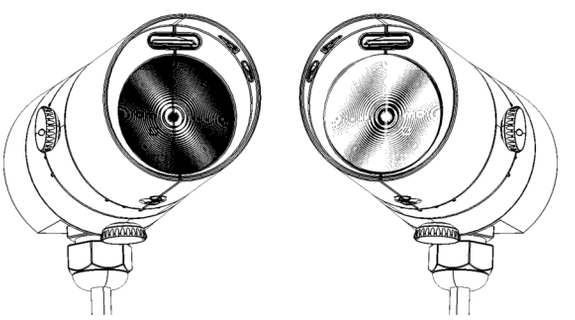
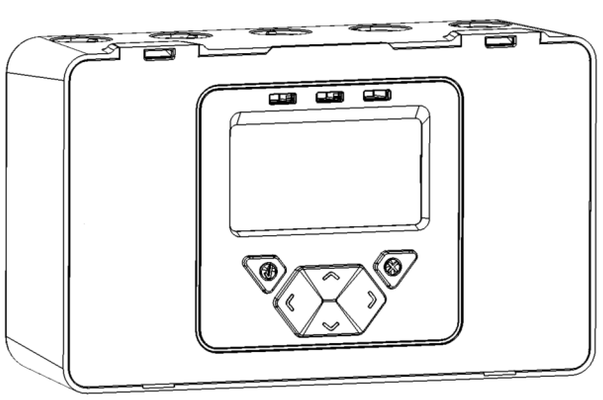
End To End
Optical Beam Smoke Detector

INSTALLATION MANUAL

EN





Document Number: 0044-047-01-EN

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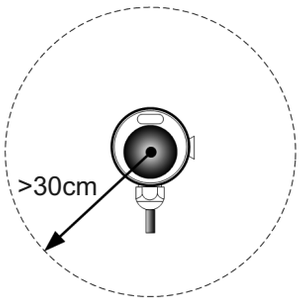
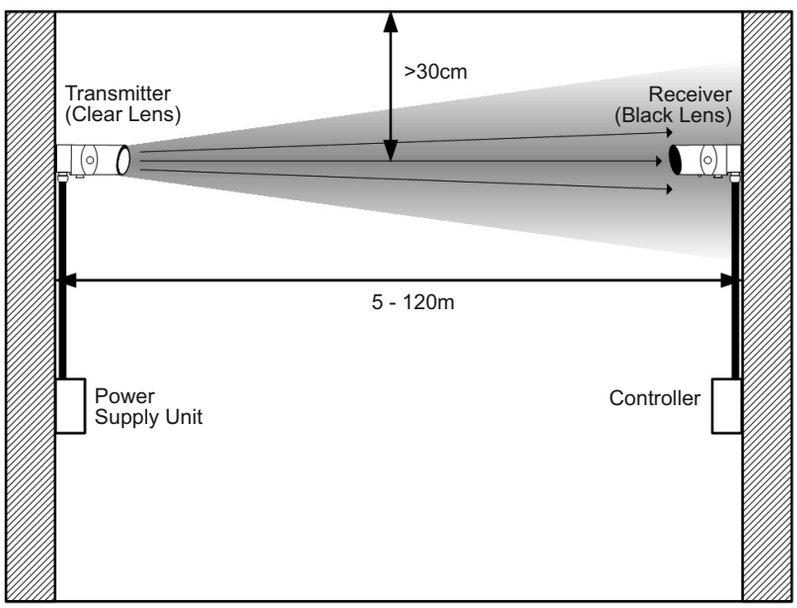
1. Installation

1.1 Mounting and Positioning

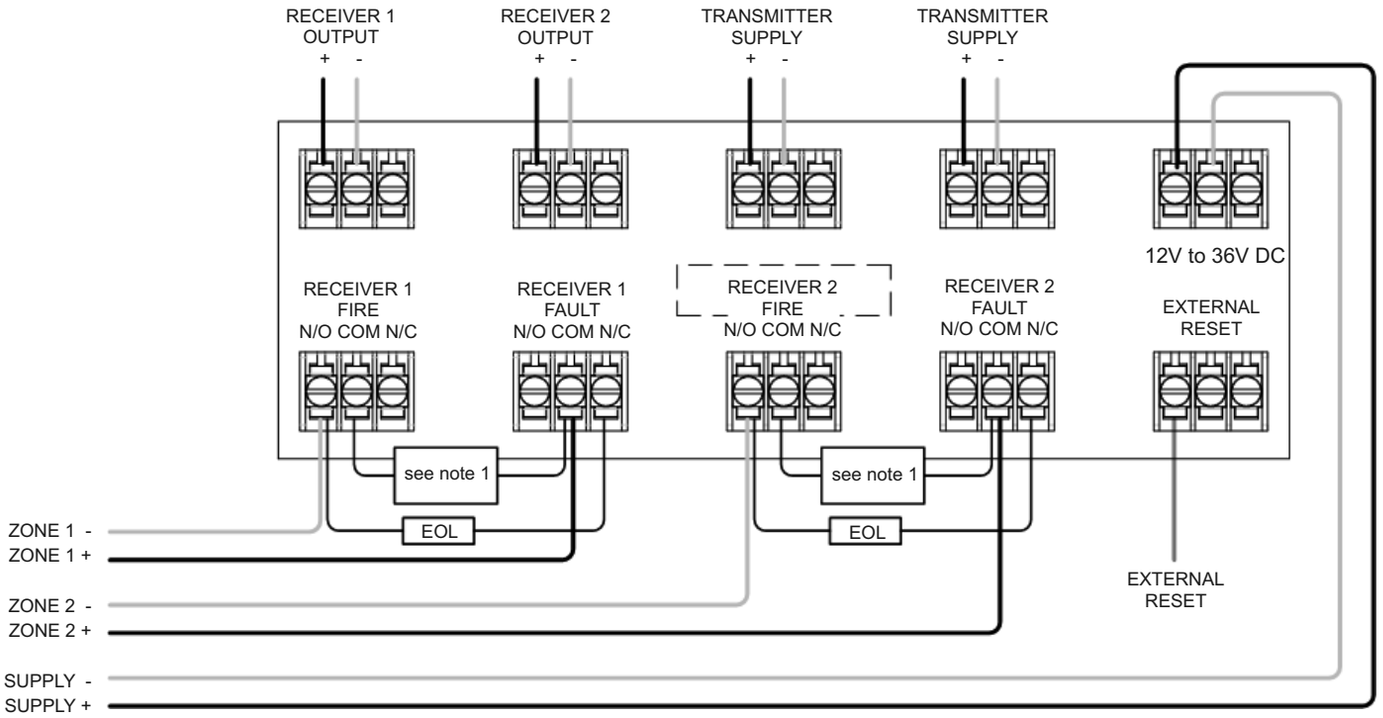




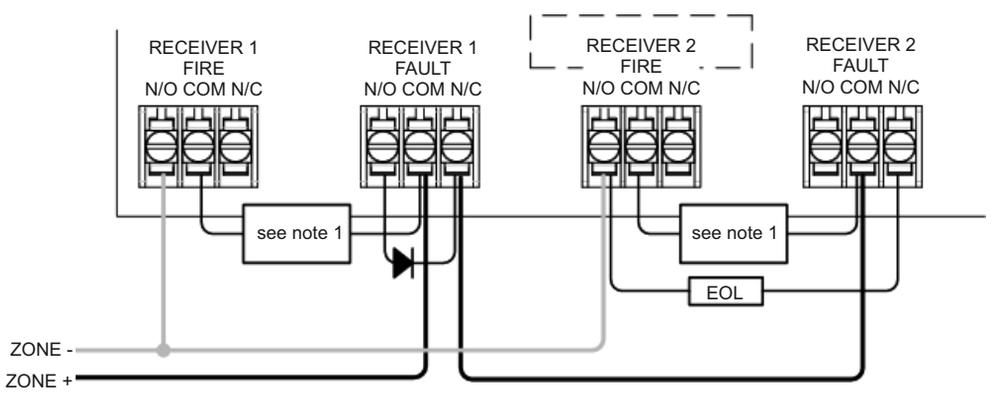
- **IMPORTANT NOTE: The infrared beam path MUST be kept clear of obstructions at all times! Failure to comply may result in the system initiating a Fire or Fault signal.**
- Check the beam spacing against local regulations
- Ensure clear line of sight from Receiver to Transmitter
- Mount on solid surfaces (structural wall or girder) and ensure fixing is rigid
- Position beam as high as possible, but with a minimum distance of 30cm from Receiver/Transmitter to ceiling
- For installations complying with UL 268/NFPA 72, the maximum distance of Transmitter and Receiver from the ceiling must be 10% of the distance between floor and ceiling
- Mount Receiver and Transmitter directly opposite each other
- Do NOT position where personnel or objects can enter the beam path

1.2 Wiring Diagram

For connection of Receivers to individual zones:

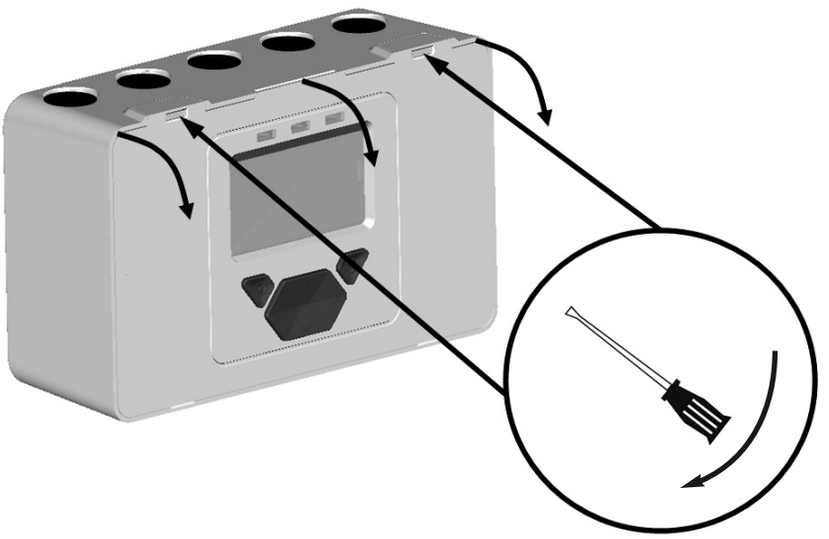


For connection of both Receivers to one zone:

