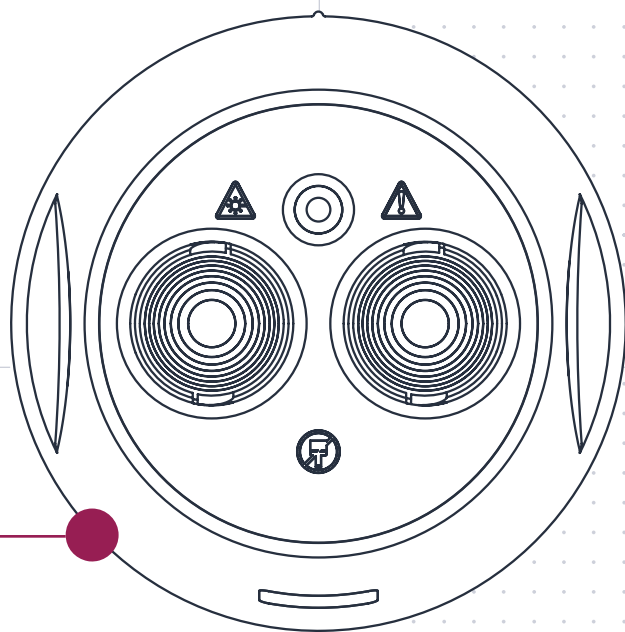


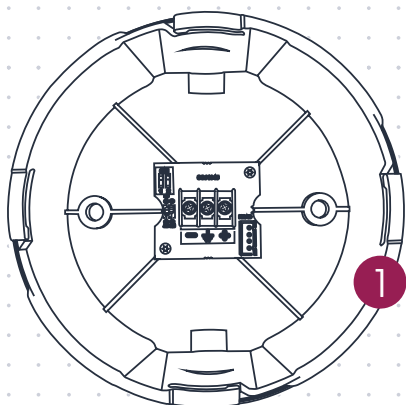
Fireray **Hub Reflective** **User guide**

Contents

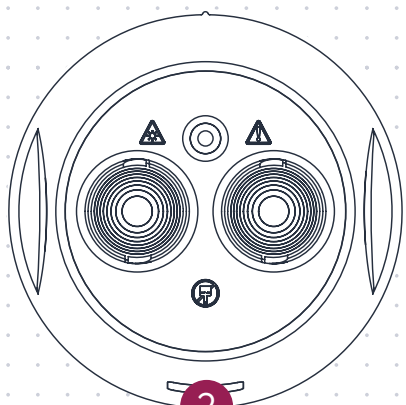
- 1. In the box 03
- 2. Introduction 04
- 3. Installation 04
- 4. Mounting – System Controller 05
- 5. Mounting – Detector 05
- 6. Wiring information 06
- 7. External reset 08
- 8. Apply power 08
- 9. Select language and power mode 09
- 10. Select date and time 09
- 11. Find Detectors 10
- 12. Alignment 11
- 13. Detector settings (unlocked) 12
- 14. Extra Detector settings (unlocked) 13
- 15. Event log 14
- 16. Test for Fire and Fault 14
- 17. System Controller settings (unlocked) 15
- 18. System Controller functions (locked) 16
 - System Controller settings (locked) 16
 - Detector settings (locked) 17
 - Extra Detector settings (locked) 17
- 19. Prism Targeting 18
- 20. Manual alignment 19
- 21. Cleaning 20
- 22. Error codes 20
- 23. Factory reset 21
- 24. Glossary of terms 21
- 25. Technical specification 22
- 26. Open source notice 23

Information in this guide is given in good faith, but the manufacturer cannot be held responsible for any omissions or errors. The company reserves the right to change the specifications of products at any time and without prior notice.

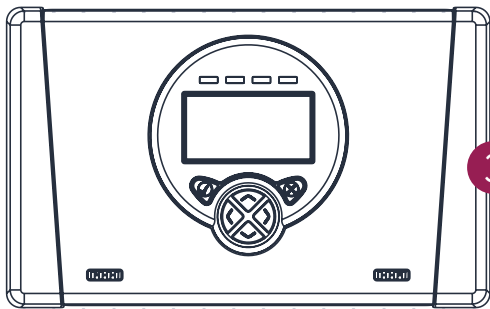
1. In the box



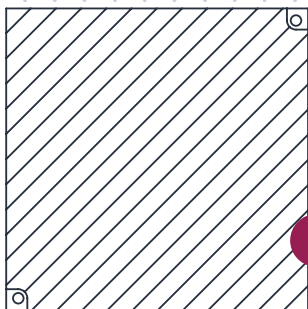
DETECTOR BASE



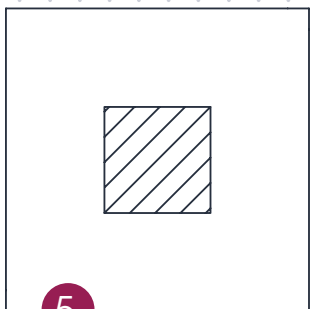
DETECTOR HEAD



SYSTEM CONTROLLER



REFLECTOR



SHORT RANGE MASK

2. Introduction

The Fireray Hub Reflective is a Modular Beam Detection System that enables up to three Reflective Detector Heads to be connected to its System Controller simultaneously. The Detector needs a 'Line of Sight' of 0.5 m (20 inch) diameter clearance to align through.

Each Detector has its own dedicated Fire and Fault relay outputs. The Detectors are commissioned and monitored by the System Controller and each Detector has its own Event Log, the operation of which is described in the Event Log section of the manual.

The Fireray Hub Reflective can be powered from a +24 V DC 1A power supply and a 2-core cable connects the Fireray Hub Reflective to each Detector (these cables should conform to local fire regulations).

The Fire and Fault contacts are voltage-free and are wired back to the fire panel. The Fireray Hub Reflective System Controller should be placed with ease of service in mind.

What you need to know:

The default passcode to unlock the Fireray Hub Reflective is 1,2,3,4.

The icon with the flashing square is the one which is active.

To align a Detector, select the 'Target' icon.



Use the direction keys to navigate through the menu.



Press the 'Tick' key to activate the System Controller with a blank screen, to select a menu or to save a change.



Press the 'Cross' key to exit a menu.



