GENT
by Honeywell

Commissioning Instructions

Nano panel - based

Fire detection and alarm system



ISSUE 3
V2.xx

Contents

Preliminary information - 5
- Safety information - 5
- Abbreviations - 5
- Pre-visit checks - 6
- Points to remember - 6

System commissioning process - 7

Controls and indications - 9

Factory default settings - 10
- Devices - 10
- Modes of operation - 10
- Access levels - 10
- External circuits - 10
- Zones - 10
- Immediate Cause and Effect - 10
- Day mode delay - 10
- Delayed Cause and Effect - 10

External Wiring - 11

Preparation for first power up - 13

Links - 14
- Flash Memory protect link P9 - 14
- Buzzer enable/disable link P5 - 14

Lithium battery - 15

12V 7Ahr batteries - 16

Location of Fuses - 17

Loop circuit connect END 1 only - 18

Power up - 19

How to adjust the LCD Contrast - 20

How to change to another Access level from access level 1 - 20

How to exit to Access Level 1 from Access level 2,3 or 4 - 20

How to change the user PIN code (Password or Usercode) - 21

How to set the 'Clock' - 21

How to conduct a 'Display Test' - 22

How to view the panel 'Firmware' - 22

How to view the 'Historic' events log - 22

Address allocation - 23
- How addresses are allocated to devices - 23
- Address allocation from Loop END 1 - 23
- Address allocation from Loop End 2 - 23
- Allocation faults - 23
- Start Up - 23

How to manually 'Power-down' or 'Power-up' the loop - 24

How to manually 'Start Detection' after manual power-up - 24

How to view the 'Loop Status' - 25

How to view the 'Loop Map' and 'Enable / Disable' Devices - 25

How to 'Find Devices' on the Loop circuit - 26

How to 'Print' the Loop map - 27

How to 'Back-up' site data to Flash memory - 28

How to 'Restore' configuration data from Flash memory - 28

How to view 'Diagnostics' data - 29

How to view 'Site data' version - 29

Measuring the loop cable resistance and capacitance - 30

When to use the 'Repair' function on the loop circuit - 30

Loop 'Short Circuit' test - 31

Loop 'Ground Break' test - 31

Loop 'Positive line' break test - 32

Loop 'Earth fault' tests - 32

To 'Save loop map' and make 'SAFE' device addresses - 33

To 'Clear loop map' and 'UNSAFE' saved addresses from loop devices 33

Insertion of new devices on a 'Saved' loop map - 34

Difference between Nano panel at V1.00 and V1.3X - 35
- Zoning devices - 35
- Feature changes - 35
- New features - 35

Difference between Nano panel at V1.3X and V2.4X - - - - - - - - 36
New features - 36
New functions - 36
Changed Functionality - 36
How to view or change 'Device configuration' - - - - - - - - - - - - 37
Typical device forms - 38
Typical device forms continued - 39
Sensor States - 40
S-Quad Heat sensor states - 41
S-Quad Dual Optical Heat / Optical Heat sensor states - - - - - - - - - - - - 41
S-Quad Dual Optical Heat CO sensor states - - - - - - - - - - - - - - - - - 42
S-Quad Optical sensor states - 42
Beam sensor states - 43
How to set 'Zone' label, mode and link to another zone - - - - - - - - 44
How to view 'Devices' assigned to a 'Zone' and change device configuration - 44
How 'Cause and Effect' interact with 'Day and Night Modes'- - - - - 45
How to setup zone for 'Immediate Cause and Effect' - - - - - - - - - 46
How to setup zone for 'Delayed Cause and Effect'- - - - - - - - - - - 46
How to set up 'Day mode' delays and timeout - - - - - - - - - - - - - 47
How to set the Calendar - 47
How to manually control Day mode operation - - - - - - - - - - - - 48
How to set-up 'Sector' mode, label and activation - - - - - - - - - - 48
How to set-up 4-channel interface devices on the loop- - - - - - - - 49
How to enable/disable a channel of a 4-channel interface device - - - 49
How to view or print device 'Time averages' - - - - - - - - - - - - - 50
Time averages explained - 51
How to view Sensor 'Condition Codes' - - - - - - - - - - - - - - - - 52
Condition Codes for S-Quad Sensors - 54
How to set up an 'External Evacuate input' - - - - - - - - - - - - - 55
How to set-up the 'Class Change input' - - - - - - - - - - - - - - - - 56
How to set up RS-232 and RS-485 serial and USB ports- - - - - - - 57
How to change access levels of 'Buzzer' & 'Device Disablement'- - - 58
How to change the 'Alarm Controls' settings - - - - - - - - - - - - - 58
How to change the 'Signal' Settings - - - - - - - - - - - - - - - - - - 59
How to set up weekly 'Fire test reminder' - - - - - - - - - - - - - - - 59
How to start or stop a 'Weekly test' - - - - - - - - - - - - - - - - - - 60
How to 'Enable' or 'Disable' a Zone- - - - - - - - - - - - - - - - - - - 61
How to place a Zone in 'Test Mode' - - - - - - - - - - - - - - - - - - 61
How to place the system in 'Commissioning mode' - - - - - - - - - - 62
How to enable/disable Master alarms, Fire relay and Evac. input- - - 63
How to enable or disable and set a Sector activation control - - - - - 63
How to set up 'Maintenance visit reminder' - - - - - - - - - - - - - 64
How to return 'System Configuration' to factory default settings - - - 64
How to return all 'Labels' to factory default settings - - - - - - - - - 65
How to return the 'Configuration and Labels' to factory default settings - 65
How to return all 'Access level PIN codes' to factory settings - - - - 66
How to clear all Logs - 66
How to access the SD card slot on Main Control Board - - - - - - - 67
How to upgrade the panel firmware from a SD card - - - - - - - - - 67
How to back up all system configuration and labels to a SD card- - - 68
How to back up all labels to a SD card - - - - - - - - - - - - - - - - 68
How to restore 'Config', 'Labels' or 'Logo' from a SD card - - - - - - 69
How to use a SD card to log 'Historic Events' for diagnostics - - - - 69
Tests on installed equipment - 70
Appendix A - Message Action List - - - - - - - - - - - - - - - - - - - 72
Appendix B - General Guidelines - - - - - - - - - - - - - - - - - - - 77
Appendix C - old Beam sensor - 79
Appendix D - old Mains powered interface unit - - - - - - - - - - - 82
Index - 84
Quick reference menu map - 86

Contents

Preface

This is the third issue of the Commissioning instructions for the fire alarm system based on the **Nano panel with Main Controller at version 2.xx.**

Associated documents

2531-221 Document Pack
- Quick reference / Drilling template
- Installation instructions
- Operating instructions
- Log book

Conventions

This is a note to highlight important text that is normally hidden in the main text.

This is either a caution to prevent damage to the equipment or a warning to inform of dangerous conditions that may result in injury or death.

Symbol Keys



What you will see



What you will hear

Once the Nano system 'Loop' is fully commissioned, the system is ready to be configured. This should be done using the **Nano commissioning tool**.

Although this manual documents the configuration menus at the panel, it is recommended you use the **Nano commissioning tool to configure the system.**

Contents

Preliminary information

Safety information



1. Do not remove or replace printed circuit boards, fuses or attempt to wire the control panel with the panel powered up. Always power down the mains supply at the fused spur unit and disconnect the battery supply before working on the panel.

2. When replacing a printed circuit board assembly from the panel always use antistatic work procedures.

3. Do not use antistatic procedures on live equipment.

Abbreviations

C - Common
CH -channel
Dv - Device (Loop device, also called outstation)
EOL - End of line
IO or I/O - Input Output (Interface unit)
IP - Ingress protection
LED - Light emitting diode
MCB - Main control board (also called MC - Main Controller)
MCP - Manual call point
N/C or NC - Normally closed
N/O or NO - Normally open
NVM - Non Volatile Memory
O/C or OC - Open circuit
PC - Personal computer
PCB - Printed circuit board
PIN - Personal identification number (usercode, password, access code)
PSU - Power supply unit
PVC - Polyvinyl chloride
QB - Quick blow (fuse)
S/C or SC - Short circuit
T - Anti-surge (fuse)
USB - Universal serial bus

Pre-visit checks

- ☐ Ensure there are accurate *as fitted wiring drawings* available, 2 copies are required.
- ☐ Ensure access will be provided to the system equipment installed in the premises.
- ☐ The installer (*electrical contractor)* will be in attendance until the installation is proved.
- ☐ Site contact or representative will be available during the visit.
- ☐ Ensure the commissioning tool along with the associated cables and printer, plus instructions, are available.
- ☐ Ensure spare parts are available, such as:
  - MCP glasses
  - MCP test key
  - Printer paper roll (for external printer if used)
  - Spare key for equipment cover.
- ☐ Ensure the system standby duration is to the project requirement and the standby duration has been checked with the Nano Battery Standby Calculator.

Check with the installer

Ensure the maximum cable length between loop devices has not exceeded 250m. This is the cable distance between previous and next device on the loop. If the cable length has been exceeded then rectification action must be taken.

Installation

- ☐ The system has been installed correctly in accordance with the installation instructions, respective standards and project specification.

Earth leads

- ☐ All *earth leads* supplied with the system equipment to include those supplied with loop devices are securely fitted to maintain earth continuity.

Loop wiring

- ☐ All the devices on the loop have been correctly wired, as shown in the installation instructions and in accordance with the *as fitted wiring drawings.*

Parts for later installation

- ☐ Those parts not used during installation have been left in a safe place for use during system Commissioning.

Points to remember

Unattended equipment

- ☐ Where equipment is to be left unattended ensure the panel cover is fitted for safety.

Static precautions

- ☐ The discharge of static electricity can damage or degrade sensitive electronic components on printed circuit boards. Antistatic procedures should be followed when handling *static sensitive boards*.

It is important that antistatic procedures are NOT carried out on live equipment.

Panel Buzzer

Dangerous voltages exist around the power supply within the panel. Always ensure the panel is completely powered down before configuring the buzzer enable / disable link.

- ☐ It may be necessary during commissioning to switch *Off* the panel buzzer. There is a buzzer enable (*On*) / disable (*Off*) link on the Main Control Board. It is important to ensure that the buzzer is switched *On* for normal operation after commissioning.

Sensor cover

- ☐ Each fire sensor installed in the system should have been fitted with a *dust cover* during installation. The dust covers must be removed from all the fire sensors after the panel loop has been satisfactorily powered-up and with addresses allocated to each device ready for further checks and tests during commissioning.

Site specific installation

- ☐ Plant equipment interfaced to the system should be tested to recommendations made in the site project specification. These tests are normally left until after the fire system is configured and tested.

Zone Test mode

- ☐ During commissioning of the system you will need to *enable* the 'Zone Test' mode or 'Commission mode'. It is important to *disable (Switch Off)* the 'Zone Test' mode or exit the 'Commission mode' after the work is over for normal operation.

Devices

- ☐ Always install new devices on the loop circuit. Never use devices that have been previously installed on the loop circuit of another system.

System commissioning process

Always power-down the panel when working on the system, such as when wiring or replacing parts.

Pre visit checks
Ensure you have:
– *As-fitted-drawings* showing the installation of system equipment
– Access to all the protected areas where system equipment is installed
– Installer present to rectify wiring faults
– Tools and spare parts available.

Inform responsible person(s)
Inform responsible person(s) that the fire alarm system is being commissioned and occupants in the protected premises will hear test alarms.
Ensure occupants are made aware of alternative site procedures should there be a fire event while the system is commissioned.

Survey the installation
Refer to the most recent *as-fitted-drawings* and ensure that all the fire system equipment has been installed in accordance with the installation instructions, respective standards and project specification.

Before powering up the Nano Panel
Open the outer cover of the panel and:
– Check all the internal cables within the panel are securely fitted.
– Ensure no external circuits are connected at this stage except for the mains supply which must be connected but NOT switched ON.
– Fit the end-of-line resistors to the master alarm circuits.
– Connect the external printer to the RS232 port, if installed.

Power up
– Fit the batteries inside the panel enclosure and connect the battery leads and then switch ON the mains supply.