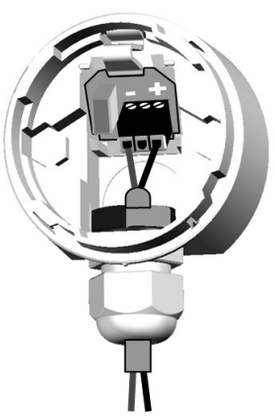


- Note 1: This component is the fire resistor. Its value is specified by the Fire Control Panel manufacturer. For U.S. installations it is typically a short circuit
- ALWAYS use a separate 2-core cable for each Receiver head
- CAUTION: For system monitoring - Do not use looped wire under any terminals. Break wire run to provide monitoring of connections
- Components not supplied:
  - Schottky Diode - Typically 60V, 1A (UL-rated for installations conforming to NFPA 72)
  - End Of Line ('EOL') component - supplied by Fire Control Panel manufacturer
  - Fire Resistor not supplied
- After installation, check operation of Fire and Fault connection on Fire Panel

1.3 Fitting the Product

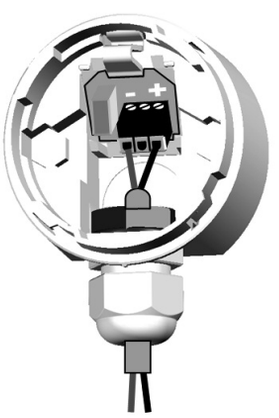


RECEIVER:

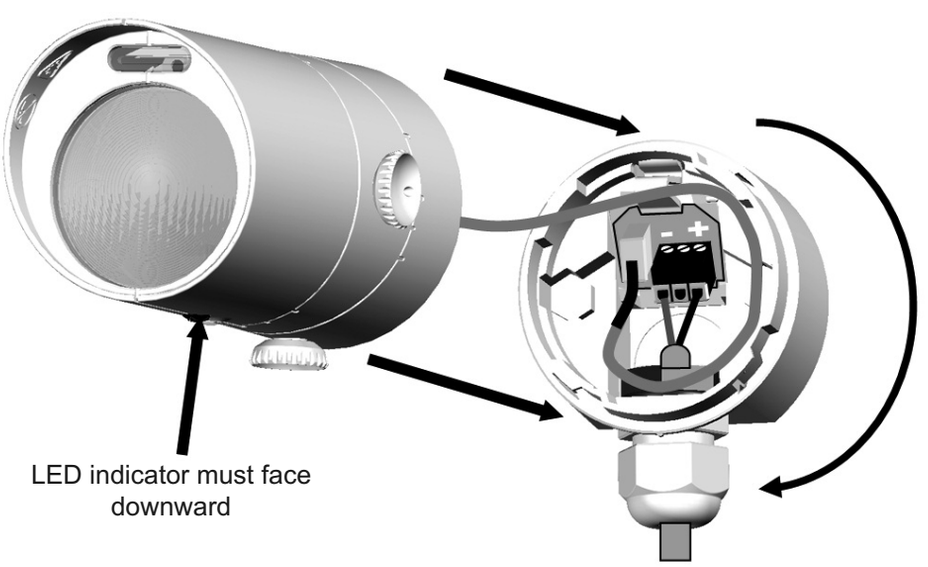


- +
TO RECEIVER
OUTPUT ON
CONTROLLER
BOARD

TRANSMITTER:



- +
TO
12 to 36V DC OR
SUPPLY ON
CONTROLLER
BOARD

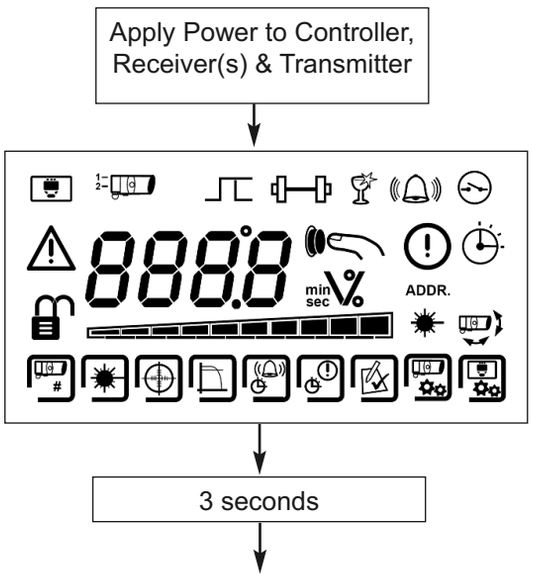


LED indicator must face
downward

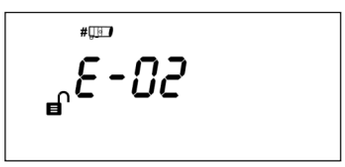
2. Commissioning

2.1 Apply Power

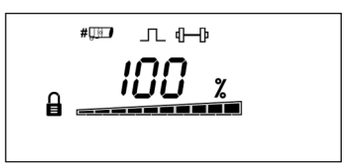
NOTE: One System Controller can be used to control and monitor up to two Receiver heads. The '#' symbol in this guide is used to represent the number of the Receiver currently selected (1 or 2).



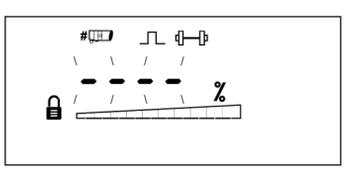
- Receivers are not found (normal at this stage):



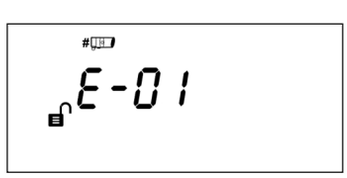
- Commissioned System:



- Receivers have been found but not commissioned:

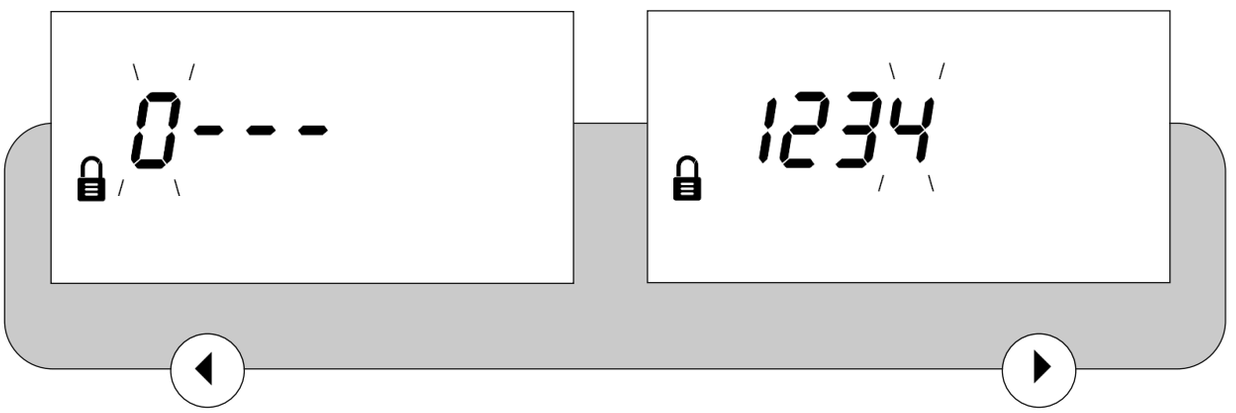


- Communications fault, or no Receiver connected:



