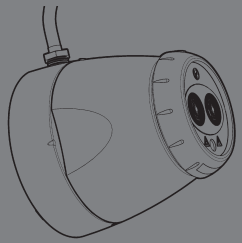
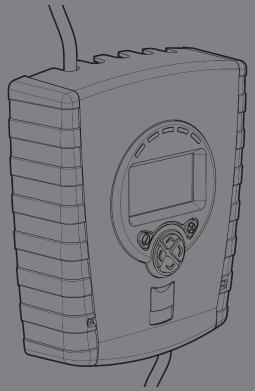
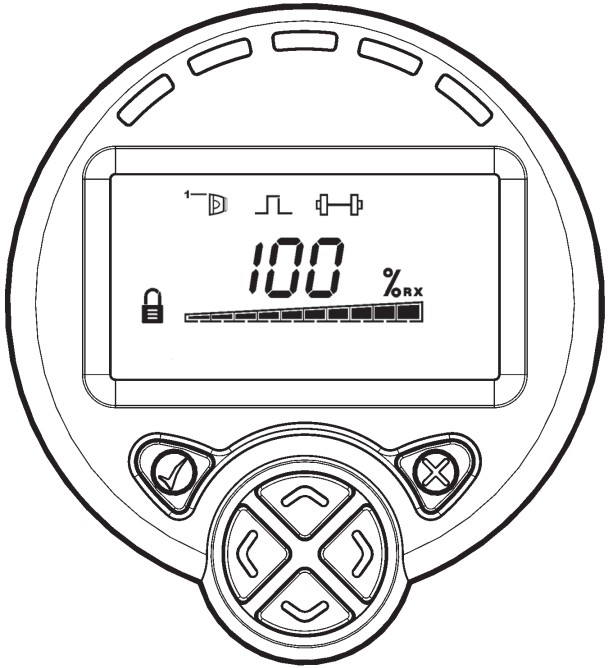
USER GUIDE







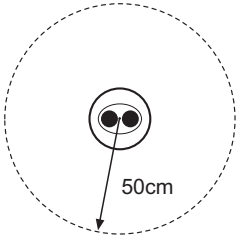
English

IMPORTANT

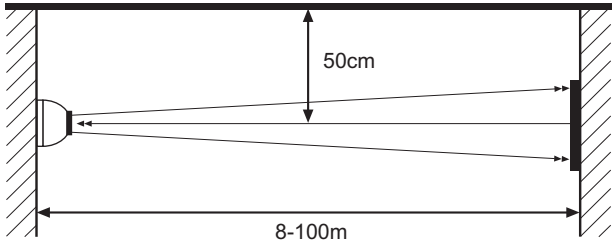
PLEASE NOTE: The infrared beam path MUST be kept clear of obstructions at all times!

Failure to comply may result in the Detector initiating a Fire or Fault signal.

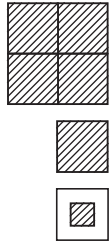
Contents



Ensure clear line of sight from Detector to Reflector



Mount on solid surfaces (structural wall or girder)

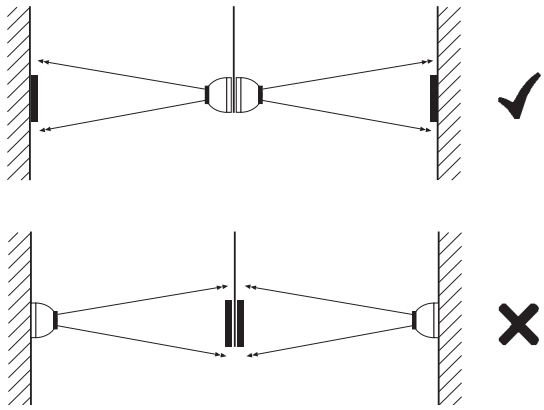


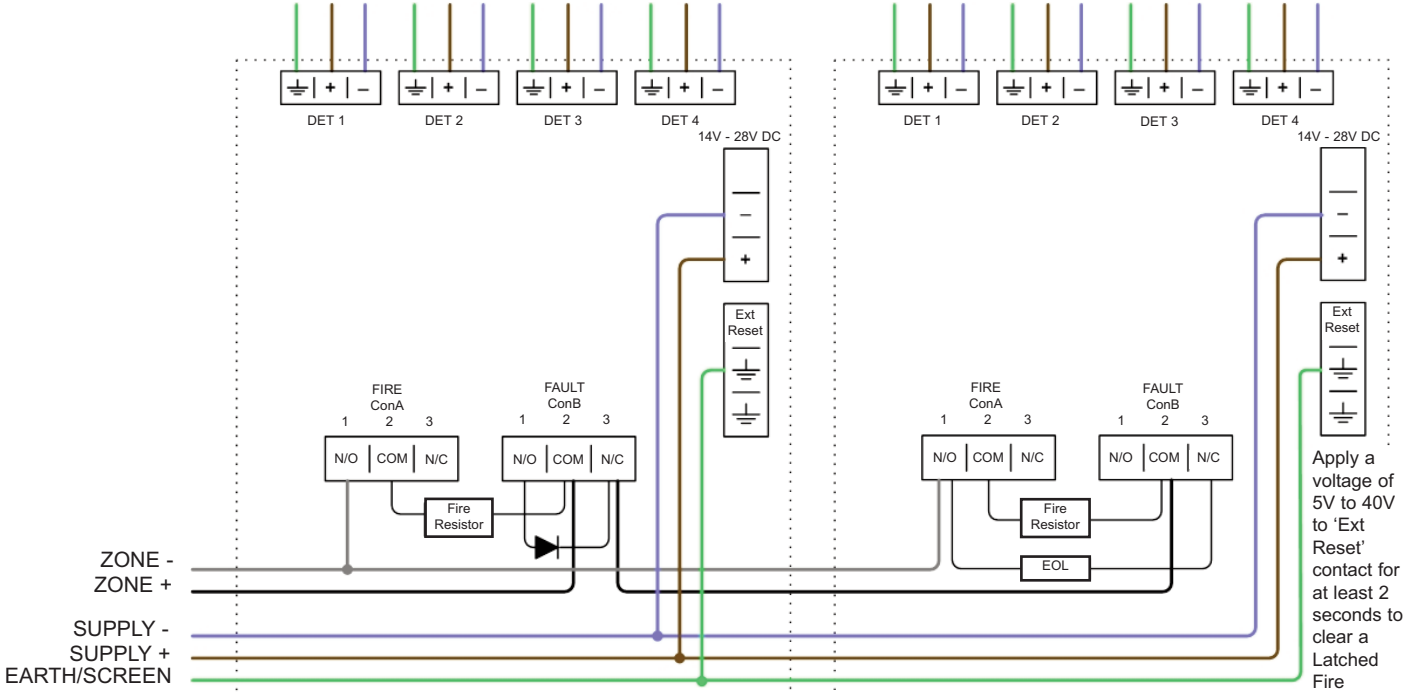
50—100m = ***4***

18—50m = ***1***

8—18m = ***1***
Use Short Range Mask

- Check the beam spacing against local regulations
- Position beam as high as possible, but with a minimum distance of 0.5m from Detector to ceiling
- Mount Detector and Reflector directly opposite each other
- Do NOT position Detector where personnel or objects can enter the beam path
- Do NOT position 2 Detectors facing each other
- LED indicator must face downward