Initial tests and set ups
– Access levels and PIN codes
– Carry out a display test and ensure DISPLAY and LEDs are working.
– Set the system clock time and date.
– Configure the RS232 printer port, if a printer is installed.

Loop Devices
– Configure the links on all 4-channel interface units connected to the loop. Ensure links are set for the required Input or Output application.

Ensure all interface Input/Output external wiring remains disconnected at this stage, unless otherwise instructed. This action will prevent inadvertent operation output/plant while the system is being commissioned.

– Power up the mains powered interface units on the loop.

Loop Device address allocation
– Connect only End 1 of the loop circuit and power-up the loop.
– Allow address allocation to finish. Any fault(s) on the loop during allocation must be rectified. Power-down the loop when correcting loop wiring faults and the power-up to continue address allocation.
– Connect only End 2 of the loop circuit and power cycle the loop and ensure address allocation is complete from End 2.
– Connect both End 1 and End 2 of the loop and check the loop allocation is complete with both ends of the loop connected.
– ‘Start Detection’ after a successful allocation of addresses.
– Check all the devices on the loop circuit are installed in their correct location using the ‘Find Device’ function at the panel and by referring to the ‘*as fitted wiring drawings*’.
– Check to ensure correct devices are installed by viewing the ‘Device details’.

Continue next page

From previous page

Backup
Back-up the system loop address allocation data to the panel memory.

Regularly back-up the configuration data during commissioning, do this every 15 minutes to ensure changes made to the configuration are not lost.

Loop wiring tests
Carry out tests on the loop wiring by introducing open and short circuit wiring faults. Ensure the panel provides an indication of each fault. Run the 'Repair' function at the panel after each fault removal.

Retrieve the device data to Commissioning tool
Connect the commissioning tool and retrieve the system device data.

Configuring the system using the Nano Commissioning Tool
Configure the system to site specific requirement using the Nano Commissioning tool, see the Nano Commissioning tool user instructions.

Where the Nano system has interface units on the loop it is very important to configure the system using the Nano commissioning tool.

Transmit the configured system to the Nano panel
Connect the commissioning tool to the Nano panel and transmit the system configuration.

Beam Sensor alignment
If there are beam sensors on the loop then commission the beam pair using the alignment and autogain function at the panel.

PIN Codes
Change the user PIN codes to site specific needs and inform the new codes to the respective users.

Installed system test
Place a zone in test mode and then carry out tests to check the system Cause and Effect in accordance with the recommendations of BS5839:Part 1 and also in accordance with project requirements. Repeat the test for other zones if used. Test:

– Fire sensors
– Interface units
  Prior to functional test ensure the I/O circuits remain isolated. After functional test reconnect the I/O circuits and where appropriate test the I/O circuits to project recommendations.
– Repeat indicator panel
  Check events are displayed and indicated.
– Fire relay
  Check the relay operates and the connected external equipment are tested.
– Connect Master alarms
  Check the alarms operate in the event of fire. If master alarms are not used then ensure the EOL components are fitted.
– Connect the Class Change switch input, if used
  Check the configured sectors operate to site requirements.
– Connect the Evacuate input switch wiring
  Check the alarms operate and can be silenced and reset.

Final changes to the configuration
Use the panel menu options to make minor adjustments to the system configuration and then back up the work. All major changes to the configuration must be done using the commissioning tool.

Configuration data file
Ensure site file held at the commissioning tool is the same as the one held at the panel for future reference and for traceability.

Controls and indications



Indications

POWER [green LED]
When illuminated it indicates that power supply to the panel is present.

FIRE [red LED]
When illuminated it indicates that a FIRE has been detected in the protected premises.

ZONE n [red LEDs]
When illuminated it indicates that a FIRE has been detected in the respective zone(s).

FAULT [amber LED]
When illuminated it indicates that a FAULT has been detected in the fire detection and alarm system.

Disablement [amber LED]
When illuminated it indicates that a part of the system has been disabled.

Test [amber LED]
When illuminated it indicates one or more zones are in Test mode.

Power Fault [amber LED]
When illuminated it indicates the battery or mains supply to the panel has failed.

Delay [amber LED]
When illuminated it indicates that one or more delays are setup on the panel.

Sounder Fault [amber LED]
When illuminated always with the FAULT LED, it indicates that there is a sounder fault .

Verify [amber LED]
When illuminated it indicates the verification delay is active. Verification delay is activated by selecting the Verify option, which will further delay the operation of alarm sounders in the system.

System Fault [amber LED]
When illuminated it indicates that a fault has occurred with the system processor.
⚠ **It is important to investigate this fault because the fire alarm system may not be able to detect fires.**

Sounder Disablement [amber LED]
When illuminated always with the DISABLEMENT LED, it indicates that there is sounder disablement.

Controls and indications

Factory default settings

The list below provides information on how the panel is configured on leaving the factory:

Devices

- ☐ All Sensor Devices are assigned to Zone 1
- ☐ All Sounder/Output Devices are assigned to Sector 1
- ☐ All Devices operate sensitivity state 0 in both Day and Night mode, where applicable
- ☐ All Device labels are 'Device n', where **n** signify the device number
- ☐ All Single channel interface devices are configured as zone inputs
- ☐ All 4 channel interface devices are configured as LED outputs

Modes of operation

- ☐ The panel will operate in Night mode
- ☐ All Sectors are in ALARM mode, not PLANT mode
- ☐ All Sectors activate by Class Change input
- ☐ Sound Alarm button operates in 'RESOUND mode' without the Fire Relay

Access levels

- ☐ Access level 1 - no code required
- ☐ Access level 2 (Customer mode) - 0 0 0 0
- ☐ Access level 3 (Engineering mode) - 3 3 3 3
- ☐ Access level 4 (Maintenance mode) - 4 4 4 4

External circuits

- ☐ External Evacuate input - Not configured for use
- ☐ Class change input - Not configured for use
- ☐ RS-232 port - Enabled for PRINTER connection
- ☐ RS-485 port - Local repeat panel - Not configured for use
- ☐ USB port - for COMMISSIONING TOOL use

Zones

- ☐ All Zones - in Normal mode (not in 2-detector mode nor in 2 -zone mode)
- ☐ All Zone labels are 'Zone n' where n signify the zone number
- ☐ All Zones are independent - not linked to another zone
- ☐ Only Zone 1 is Enabled, Zone 2 to 16 are disabled
- ☐ No Zones are in Test mode

Immediate Cause and Effect

- ☐ All zones will action 'no action' on all Sectors
- ☐ All zones are configured for 'no action' on Master alarms
- ☐ All zones are configured for 'no action' on Fire relay activation

Day mode delay

- ☐ Initial delay is 30 seconds
- ☐ Day mode delay is 5 minutes
- ☐ Day mode timeout is 8 hours
- ☐ Manual mode (not in On, Off or Calender mode)

