjustment step of the alignment mode, indicated by the illumination of the dual digital display. To set the sensitivity, depress the sensitivity button one time. See Figure 10. Once the switch is pressed the digital display will illuminate and read the current sensitivity setting in percent obscuration. To change the sensitivity, continue to depress the sensitivity switch until the desired setting is achieved. The digital display will turn off automatically if no further switch presses occur.

Sensitivity Setting	% Obscuration	Display Reading	Acceptable Distance Between Detector and Reflector (Feet)	Acceptable Distance Between Detector and Reflector (metres)
Level 1	25 total obscuration	25	16.4 to 120	5.0 to 36.6
Level 2	30	30	25 to 150	7.6 to 45.7
Level 3	40	40	60 to 220	18.3 to 67
Level 4	50	50	80 to 328	24.4 to 100
Acclimate Level 1	30 to 50	A1	80 to 150	24.4 to 45.7
Acclimate Level 2	40 to 50	A2	80 to 220	24.4 to 67

In addition to the four standard sensitivity selections, the detector has two Acclimate settings. When either of these settings is chosen the detector will automatically adjust its sensitivity using advanced software algorithms to select the optimum sensitivity for the environment. The sensitivity will be continuously adjusted within the ranges specified in the chart above.

Sensitivity

Total obscuration can be converted to percent per foot, assuming uniform smoke density for the entire length of the beam. The chart below converts total obscuration to percent per foot for all acceptable sensitivity settings.



Sensitivity Testing

NOTE: Before testing, notify the proper authorities that the smoke detector system is undergoing maintenance and therefore the system will be temporarily out of service. Disable the zone or system undergoing maintenance to prevent unwanted alarms.

Detectors must be tested after installation and following periodic maintenance. The sensitivity of the BEAM200/BEAM200S may be tested as follows:

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Appendix I. Operation Modes and Troubleshooting Guide

Modes	*Red See Note Below	Yellow and Remote Trouble Out	Green See Note Below	Remote Alarm Output	Dual Digital Display	Initiating means	Comments & Troubleshooting Tips
Normal	Off	Off	Blink	Blink	Off	Successful completion of initialisation or detector reset	
Alignment	Off	On	Blink	Blink	On, relative amount of signal 0-99, or – if automatic gain resetting, or Lo if signal is too low.	Alignment switch	
Alarm	On	Off	Off	On	Off	Smoke, Test Filter, RTS451 Test Stations	
Trouble-Drift Comp Elevated Signal	Off	3 Quick Blinks	Blink	Blink	Off	Long Term Drift Reference Out of Range	Sunlight into detector or reflector Re-align detector
Trouble-Drift Comp Reduced Signal	Off	2 Quick Blinks	Blink	Blink	Off	Long Term Drift Reference Out of Range	Clean detector and reflector
Trouble-Signal Over Range	Off	2 Quick Blinks	Blink	Blink	Off	Increase of Reflected Signal	Inspect line of sight between detector and reflector for reflective objects in the pathway
Trouble-Beam Blockage Initial Response	Off	4 Quick Blinks	Blink	Blink	Off	Beam Blockage	Remove blockage Faulty unit
Trouble-Beam Blockage Long Term Response	On	4 Quick Blinks	Blink	On	Off	Beam Blockage	Remove blockage Faulty unit
Initialisation-Power On	Off	Blink until complete	Blink	Blink	Off	Apply Power from discharged state	
Initialisation-alignment exit	Off	Blink until complete	Blink	Blink	Off	Depressing RESET switch after alignment	
Local Test (BEAM200S) Pass Result	On	Blink out amount of drift used	Off	On	Off	Panel or RTS451/KEY	Remains in alarm until reset or time-out
Local Test (BEAM200S) Fail Result	Off	On until reset or time-out	Blink	Blink	Off	Panel or RTS451/KEY test input	Remains in fault until reset or time-out
Local Test (BEAM200S) Fail	Off	On until reset or time-out	Blink	Blink	Off	Panel or RTS451/KEY test input	Remains in fault until reset or time-out
Local Test (BEAM200) Pass Result	On	Blink out amount of drift used	Off	On	Off	Panel or RTS451/KEY	Remains in alarm until reset or time-out

Note: Green and Red LEDs are controlled by the control panel.

Blinks output by Yellow LED and Remote Trouble Output once the device has passed a local remote test:

Percent the detector has drifted	Number of blinks output
<10%	None
<20%	1
<30%	2
<40%	3
<50%	4
<60%	5
<70%	6
<80%	7
<90%	8
<100%	9

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