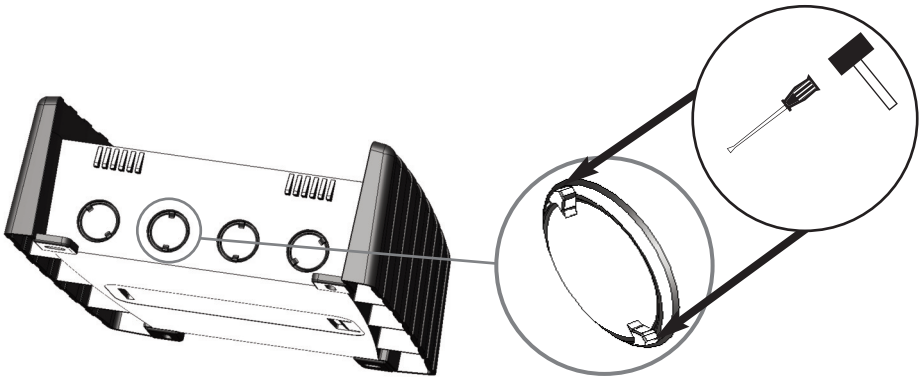
Wiring for all other System Controllers (where more than one System Controller is on one zone)
(Not to be used for UL region installations. Please refer to supplied CD for UL region installation multiple-System Controller wiring)

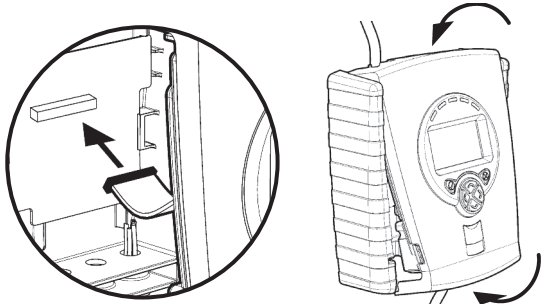
Wiring for a single System Controller or last System Controller on one zone

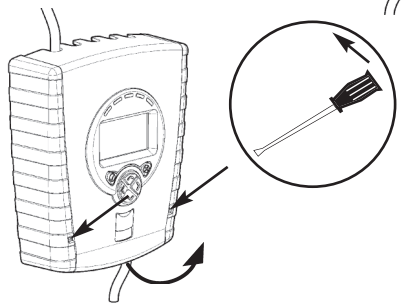
- Check operation of Fire and Fault connection on Fire Panel
- ALWAYS use a separate screened 2-core cable for each detector head
- CAUTION: For system monitoring – Do not use looped wire under any terminals. Break wire run to provide monitoring of connections

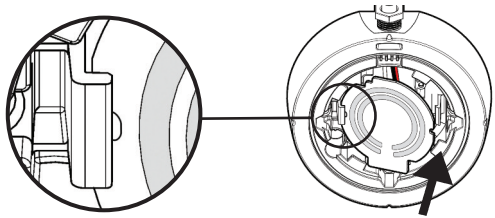
Components not supplied (Check Fire Control Panel manufacturer for values):

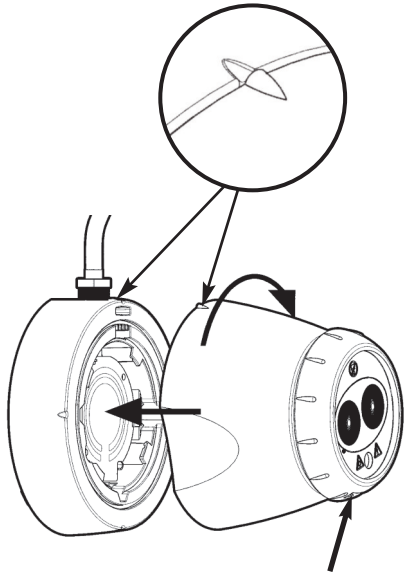
- Fire Resistor (Some Zone and Switch Interface Modules do not need a Fire Resistor - replace Resistor with a short circuit.)
- Detector Continuity Diode
- End Of Line ('EOL') component







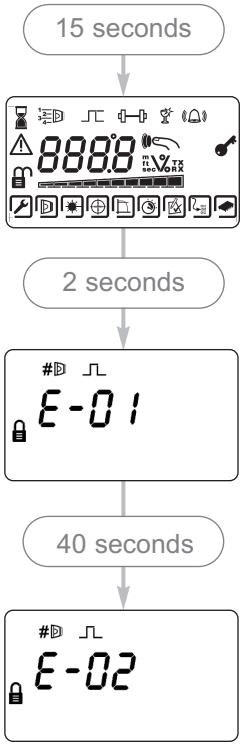




LED indicator must face downward

One System Controller can be used to control and monitor up to four Detector heads.
The '#' symbol in this guide is used to represent the number of the Detector currently selected (1, 2, 3 or 4).

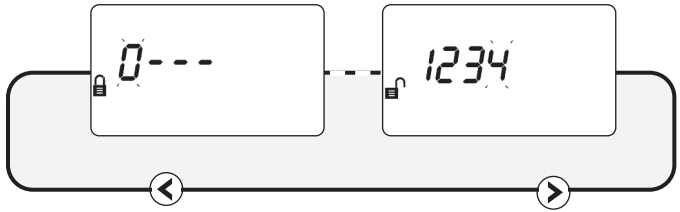
1. Apply power



- 'E-02' at this stage is normal

2. Enter Pass Code to Access Engineering Menu

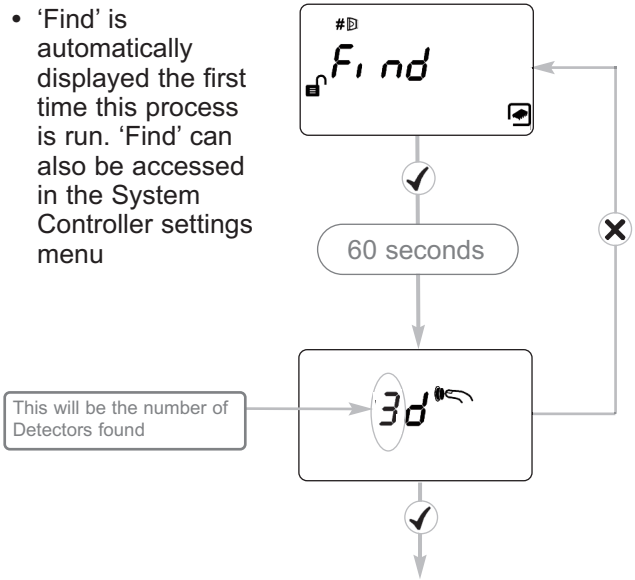
Press ✓ for Pass Code screen:



- Default Pass Code: **1 2 3 4**
- ▲ ▼ Change digit
- ◀ ▶ Move between digits
- ✓ Accept
- An incorrect Pass Code will return the display to the Pass Code entry screen
- Three incorrect attempts will lock access for three minutes

3. Find Detectors

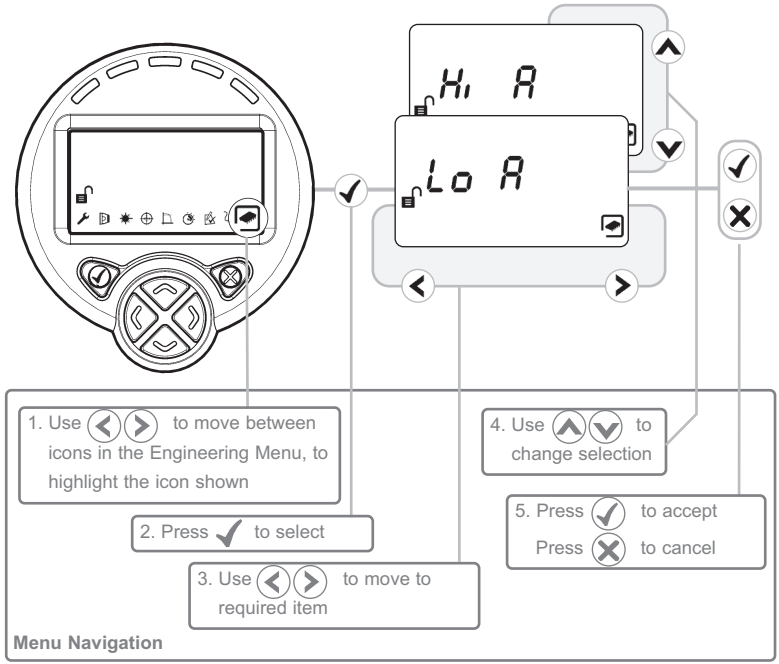
- 'Find' is automatically displayed the first time this process is run. 'Find' can also be accessed in the System Controller settings menu