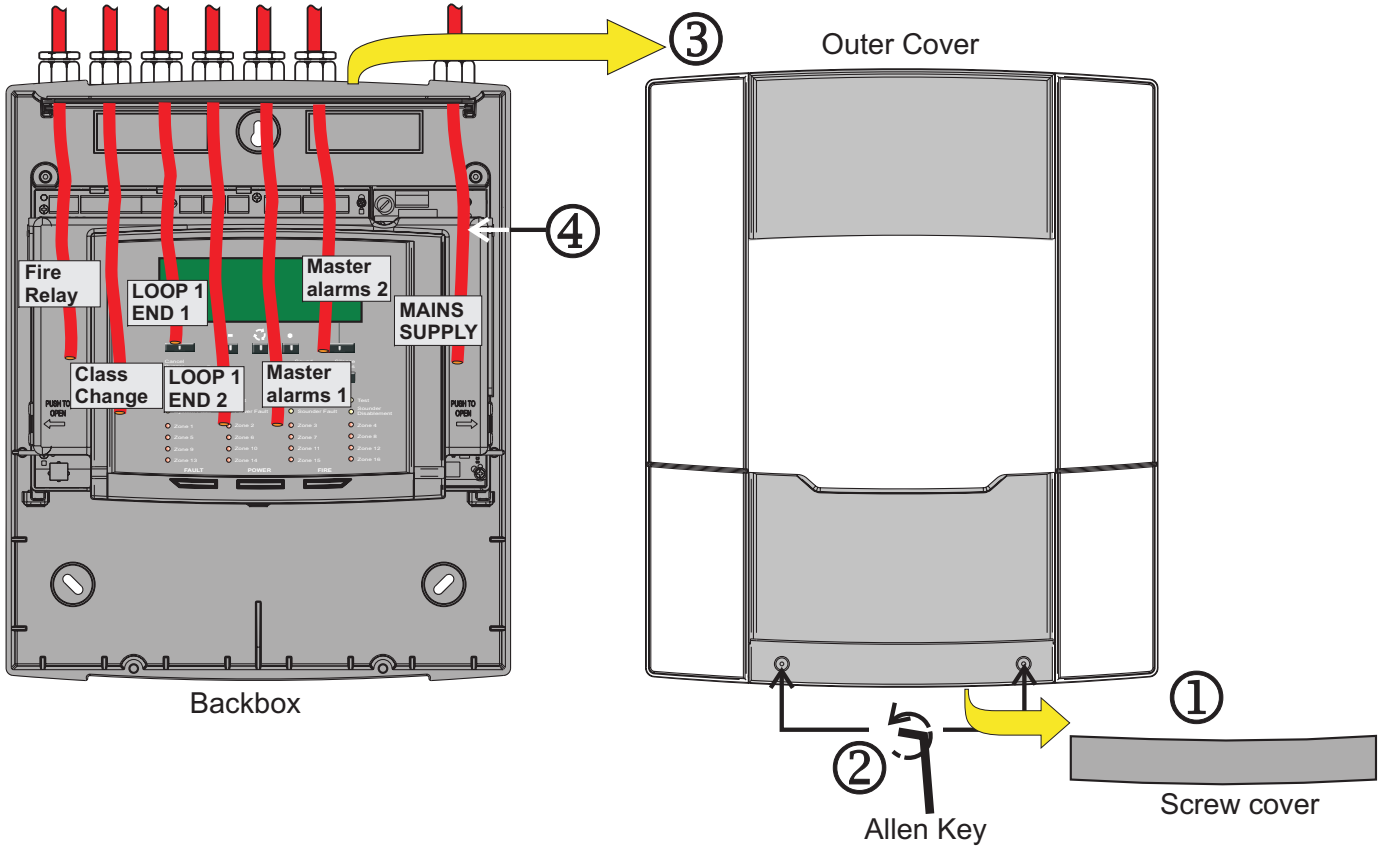
Delayed Cause and Effect

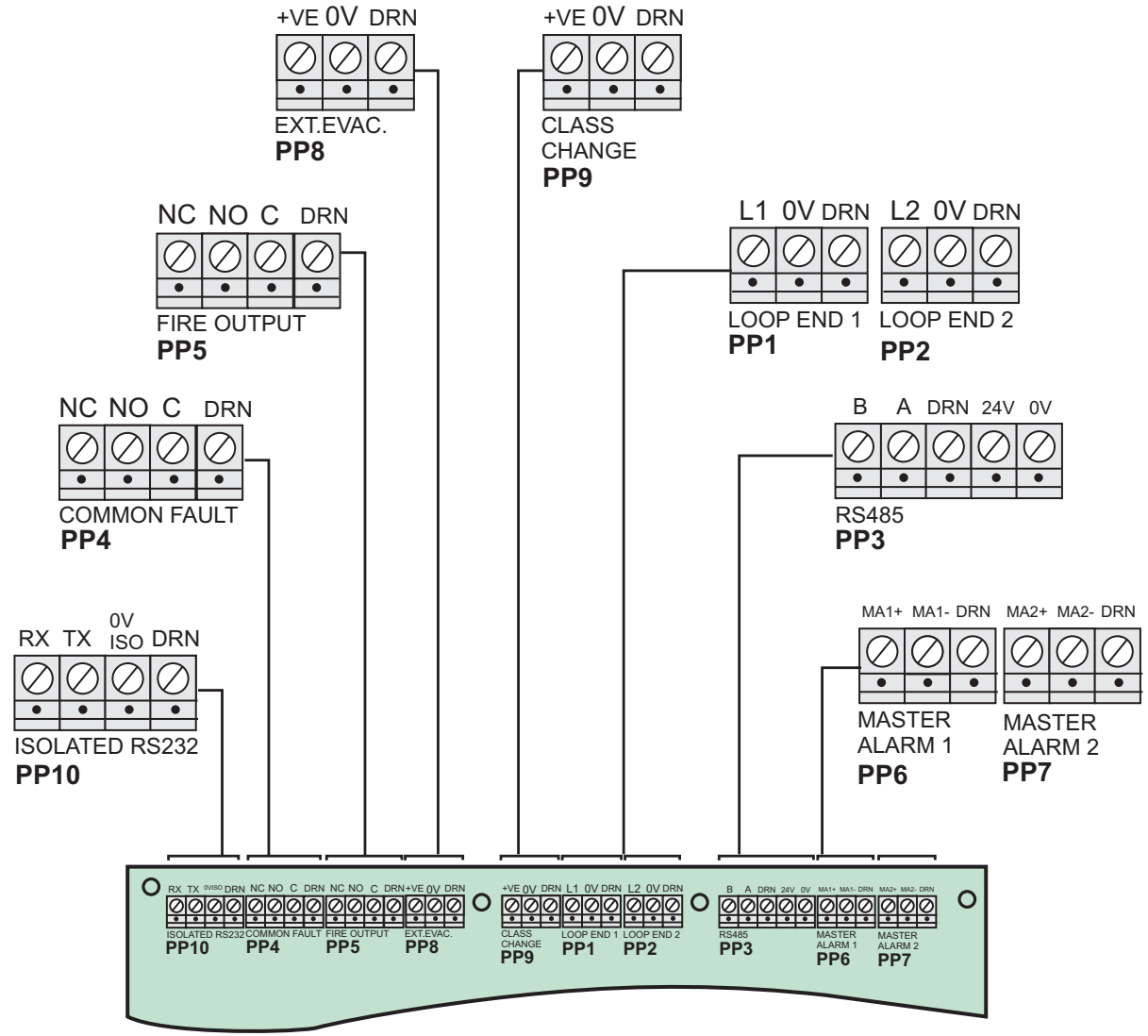
- ☐ All zones will action Evacuate alarms on all Sectors after a delay
- ☐ All zones will action Master alarms after delay
- ☐ All zones will action Fire relay after delay

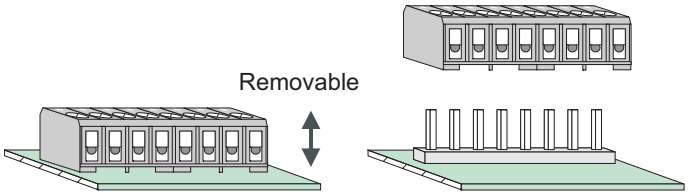
External Wiring

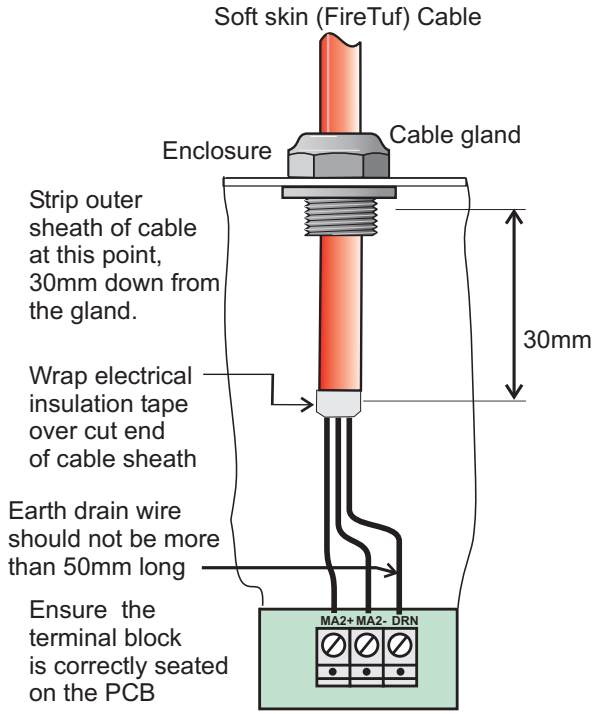
The following procedures assume the Nano panel is installed.

- ☐ Remove the Screw cover ① from the Outer cover to reveal the fixing screws
- ☐ Using the allen key ② open the two fixing screws
- ☐ Open out the bottom edge of the Outer cover and lift it up and out ③.
- ☐ Depending on the installation, the cables may be connected to respective terminals or left unconnected. If the cables are to be connected then straighten out the cable tails ④ and then one-by-one connect each cable to the respective terminals.




+VE 0V DRN
EXT.EVAC.
PP8
+VE 0V DRN
CLASS CHANGE
PP9
NC NO C DRN
FIRE OUTPUT
PP5
L1 0V DRN
L2 0V DRN
LOOP END 1
PP1
LOOP END 2
PP2
NC NO C DRN
COMMON FAULT
PP4
B A DRN 24V 0V
RS485
PP3
RX TX 0V ISO DRN
ISOLATED RS232
PP10
MA1+ MA1- DRN
MA2+ MA2- DRN
MASTER ALARM 1
PP6
MASTER ALARM 2
PP7


Removable

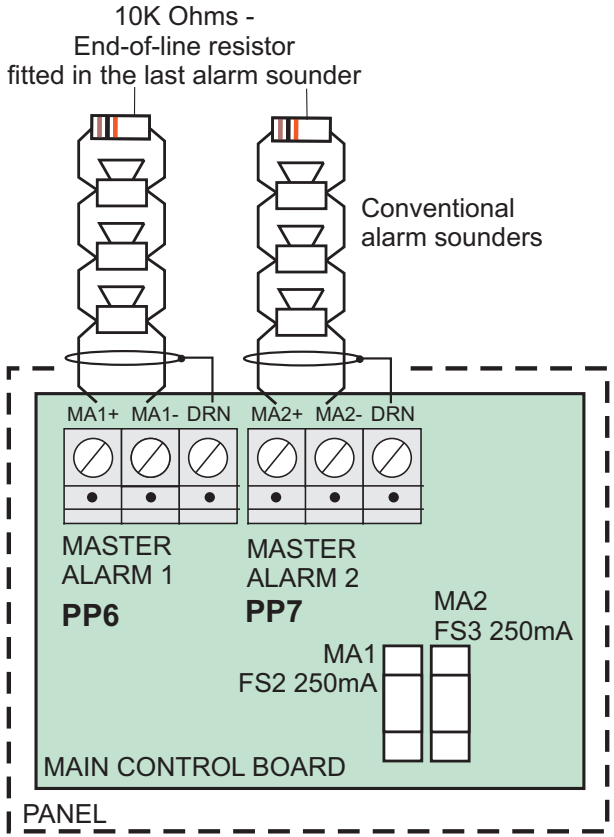

Soft skin (FireTuf) Cable
Enclosure
Cable gland
Strip outer sheath of cable at this point, 30mm down from the gland.
30mm
Wrap electrical insulation tape over cut end of cable sheath
Earth drain wire should not be more than 50mm long
Ensure the terminal block is correctly seated on the PCB
MA2+ MA2- DRN

Preparation for first power up

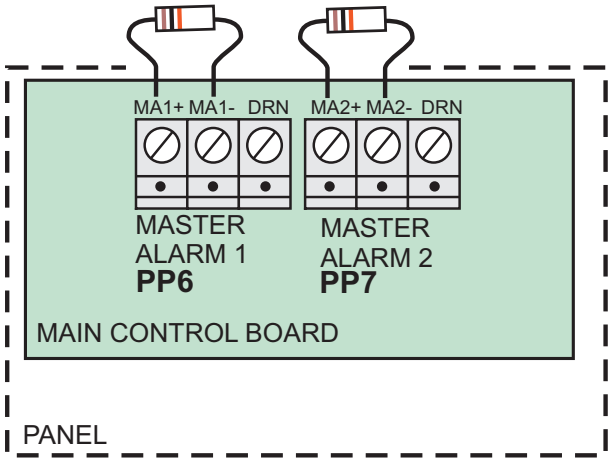
The mains supply cable must remain connected to the Power supply assembly, but the mains power must remain **switched OFF**.

Sequentially connect each external circuit one at a time and test it to ensure it is working correctly. It is a good idea to first pull out those terminal blocks of the external circuits to be tested later. Start with the loop circuit and leave only Loop End-1 connected in preparation for the power up.

The master alarm circuits will require an end-of-line resistor to be fitted at the last alarm device to prevent fault events being raised at the panel. If the master alarm circuits are not being used then ensure the resistors are fitted to the Master Alarm circuit terminal blocks on the MCB.



If master alarms are not being used then connect the 10K ohms End-of-line resistors to the master alarm terminals.



Links

There are LETHAL VOLTAGES present on the Power assembly. Therefore it is important when working on the MCB or PSU board to completely power down the panel. The mains supply must be switched Off and the battery supply disconnected.

Flash Memory protect link P9

A hardware link is provided on the *Main Control Board (MCB)* to protect the FLASH memory that holds the system configuration data.

Flash Unprotected: Normally during commissioning the FLASH memory is not required to be protected to allow the configuration data to be backed-up. The link **P9** on the *Main Control Board* is placed in the **'Enabled'** position to allow data to be backed-up.

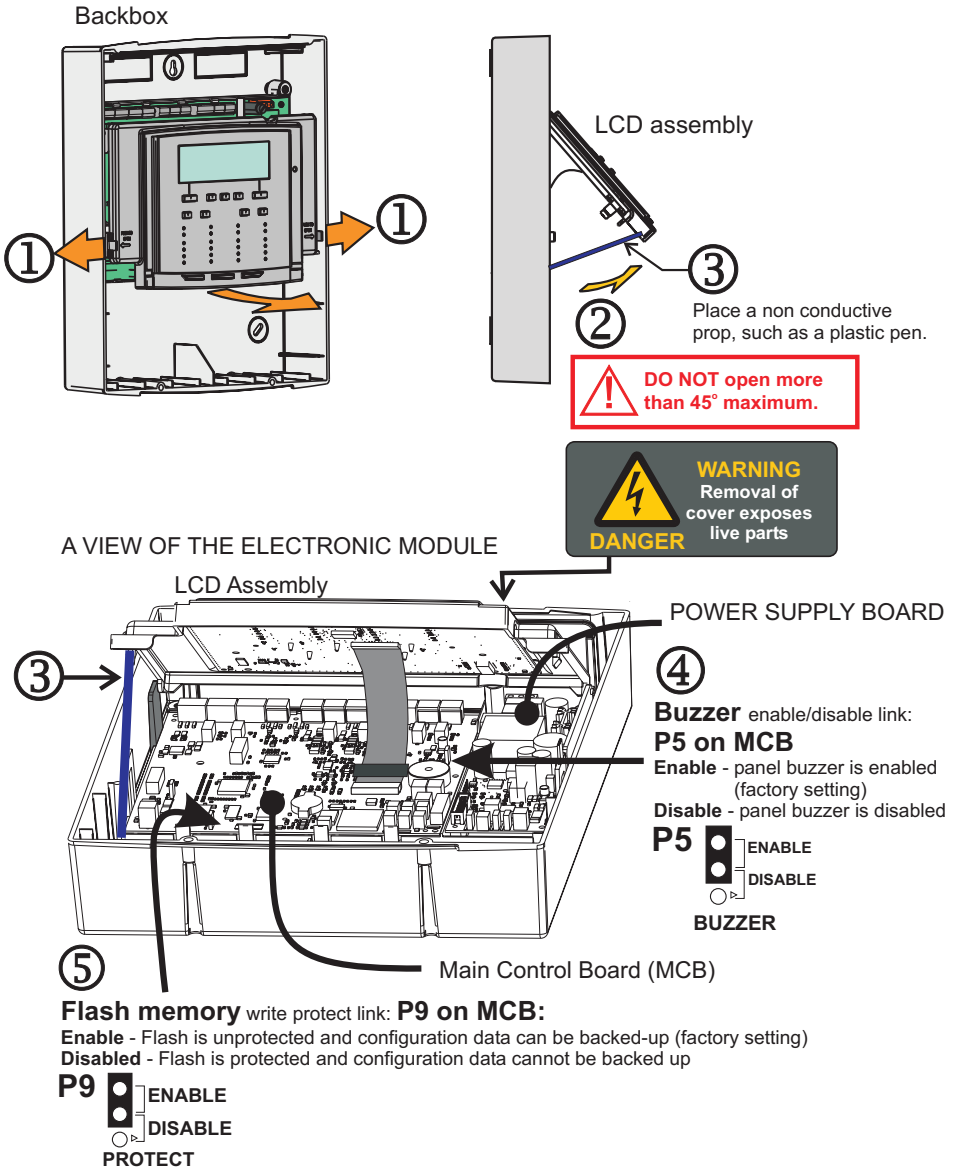
Flash Protected: When all the final configuration data is backed- up to the Flash memory and on completion of all commissioning work, place the link **P9** in the **'Disable'** position to prevent inadvertent changes of configuration data being backed-up.