2.2 Enter Pass Code to Access Engineering Menu

To enter PASS CODE SCREEN in USER MENU



Default Pass Code: **1 2 3 4**

Change digit

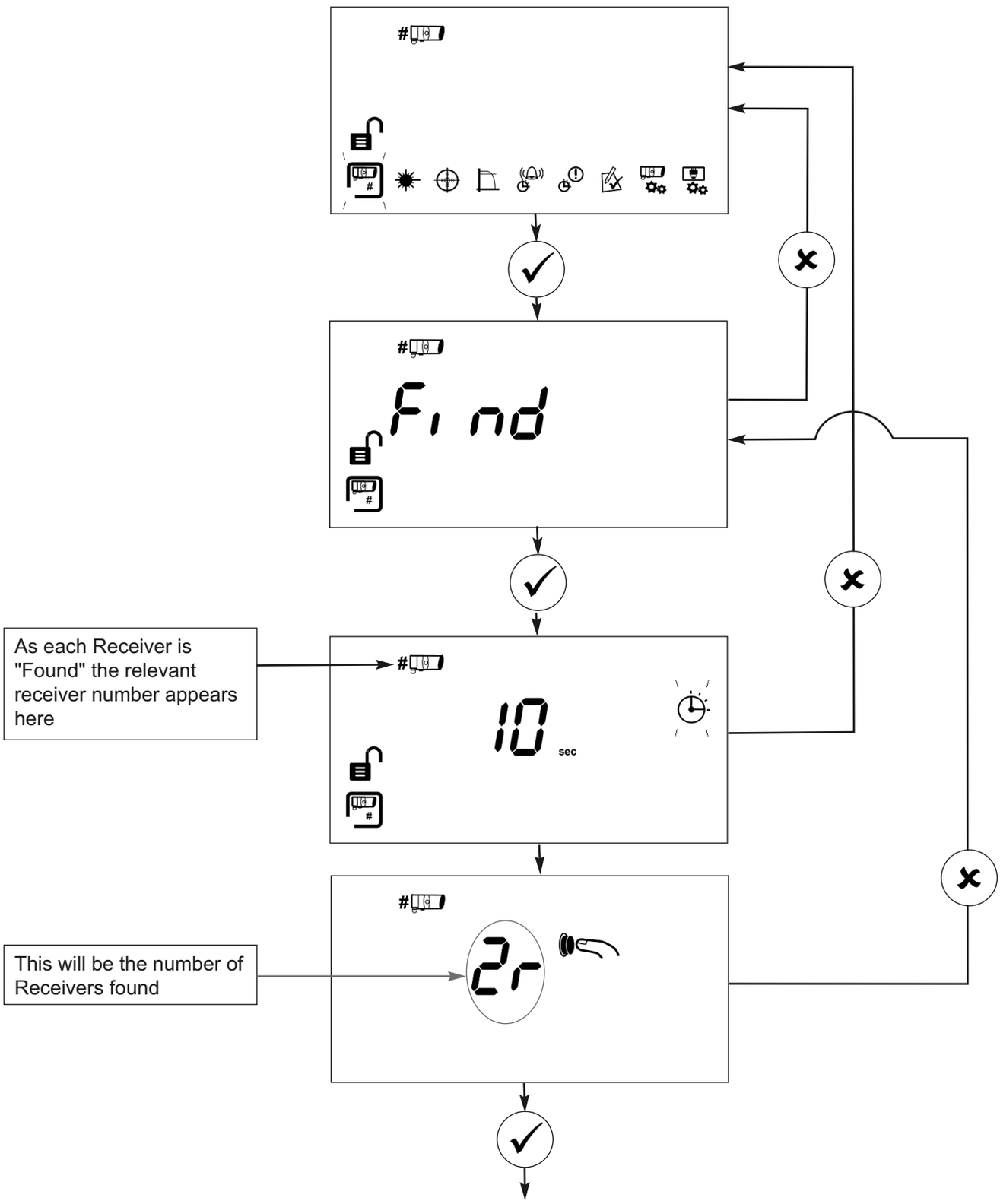
Move between digits

Accept

- An incorrect Pass Code will return the display to the Pass Code entry screen
- A partial passcode (ie. with dashes in it) will not be accepted
- Three incorrect attempts will lock access for three minutes

2.3 Finding Receivers

- Perform 'Find' during initial installation, or when adding or removing Receivers

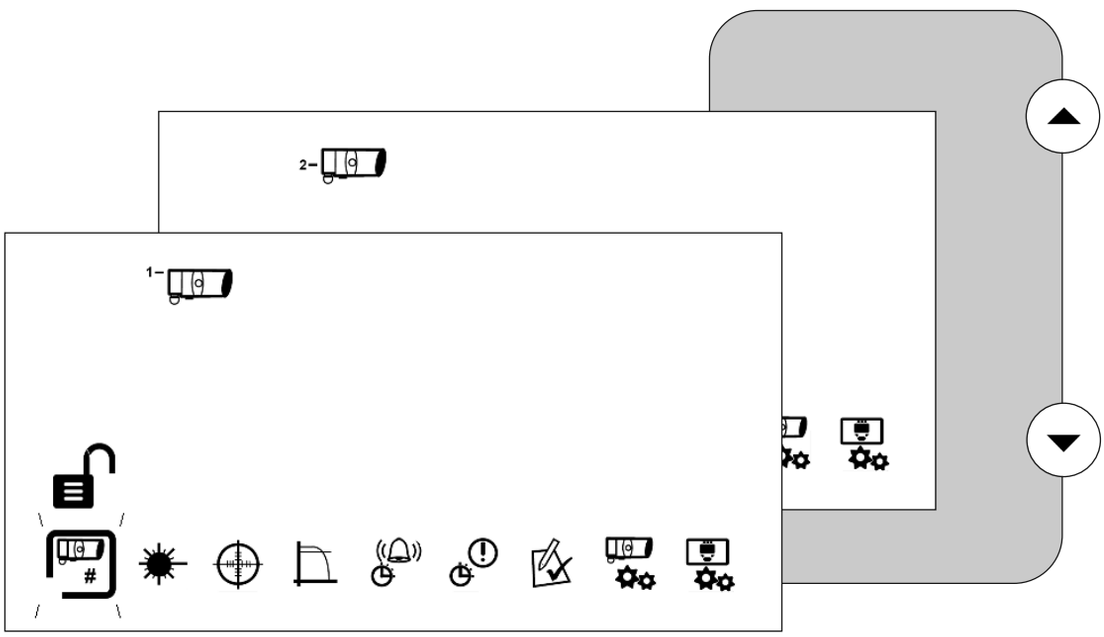


- Press tick to enable ‘Found’ Receivers
- Any unused Receiver channels are switched off

To re-scan if the number is incorrect

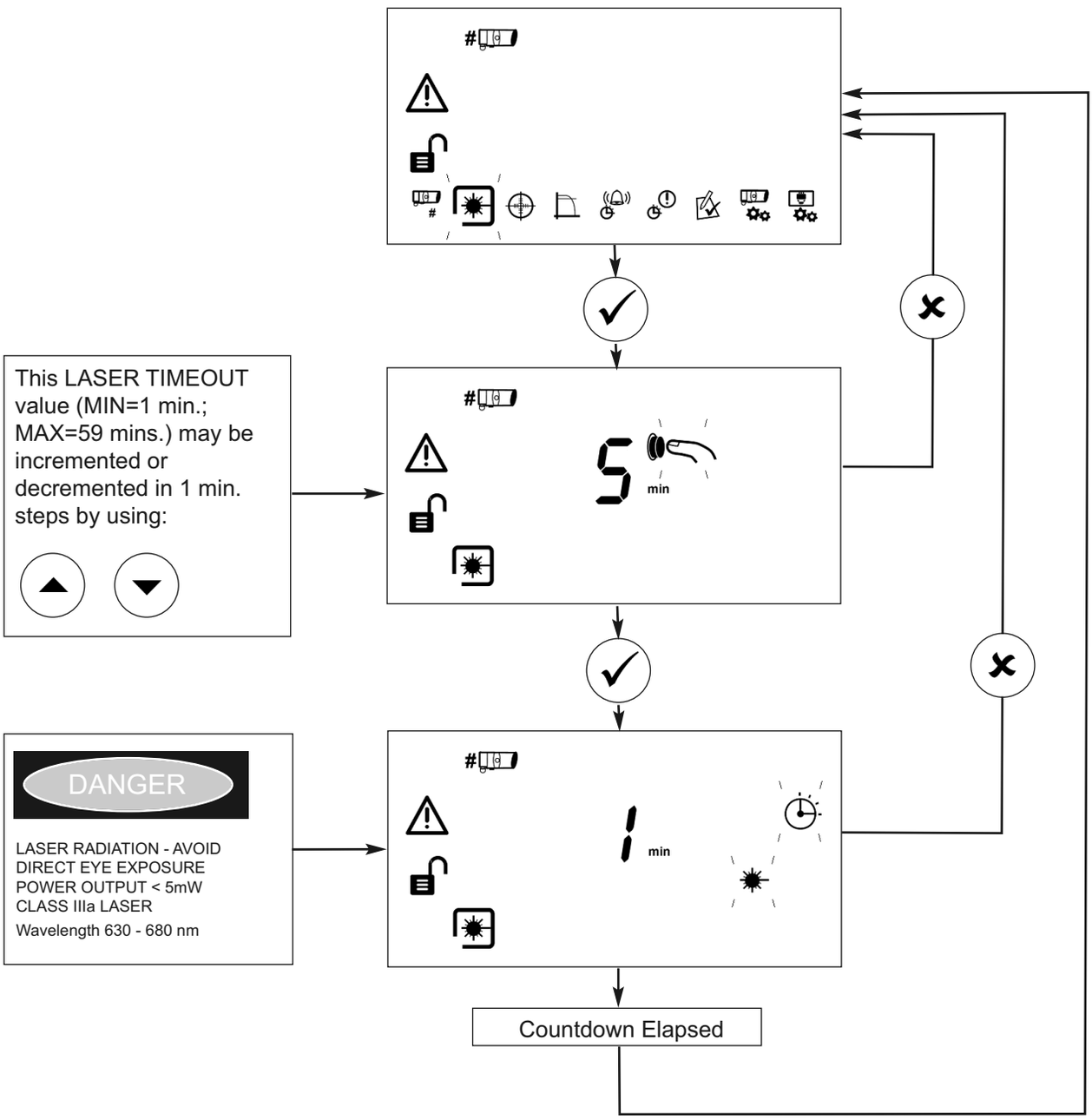
2.4 Select Receiver to be Accessed

- All Receivers need to be aligned separately
- The following sections in this User Guide explain how to align individual Receivers



2.5 LASER Targeting

- The LASER in the Receiver head is used to align the Receiver with the Transmitter.
- The LASER can be activated using the button on the Receiver head whilst in Engineering Menu, or via the LASER icon in the ENGINEERING MENU as shown below.
- Move the LASER as close to the Transmitter as possible, by moving the Receiver's thumbwheels
- The system will signal Fault while in this mode

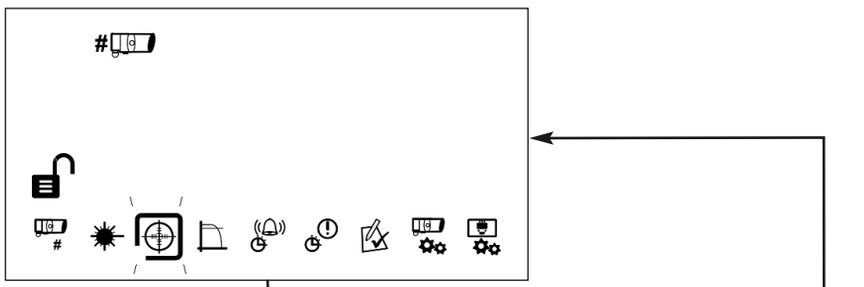


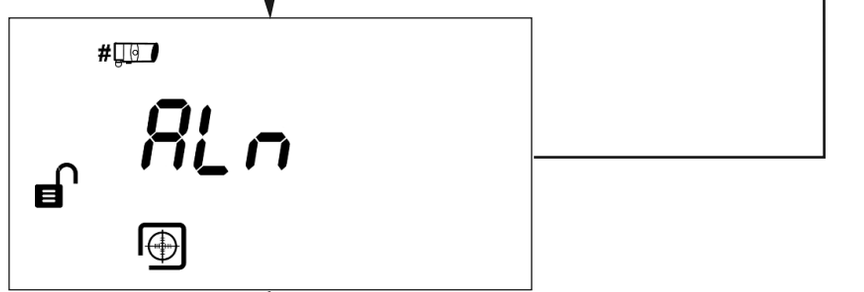
If it is not possible to see the LASER because of the installation environment (for example, if there is high ambient light) then mechanically align the Receiver by eye so that it is pointing at the Transmitter.