3. Installation



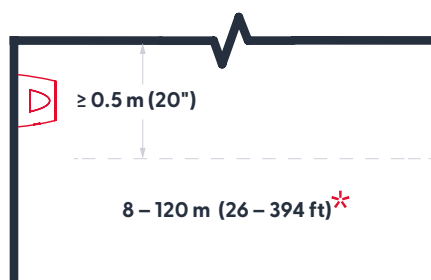
Do NOT position the Detector where personnel or objects can enter the Beam path.

Do NOT mount Reflector onto reflective surfaces.

Do NOT install the Detector or Reflector in environments where condensation or icing are likely to occur unless preventative measures have been taken.

Smoke detectors are not to be used with detector guards unless the combination has been evaluated and found suitable for that purpose.

Position Beam as high as possible, but with a minimum distance of 0.5 m (20") from Detector and Reflector to ceiling.



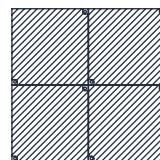
For Detectors approved to UL 268 refer to NFPA 72 or ULCS 536 for installation guidance. In such installations, it is generally recommended to mount Detectors and Reflectors within the upper 10% of the floor-to-ceiling height. If the floor-to-ceiling height is less than 5 m (16½ ft), then 0.5 m / 20" below the ceiling should be used.



8 – 20 m (26 – 66 ft)*
= 1 Reflector + Short
Range Mask



20 m – 50 m
(66 – 164 ft)
= 1 Reflector



50 – 120 m
(164 – 394 ft)
= 4 Reflectors

Ensure correct Reflector selected for the appropriate distance. Mount Detector and Reflector directly on solid surfaces opposite each other.

All installations should comply with local regulations.

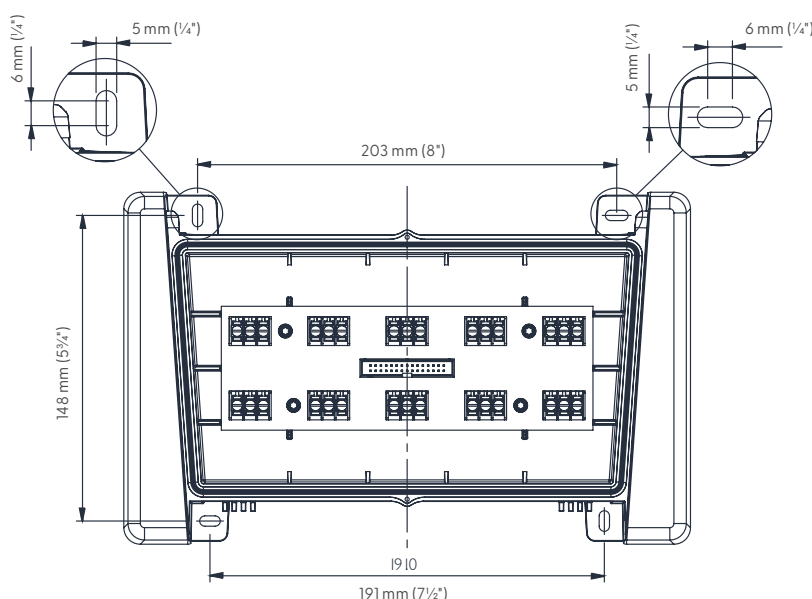
***For UL approved installations, the minimum separation between Detector and Reflector is 10m (33ft).**

4. Mounting – System Controller

To remove the System Controller cover, use a flat screwdriver to lever the catch in both slots.

Carefully disconnect the ribbon cable joining the front panel to the base and put the front panel in a safe place while the base is being installed to avoid damage to the panel or cable. Reconnect the front panel and close the cover once wiring is complete.

Mark and drill holes for mounting the base. Using appropriate hardware (not supplied) mount the base securely in the orientation shown. Cable glands should be used on the cable entry to maintain the IP rating of the enclosure and provide cable strain relief. There are 10 knock-out locations of 21 mm ($\frac{3}{4}$ " diameter and 10 drill-out locations for hole sizes up to 21 mm ($\frac{3}{4}$ " diameter.



5. Mounting – Detector

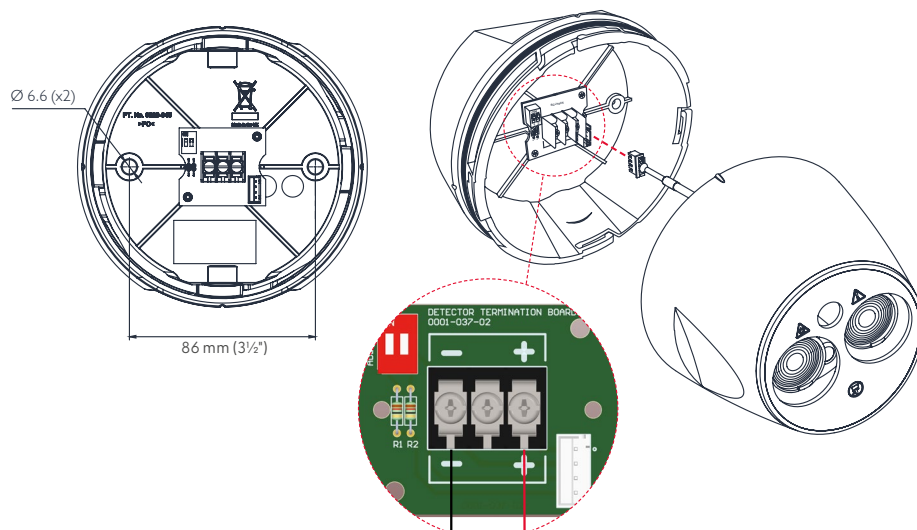
Mark and drill holes for mounting the base. Using appropriate hardware (not supplied), mount the base securely in orientation shown.

Plug the cable from the Detector Head into the connector on the PCB in the base.

Locate the Detector Head on the base. Grip sides of Detector Head and rotate clockwise to lock together.

Cable glands should be used on the cable entry to maintain the IP rating of the enclosure and provide cable strain relief. There are two knock-out locations of 21 mm diameter and two drill-out locations for hole sizes up to 21 mm diameter.

Ensure the 'Pip and Dip' details align.