Pull out the tabs ① that secure the *LCD assembly* and open the LCD assembly ② to no more than 45° angle. Use a prop ③ such as a plastic pen to hold up the assembly when working on the MCB. If required configure link P9 on the MCB ⑤.

Buzzer enable/disable link P5

The panel buzzer will automatically sound with a fault or fire event. During commissioning it may be necessary to disable the panel buzzer by configuring the link **P5** located on the Main Control Board. When the link is set in the **disable** position, the buzzer will not sound with a fault or fire event. If required configure the link P5 on the MCB ④.

It is important to ensure that the buzzer is switched *On* for normal operation after commissioning.

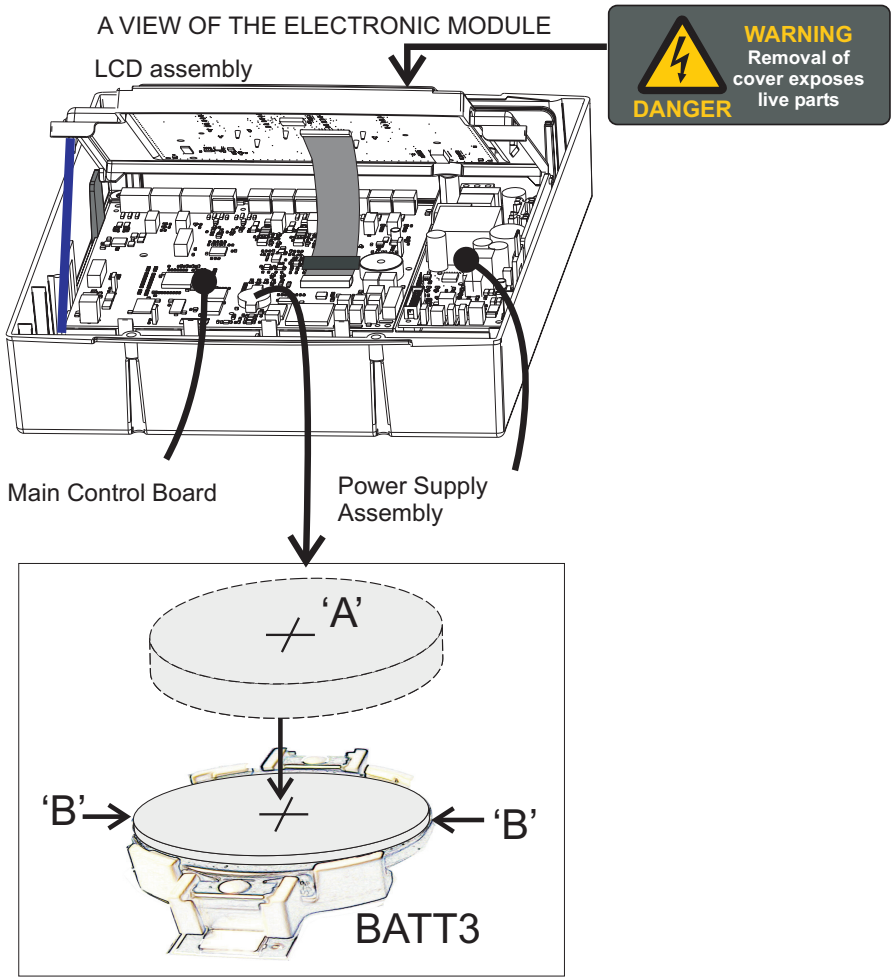


Lithium battery

There are LETHAL VOLTAGES present on the Power supply assembly. Therefore it is important when working on the MCB or PSU board to completely power down the panel. The mains supply must be switched off and the battery supply disconnected.

The 3V lithium battery suppled in the spares pack must be fitted to the Main control board (MCB). The battery provides the power to retain the system configuration data in the event of panel power failure or disconnection. See the 'Links' section for procedures on how to gain access to the Main control board (MCB).

Always use the recommended replacement battery. As there is a risk of an explosion if incorrect battery is used.



Place lithium battery with + marking on top into the socket BATT3. The socket BATT3 is located on the Main Control Board.

Push the battery 'A' down until it locks into the socket.

To remove the lithium battery hold it by the sides 'B' and gently pull it out.

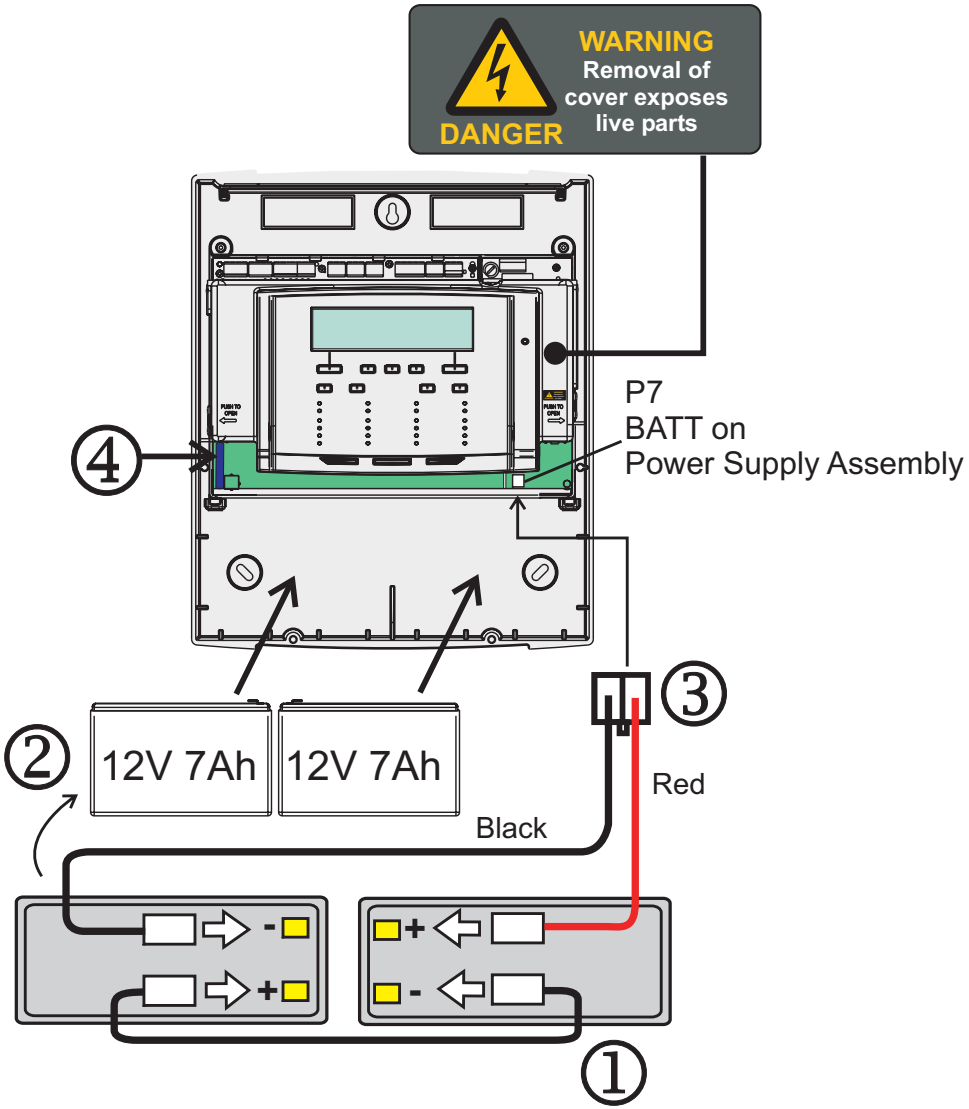
12V 7Ahr batteries

There are LETHAL VOLTAGES present on the Power supply assembly. Therefore it is important when working on the MCB or PSU board to completely power down the panel. The mains supply must be switched off and the battery supply disconnected.

Ensure the two 12V 7Ahr batteries are connected as illustrated using the battery lead and link lead ①. Place the batteries on the bottom shelf ② of the enclosure. Ensure the plug-end of the battery lead ③ is connected to socket marked BATT on the power supply assembly.

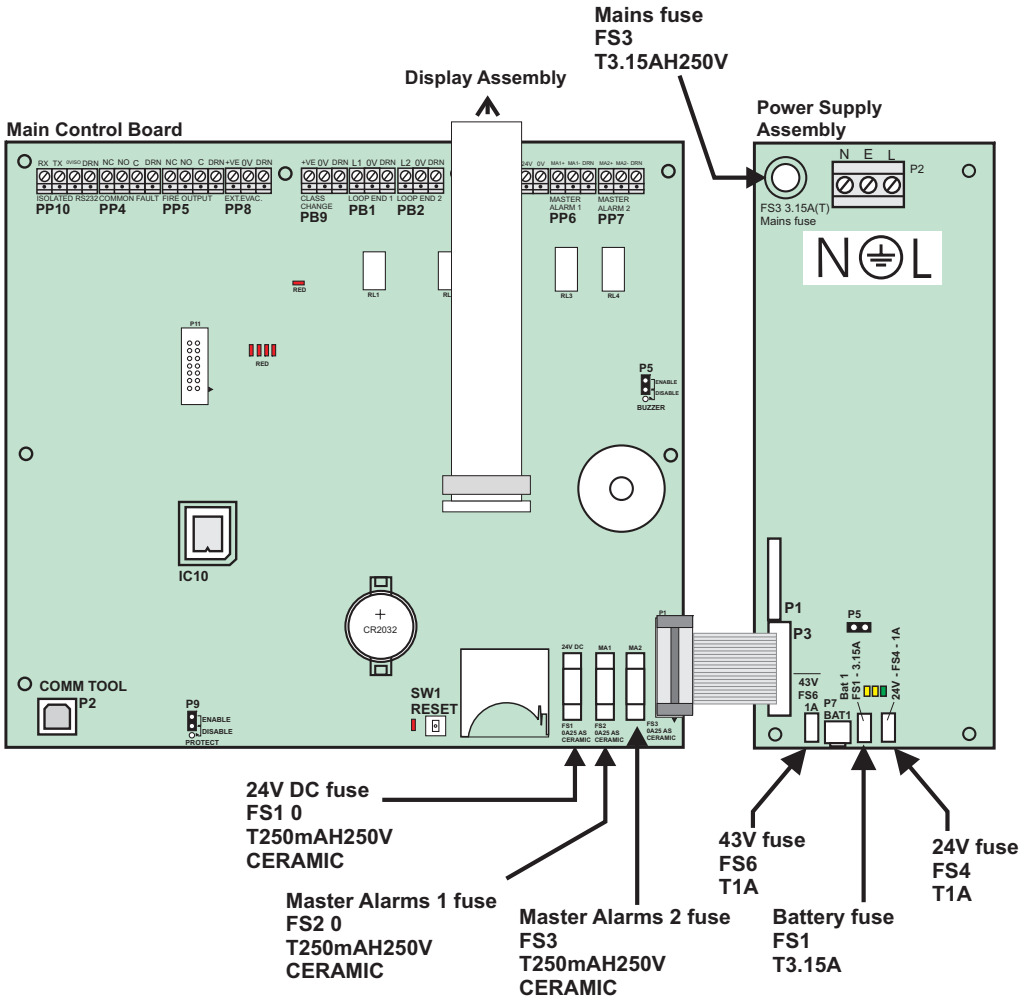
The panel will only power up after the mains supply is connected and switched ON.