2.6 Alignment

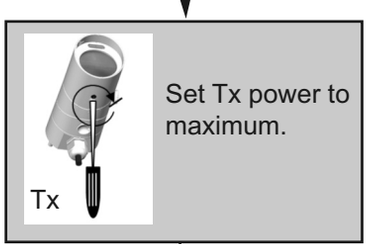
Step 1

In alignment mode you are centring the Transmitter beam onto the Receiver and the system is adjusting its power for optimum signal.



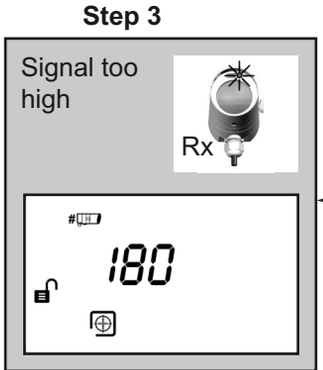


Step 2



NOTE 1: Value can be between 2 and 178. A higher value means a better alignment.

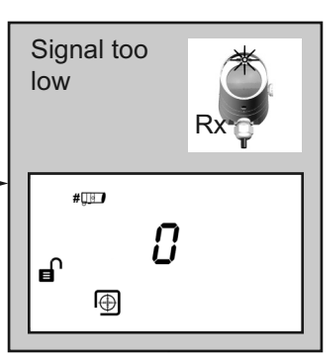
Step 3



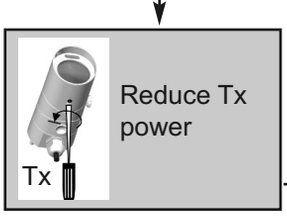
Green - short/long flash

View LEDs on Rx or LCD value

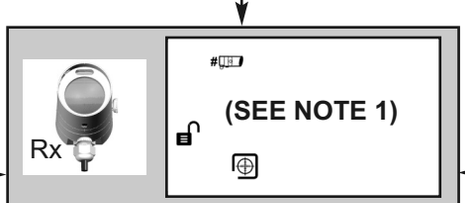
Amber - short/long flash



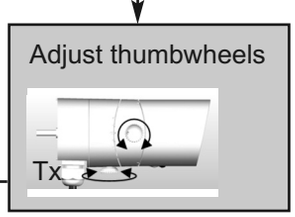
No flash



No flash



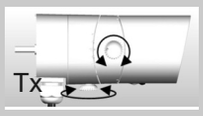
No flash



Proceed to Step 4

Step 4

From Step 3



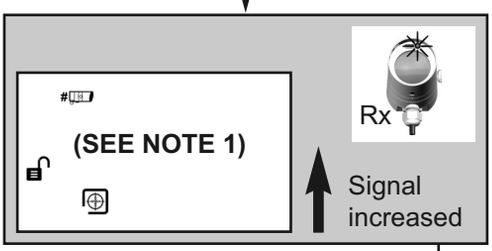
Adjust one thumbwheel by 1/4 turn.

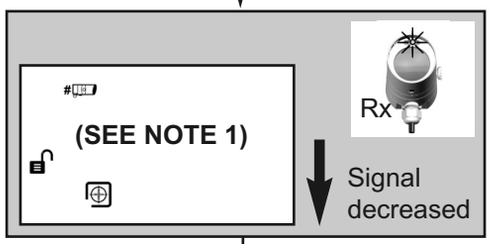
NOTE 1: Value can be between 2 and 178. A higher value means a better alignment.

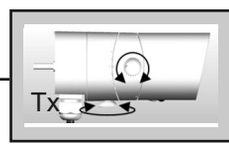
View LEDs on Rx or LCD value

Green - flash/stop

Amber - flash/stop

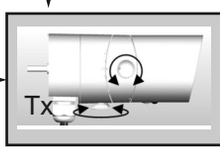






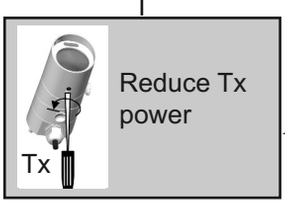
Adjust same thumbwheel by 1/4 turn in the opposite direction.

Green - flash/stop



Adjust same thumbwheel by 1/4 turn in the same direction. Release thumb-wheel and wait 1 second.

LED - no flash
LCD = between 2 and 178



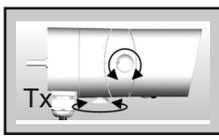
Reduce Tx power

Green - short/long flash
LCD = 180

View LEDs on Rx or LCD value

Green - flash/stop
LCD value increases

Amber - flash/stop
LCD value decreases



Adjust same thumbwheel by 1/8 turn in the opposite direction

Repeat step 4 for the other thumb-wheel

Press tick to accept alignment

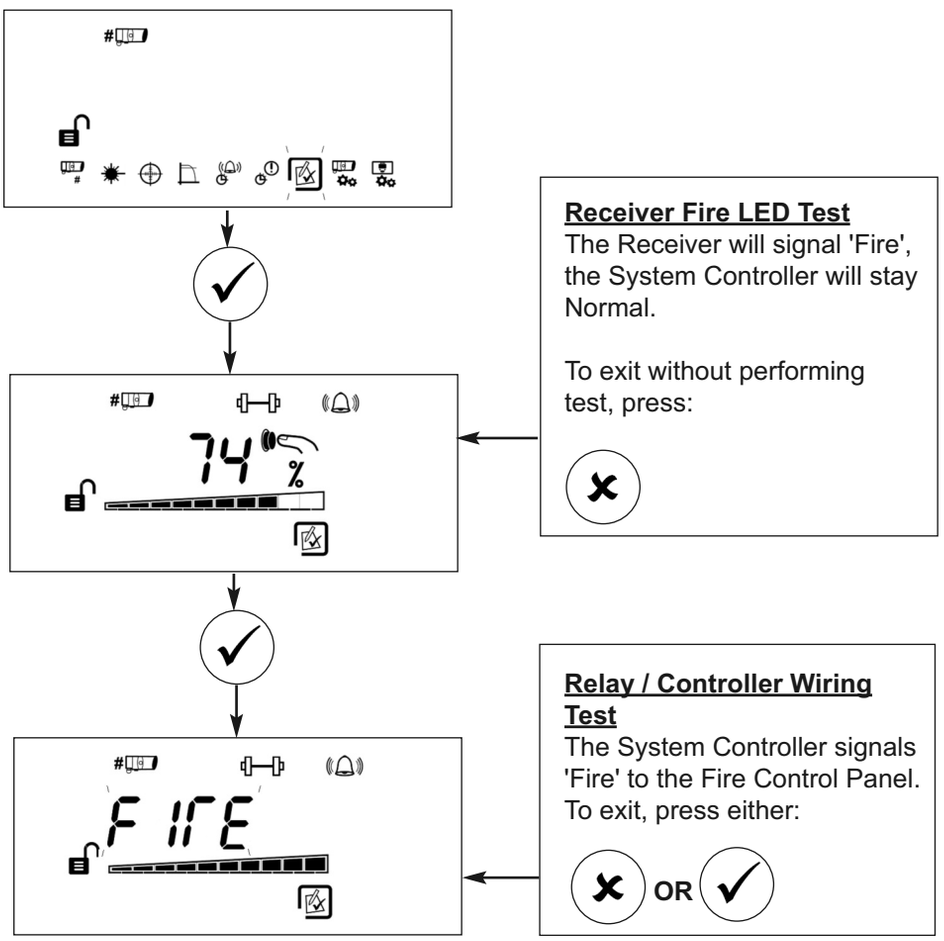
2.7 Fire and Fault Tests

- After alignment or maintenance, it is recommended that Fire and Fault tests are performed:

2.7.1 Remote Fire Test

The Remote Fire Test allows the user to perform a Fire Test from the System Controller.

The Remote Fire Test is acceptable for Fire Authority Acceptance and Routine Maintenance per UL 268-5.



2.7.2 Fault Test

Completely cover the Receiver taking less than 2 seconds to do so. The Controller will indicate Fault after the Fault Delay time.

Uncover the Receiver. The Controller will return to Normal state after approximately 5 seconds.

2.7.3 Manual Fire Test

Although the Remote Fire Test adequately tests the Fire response of the system it is also possible to perform a Manual Fire Test.

Slowly half-cover the Receiver. The Controller will indicate Fire after the Fire Delay Time.

Uncover the Receiver. The Controller will return to Normal state after approximately 5 seconds.