- Press tick to enable 'Found' Detectors
- Any unused Detector channels are switched off
- Press ✕ to re-scan if number is incorrect

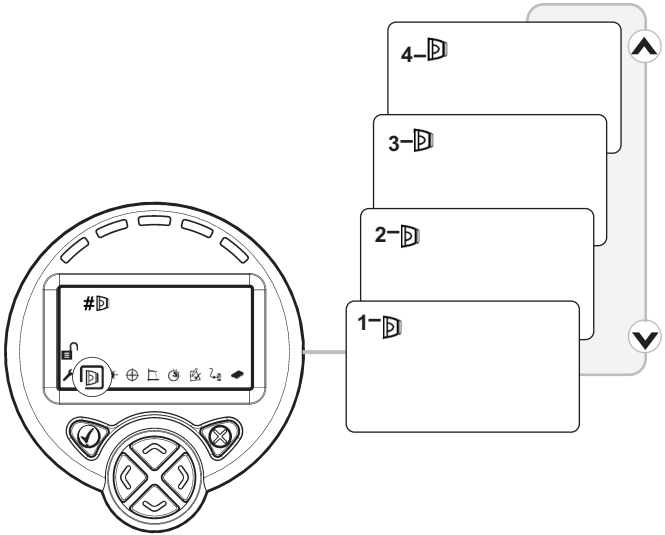
4. Select Power Mode

- All functions can be performed in 'Lo A' mode (default) (10, 12, 14 or 16 mA for 1, 2 ,3 or 4 Detectors found)
- The system will default to 'Lo A' mode when power is applied
- Select 'Hi A' (50mA) to enable faster beam movement during Auto-Align, Hand Align and Laser Targeting
- After installation, set the system back to 'Lo A'



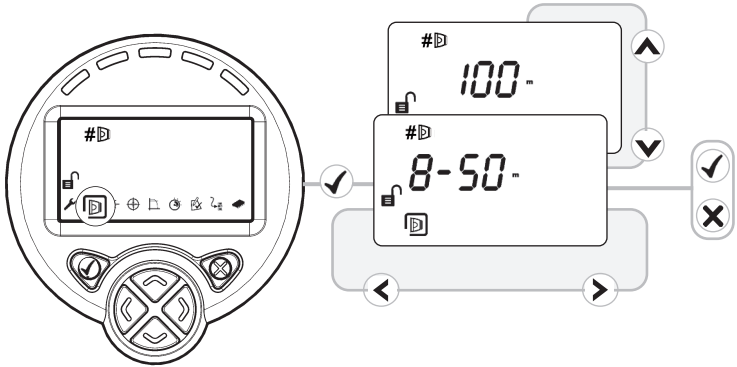
5. Select Detector

- Select Detector to be accessed
- All Detectors need to be aligned separately
- Steps 6 to 9 explain how to align individual Detectors

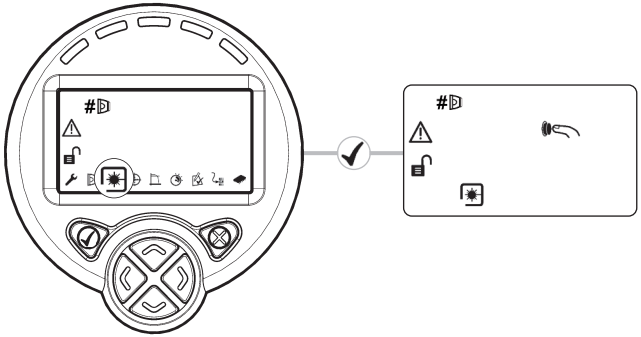


6. Select Distance between Detector and Reflector

- Select 8-50m (default) or 100m
- It is possible to set the range of each individual Detector



7. LASER Targeting



LASER RADIATION - AVOID DIRECT EYE EXPOSURE

POWER OUTPUT < 5mW

CLASS IIIa LASER

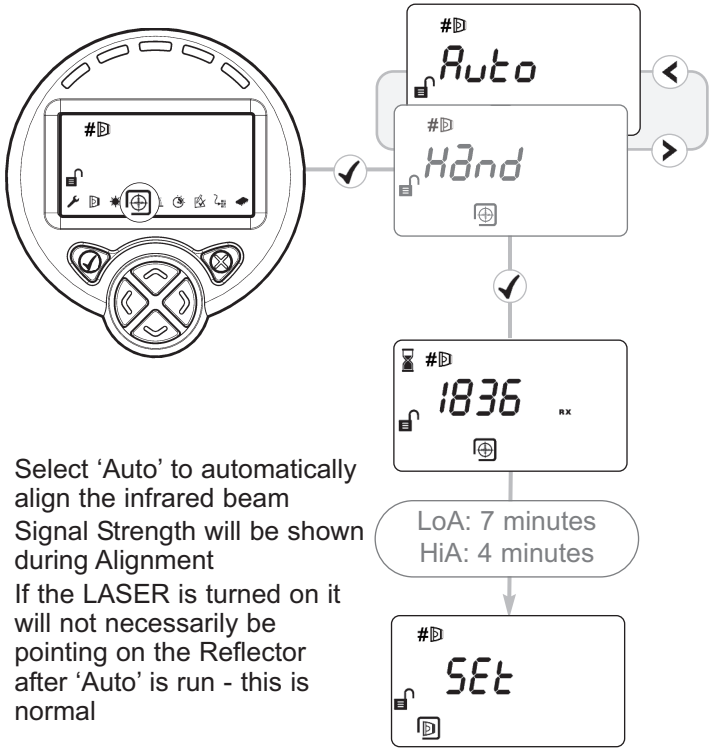
Wavelength 630 - 680 nm

The system will signal Fault while in this mode

The LASER is used to align the Detector with the Reflector. It is an approximate alignment tool only. After Auto-Align the LASER will not necessarily be pointing on the Reflector

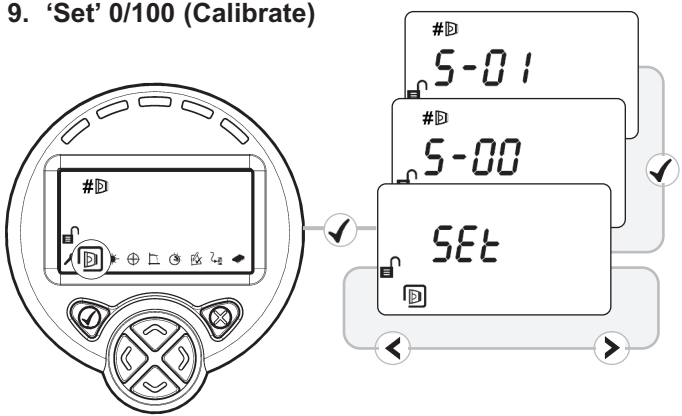
- Use ◄ ► ▲ ▼ to move the LASER as close to the Reflector as possible
- One press of an arrow key results in one movement of the Detector head
- Press ✓ or ✗ to turn off the LASER and return to the Settings menu
- Refer to User Guide page 20 for troubleshooting if LASER is not visible

8. 'Auto' Alignment



- Select 'Auto' to automatically align the infrared beam
- Signal Strength will be shown during Alignment
- If the LASER is turned on it will not necessarily be pointing on the Reflector after 'Auto' is run - this is normal

9. 'Set' 0/100 (Calibrate)



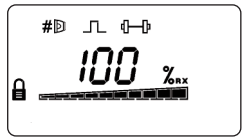
- When 'Set' is displayed press ✓
- When 'S-00' is displayed, cover the Reflector with a non-reflective material and leave covered, then press ✓
- When 'S-01' is displayed, uncover the Reflector and leave uncovered, then press ✓
- Repeat Steps 5 to 9 for any other Detectors found during the 'Find' process