Once the 12V 7Ahr batteries are connected up to the power supply assembly, remove the prop ④ used to support the LCD assembly and then close the LCD assembly.



Location of Fuses

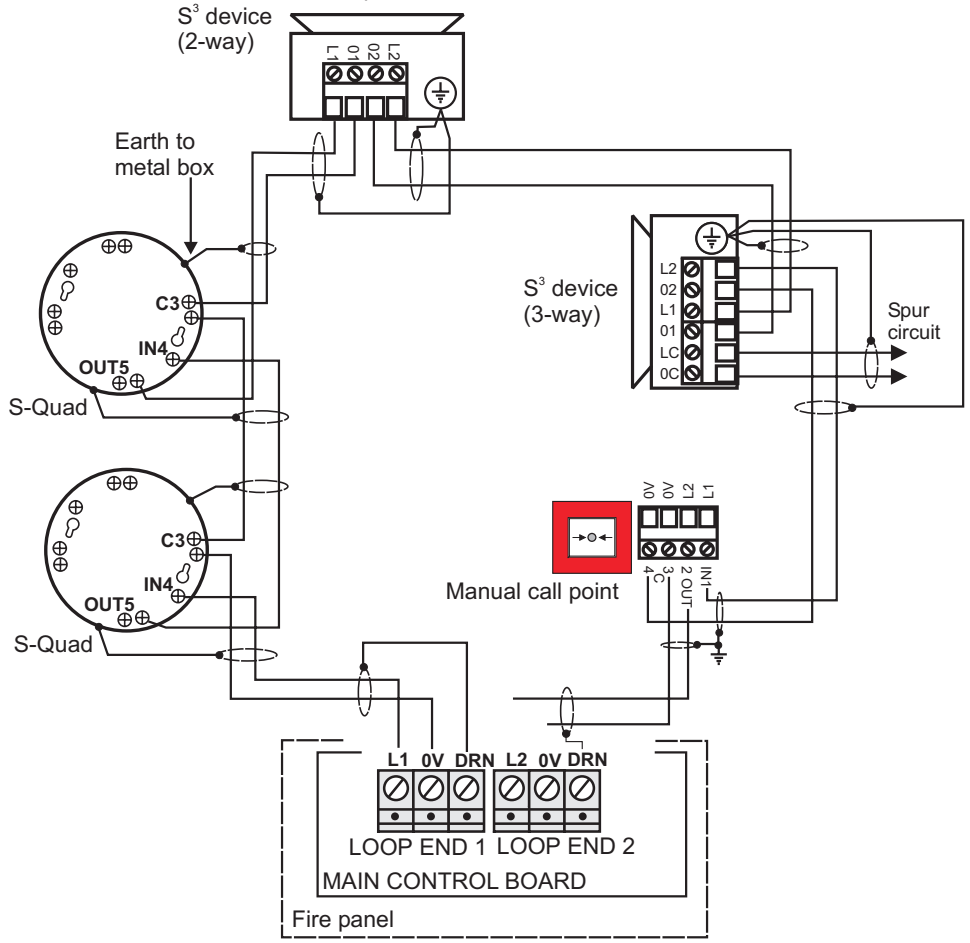
There are LETHAL VOLTAGES present on the Power supply assembly. Therefore it is important when working on the MCB or PSU board to completely power down the panel. The mains supply must be switched off and the battery supply disconnected.



Loop circuit connect END 1 only

Check with the installer and refer to the 'as Fitted Wiring Diagram' to ensure the cable run between Previous and Next Devices, at any point on the loop circuit HAS NOT EXCEED 250m. If cable distance is exceeded then rectification action must be taken.

The following diagram shows how to connect loop devices. Ensure only Loop End-1 is connected at the panel and End-2 of the loop cable remains disconnected at the panel until successful allocation of addresses to all the devices on the loop.



Power up

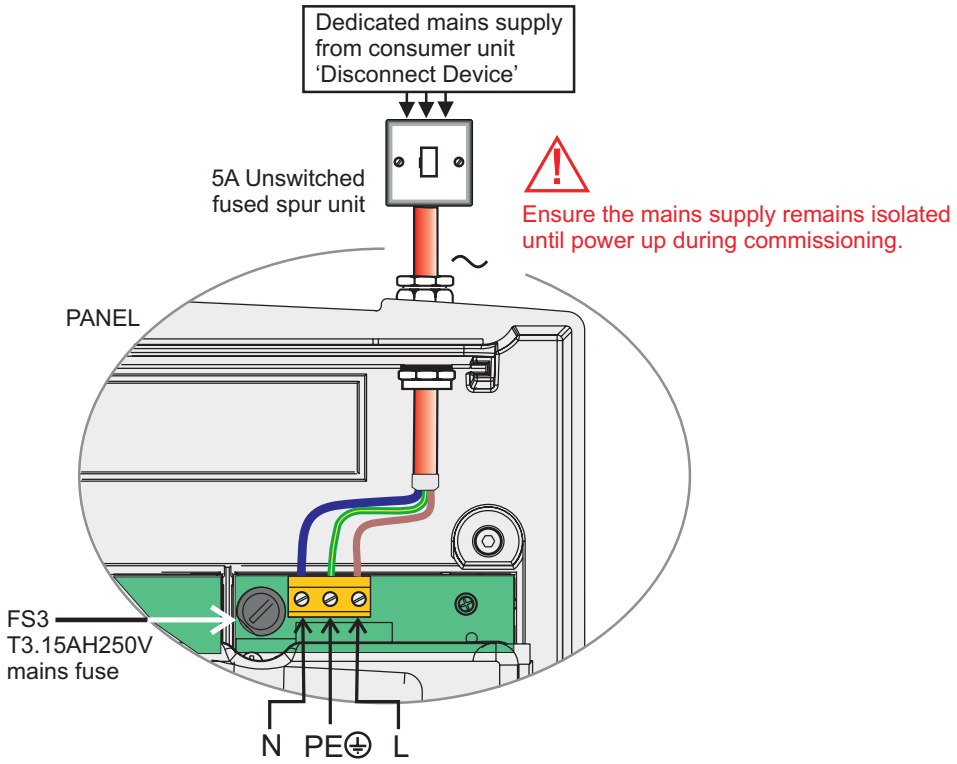
Ensure the mains cable is securely connected to the mains terminal block on the Power supply assembly and then switch On the mains power.

The fire alarm system products are NOT designed to be powered from IT Power systems.

All mains powered equipment must be earthed. Mains supply to any fire alarm control and indicating equipment must be via a dedicated unswitched 5A fused spur unit, which should be clearly labelled **FIRE ALARM - DO NOT SWITCH OFF**.

A 'disconnect device' must be provided to disconnect both poles and must have a minimum gap of 3mm. The Disconnect device should be available as part of the building installation and must be easily accessible after installation is complete.

Hazardous voltage remains after operation of a protection fuse. Take appropriate action to guard against the risk of equipment having exposed live mains supply.



When the panel is powered up for the very first time with 'time and date' not set up you will get a 'System fault' indication.

System Fault
[amber LED]

To remove the 'System Fault' indication you will need to press the 'Reset' button.

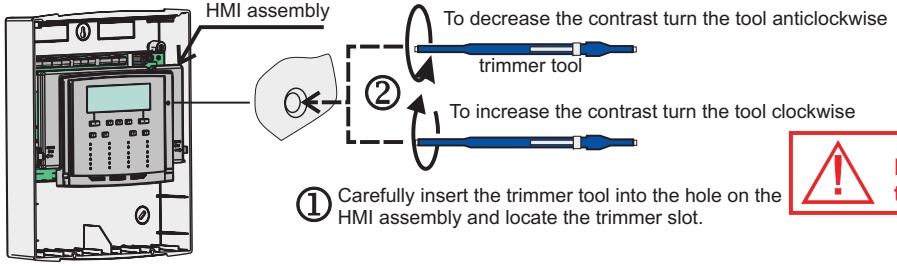
Enter 'Customer mode' PIN Code (Access level 2)

Reset

How to adjust the LCD Contrast

You may need to adjust the LCD display contrast to suit the lighting level where the panel is installed.

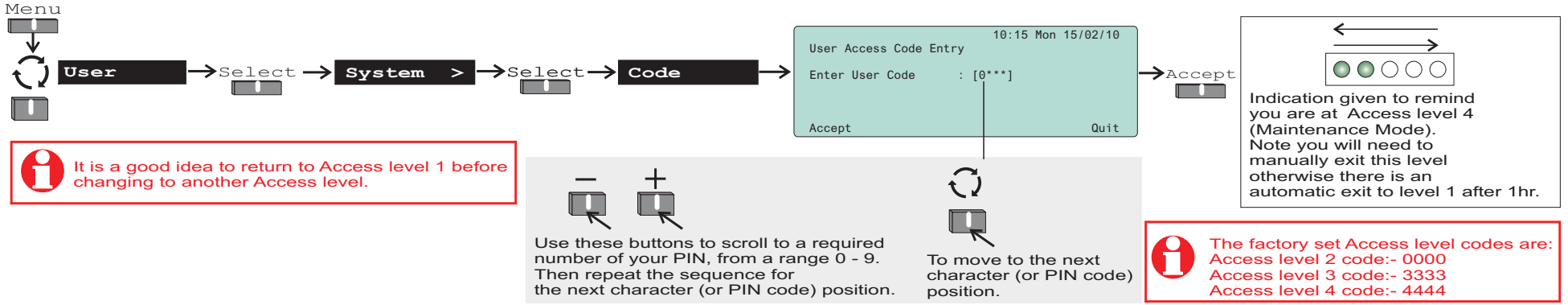
Panel is shown without the front cover fitted



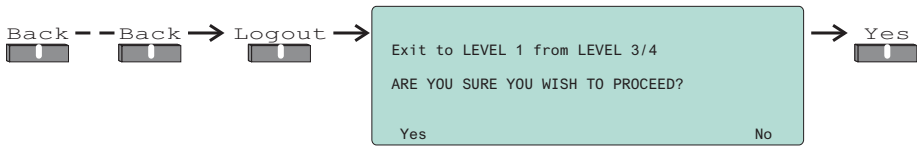
Note component damage may occur if the trimmer tool is forced into the hole.

How to change to another Access level from access level 1

If the controls are not used when at Access level 2, 3 or 4 then the system will timeout and return to Access level 1. When at Access levels 2 or 3 the system will timeout after about 3 minutes and return to Access level 1. When at Access level 4 the menu will exit to Access level 1 after 1 hour.