If Fire Latching Mode is set to ‘On’ then clear the Fire condition by:

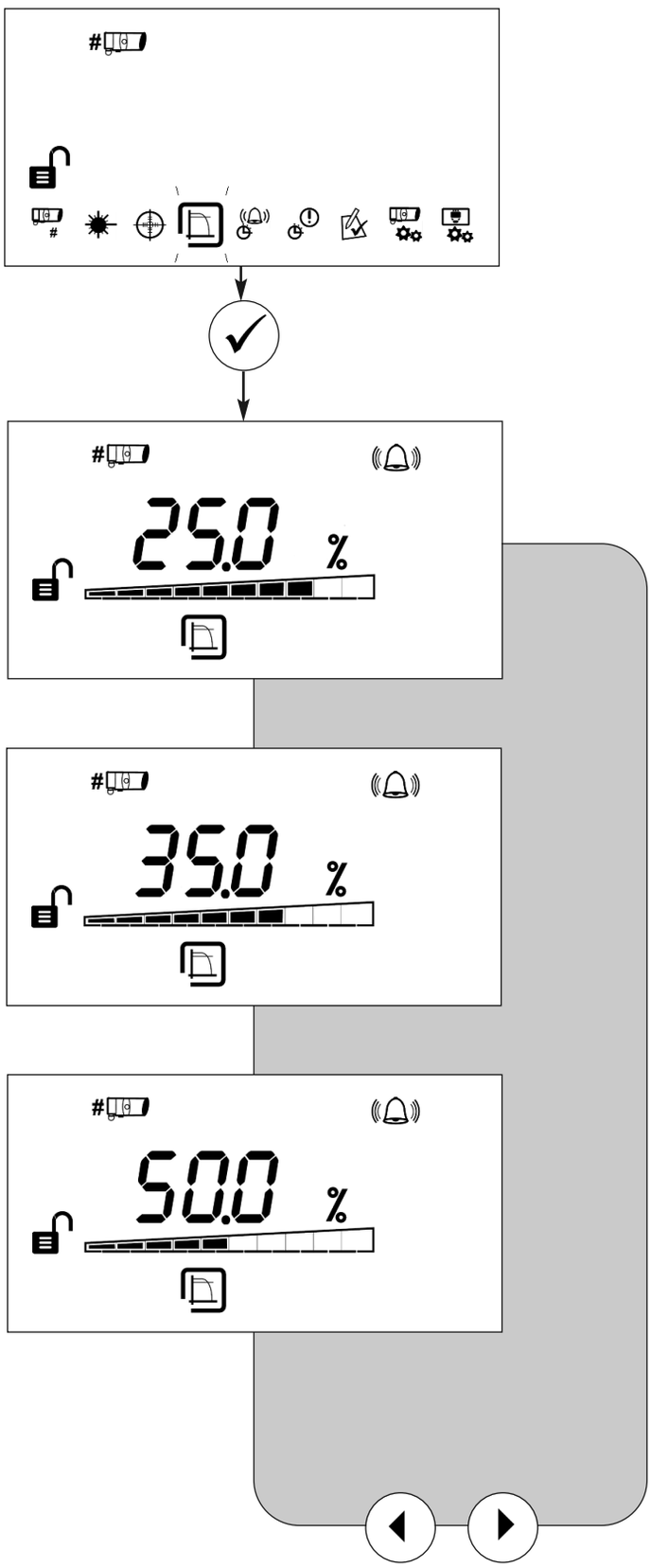
- Applying a voltage between 5V and 40V to the external reset terminal
- Entering the Pass Code
- Disconnecting the power to the Controller for more than 20 seconds. System will clear latched fire when power is re-applied.

3. In Use

3.1 Settings

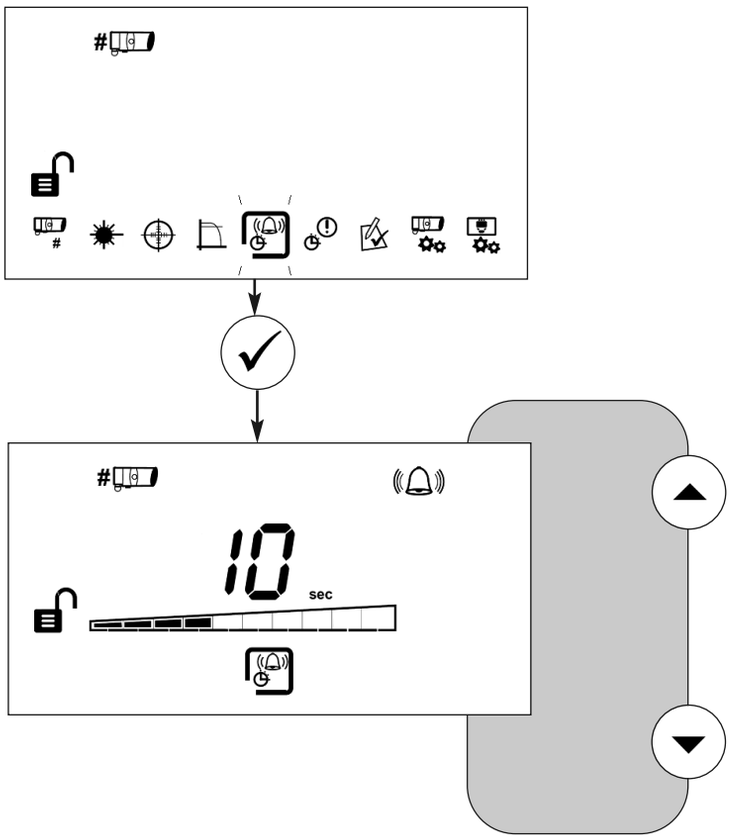
3.1.1 Fire Threshold

This setting is the threshold at which the Receiver will detect a fire. Default factory setting=35%.
(Set for each Receiver).



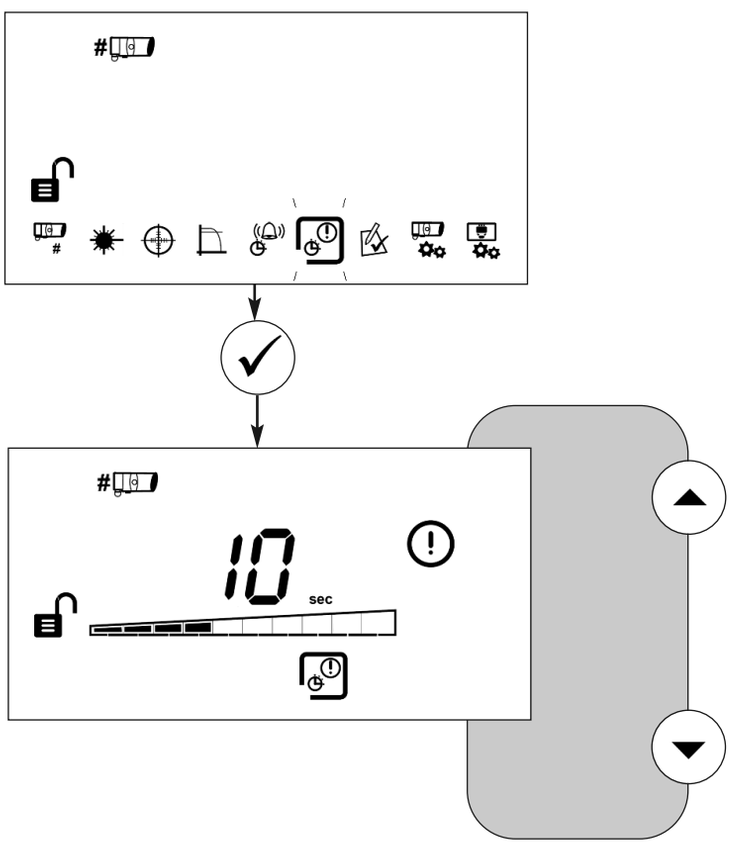
3.1.2 Delay To Fire Screen

This setting is the delay the System Controller uses before signalling a FIRE condition to the Fire Control Panel. Default factory setting=10 seconds.
(Set for each Receiver).



3.1.3 Delay To Fault Screen

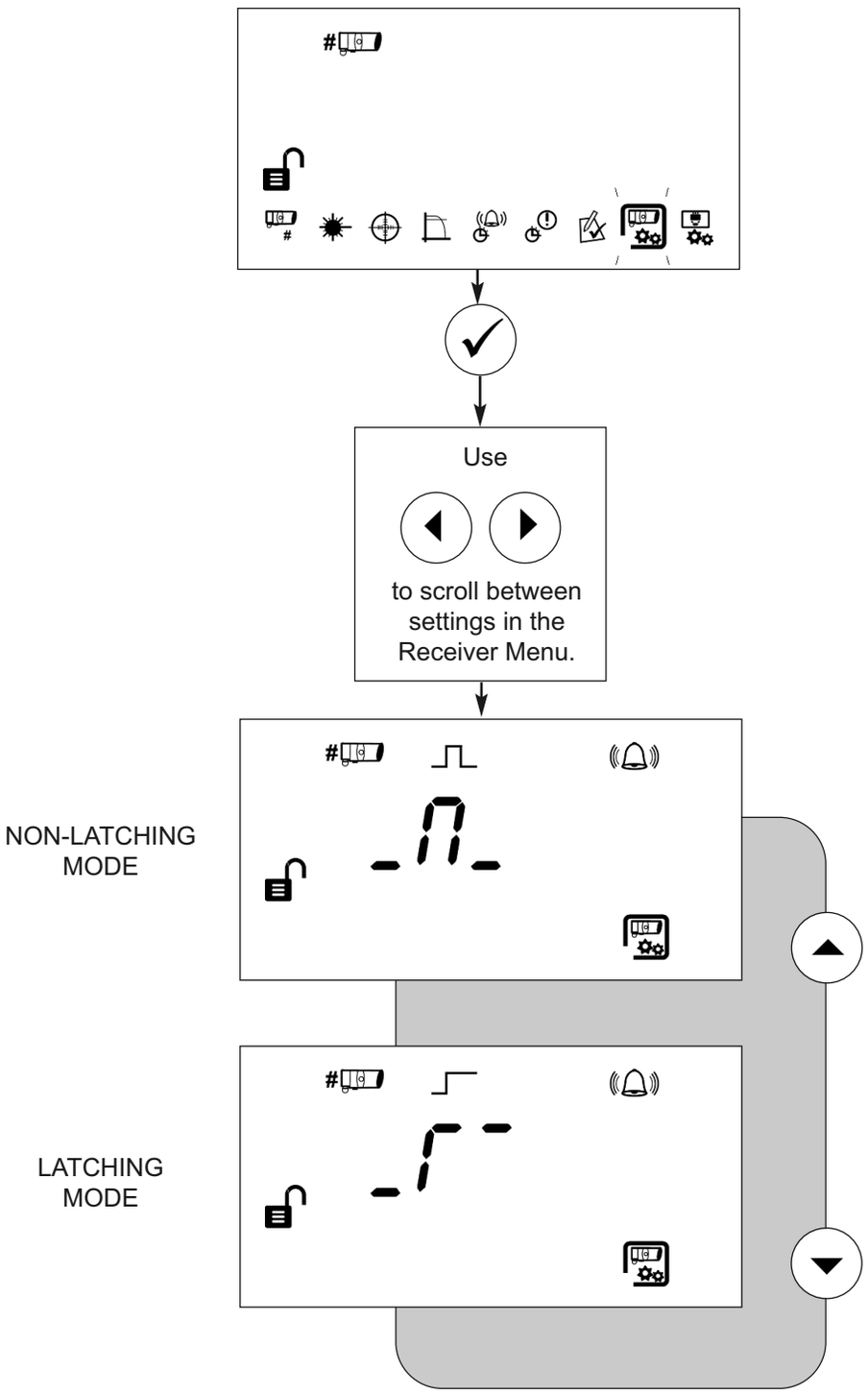
This setting is the delay the System Controller uses before signalling a FAULT condition to the Fire Control Panel. Default factory setting=10 seconds.
(Set for each Receiver).