10. System is Aligned

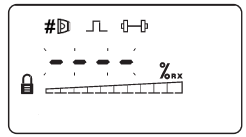
- It is recommended to set the system back to ‘Lo A’ mode
- Green LED on Detector will flash every 10 seconds, and Signal Strength should be between 99% and 101%
- Default values: 35% Fire Threshold, 10 second delay to Fire and Fault, Non-Latching mode
- Refer to User Guide page 13-14 to change settings and for Fire and Fault Test

11. Check Alignment Status Displays

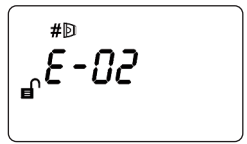
A commissioned system will display:



When Detectors have been found but the selected Detector is not aligned the system will display:

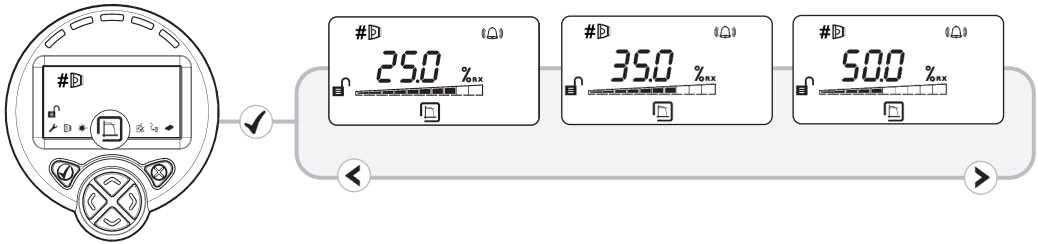


When a Detector is connected but not ‘Found’ the system will display:



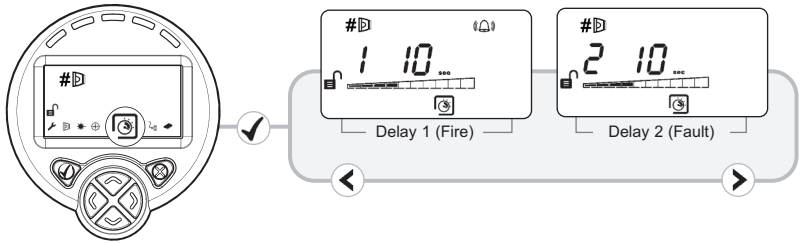
Fire Threshold
How to change the threshold at which the Detector will detect a Fire

(Set for each Detector)



Fire / Fault Delay
How to change the delay the System Controller uses before signalling a Fire or Fault to the Fire Control Panel

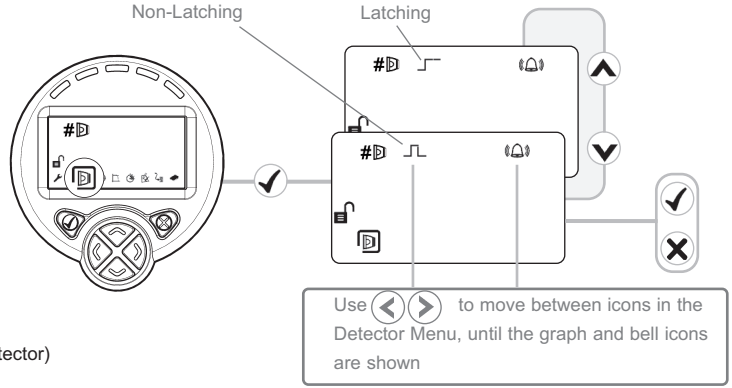
(Set for each Detector)



Delay to Fire (Delay 1) cannot be less than Delay to Fault (Delay 2)

Latching/Non-Latching Mode
How to select either Latching Mode (system will stay in Fire condition after the fire clears) or Non-Latching Mode (system will automatically return to normal condition after the fire clears)

(Set for the system not each individual Detector)



Manual Fire and Fault Tests

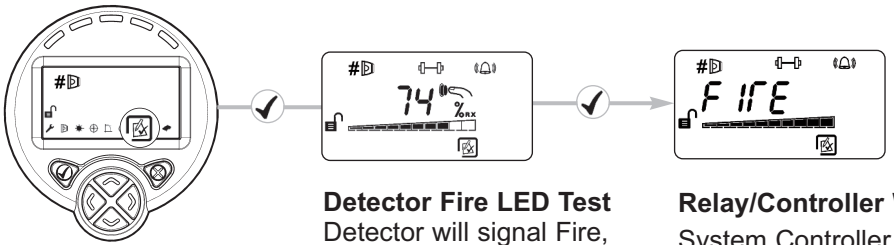
After installation or cleaning, it is recommended that a manual Fire and Fault test is performed:

Fire Test: Cover the Reflector slowly so that it takes longer than 5 seconds to cover. The System Controller will signal Fire to the Fire Control Panel

Fault Test: Cover the Reflector completely within 2 seconds. The System Controller will signal Fault back to the Fire Control Panel.

Software Fire Test
How to perform a Fire Test from the System Controller, to test the wiring to the Fire Control Panel

NOTE: The Software Fire Test is acceptable for Fire Authority Acceptance and Routine Maintenance per UL268-5



Detector Fire LED Test
Detector will signal Fire, System Controller will stay Normal.
Press ✗ to exit without performing the test

Relay/Controller Wiring Test
System Controller signals 'Fire' to Fire Control Panel
Press ✓ or ✗ to exit

Cleaning the System

The system will automatically compensate for dust build-up by changing the Compensation Level.

However, it is recommended that the Detector lenses and the Reflector are cleaned periodically with a soft lint-free cloth.

If the Compensation Level for a particular Detector remains above 130 for several days, this indicates that cleaning should take place on that Detector.

The system should be isolated from the Fire Control Panel before cleaning takes place.

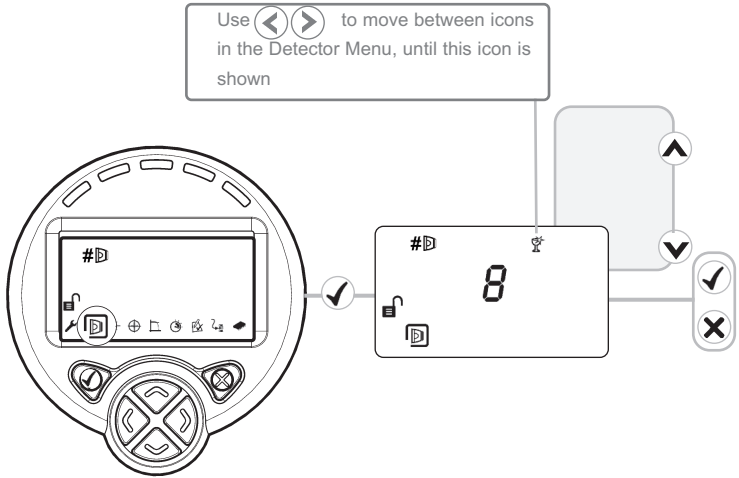
After cleaning, verify that the system is operating normally:

If the Signal Strength is between 92% and 108%
- leave the system to compensate back to 100% (this should take no more than 12 hours)