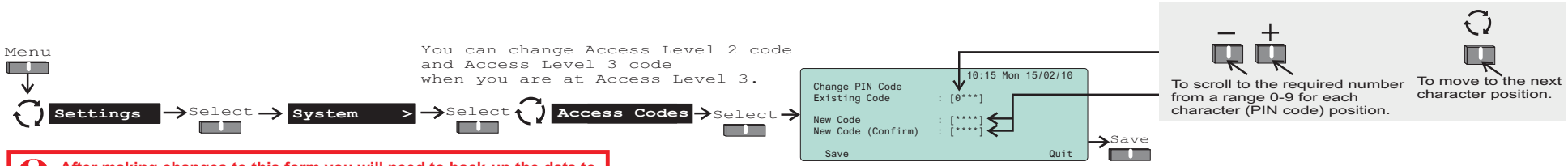
How to exit to Access Level 1 from Access level 2, 3 or 4



How to change the user PIN code (Password or Usercode)

You will need to be at the appropriate Access level 3 or 4 to be able to change the Access level PIN codes. Access level 1 has no PIN code assigned.
Factory default PINs are:

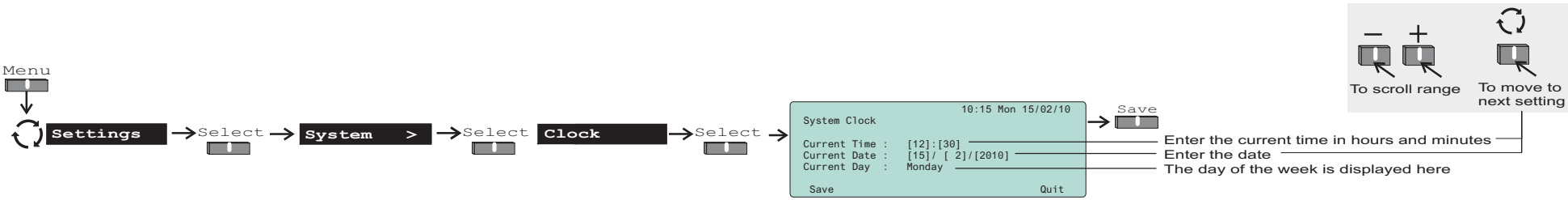
- ☐ Access level 2 - 0 0 0 0 (Customer mode)
- ☐ Access level 3 - 3 3 3 3 (Engineering Mode)
- ☐ Access level 4 - 4 4 4 4 (Maintenance Mode)



After making changes to this form you will need to back-up the data to memory. Ensure the write protect link P9 on the MCB is configured in the ENABLED position to allow back-up of data.

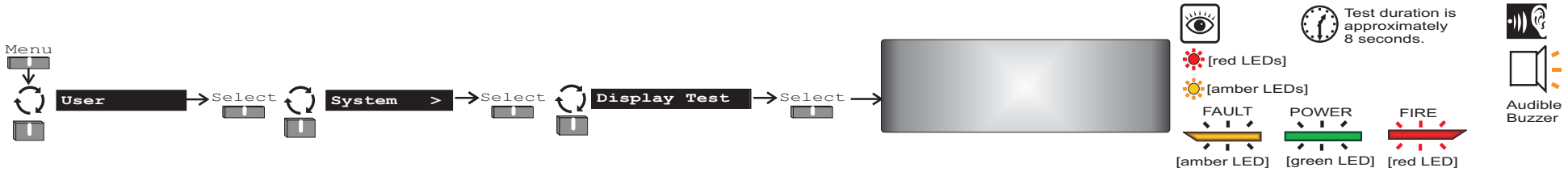
How to set the 'Clock'

The 'clock' sets the time and date, which is used by the panel to display the exact time and date of an active event of Fire, Fault or Disablement. The event information along with time and date is logged in the historic log for future reference. You will need to be at Access level 2 or above to set the clock.



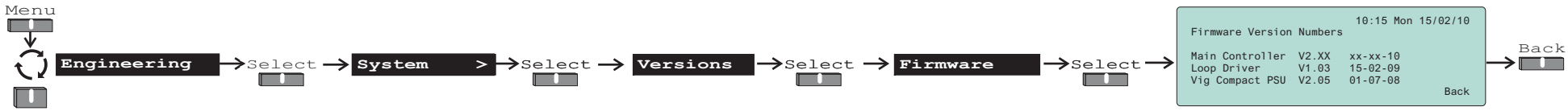
How to conduct a 'Display Test'

It is possible to check if all the LEDS and the display of the panel have not failed by conducting a display test. You will need to be at Access Level 2 or above to conduct a Display test.



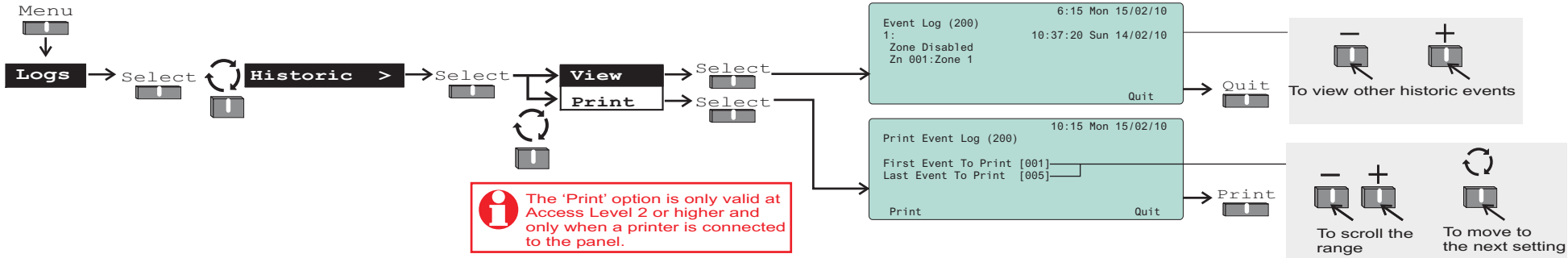
How to view the panel 'Firmware'

To check you have the latest panel firmware to support the installed system you can view the firmware of the Main Controller, Loop driver and PSU.
You will need to be at Access Level 2 or above to check the panel firmware.

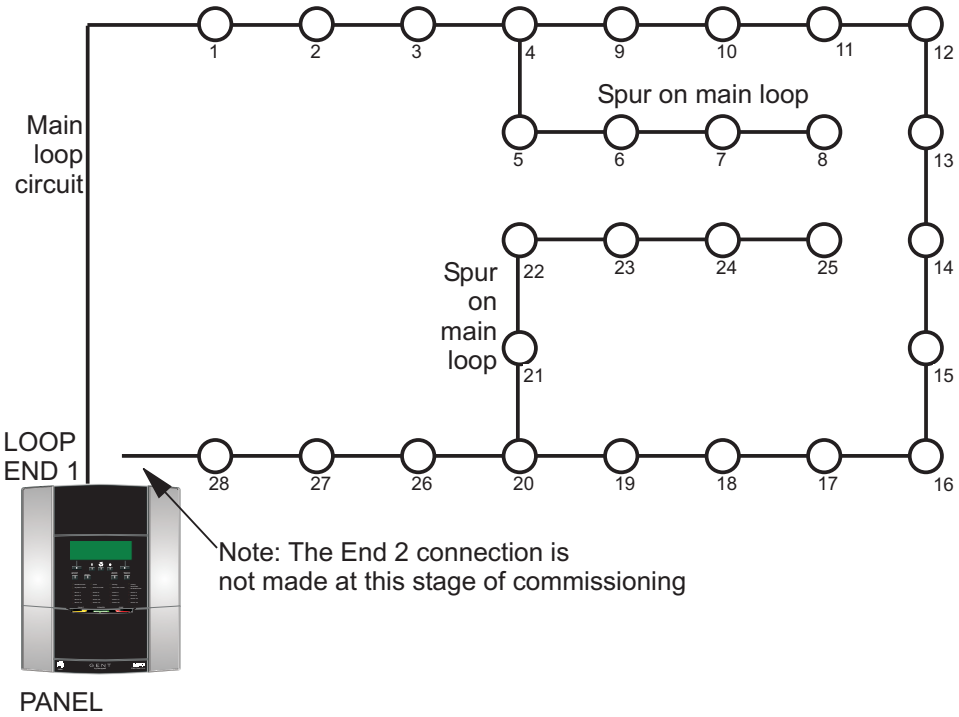


How to view the 'Historic' events log

The Historic events log holds up to 999 records of events in the system. You can scroll through all the events with event number 1 being the latest event. You can also print a range of events to a printer, providing a printer is connected to the panel.



Address allocation



How addresses are allocated to devices

Each device that is connected to the loop circuit is allocated an address (a soft address). The first device is given address 1 and the next one is given address 2 and so on.

- ☐ The allocation of addresses starts from one End of a loop circuit in a numerical order. If both ends of the loop are connected then the allocation of addresses starts from End-1. On reaching a T-breaker the spur circuit off the main loop is allocated with addresses. On completion the process continues along the main loop.

The new map is checked against the last map held in the Flash memory, if found to be different then a message is displayed.

Address allocation from Loop END 1

- ☐ You will see the 'powering up' messages which tells you the progress of address allocation and the number of devices found and the last device on the loop.
- ☐ If the address allocation reaches the last device then the panel will show 'Wiring open circuit' fault as End 2 is not connected to the panel and also there will be a 'Backup required' reminder. Ignore the reminder at this stage of commissioning.
- ☐ Even if all the devices are wired correctly, there may still be other device faults, like mains and battery disconnected at a mains powered interface unit. The panel *fault buzzer* will sound and the Fault LED will be lit.
- ☐ To stop the local buzzer from sounding, press the *Cancel Buzzer* button. You may need to enter an access code if at level 1.

Refer to 'Appendix A - Message action list' for information on the displayed fault(s) and possible action to rectify the fault(s), see page 72.

Address allocation from Loop End 2

Manually **Power-Down** the loop and disconnect Loop at End-1 and connect Loop at End-2 to check address allocation works from Loop End 2. **Power-Up** the loop. On successful allocation of addresses **Power-Down** the loop and then connect both ends of the loop and then **Power-up** the loop. Upon successful allocation of addresses to all devices on the loop you can **Start Detection.**

Allocation faults

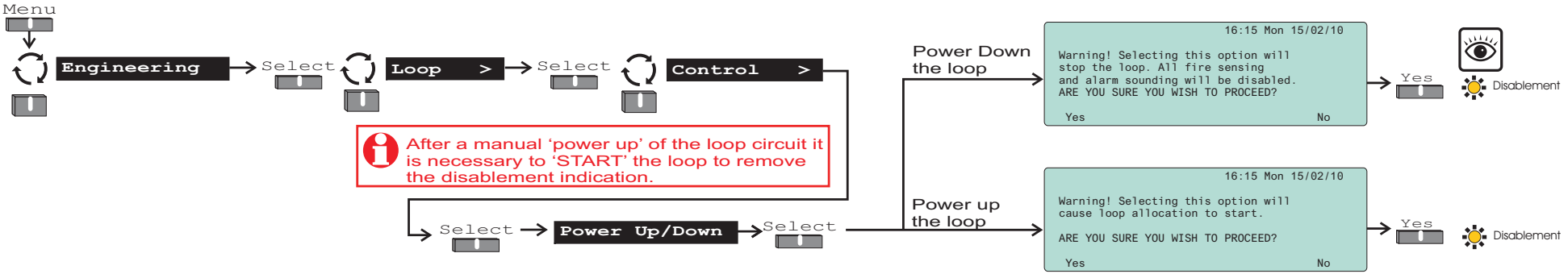
- ☐ The device with a hardware fault may have its LED lit.
- ☐ An *allocation fault* that has been rectified will not be recognised until after re-allocation of the loop.
- ☐ *Allocation faults* will not be able to distinguish between a point type sensor and a call point.
- ☐ When a short circuit fault is found, the loop re-allocates to the device before the short circuit. The device loop breaker remains open and the device LED is lit.

Start Up

- ☐ A loop is started after allocation, each device is set up to start operating normally based on device type, when analogue channels are read.

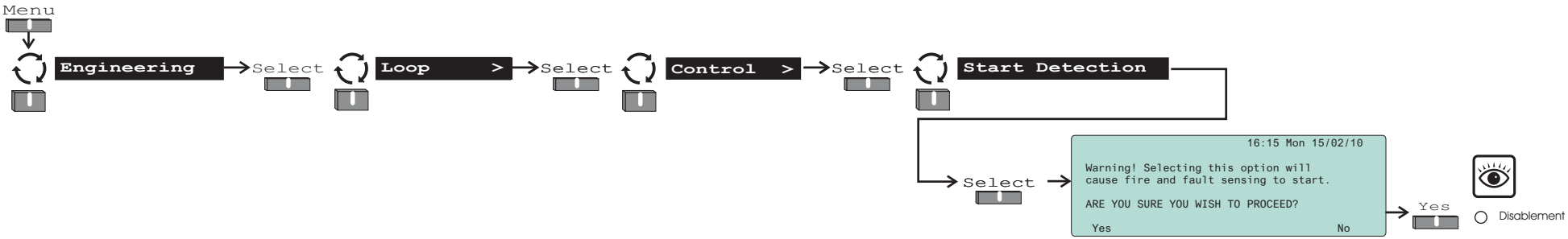
How to manually 'Power-down' or 'Power-up' the loop

When working on the loop circuit or after changes have been made to the devices on the loop it is important to reallocate addresses given to devices on the loop. To re-allocate addresses to devices on the loop circuit you will need to 'Power-down' the loop and then Power-up the loop. You will need to be at Access Level 4 to control power to the loop.