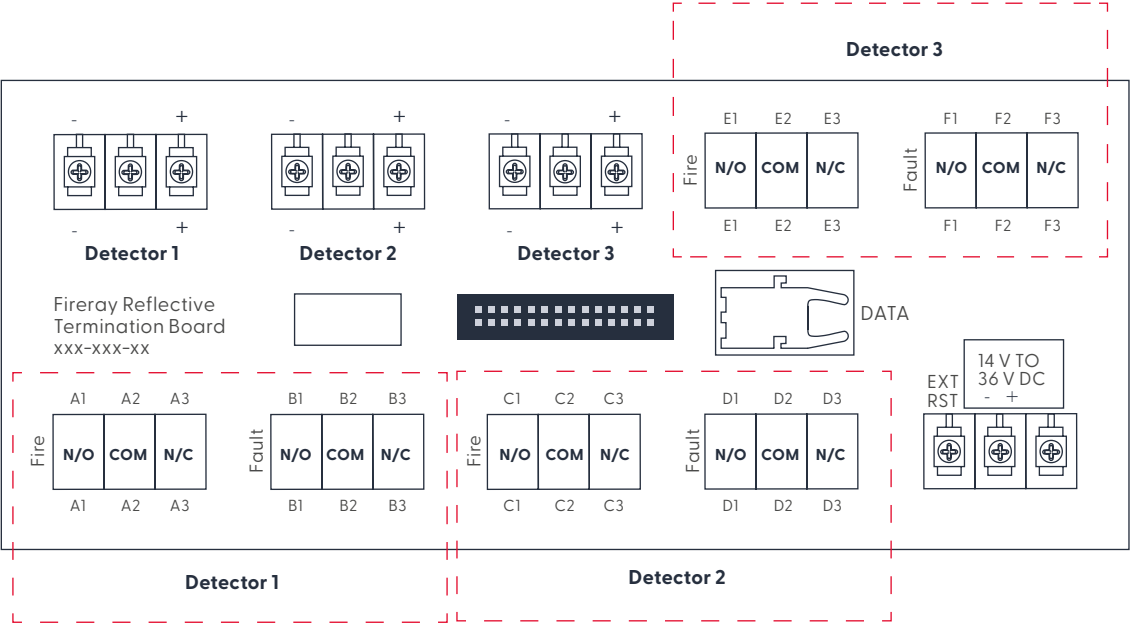


Ensure Base is mounted on solid surface such as a structural wall or girder. For mounting accessories please see our website. ffeuk.com | ffeus.com

All installations should be as per the latest version of BS 5839, NFPA 72 or local equivalent.

6. Wiring information

When the system is operating with no Fire or Fault condition the relay contacts marked ‘N/O’ will be open and the contacts marked ‘N/C’ will be closed. When the system is not powered the Fault relays will be in the ‘N/O’ position.

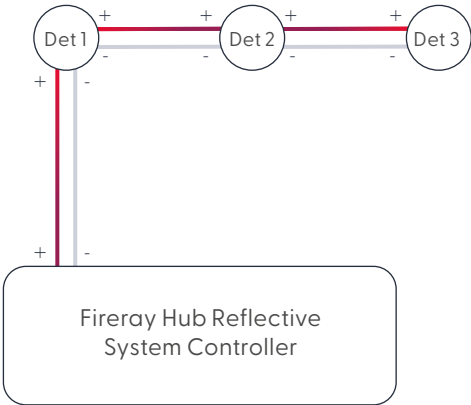


There can be up to 100 m (262 ft) of cable between the Fireray Hub Reflective System Controller and the Reflective Detector.

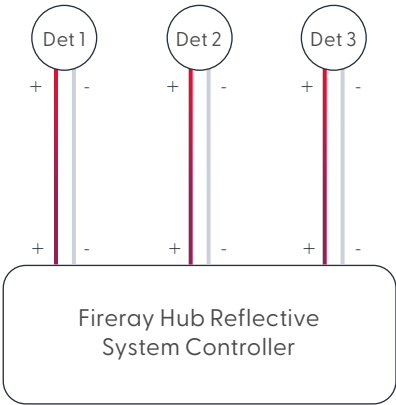
The Fireray Hub Reflective System Controller can be wired to the Detectors in either Parallel or Network mode. If in Network mode, the address of each Detector needs to be set as shown in the table, using the 2-way DIP switch found on the PCB in the Detector base. The Detectors will not be found correctly if two Detectors share the same address. For Network mode the ‘Detector 1’ terminals should be used and nothing should be wired to the ‘Detector 2’ and ‘Detector 3’ terminals.