3.1.4 Set Fire Latching Mode Screen

Default factory setting=Non-Latching (Set for each Receiver).

To clear a latched fire, apply 5-40V to the External Reset terminal, enter the passcode, or power cycle for 20s.



4. Maintenance and Troubleshooting

4.1 System Maintenance

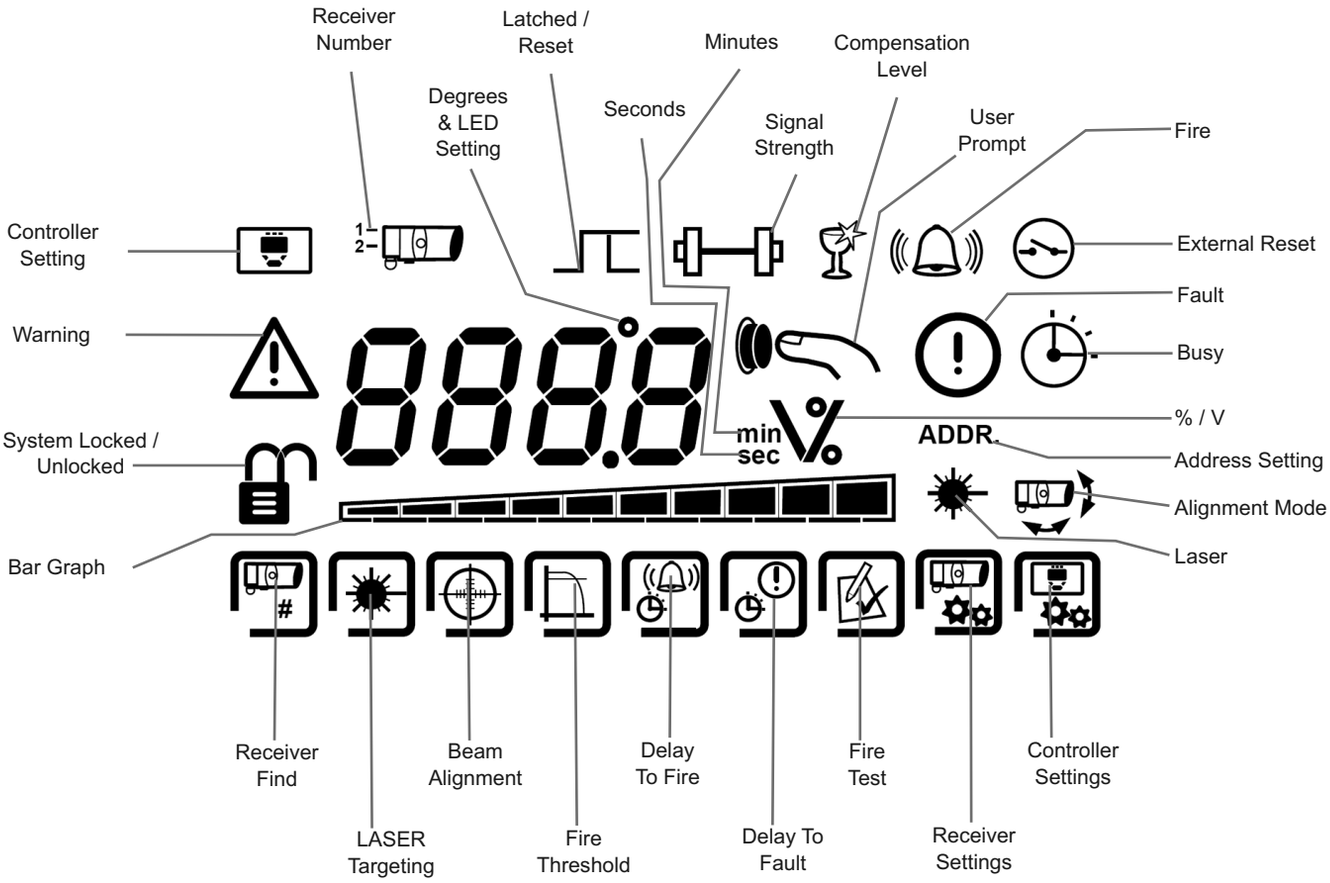
The system will automatically compensate for dust build-up by changing the Compensation Level. However, it is recommended that the Transmitter and Receiver lenses are cleaned periodically with a soft lint-free cloth. The system should be isolated from the Fire Control Panel before cleaning takes place. After cleaning, verify that the system is operating normally by following the Alignment procedure and the Fire and Fault Tests described in this User Guide.

4.2 Error Codes

Error Code	Meaning	Corrective Action
E-00	AIM not recognised	Refer to manufacturer for further technical assistance
E-01	Receiver Communications Fault	Check wiring between Controller and Receiver
E-02	'Find' not successfully executed	Follow 'Find' process
E-03	Compensation limit reached	Clean and re-align system
E-04	Receiver missed too many readings, or lost sync with the Transmitter	Ensure clear line of sight from Transmitter to Receiver
E-05	Receiver is not aligned	Follow alignment procedure
E-06	Rapid Obscuration Fault	Ensure clear line of sight from Transmitter to Receiver
E-07	Signal High Fault	Ensure there is no stray light from another source
E-15	Signal too low at end of alignment	Ensure clear line of sight from Transmitter to Receiver. Ensure alignment of Transmitter AND Receiver. Do not exit whilst alignment status LEDs are still flashing
E-16	Signal too high at end of alignment	Follow alignment procedure again. Do not exit whilst alignment status LEDs are still flashing
E-18	Short circuit detected on communications between Controller and Receiver	Check wiring between Controller and Receiver
E-19	IR signal integrity fault	Check there are no strong sources of light near the Receiver, or direct sunlight
E-20	Ambient light fault	Check there are no strong sources of light near the Receiver, or direct sunlight
E-21	Power too low fault	Check power supply to Controller

5. Display and Indicators

5.1 LCD Icon Layout



5.2 Receiver Status Indicators

The Green and Amber LEDs flash during alignment to indicate alignment status. Refer to alignment procedure for further information.

The Red LED will flash every 10 seconds when a fire is detected during normal operation.

5.3 Controller Status Indicators

Condition	**(LEFT HAND LED) RECEIVER 1 STATUS LED**	**(MIDDLE LED) RECEIVER 2 STATUS LED**	**FIRE RELAY STATE**	**FAULT RELAY STATE**
Normal	No Flash	No Flash	Open	Closed
Fault (Trouble)	Flashes AMBER every 10 seconds	Flashes AMBER every 10 seconds	Open	Open
Fire (Alarm)	Flashes RED every 10 seconds	Flashes RED every 10 seconds	Closed	Closed