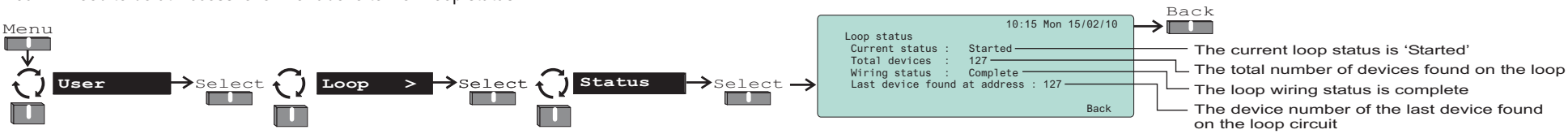
How to manually 'Start Detection' after manual power-up

Following a manual 'Power-up' of the loop circuit and upon successful allocation of addresses to all the devices on the loop you must manually 'Start Detection'.
You will need to be at Access Level 4 to start detection.

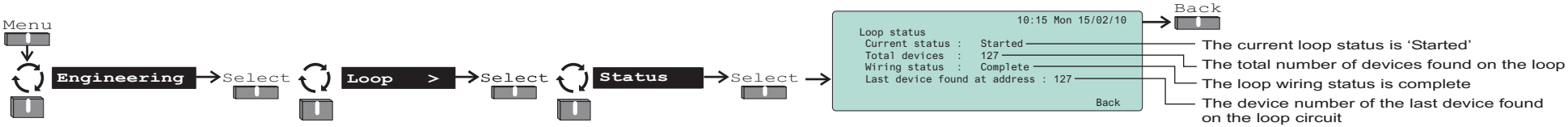


How to view the 'Loop Status'

The loop status provides information on the current status of the loop, total number of devices found on the loop, wiring status and the address of the last device on the loop.
You will need to be at Access level 2 or above to view loop status.



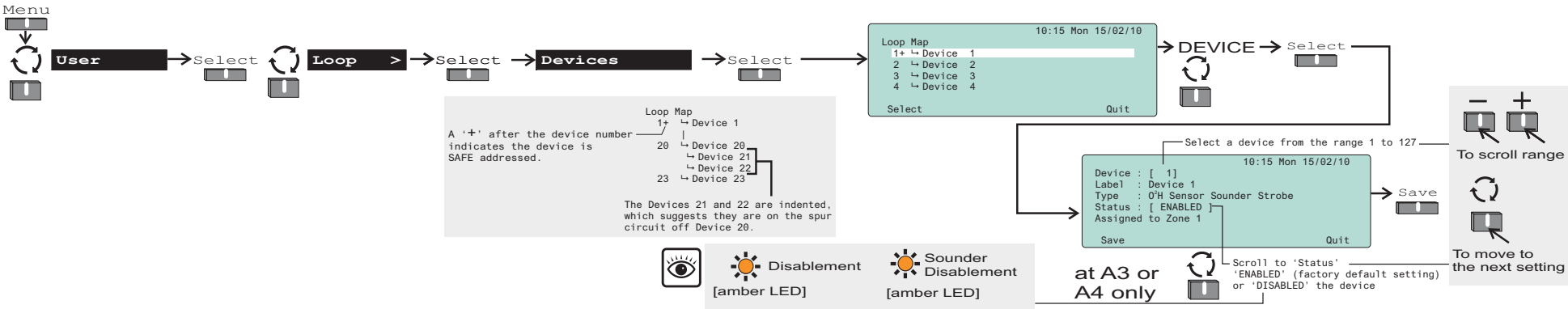
You can also view the loop status at Access level 4.



How to view the 'Loop Map' and 'Enable / Disable' Devices

The 'Loop map' is a list of devices installed between end-1 and end-2 of the loop wiring. It shows devices in sequential order starting from End-1 of the loop. This is the first check against the *as fitted wiring drawings,* that confirms the number of devices installed in the protected premises. It is possible to display or print a loop map. The printout is only possible if a printer is connected. In addition to this it is possible to scroll to a selected device and view the device information. After viewing the device details you can return to the loop map by selection the'Back' option. You will need to be at Access level 2 or above to view the loop map.

The display of Individual 'Sounder disablement' information will be suppressed when the panel enters a fire condition, consequently in this condition the panel will fail to meet the requirements of EN54-2 clause 9.4.2 a) amendments.

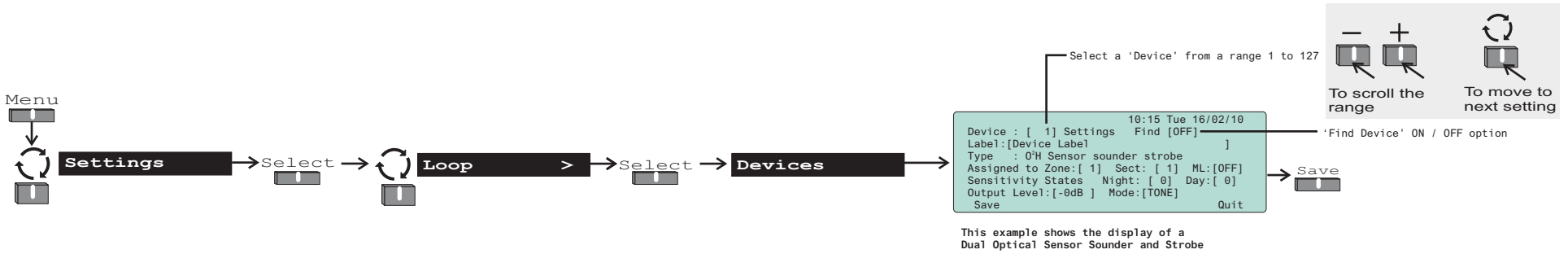


How to 'Find Devices' on the Loop circuit

To check the physical location of devices on the loop circuit you will need two people in communication with each other. While one person walks around the site and marks off the devices found on a copy of the *as fitted wiring drawings*, the other person operates the panel controls. The 'find device' function is used to provide a visual or audible indication at the respective device on the loop circuit.

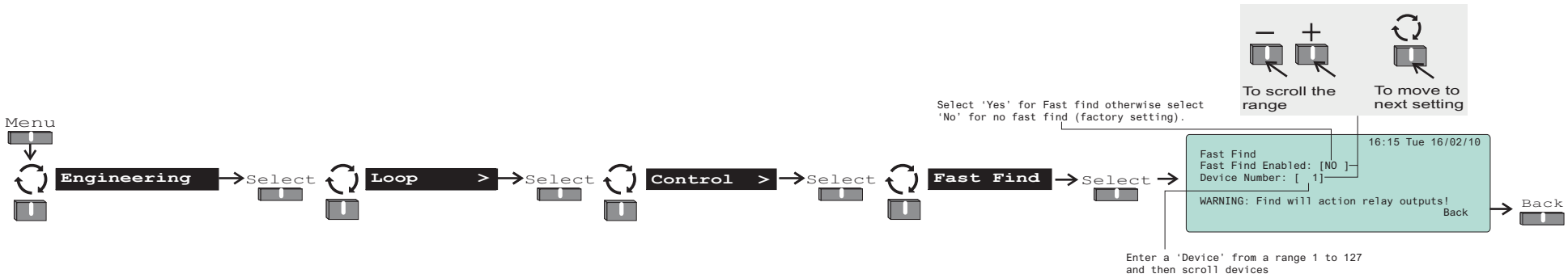
Method 1:

Select the device and switch ON 'Find' to find the device. You will need to be at Access Level 3 or above to find devices on the loop circuit using this method.



Method 2:

To 'fast find' a device on the loop circuit you will need to enable the option in the 'Fast find' form and then enter the device number to find. You can then scroll to find the next or previous device. You will need to be at Access Level 4 to fast find devices on the loop circuit.



When using the Find device function at an interface it will cause its output channels to activate.

Visual and audible indication of 'Find Device'

Sensors and MCP

☐ A *S-Quad fire sensor* or *manual call point* will operate its LED for 0.5 second *On* and 0.5 second *Off* repeated.

Sounders and S Cubed

☐ Each *S cubed or S-Quad with sounder* device will provide an audible tone and/or visual indication for 0.5 second *On* and 0.5 second *Off* repeated. If the device operates in voice mode then the pre-tone followed by a full test message will be played.

Interface units

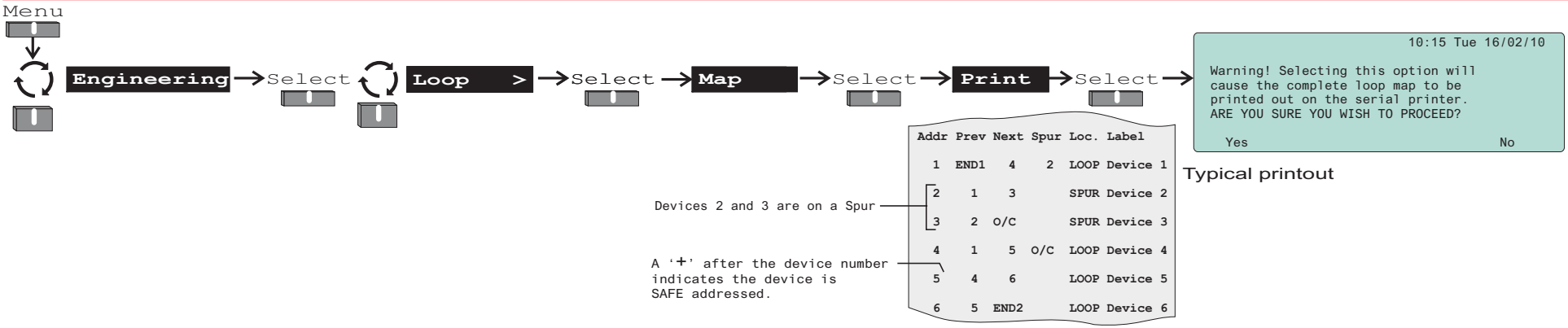
Ensure Interface outputs are not connected to external equipment at this stage of commissioning. These must be tested in accordance with project recommendations.

☐ Each *interface output* will in turn be activated for 0.5 second *On* and 0.5 second *Off,* this will repeat.

How to 'Print' the Loop map

You can print the loop map to a local printer connected to the panel. You will need to be at access level 4.

A printout will only print the first 15 characters of a label due to the limit of 40 characters per line on the handheld printer.



How to 'Back-up' site data to Flash memory

Once the panel has allocated addresses to all the loop devices and the loop has started you will need to back-up the site data to the Flash memory at the panel. Any subsequent changes to the configuration and labels during commissioning will also need to be backed-up. When the commissioning tool is used to transmit the custom configuration to the panel, the new data at the panel must be backed-up to the panel memory. You will need to be at access level 3 or above to back-up site data to flash memory.



Ensure the write protect link P9 on the MCB in configured in the ENABLED position to allow back-up of data to memory.