Network mode address settings

1	2	
OFF	ON	Detector 1
ON	OFF	Detector 2
ON	ON	Detector 3

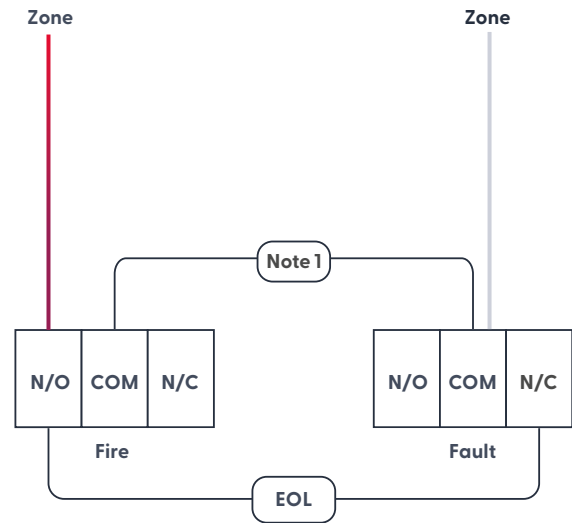


Network wiring



Parallel wiring

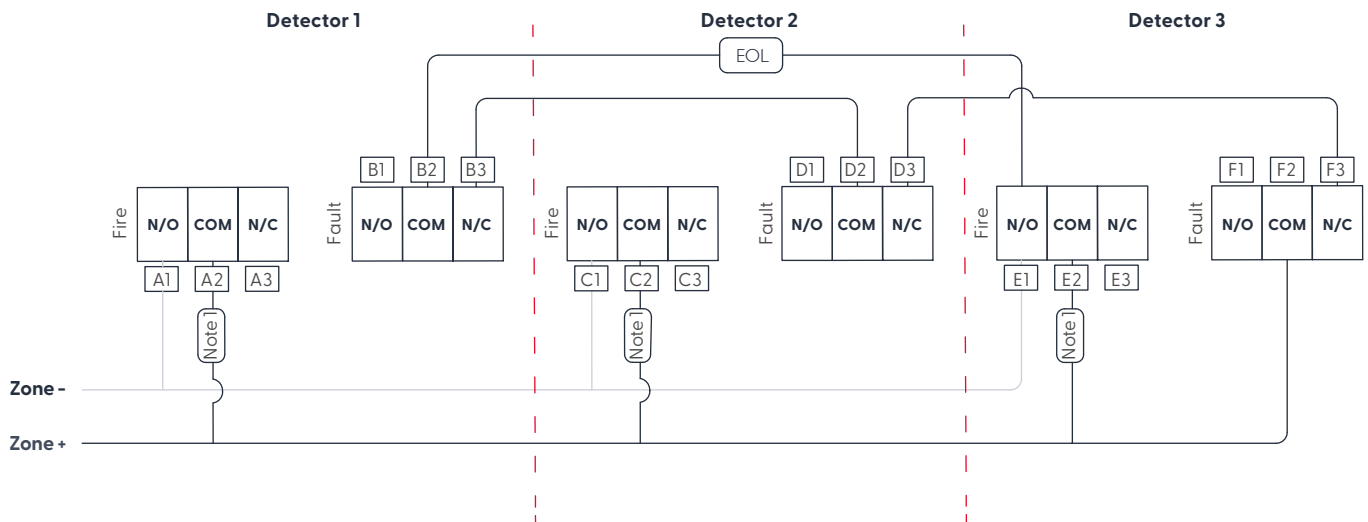
NOTE: When the system is operating with no Fire or Fault condition, the relay contacts marked 'N/O' will be open and the contacts marked 'N/C' will be closed. When the system is not powered, the Fault relays will be in the 'N/O' position.



Fireray Hub Reflective wiring for three Detectors connected to one zone

When using more than one Detector on a single zone of a conventional fire panel, it is important to choose the correct method of wiring. Incorrect wiring may result in a Detector isolating subsequent devices on that zone if it enters a Fault condition, and may prevent these subsequent devices signalling a Fire condition back to the fire panel.

N/O = Normally open
N/C = Normally closed
COM = Common
EOL = End of Line



This wiring diagram provides an example of how to wire three (or any number of) Detectors to provide a common alarm and fault.

If the fire panel is addressable, the Fireray Hub Reflective System Controller should be wired to the switch monitor(s) using the same configurations as for the zone connections.

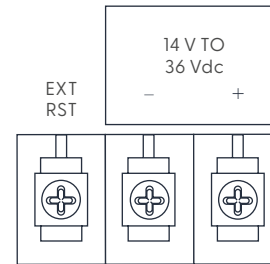
CAUTION: For system monitoring do not use looped wire under any terminals. Break wire run to provide monitoring of connections.

Components not supplied:

1. Fire Resistor ('Note 1') – value is specified by the FCP manufacturer. Not required in UL 268 (NFPA 72) installations and should be replaced with a jumper.
2. End Of Line ('EOL') component – supplied by FCP manufacturer.

7. External reset

If Latching Mode is selected then to clear a Fire condition, apply a voltage of between 5 V to 36 V to the EXT RST terminal for longer than 2 seconds. A self-resetting push-to-make switch can be wired between the + and EXT RST terminals to enable this.



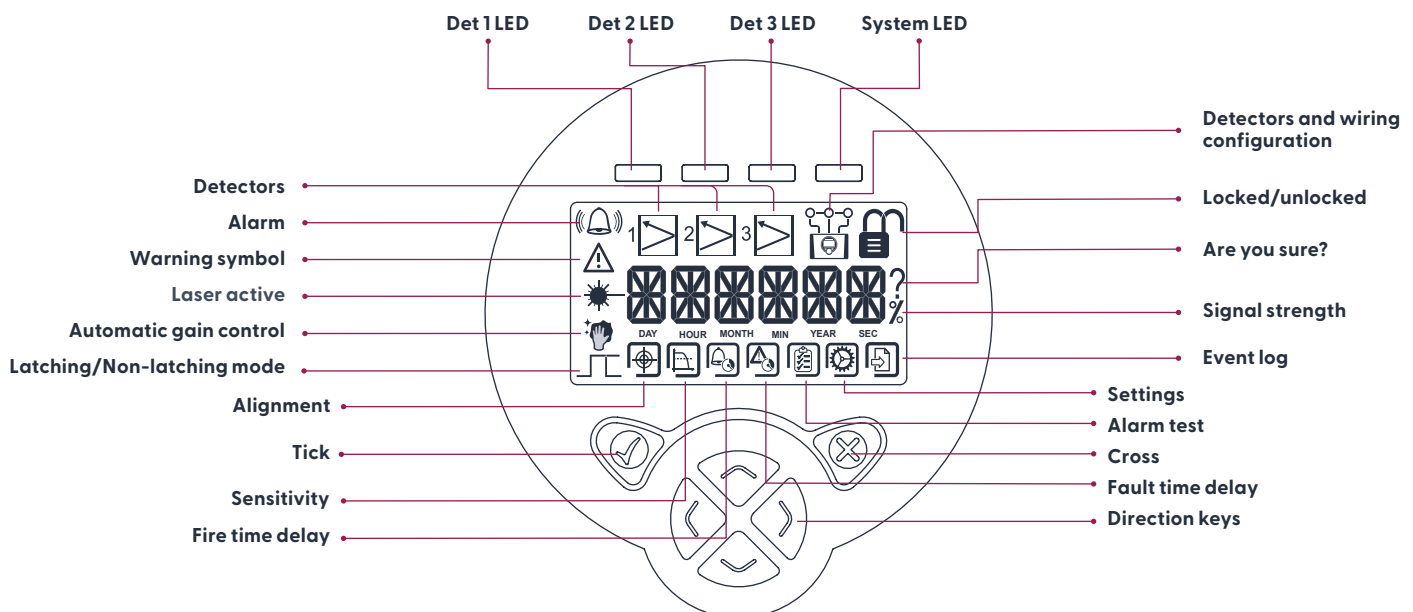
8. Apply power

All the LCD segments will momentarily light up, the screen will display "WAIT" and then the language selection menu will appear.

The Detector LEDs flash amber for Fault and red for Fire. The System LED is green when there are no Fires or Faults. The green LED will flash every 10 seconds, red and amber LEDs flash every 5 seconds. The System LED can be permanently switched off if required (see page 15).