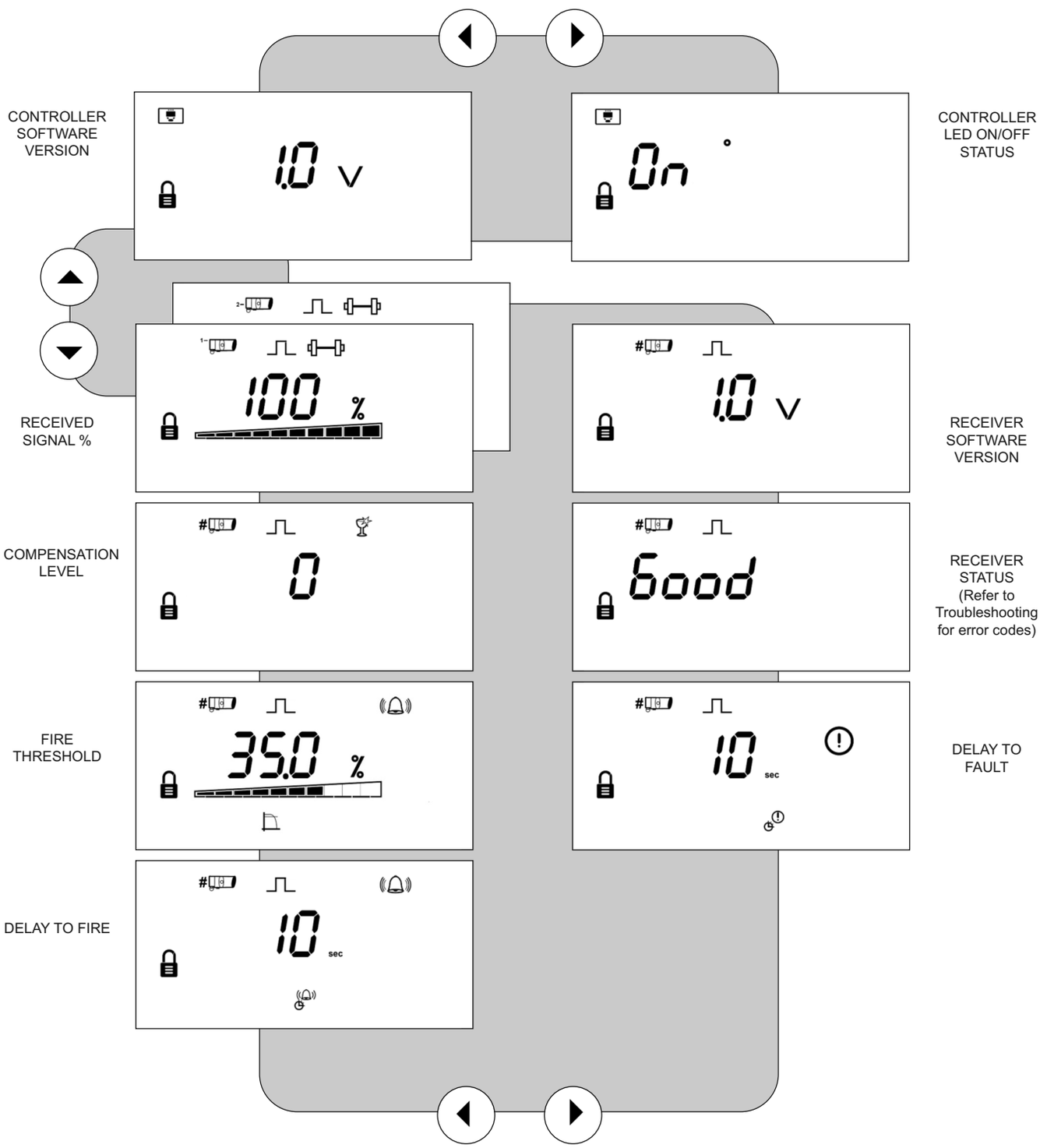
System Controller Status LED (Right-hand LED) flashes green every 10 seconds.

6. User Menu

6.1 User Menu Overview

The USER MENU allows system settings to be viewed only.

The USER MENU will timeout 15 minutes after the last key press.

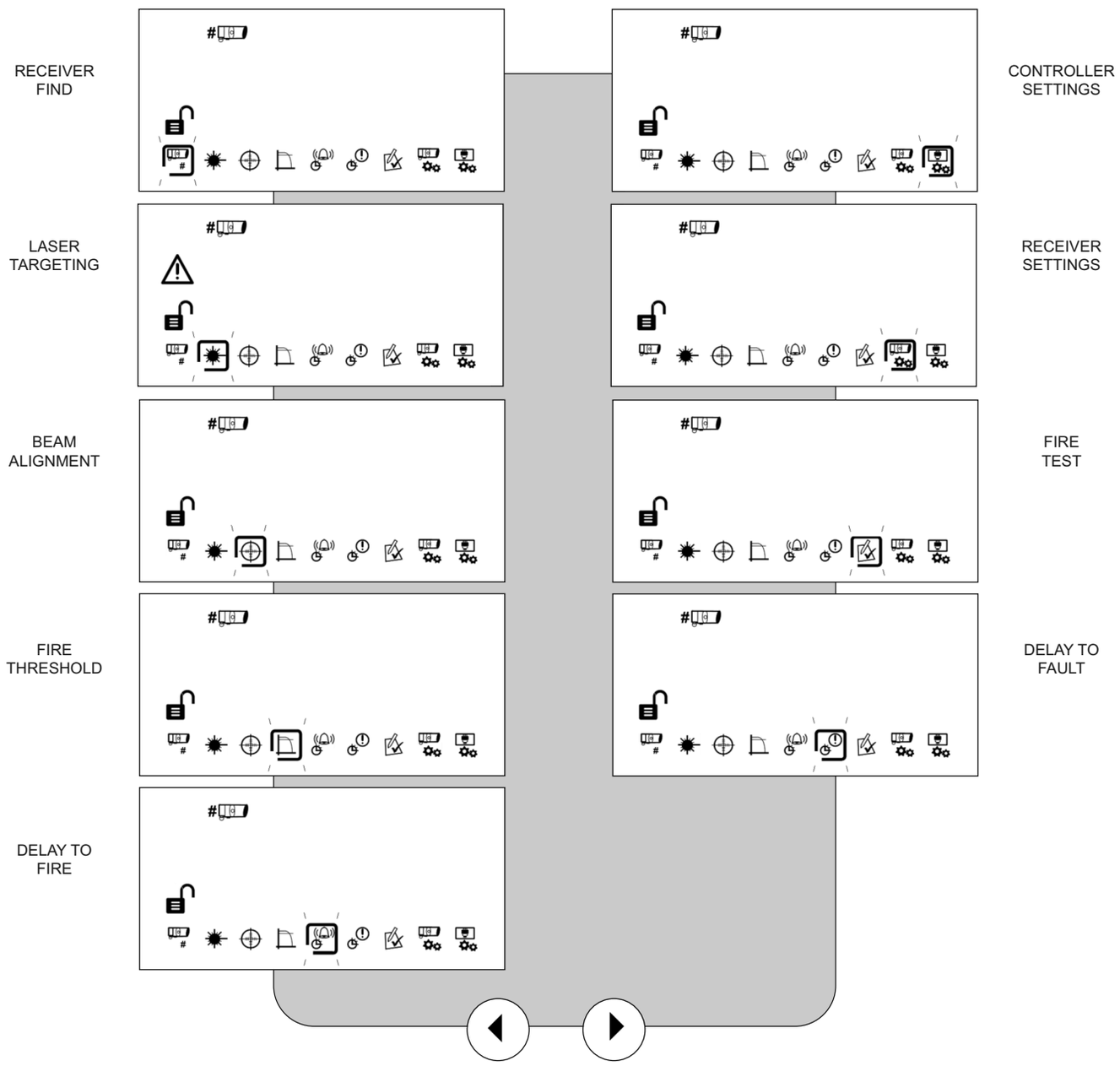


7. Engineering Menu

7.1 Engineering Menu Overview

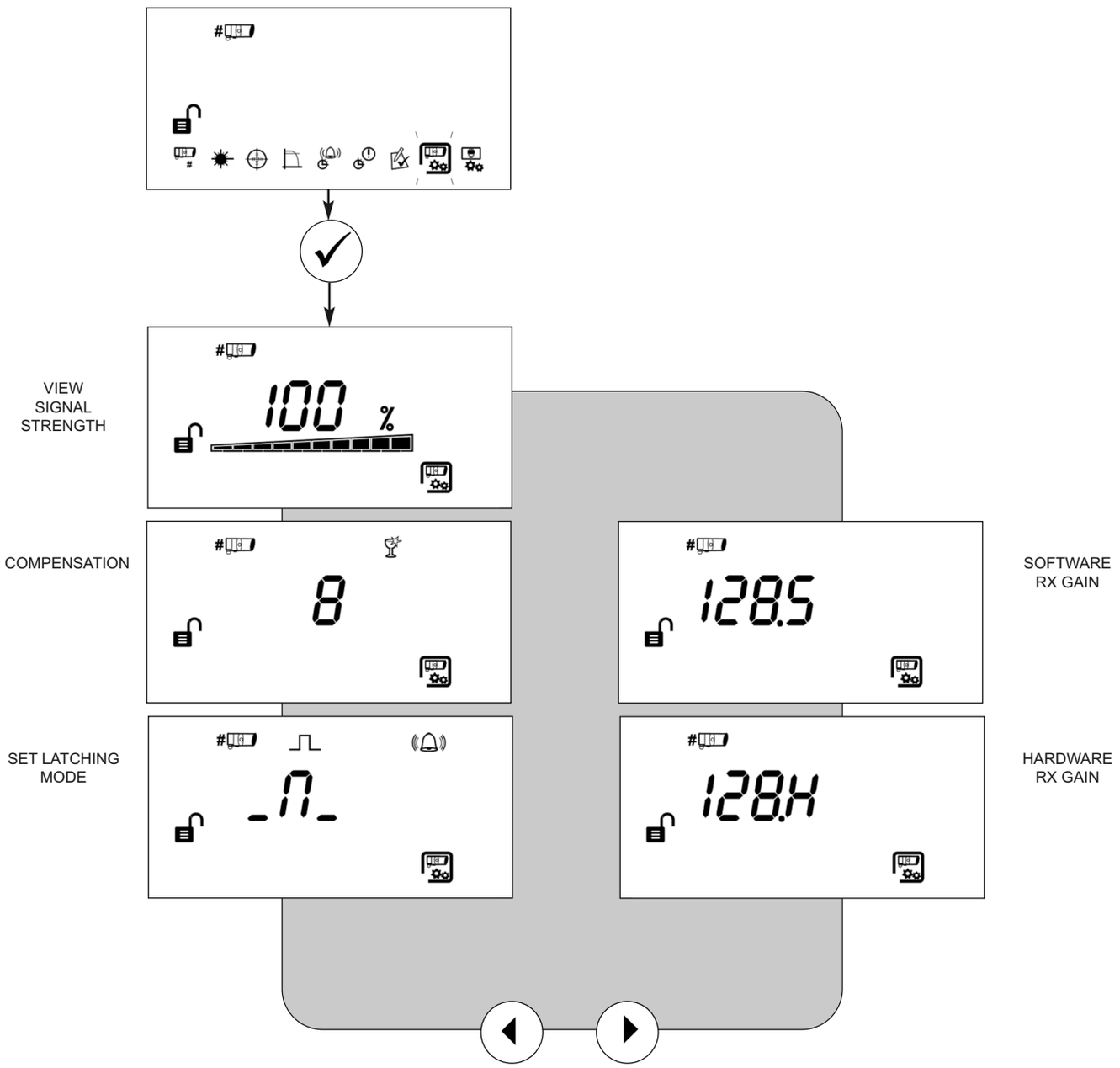
The ENGINEERING MENU allows system settings to be changed.

