Fireray One
Technical notes

1. Fireray One Technical Notes:

If the Fireray One sets up the first time, then the only issue the engineer will have will be to connect to the Fire Panel, but this will be no different to the other FFE Beams (see General Comments at the end of the document).

At power-up, you need to move the Slide Switch from left to right and back to left again to operate the laser.

Notes on alignment:

1. Prism Targeting:

This function would be used if there is either too much background light to see the laser or if there are a lot of obstructions, such as girders, that are close to the Fireray One's 'line of sight' (1M in diameter) and which may block the laser on its way to the Reflector. If there is a lot of space between the 'line of sight' and the nearest obstruction, then the Prism Targeting should be easy as there will be nothing to miss-align onto. It is important, however, to cover the Reflector(s) at the end of the Prism Targeting process to check that the alignment has been successful. The Amber LED on the underside of the Fireray One will flash every 10 seconds.

Set the Targeting Switch from 'Laser' to 'Prism'.

(Ignore the Right Hand Green LED when in Prism Targeting, it will flash constantly).
The Left Hand Green LED and Middle Amber LED will both flash together at this point. Wait for them to go out before starting the alignment (this should only be a few seconds).

There is no right or wrong process that this point. You use the up, down, left and right buttons to get the Left Hand Green LED to be on solid. It is important to not press the buttons too quickly at this point, what you do is press a button and wait for the left and middle LEDs to respond (this will take about a second) before continuing. You may not need to go in all 4 directions to get the Left Hand Green LED on solid. What the Left Hand Green and Middle Amber LEDs do are as follows:

No Infra-Red signal coming back from the Reflector will result in neither the Left Hand Green LED or the Middle Amber LED flashing.

A weak IR signal will cause the Amber LED to flash.

An increase in Infra-Red signal will result in the Green LED flashing once, then the Amber LED will flash. (so, continue in this direction until either the Green LED goes solid (Prism Targeting is finished) or stops flashing, in which case stop and use the buttons on the opposite axis to get a Left Hand Solid Green LED).

A good Infra-Red signal will cause the Green LED to go solid. If the Green LED stays on, stop and then block the Reflector to make sure you are getting the Infra-Red signal back from the Reflector. What you are looking for is for the Green LED to go out, you will either see no LEDs at this point or a flashing Amber LED. (If the Green LED does not go out, it is possible to have aligned onto a shiny surface such as a window, steel ducting or cling-film, in which case you will have to repeat the process).

Set the Slide Switch to 'Operate', to complete the Alignment. (You can leave the Targeting Switch set to Prism). If this test passes, you will hear the Fault relay change state and then the Green LED on the underside of the Fireray One will flash every 10 seconds.

2. Manual Alignment:

This function would be used if the Auto alignment has failed (I would try 3 Auto Alignments before giving up). Check that the correct number of Reflectors are being used for the distance covered and that the 'line of sight' is 1M (the further the distance, the more important the 1M distance becomes). The 'line of sight' should not have anything (even cables or steel rods) in it. Shiny surfaces along the Beams path or near the Reflector(s) could also cause a failure. The Amber LED on the underside of the Fireray One will flash every 10 seconds.

Target the laser onto the Reflector.

Set the Alignment Switch from 'Auto' to 'Manual' and set the Slide Switch to 'Operate'

(Ignore the Right Hand Green LED when in Manual Alignment, it will flash constantly).

The Left Hand Green LED and Middle Amber LED will both flash together at this point. Wait for them to go out before starting the alignment (this should only be a few seconds).

Again, there is no right or wrong process at this stage, you must press the up, down, left and right buttons (again wait for an LED to come on before you press a button again) and the results you are looking for are as follows:

Left Hand Green LED comes on = Infra-Red signal is going up.

Middle Amber LED comes on = Infra-Red signal is going down.

Both Left Hand Green and Middle Amber LEDs come on = Infra-Red signal did not change, now do the same procedure with the opposite axis.

When both axis have been done, stop and set the Alignment Switchback from 'Manuel' to 'Auto'. The Right Hand Green LED will then flash 10 times and you will hear (if quiet enough) the Fault relay change state. The Green LED on the underside of the Fireray One will now flash Green every 10 seconds.

3. Testing for Fire and Fault:

(As of the day of writing, several Fireray Ones (when aligned over 100M) have gone into Fire when the Reflectors have been covered instead of 'Fault'. R&D is looking into a solution for this, so now the best advice is to leave the Fireray One as it is).

To test for fault is easy, you completely block the Reflector(s) instantaneously with a non-reflective material (such as cardboard). After 10 seconds, the Fireray One should go into Fault. The Amber LED on the underside of the Fireray One will flash every 10 seconds and the fault relay will open. The Fire Panel should then go into fault. If not, there could be a wiring problem of the wrong EOL (End of Line) device is fitted.

To test for Fire, you need to cover roughly ¾ of the Reflector(s) and after 10 seconds, you will get a Fire. The Red LED on the underside of the Fireray One will flash every 10 seconds and the Fire relay will close. The Fire Panel should then go into fire. If it doesn't again, there could be a wiring issue, or the fire resistor

is the wrong value or not fitted correctly.
Both Fire and Fault should reset after removing the object used to cover the Reflector. If not, check latching alarms switch has not been set.

4. General Comments on the Fireray One:

If there's a comms fault between the Smart Base and the Detector (RDH, Reflective Detector Head), you will see the middle (Amber) LED flash constantly on and off. The whole of the Fireray One will need to be replaced.

The Status LEDs on the underside of the Detector will work as follows:

- Green LED flashing every 10 seconds = Detector OK.
- Red LED flashing every 10 seconds = Fire.
- Amber LED flashing every 10 seconds = Signal low or high.
- Amber LED flashing every 5 seconds = AGC limit reached.
- Amber LED flashing every 3 seconds = Internal fault. This will be terminal and the whole of the Fireray One will need to be replaced.

One engineer I was speaking to was speaking to commented on the fact that while the Fireray One went into fire when tested, the fire panel did not. This indicated that there was a problem with the wiring, the value (or position) of the fire resistor or the fire relay may not be working. Usually, this should be easy to solve, but as the relays, wiring and resistors are hidden behind the Detector, this was a little tricky to resolve. The engineer left the Detector (AKA the RDH) dangling from the Smart Base with the risk of it dropping to the ground.