Press 'Tick' to activate the System Controller when the screen is blank, to select a menu or to save a change. Press 'Cross' to exit a menu.

The display will 'time out' and go blank after a short period of time.



9. Select language and power mode

Set the language

This can be English, Italian, French, Spanish, German or Serbian. Use the 'Up' and 'Down' arrow keys to go through the languages, then press 'Tick' to select.



Set the power mode

Use the 'Up' and 'Down' arrow keys to choose between 'Fast Align' and 'Standard' and press 'Tick' to select.

'Fast Align' mode is recommended. In this mode the LCD backlight will switch on and alignment of Detectors will be much quicker. The current drawn will be 33 mA when the LCD backlight is on, and during alignment. When the backlight is off and alignment is not being performed, the current drawn will be 12.5 mA if one Detector is connected, 15 mA if two Detectors are connected, or 17.5 mA if three Detectors are connected.

In 'Standard' mode the current drawn will be 12.5 mA if one Detector is connected, 15 mA if two Detectors are connected, or 17.5 mA if three Detectors are connected. The LCD backlight will not switch on and alignment will be much slower.



10. Select date and time

Set the date format

Use the 'Up' and 'Down' arrow keys to choose between 'DDMMYY', 'YYMMDD' and 'MMDDYY', then press 'Tick' to select.

Set the date and time.

Use the 'Up' and 'Down' arrow keys to change the value of each item and the 'Left' and 'Right' arrow keys to move between items. Press 'Tick' to save the 'Date' and 'Time' settings.



11. Find Detectors

Select 'Find' by pressing the 'Tick' key, this will find the number of Detectors and the wiring configuration of the Detectors that are connected to the System Controller.

The number of Detectors will be displayed after a countdown of 60 seconds. The wiring configuration (Parallel or Network) will also be displayed. Press the 'Tick' key to confirm or press the 'Cross' key to repeat the process.

Note: If you are using Network mode, you need to set the address of each Detector as shown in the table below.

The 2-way DIP switch is found on the PCB in the Detector base.

Network Mode Address Settings

1	2	
OFF	ON	Detector 1
ON	OFF	Detector 2
ON	ON	Detector 3



12. Alignment

Select the Detector to be aligned by using the 'Left' and 'Right' arrow keys. The flashing icon indicates the Detector that is selected.



Press 'Tick' to select the Detector to align, press 'Tick' again to unlock the Controller by entering the passcode. The default passcode is 1,2,3,4.



Press the 'Left' and 'Right' arrow keys to select the 'Targeting' icon, and press the 'Tick' key. Press the 'Tick' key again to switch on the laser.



Use the arrow keys to guide the laser onto the Reflector(s). Press the 'Tick' key to confirm. Note: the laser just needs to be on the Reflector(s), it is not necessary to position it precisely.

If the laser cannot be seen, for example in very bright environments or over long distances, then Prism Targeting mode can be used. See Section 19: Prism Targeting.



Press the 'Tick' key to select the 'Auto' alignment option.



The Detector is aligning.



When the alignment process succeeds, 'Aligned OK' will be shown.

If the alignment process fails, the message "ALIGN ERROR" will be displayed followed by a number. Common alignment errors are listed below.

Error	Meaning
21	The initial search failed to find the Reflector.
23	The second stage of the alignment process failed to complete.
4, 26	Timeout – the alignment process failed to complete for an unknown reason.

If any of the above errors are displayed, check the alignment of the Detector and Reflector and try again, ensuring that the initial targeting phase has been carried out correctly.

Error	Meaning
22	Initial range adjustment failed – IR signal is too strong or too weak.
25	Final range adjustment failed – IR signal is too strong or too weak.
7, 27	Failed to set final 100% reference value.

If any of the above alignment errors occur, check the beam path between the Detector and Reflector, ensuring that no reflective surfaces other than the Reflector are present.

If any error numbers other than those listed above are displayed, check the wiring between the Controller and Detector and try again.

If the Detector will not align after several attempts, see Section 20: Manual alignment. To configure the Detector sensitivity and time delays, see Section 13: Detector settings (unlocked). After alignment the Detector should be tested, see Section 16: Test for Fire and Fault.

13. Detector settings (unlocked)

Select the Detector you want to check and press the ‘Tick’ key. Move between functions using the ‘Left’ and ‘Right’ arrow keys and press the ‘Tick’ key to confirm your selection. Values can be changed by pressing the ‘Up’ and ‘Down’ arrow keys and confirmed by pressing the ‘Tick’ key.

Alarm Threshold



The Alarm Threshold may be set between 10% and 85%. 35% is the default. Press ‘Up’ or ‘Down’ to change the value in 1% steps, or press ‘Left’ or ‘Right’ to scroll through commonly used thresholds. Refer to **Alarm Threshold** below for further details.

Time Delay to Fire



The Time Delay to Fire can be set between 2 and 30 seconds. 5 seconds is the default value.

Note: The unit is approved to EN 54-12 with 5 seconds delay to fire.

Time Delay to Fault



The Time Delay to Fault can be set between 2 and 30 seconds. 10 seconds is the default value.

Alarm Test



The Alarm Test will perform a Fire relay test. Press the ‘Tick’ button twice.

Note: The fire panel will go into alarm, so make sure it is safe to test. For EN 54 installations the Alarm Test should only be used to prove connection to the fire panel; for UL 268 installations the Alarm Test is acceptable for Fire Authority Acceptance and Routine Maintenance per UL 268.

Alarm Threshold

The Alarm Threshold sets the value by which the signal must drop for the Detector to indicate a fire condition. For example, a threshold of 35% means that a fire will be indicated once the signal level has dropped below 65% and remained below that level for the number of seconds set by the Time Delay to Fire setting.

EN 54-12 Threshold Selection: Only the 25% and 35% thresholds are approved. Both are suitable for separations of 8 m to 120 m (26 ft to 394 ft).

UL 268 Threshold Selection: Select the correct threshold from the table for the installed distance.