The ENGINEERING MENU will timeout 60 minutes after the last key press.



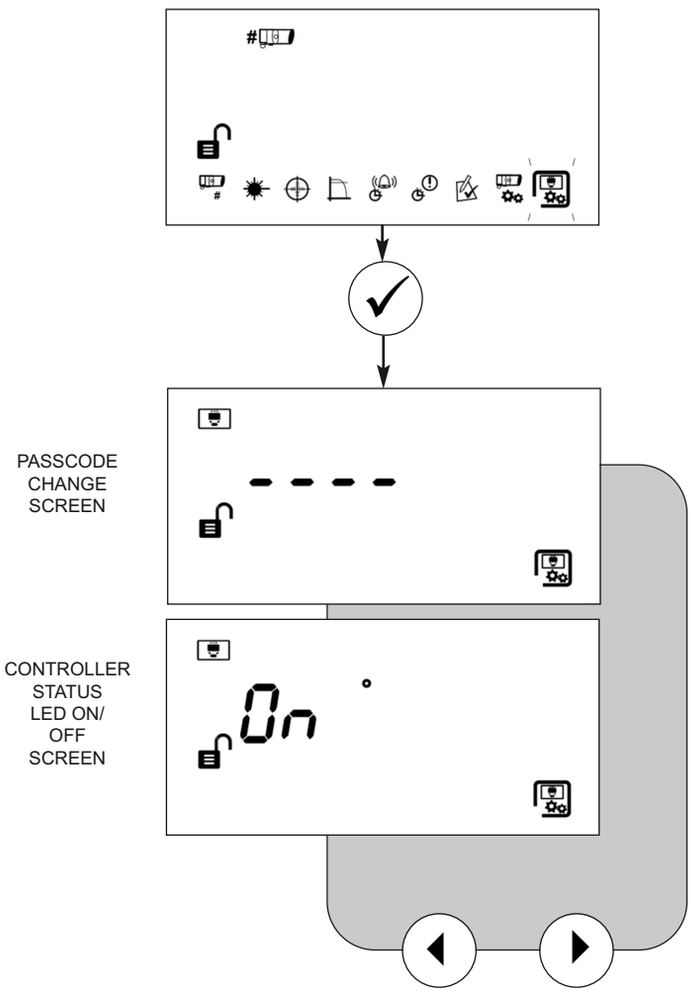
7.2 Receiver Settings

7.2.1 Receiver Settings Overview



7.3 Controller Settings

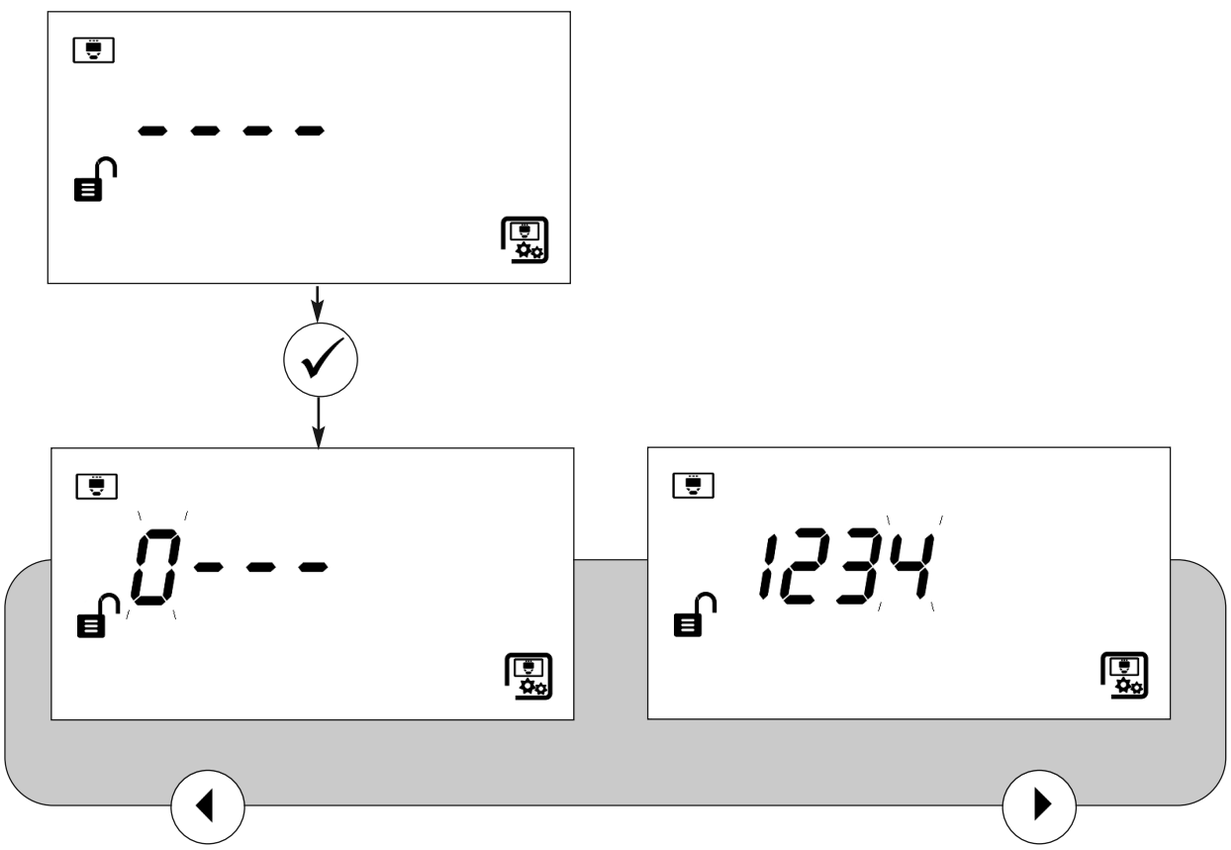
7.3.1 Controller Settings Overview



7.3.2 Passcode Change Screen

- This screen allows the user to change the Pass Code used to access the ENGINEERING MENU.

NOTE: The number being altered flashes. A partial passcode (ie. with dashes in it) will not be accepted.



Default Pass Code: **1 2 3 4**

Change digit

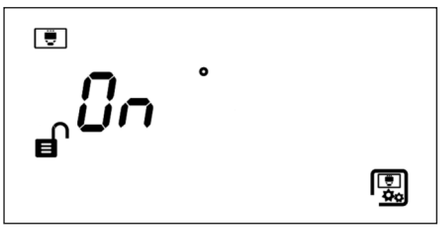
Move between digits

Save new Pass Code

Abort change

7.3.3 Controller Status LED ON/OFF Screen

This setting controls whether the System Controller Status LED will flash.



OR Toggle ON or OFF

Confirm setting

Abort change

8. Specification

Parameter	Value
Operating Range:	5 to 120m
Operating Voltage Range:	12 to 36V DC +/- 10%
Transmitter Current:	8mA
Quiescent Current (Controller with 1 or 2 Receivers):	14mA
Alarm Current (Controller with 1 or 2 Receivers):	14mA
Fault Current (Controller with 1 or 2 Receivers):	14mA
Power Down Reset Time:	>20 seconds
Fire and Fault Relay Contacts:	VFCO 2A@ 30 Volts DC, resistive
Operating Temperature:	-10°C to +55°C (non-condensing)- EN -20°C to +55°C (non-condensing)- UL
Storage Temperature:	-40°C to +85°C (non-condensing)
Receiver Tolerance to Beam Misalignment at 25% sensitivity:	+/- 2.5%
Transmitter Tolerance to Beam Misalignment at 25% sensitivity:	+/- 0.7%
Fire Alarm Thresholds:	Selectable increments of 1% from 10% to 60%. Major selectable increments are 25, 35 and 50%
Delays to Fire and Fault:	2-30s, individually selectable
Optical Wavelength:	850nm
Control Unit Dimensions:	203 x 124 x 73mm (W x H x D)
Transmitter & Receiver Dimensions:	74 x 74 x 161mm (W x H x D)
Weight (Control Unit):	606g
Weight (Transmitter & Receiver inc. brackets):	207g
LED Indications - Control Unit:	Red = Fire (one for each Receiver) Amber = Fault (one for each Receiver) Green = System OK
LED Indications - Receiver:	Red = Fire. Green and Amber indication LEDs for single-person alignment
IP Rating:	IP54
Relative Humidity (Max.):	93%, (non-condensing)
CPD Reference:	TBC
UL File:	S3417 (volume 6)
Housing Construction (Controller/Transmitter/Receiver):	UL94 V0 PC

9. Approval Information

9.1 UL Approval Information

- UL File Number: S3417

- All installations should comply with NFPA72. No liability will be accepted for applications not conforming to NFPA regulations.

Distance betweenTransmitter and Receiver	Fire Threshold Range
5 - 10m (16.4 - 32.8 ft)	25%
10 - 20m (32.8 - 65.6 ft)	25 - 30%
20 - 40m (65.6 - 131.2 ft)	25 - 45%
40 - 60m (131.2 - 196.8 ft)	35 - 60%
60 - 80m (196.8 - 262.5 ft)	45 - 60%
80 - 100m (262.5 - 328.1 ft)	55 - 60%
100 - 120m (328.1 - 393.7 ft)	60 %

9.2 European Approval Information

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