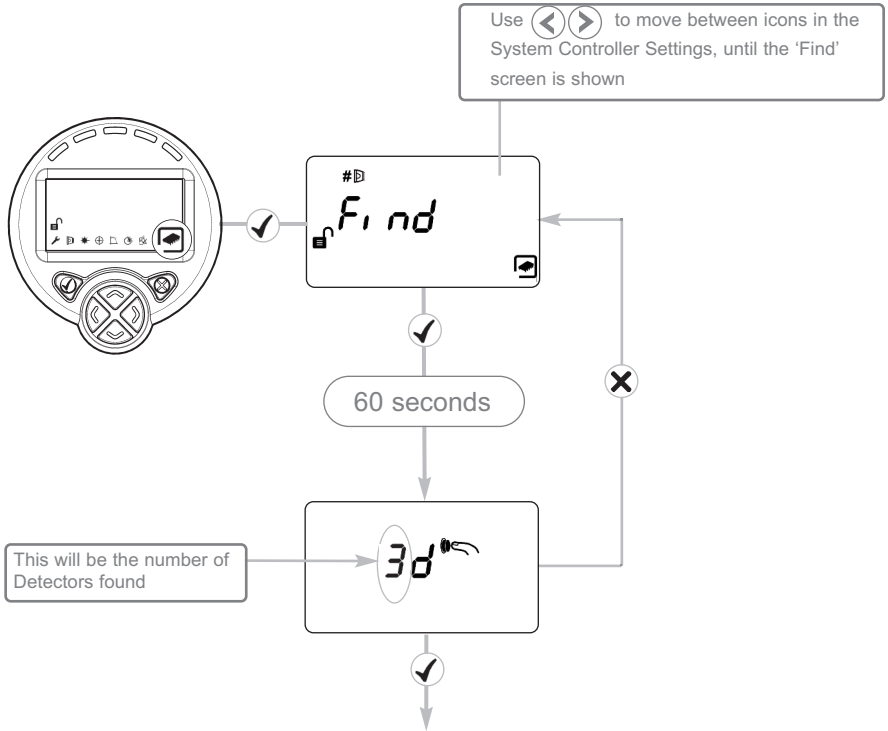
If the Signal Strength is above 108%
- reduce Compensation Level until Signal Strength is 92—108%, and wait for system to compensate back to 100%

If the Signal Strength is below 90%
- perform LASER Targeting, Auto-Align, and Set.

How to change Compensation Level:

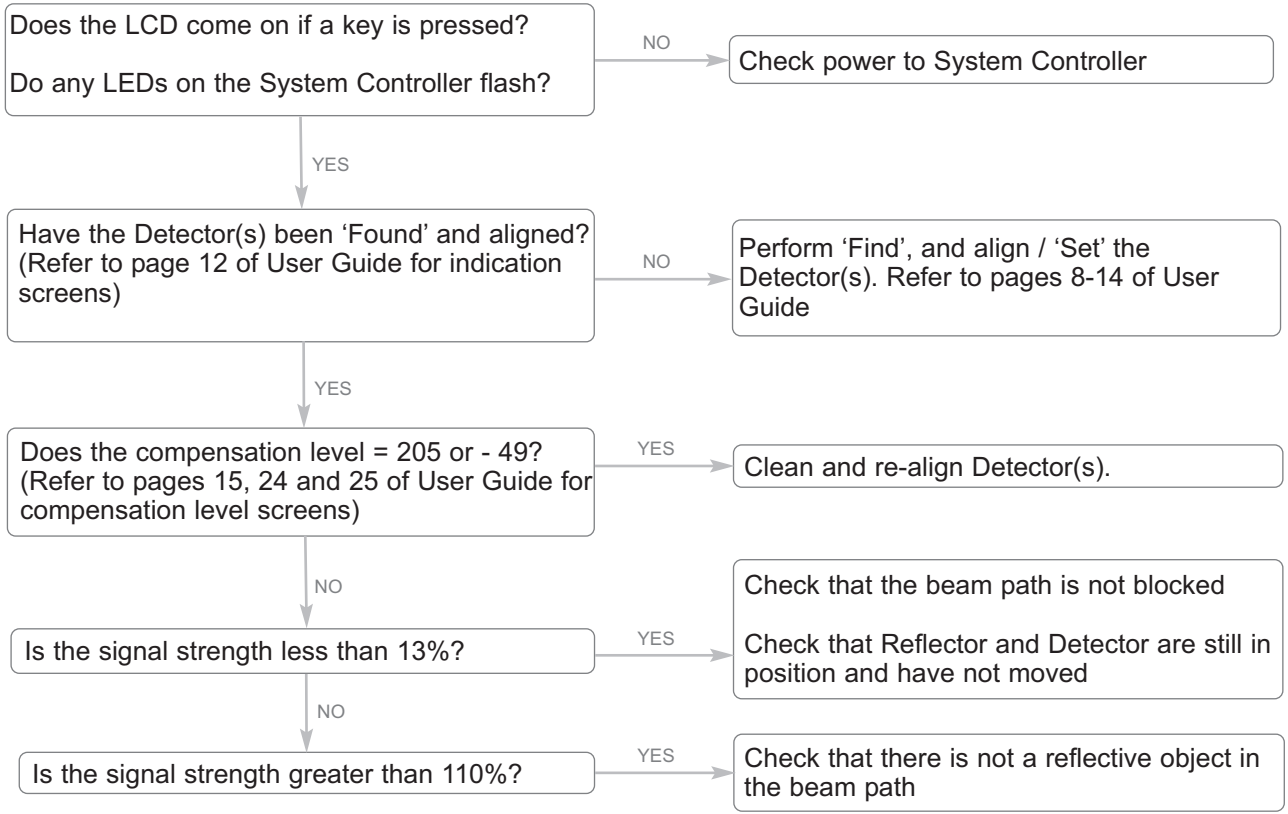


- Power Down the system
- Connect new Detector(s) or disconnect unwanted Detector(s)
- Power the system back up, then follow procedure:



- Press tick to enable found Detectors
- Any unused Detector channels are switched off
- Press ✕ to re-scan if number is incorrect
- Repeat Alignment (Steps 5 to 9) for any other Detectors found during the 'Find' process

- If a Fault/Trouble is indicated at the System Controller:



- Refer to manufacturer for further technical assistance

Detector Not Found

System Controller could not find Detector. Also displayed during power up.

- Wait 45 seconds for system to power up
- Check wiring between System Controller and Detector (Voltage to Detector should be 11—13V)

Detector is connected but not 'Found'

A Detector is connected but not 'Found'

- Follow 'Find' process and align if necessary

Compensation Level Not Zero

Compensation must equal zero when 'Set' is selected.

- Re-align Detector using Auto-Align

Signal Strength Out of Range

Signal Strength is too low or too high after Auto-Align.

- Ensure correct distance has been set
- Ensure correct Reflector type has been used
- Ensure clear line of sight to Reflector
- Re-align Detector using LASER and Auto-Align

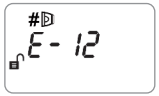
Reflector Not Found

Detector could not align with Reflector

- Ensure correct distance has been set
- Ensure correct Reflector type has been used
- Ensure clear line of sight to Reflector
- Re-align Detector using LASER and Auto-Align

Auto-Align Failed

- Ensure correct distance between Reflector and roof structures
- Ensure clear line of sight to Reflector
- Re-align Detector using Auto-Align



Cannot Zero During ‘S-00’ in ‘Set’

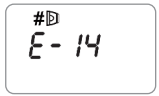
The Reflector was not covered or the Detector was not aligned onto the Reflector.

- Ensure Reflector was completely covered with a non-reflective material
- Re-align Detector using Auto-Align

No Signal During ‘S-01’ in ‘Set’

The Reflector was not uncovered during ‘S-01’.