Separation between Detector and Reflector	Acceptable Alarm Threshold range	Recommended Alarm Threshold
10 – 17 m (33 – 55 ft)	25%	25%
17 – 26 m (55 – 85 ft)	25 – 35%	35%
26 – 35 m (85 – 115 ft)	25 – 50%	35%
35 – 55 m (115 – 180 ft)	35 – 50%	35%
55 – 91 m (180 – 300 ft)	50%	50%
91 – 120 m (300 – 394 ft)	60%	60%

14. Extra Detector settings (unlocked)



Select the 'Settings' icon and press the 'Tick' key to access the extra settings. Use the 'Left' and 'Right' arrow keys to move between the settings.

Laser

Use the 'Up' and 'Down' arrow keys to switch the Detector laser on and off.



AGC (Automatic Gain Control)

This shows the AGC value. It can be between -49 and +205. A positive value indicates that the signal has been dropping, a negative value indicates the signal has increased (see Section 21: Cleaning).



Latching Alarm Modes

When latched, the Detector can be reset in three ways: entering the passcode, using the External Reset function (see page 08) or by power cycling the Controller. Latching mode cannot be enabled when Ganged Relay Mode is selected (see page 15).



Non-latching (default) mode



Latching mode



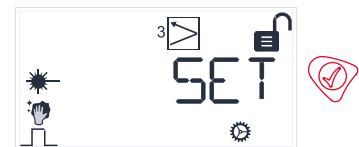
Home

Resets the Beam to its default position prior to alignment. This will reset the Detector to an unaligned state.



Set Compensation

In order to test the obstruction fault detection after aligning a Detector, the Reflector should be covered quickly (clear to covered in under two seconds). The Detector should go into Fault after the Time Delay to Fault period. If the Detector goes into Fire instead then it is likely that there are stray reflections entering the Detector and preventing the signal from dropping to the Fault threshold. This can be overcome by uncovering the Reflector to clear the fire condition and then using the Set Compensation feature. This will tell the Detector that the previously recorded Fire should have been a Fault, allowing the Detector to compensate for the stray reflections. Repeating the obscuration test should then result in a Fault being indicated. This feature can only be used once after alignment and a message "Set Failed 2" is displayed if attempted again.



Detector Serial Number

Displays the serial number of the Detector.



Detector Firmware Version

Displays the version number of the Detector firmware.



15. Event log

The Event Log allows you to access the event logs for each Detector and for the System Controller. Each Detector can store up to 128 events in its log, and the System Controller's log can store up to 600 events.

By selecting 'View' and pressing the 'Tick' key, the events can be viewed. Use the 'Up' and 'Down' arrow keys to step through the Event Log, or 'Left' and 'Right' to scroll between events. Selecting Erase will clear the event log.



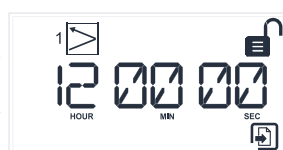
The first event



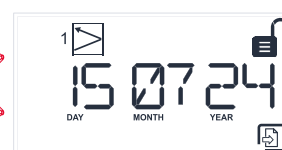
Event information



Time the event occurred



Date the event occurred



Event number followed by the event code

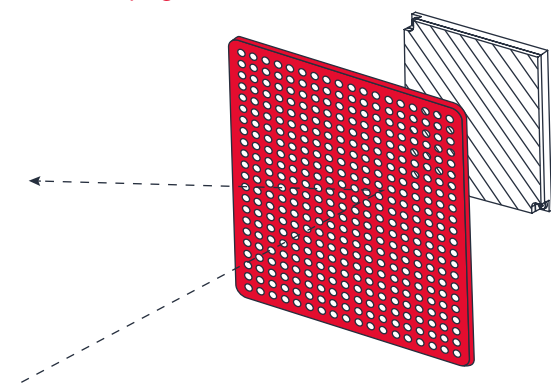
16. Test for Fire and Fault

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

Fire test

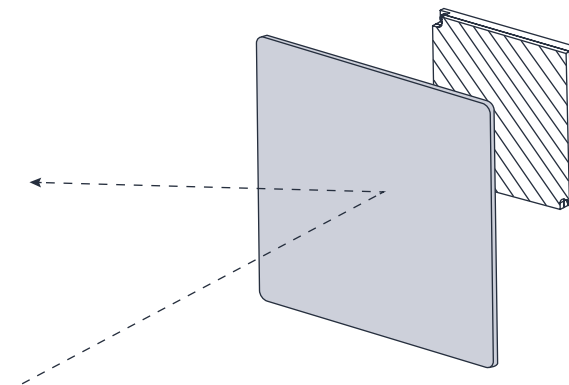
Cover the Reflector with the perforated filter from the Commissioning and Maintenance Kit (1150-000). The Detector will indicate Fire after the 'Time Delay to Fire' period (5 seconds by default). If the perforated filter is not available, cover the Reflector slowly so that it takes longer than 5 seconds to cover.

Note: Commissioning and Maintenance Kits are available to order (see page 20).



Fault test

Cover the Reflector completely within 2 seconds. The Detector will indicate Fault after the 'Time Delay to Fault' period (10 seconds by default). If the Detector goes into Fire instead then it is likely that there are stray reflections entering the Detector and preventing the signal from dropping to the fault threshold. This can be overcome by using the Set Compensation feature (see page 13).



17. System Controller settings (unlocked)

With the System Controller locked, select the Lock icon, press 'Tick' key and enter the passcode to unlock the System Controller.

To access the System Controller settings, select the System Controller icon and press the 'Tick' key. Then select the Settings icon and press the 'Tick' key. Press the 'Right' and 'Left' arrow keys to step through the options. Press the 'Tick' key to select the setting to be changed.

Find Detectors



Repeats the Find process.
See page 10.

Align Mode



Selects the alignment power mode.
See page 09.

Language



Selects the language.
See page 09.

Set Time



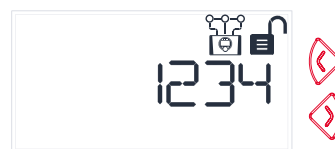
Sets the time and date.
See page 09.

Relay Mode



Use the 'Up' and 'Down' Keys to select between the possible options. See page 17. If the Detectors are not all set to the same latched fire mode only the 'Indiv' option will be available.

Passcode



Change passcode if required, default: 1,2,3,4.

Status LED



Selects whether the green System LED flashes when there are no Fire or Fault conditions.

Temperature



Use the 'Up' and 'Down' keys to switch between Celsius and Fahrenheit.

Hub Serial Number



The serial number of the Hub.

Hub Firmware Version



The version number of the Hub firmware.

AIM Serial Number



The serial number of the AIM.

AIM Firmware Version



The version number of the AIM firmware.

18. System Controller functions (locked)

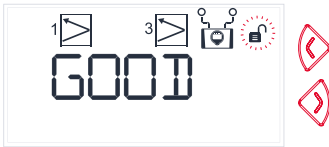
With the Beam aligned (and not in Fault), the System Controller will display the following without entering the passcode. With a blank screen, press the 'Tick' key. This will display the word 'Good' and show the Detectors connected to the System Controller.



To access the Detector settings, select the Detector you want to check and press the 'Tick' key. See below for details.



To view the System Controller settings, select the Controller Icon and press the 'Tick' key. See page 17 for details.



To unlock the Controller, select the Padlock Icon and press the 'Tick' key. Enter the passcode (1, 2, 3, 4 by default) by using the 'Up' and 'Down' arrow keys to set a digit and 'Left' and 'Right' arrow keys to move between digits. Press the 'Tick' key when all four digits have been entered. If the passcode is entered incorrectly four times in a row, the passcode entry screen will be locked for three minutes.

System Controller settings (locked)



With the cogwheel icon flashing, press the 'Tick' key to view the Controller settings below. Pressing the 'Tick' key on any screen will take you to the passcode entry screen so that you can unlock the Controller and change the settings (see Section 17).



With the Event Log Icon flashing, press the 'Tick' key to view the log (see Section 15).

Power Mode

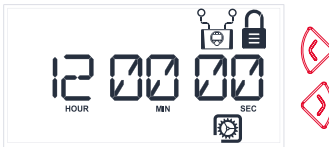


'Fast Align' or 'Standard'
– see page 09.

Date



Time



Relay Mode



'Indiv', 'Ganged Fire', 'Ganged Fault' or 'Ganged'.

Temperature



Status LED



System LED On/Off.

Detector settings (locked)

Pressing the 'Tick' key on any screen other than 'Settings' or 'Event Log' will take you to the passcode entry screen so that you can unlock the Controller and change the Detector's settings (see Section 13).

Detector Signal Strength

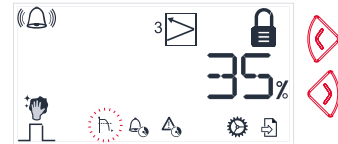


AGC Value



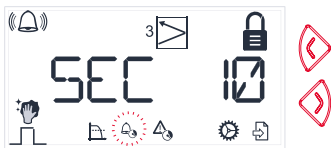
The AGC value can be between -49 and +205. A positive value indicates that the signal has been dropping, a negative value indicates the signal has increased (see Section 21: Cleaning).

Alarm Threshold



Graph icon flashing.

Time Delay to Fire



Bell icon flashing.

Time Delay to Fault



Triangle icon flashing.

Settings



Cogwheel icon flashing. Press the 'Tick' key to access more Detector settings screens (see page 17).

Event Log



Press 'Tick' to view (see Section 15).

Extra Detector settings (locked)

Detector Signal Strength



Detector Temperature



Address Switch



e.g. 1, 2 or 3

19. Prism Targeting

Prism Targeting should only be used when the laser cannot be seen, for instance in high ambient lighting conditions or over very long distances.



Press 'Tick' to select the Detector to align, press 'Tick' again to unlock the Controller by entering the passcode. The default passcode is 1,2,3,4.



Press the 'Left' and 'Right' arrow keys to select the 'Targeting' icon, and press the 'Tick' key. Press the 'Down' key to select Prism Targeting. Press the 'Tick' key again to confirm.



Use the arrow keys to move the Detector in one axis until the number displayed increases. If the number stays the same, keep going in the same direction. If the number decreases, then reverse direction. Once the number starts to increase, keep going until the number starts to decrease again, at which point reverse the direction for two steps and perform the same process in the other axis.

If Prism Targeting has been performed on both axes, and the number is above 400, cover the Reflector(s) with a non-reflective material and check the signal drops to less than half the uncovered value. If the signal does not drop then the light received by the Detector is being reflected by some other object in or around the beam path. Take care to make sure there are no reflective objects within 0.5 m (20") of the centre of the beam path, and try again.

When the number is as high as possible and drops by over half when the Reflector is covered, press 'Tick' to complete the process. If the number is below 400 then ensure the following:

- The correct number of Reflectors for the range has been used
- The distance has not exceeded the maximum (120 m / 394 ft)
- The Reflector and Detector are parallel to each other.

20. Manual alignment

After completing the Laser Targeting process as described on page 17, use the 'Down' key to switch from 'Auto' to 'Manual' and press the 'Tick' key to confirm.

Use the arrow keys to move the Detector in the up-down axis. First, use the 'Down' key. Press it once, and wait to see how the number on the display changes. If the number decreases, the signal is smaller and the Detector has moved away from the Reflector(s). Using the arrow keys, reverse direction for 2 steps. If the number increases, the signal is larger and the Detector is moving closer to the Reflector(s). The next movement must be in the same direction. Keep moving the Detector, and:

- If the number continues to increase, keep going in the same direction.
- If the signal does not change, no further movement in that axis is needed so move onto the other axis.
- If the number decreases move back in the opposite direction once, then move onto the other axis

Follow the same process, this time in the left-right axis. Start by moving in the left direction, and follow the same procedure as for the up-down axis.

Once the highest value possible has been obtained (should be over 400), cover the Reflector(s) with a non-reflective material and check the signal drops to less than half the uncovered value. If the signal does not drop then the light received by the Detector is being reflected by some other object in or around the beam path. Take care to make sure there are no reflective objects within 0.5 m (20") of the centre of the beam path, and try again.

When the manual value is as high as possible and drops by over half when the Reflector is covered, press 'Tick' to complete the alignment.