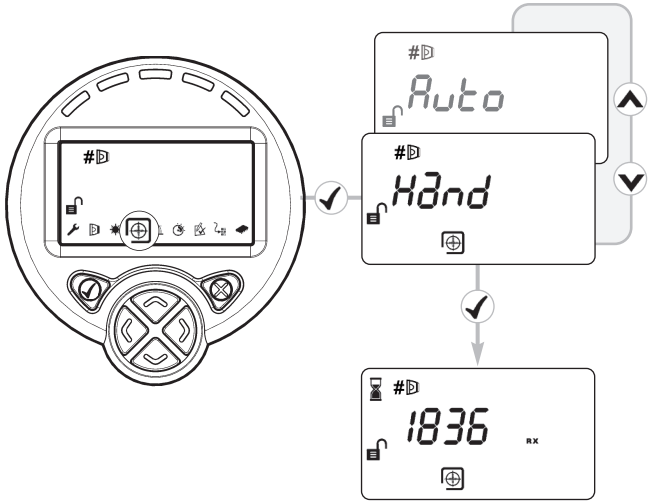
- Ensure Reflector was uncovered when ‘S-01’ was selected



‘Centre’ Stage of Alignment Failed

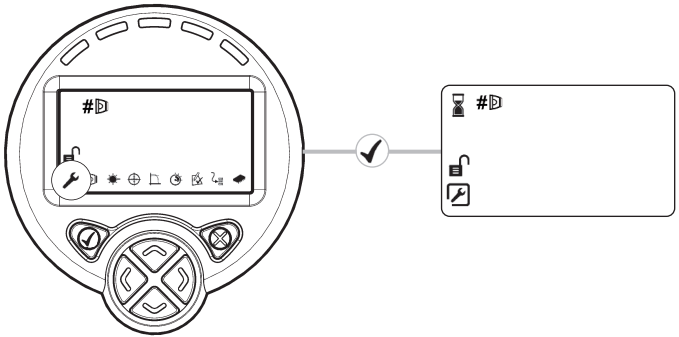
Detector has aligned on something other than the Reflector

- Ensure clear line of sight from Detector to Reflector for a radius of 0.5m



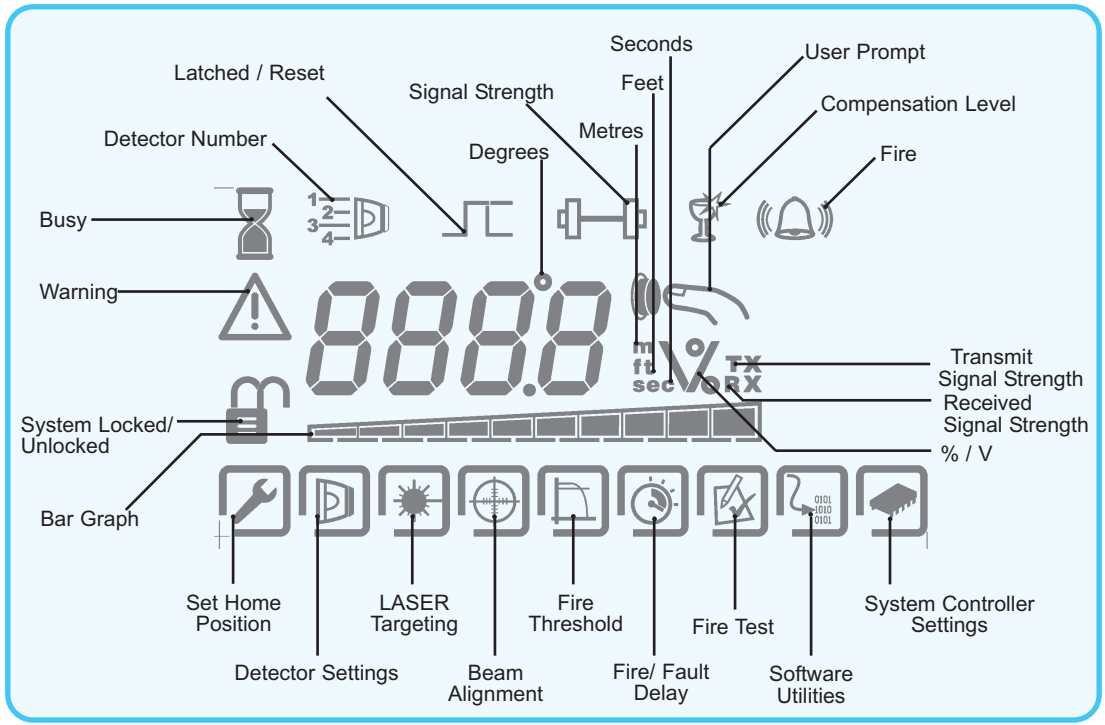
If it is not possible to see the LASER because of the installation environment (for example, if you cannot see the Reflector from the System Controller or there is high ambient light) then use ‘Hand’ Alignment. This option displays the signal strength value returned by the Detector, and allows the user to move the beam

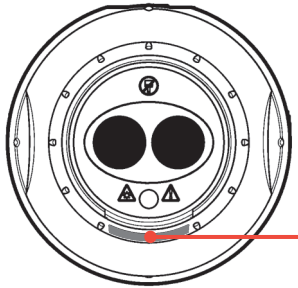
1. Start ‘Auto’ Alignment and press ✕ after two seconds to exit. (this will maximise infrared power)
2. Select ‘Hand’ alignment
3. Use ◄ ► ▲ ▼ to steer the beam until the signal strength is above 800. There is no auto-repeat function on any key. To move the motor in any given direction more than once, press the key multiple times
4. Cover the Reflector. If the Signal Strength does not drop by more than half, the beam is not aligned to the Reflector, so repeat Step 3
5. Perform ‘Auto’ alignment, followed by ‘Set’



If it is not known where the beam is pointing, use Home Position to automatically steer the infrared beam to approximately the centre of its range of movement.

- Press ✓ or ✗ to exit this function
- This will take up to 15 minutes to complete
- When complete the display will return to the Engineering Menu

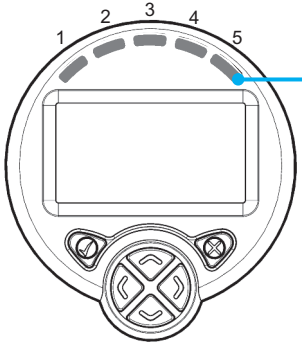

Seconds
User Prompt
Latched / Reset
Feet
Signal Strength
Compensation Level
Detector Number
Metres
Degrees
Fire
Busy
Warning
8888
m
ft
sec
%
V
TX
RX
Transmit
Signal Strength
Received
Signal Strength
% / V
System Locked/
Unlocked
Bar Graph
Set Home
Position
LASER
Targeting
Fire
Threshold
Fire Test
System Controller
Settings
Detector Settings
Beam
Alignment
Fire/ Fault
Delay
Software
Utilities



Detector

Indicator flashes every 10 seconds.

NORMAL:	GREEN
FAULT:	YELLOW
FIRE:	RED

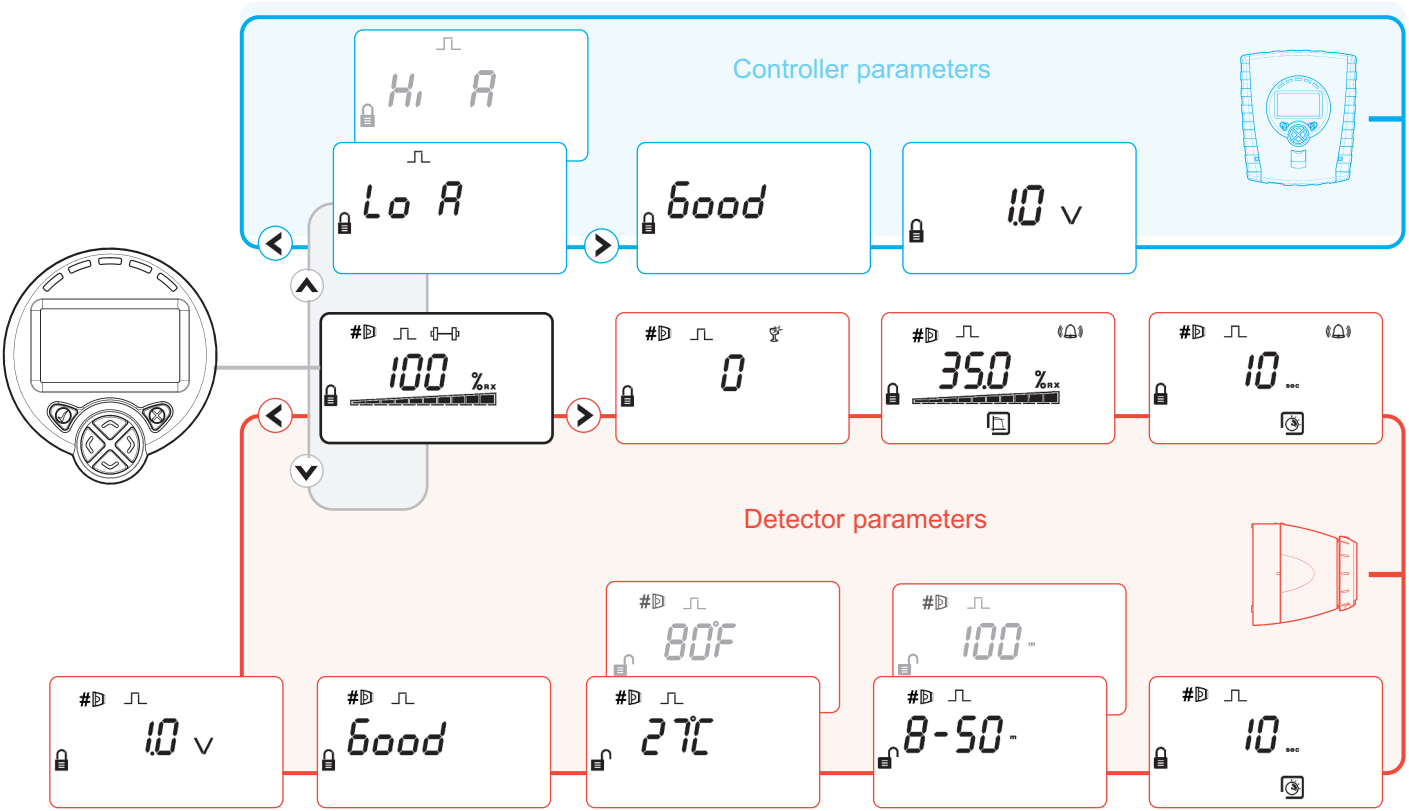


System Controller

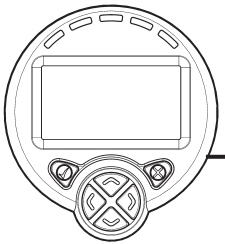
Indicators 1 to 4 show status for Detectors 1 to 4:

NORMAL:	No flash
FAULT:	YELLOW
FIRE:	RED

Indicator 5 flashes GREEN to indicate NORMAL System Controller status.
All indicators flash every 10 seconds.



- Press ✓ in this menu to enter the Pass Code
- Press ✗ to put the system into Sleep



Controller parameters

Power Mode
'Hi A' or 'Lo A'