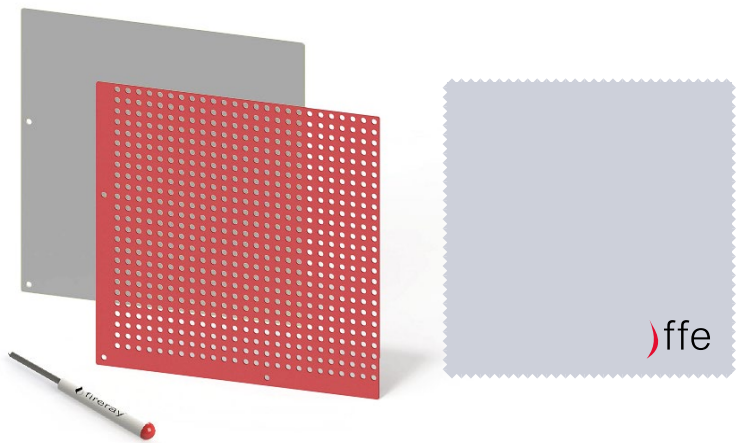
21. Cleaning

The Detector will automatically compensate for dust build-up by changing its AGC (Automatic Gain Control) level. This feature keeps the Beam's signal at 100% +/- 2%. Once the minimum or maximum limit (-49 and +205) has been reached, the Detector will indicate a Fault and cleaning must be performed.

It is recommended that the Detector lens window and Reflector are periodically cleaned with a soft lint-free cloth to prevent AGC limit faults occurring.

After cleaning, if the Detector is in a Fault state, the signal strength may have increased above the 'signal too high' threshold. If this is the case, re-align the Detector.

Note: Commissioning and Maintenance kits are available to order. Includes cleaning cloth. Part No: 1150-000.



22. Error codes

E-00	AIM not communicating.	Refer to manufacturer for further technical assistance.
E-01	Detector communications Fault.	Check wiring between Controller and Detector.
E-02	Detector replaced or 'Find' not successfully executed.	Follow 'Find' process.
E-03	Compensation limit reached.	Clean and re-align system.
E-04	Missed too many readings.	Check power supply to the Controller and wiring between Controller and Detector.
E-05	Detector is not aligned.	Follow alignment procedure.
E-06	Rapid obscuration fault.	Ensure clear line of sight between the Detector and the Reflector.
E-07	Signal high fault.	Ensure there is no stray light from another source.
E-18	Short circuit detected on communications between Controller and Detector.	Check wiring between Controller and Detector.
E-20	Ambient light fault.	Check there are no strong sources of light near the Detector, or direct sunlight.
E-21	Power too low fault.	Check power supply to the Controller.
E-26	Internal controller fault.	Refer to manufacturer for technical assistance.

Equipment disposal

Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points. For more information see: www.recyclethis.info

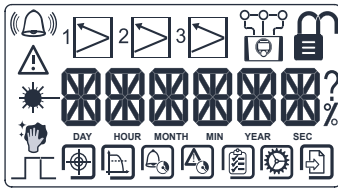


For help contact Technical@ffeuk.com or visit our website at www.ffeuk.com

23. Factory reset

The System Controller can be reset to its factory default settings. This may be necessary if a controller is moved to a new location, or if the passcode has been forgotten. This process will also reset all connected Detectors to their factory default settings and put them into an unaligned state. The full setup and alignment process will need to be carried out again.

To carry out a factory reset, hold down the 'Cross' key for 8-10 seconds until the system restarts. As the system starts up, all the segments on the LCD display will be switched on for three seconds.



During this period, hold down the 'Tick' and 'Cross' keys simultaneously to display the Reset screen.

If the 'Tick' key is now pressed, the Controller and any attached Detectors will be reset to their factory defaults and the system will restart from the language selection screen (see page 09).

RESET ?

24. Glossary of terms

AGC (Automatic Gain Control):

This function keeps the signal strength at 100% ($\pm 2\%$) and can boost or reduce the signal as required. (Limits -49 to +205.)

Power mode:

Can be 'Fast Align' or 'Standard'. See Page 09.

Relay mode:

This can be one of the following options:

- 'Individual' – the Fire and Fault relays for each Detector operate independently.
- 'Ganged' – the Fire and Fault relays work together. If any Detector is in a Fire state, all the Fire relays close, and if any Detector is in a Fault state (but no Detector is in Fire) all the Fault relays close.
- 'Ganged Fire' – the Fire relays work as one but the Fault relays work independently.
- 'Ganged Fault' – the Fire relays work independently but the Fault relays work as one (except that a Fire state will take priority for the Detector position that is in Fire).

Fault/trouble:

For the purposes of this manual, the term 'Fault' should be considered equivalent to 'Trouble' in those markets where this is the preferred term.

AIM (Application Interface Module):

A module inside the Hub System Controller that controls the Fire and Fault relays.

25. Technical specification

Firearay Hub Reflective – Reflective Detectors Parameters	Min	Typical	Max	Unit
Operating voltage	14	-	36	V
Operating current fast align mode (while aligning or LCD backlight is on)	31	33	35	mA
Operating current (one Detector)	12.0	12.5	13	mA
Operating current (two Detectors)	14.5	15	15.5	mA
Operating current (three Detectors)	17	17.5	18	mA
Response thresholds (note – only 25% and 35% are EN 54-12 approved)	0.46 10	1.87 35	8.24 85	dB %
Delay to Alarm. Note: The Firearay Hub Reflective is approved to EN 54-12 with a delay to fire of 5 seconds	2	5	30	s
Delay to Fault	2	10	30	s
Operating distance (Separation between Detector and Reflector) * *	8	-	120	m
4 Reflectors required for >50 m (>164 ft)	26	-	394	feet
Rapid obscuration fault threshold	-	85	-	%
Maximum angular alignment range of Detector	-	-	±4.5	Deg
Tolerance to beam misalignment (per EN 54-12) – Detector	-	±0.5	-	Deg
Tolerance to beam misalignment (per EN 54-12) – Reflector	-	±5	-	Deg
Optical wavelength	-	850	-	nm
Operating temperature	-10 +14	- -	+55 +131	°C °F
Storage temperature	-40 -40	- -	+85 +185	°C °F
Relative humidity (non-condensing)	-	-	93	%RH
IP rating (Detector)	-	IP55*	-	-
IP rating (Controller)	-	IP65*	-	-
Fire & Fault relays (VFCO, resistive) – contact voltage	-	-	36	Vdc
Fire & Fault relays (VFCO, resistive) – contact current	-	-	1	A
Cable gauge	24 0.5	- -	14 1.6	AWG mm
Housing flammability rating	-	UL940 V0	-	-

* IP rating is not EN54 approved

* * For UL approved installations, the minimum separation between Detector and Reflector is 10m (33ft).

26. Open source notice

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