System Controller Status

System Controller Software Version

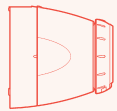
Received Signal Percentage

Compensation Level

Fire Threshold

Fire Delay

Detector parameters



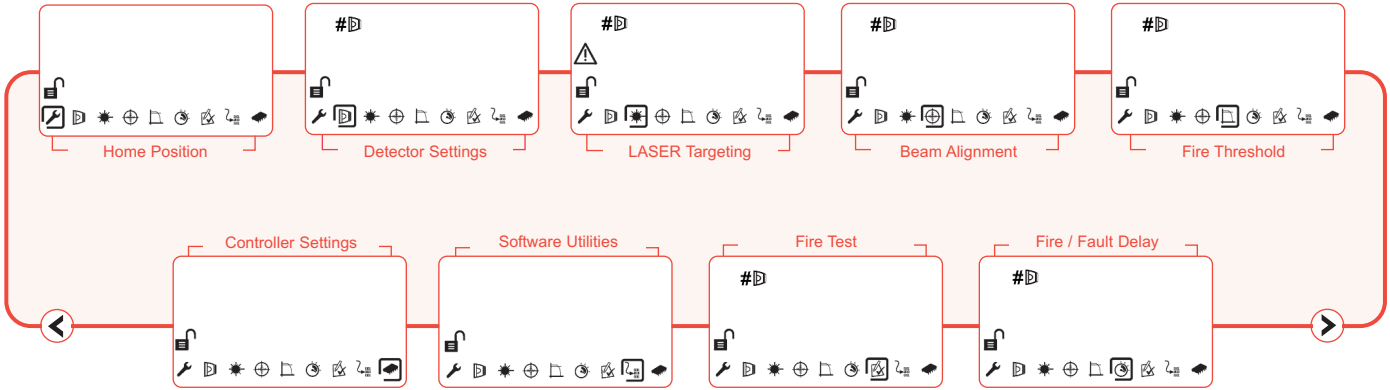
Detector Software Version

Detector Status

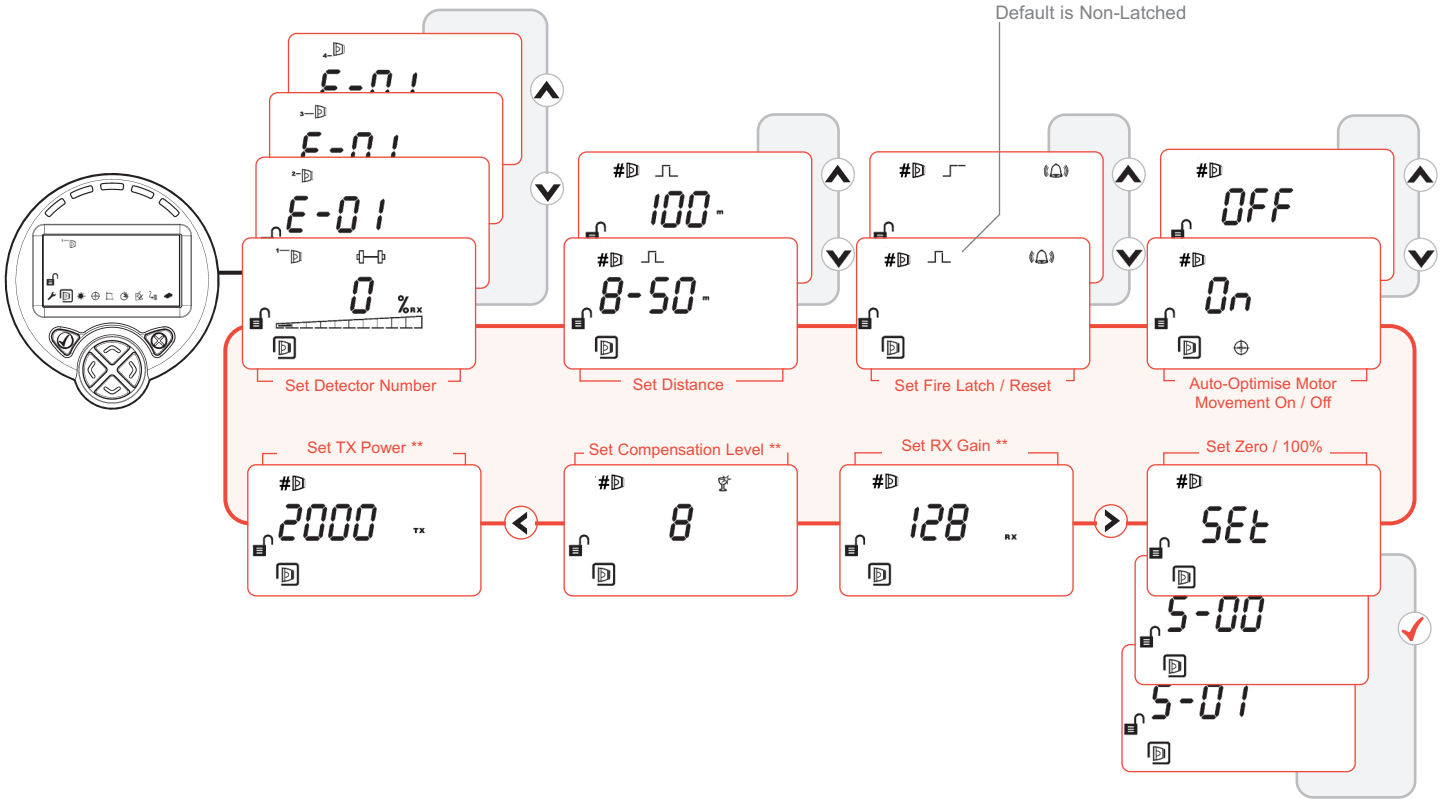
Temperature
Centigrade or Fahrenheit

Distance
8—50m or 50—100m

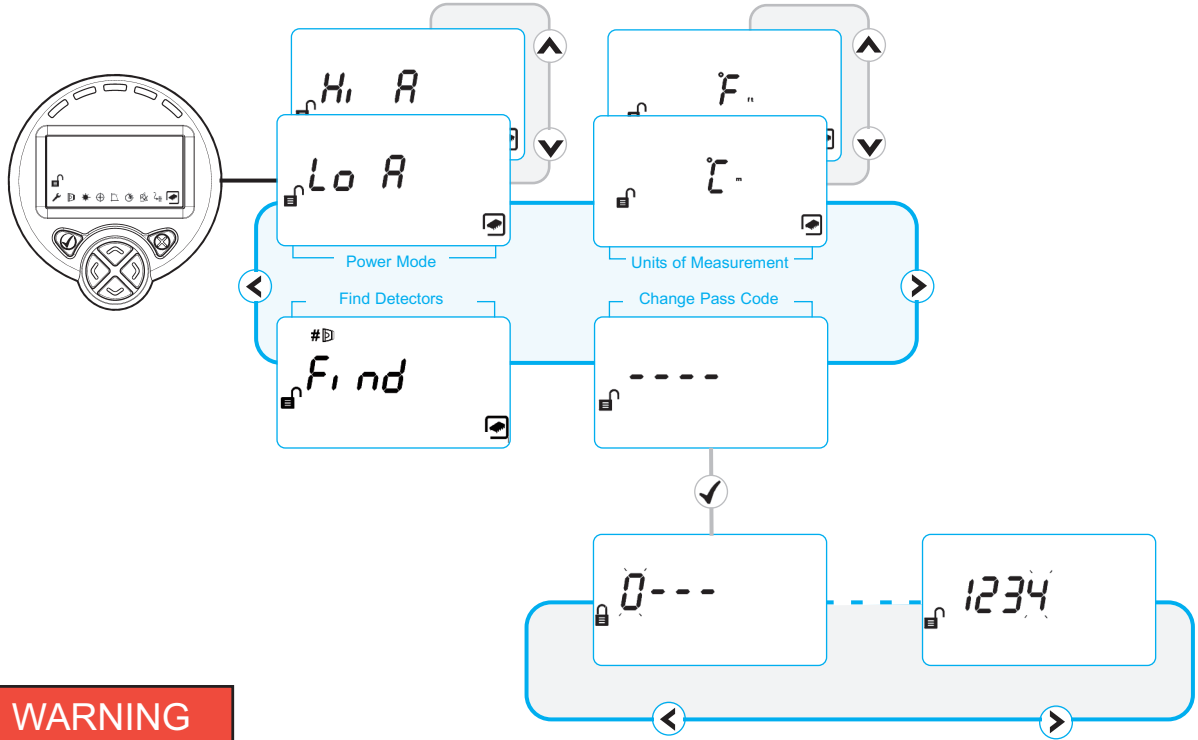
Fault Delay



- The Pass Code must be entered to access the Engineering Menu
- The menu is navigated by using ‹ › keys to move the cursor.
- Items are selected by using ✓
- Pressing ✗ exits this menu and returns the system to a ‘locked’ state



** WARNING: ENGINEERING USE ONLY. ALTERING MAY CAUSE MALFUNCTION



WARNING

Care must be taken when changing the Pass Code. If the code is lost, contact the manufacturer for Pass Code reset.

- **Units of Measurement**

Changes between 'Metric' and 'Imperial'

- **Change Pass Code**

Use ‹ › to access each digit

Use ˅ ˄ to change the digit

Press ✓ to save the new Pass Code and return to the settings menu

Press ✗ to cancel the change and return to the Engineering menu

Parameter	Value
Operating Voltage	14—28V DC
Operating Current – Low Power Mode	10, 12, 14 or 16 mA ± 2mA (for 1, 2, 3 or 4 Detectors found)
Operating Current – High Power Mode	48—52mA
Fire Threshold Range	0.45—3.98 dB 10—60%
Delay to Fire	2—30 s
Delay to Fault	2—30 s
Operating Distance between Detector and Reflector	8—100 m
Maximum angular misalignment of Detector	± 0.3 Deg
Maximum angular misalignment of Reflector	± 5 Deg
Maximum angular movement of Detector head	± 3.5 Deg
Optical wavelength	850 nm
Rapid Obscuration Fault threshold	87%
Operating Temperature (UL Approved)	0—+37.8 Deg C
Operating Temperature (EN54-12 Approved)	-10—+55 Deg C
Storage temperature	-40—+85 Deg C
Relative Humidity (non condensing)	93%
IP Rating	IP54
Relay Contact Voltage	30V DC
Relay Contact Current	100 mA
Maximum Cable Length (Controller to Detector)	100 m
Cable Gauge	24—14 AWG 0.5—1.5 mm
Housing Flammability rating	UL94 V0

Parameter	Description	Default
Pass code	User Code required to access Engineering Menu	1 2 3 4
Power Mode	'Hi A': System will operate at 50mA constant current consumption 'Lo A': System will operate at 10,12,14,16 mA constant current consumption (for 1, 2, 3 or 4 Detectors found)	'LoA'
Compensation Level	Range –49 to +204. Level of amplification applied to compensate for dust build-up and building movement At 75 Auto-Optimise is started	0
Transmit power	Range 50 to 4095. Indicates the optical power output. Set automatically by Auto-Align	-
Receive Gain	Range 1 to 255. Indicates the level of amplification applied by the receiver Set automatically by Auto-Align	-
Fire Threshold	Range 10% to 60%. Sets the amount of obscuration required for the Detector to signal a Fire	35%
Delay to Fire	Range 2s to 30s. Sets the time the system needs to be below the Fire threshold before signalling a Fire	10 seconds
Delay to Fault	Range 2s to 30s. Sets the time the system needs to be below the Fault threshold before a Fault is signalled Note the signal needs to fall to <=13% within 2s	10 seconds
Distance	8—50m or 50—100m. Sets the distance between Detector and Reflector. Affects the initial transmit power at the start of Auto-Align	8-50m
Auto-Optimise On/Off	Disables or enables Auto-Optimise (the automatic beam movement function)	On
Latched/non-latched	Sets if the system will latch Fire or automatically reset Faults are always non-latching.	Non-latching

Dimensions	Width, in (mm)	Height, in (mm)	Depth, in (mm)	Weight, lb (kg)
System Controller, including base	8.0 (202)	9.1 (230)	3.2 (81)	2.2 (1.0)
Detector, including 'easy fit' base	5.3 (135)	5.3 (135)	5.3 (135)	1.1 (0.5)
Universal Bracket	5.3 (135)	5.3 (135)	2.8 (71)	0.4 (0.2)
Reflector (Single)	3.9 (100)	3.9 (100)	0.4 (10)	0.2 (0.1)

UL Approval Information

UL File Number: S3417

Distance between Detector and Reflector	Fire Threshold Range
8–10m (26.2–32.8ft)	10–18%
10–15m (32.8–49.2ft)	15–25%
15–22m (49.2–72.2ft)	15–35%
22–40m (72.2–131.2ft)	25–50%
40–60m (131.2–196.8ft)	35–50%
60–100m (196.8–328.1ft)	50%

All installations should comply with NFPA72

European Approval Information

CE
0832

Fire Fighting Enterprises Ltd, 9 Hunting Gate, Hitchin, SG4 0TJ, UK

07
0832-CPD-0565

EN54-12
Line Detector using an Optical Beam
Fire Safety
Documentation: See doc. 0044-034

Complies with EN54-12 for sensitivity levels between 25% and 35% with a maximum delay to fire of 20 seconds.