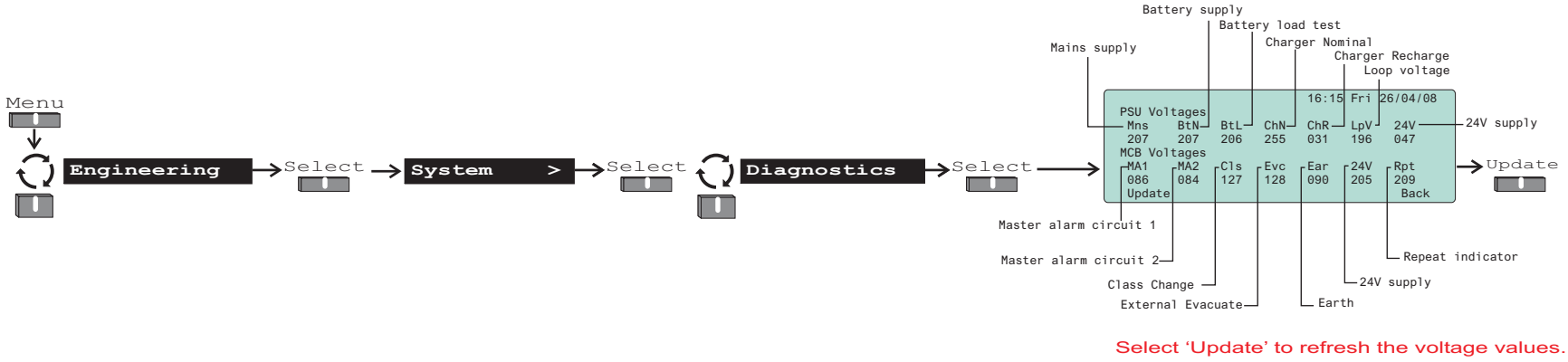
How to 'Restore' configuration data from Flash memory

If for some reason the changes made to the configuration since previous back-up is not known then you can restore the previous back-up. You will need to be at access level 3 to restore configuration data.



How to view 'Diagnostics' data

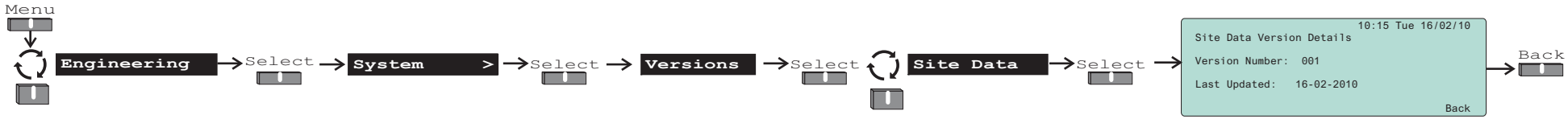
The diagnostic data of mains, battery, loop, 24V supply, master alarm circuits, class change, external evacuate, earth and repeat indicator can be displayed for engineering use. This information is for engineering use only and the illustration below show typical values. You will need to be at Access level 4 to view diagnostics data.



Select 'Update' to refresh the voltage values.

How to view 'Site data' version

The Site Data version number is a count of each upload of the configuration made from the Nano commissioning tool. You will need to be at access level 2 or above to view site data version.



Measuring the loop cable resistance and capacitance

Power-down and disconnect both ends of the *loop* wiring by pulling out the associated terminal blocks at the control panel.

Resistance measurement

☐ Using a *multimeter* measure the resistance between the *loop L1 0V* (End 1) and loop L2 *0V* (End 2). In practice this should not be greater than **13 ohms.**

Capacitance measurement

☐ Check the capacitance between the *loop 0V* and *cable screen*. The capacitance should not be greater than **1.0uF.** Also the cable End-1 and End-2 should read the same value.

When to use the 'Repair' function on the loop circuit

When a loop circuit is tested for short circuit fault or if a genuine wiring short circuit fault should occur, then rectification action must be taken. First rectify the wiring fault and then process the **'Repair'** command at the control panel. You will need to be at Access level 2 or above to activate the repair function.



Loop 'Short Circuit' test

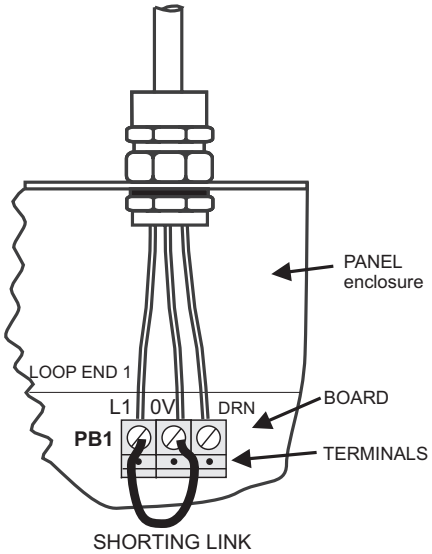
A loop short circuit isolation test should be carried out at this stage. It is recommended that the sounders are switched On before conducting this test. If the test is unsuccessful then after the rectification work is complete, re-allocate the loop circuit by using the **'Power-Down'** and **'Power-Up'** functions followed by **'Start Detection'**.

End 1 Short circuit test

- ☐ Place a short circuit across the loop terminals at **End-1**. There should be no loss of any part of the system. The display will give a 'wiring changed' message with location of the device at which the short was detected.
- ☐ Run the **'Repair'** function to clear the fault indication.

End 2 and Mid loop - Short circuit test

- ☐ A short circuit test should then be repeated at **End-2** and again at **mid point** of the loop.
- ☐ Run the **'Repair'** function to clear the fault.



Loop 'Ground Break' test

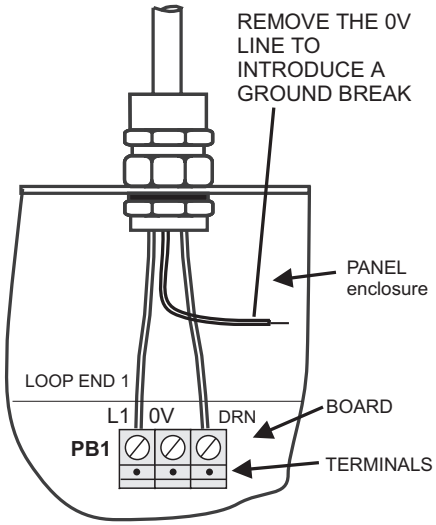
A ground break test should be carried out at this stage. A single 0V line break should not cause the loss of any part of the system. If the test is unsuccessful then after the rectification work is complete, re-allocate the loop circuit by using the **'Power-Down'** and **'Power-Up'** functions followed by **'Start Detection'**.

End 1 ground cable break test

- ☐ Disconnect the *0V line* from **End-1** of a loop circuit.
- ☐ The cable break may have to be sustained for up to a minute. The display will show a wiring changed message with location of device at which the break was detected.
- ☐ If necessary run the **'Repair'** function to clear the fault indication.

End 2 ground cable break test

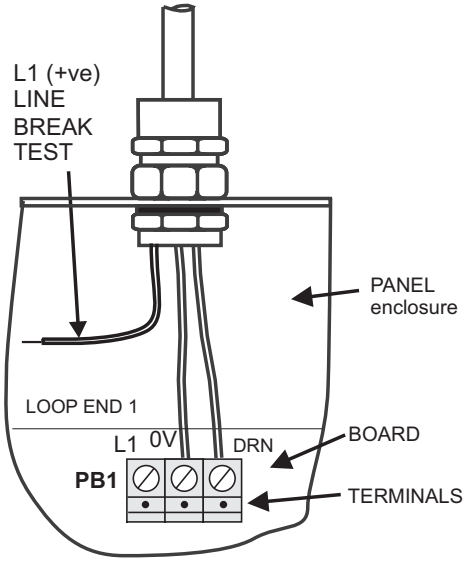
- ☐ The ground break test should be repeated at the other end of the loop circuit, **End-2** and again at **mid point of the loop**.
- ☐ If necessary run the **'Repair'** function to clear the system.



Loop 'Positive line' break test

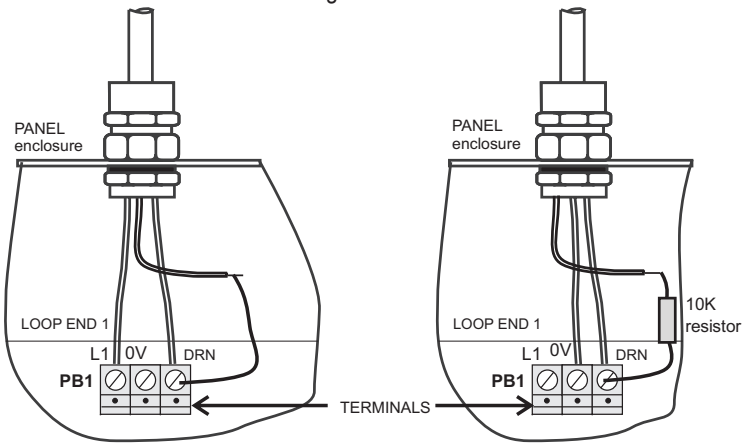
A positive line break test should be carried out at this stage. A single +ve line break should not cause the loss of any part of the system. If the test is unsuccessful then after the rectification work is complete, re-allocate the loop circuit by using the **'Power-Down'** and **'Power-Up'** functions followed by **'Start Detection'**.

- ☐ Disconnect the *+ve line* connection at one **End-1** of the loop circuit. The display will show a wiring changed message with location of device where the positive break was found.
- ☐ If necessary run the **'Repair'** function to clear the system.



Loop 'Earth fault' tests

Earth fault tests should be carried at this stage:



0V-line earth fault test

- ☐ Connect the *0V line* to the earth of the control panel. This may have to be sustained for up to 1 minute for the fault to be detected. The display will show an 'Earth fault'.
- ☐ Restore the wiring and the display will show 'Earth Fault cleared'.

+ve line earth fault test

- ☐ Now connect the *+ve line* to earth via a **10K ohm** resistor. This may have to be sustained for up to 1 minute for the fault to be detected. The display will show an 'Earth fault' message and after restoration of the wiring a cleared message is displayed. If the resistance between 'Earth' and 'Loop +ve' is in the order of a few ohms then this will be registered as a ‘short circuit’.

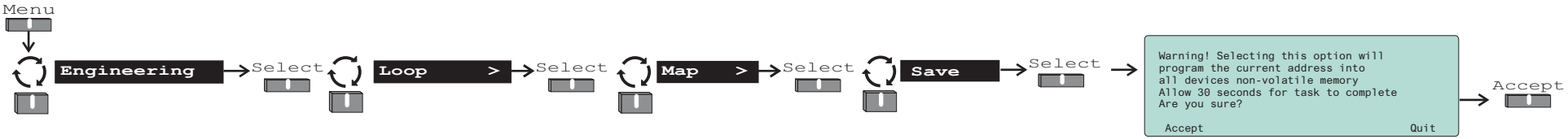
Type of earth fault

Interrogate the **Diagnostics** and check the readings given for Earth fault.

Type of Earth fault	Earth (Ear) reading
No earth fault	around 89
+ve line and earth	around 75
-ve line and earth	less than 40

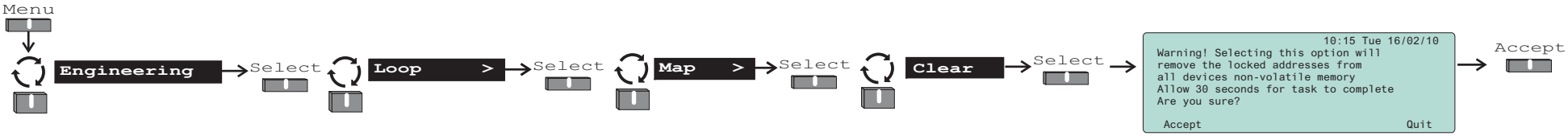
To 'Save loop map' and make 'SAFE' device addresses

The Soft addresses given to devices on the loop can be locked and saved in the non volatile memory (made SAFE) within each device and carried with the device. You will need to be at access level 4 to SAFE address devices on the loop.



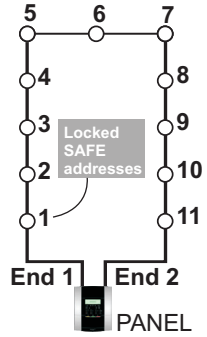
To 'Clear loop map' and 'UNSAFE' saved addresses from loop devices

The SAFE addresses can be cleared from all the devices on the loop circuit. The devices on the loop will revert to soft addresses. You will need to be at access level 4 to unlock addresses at devices on the loop.

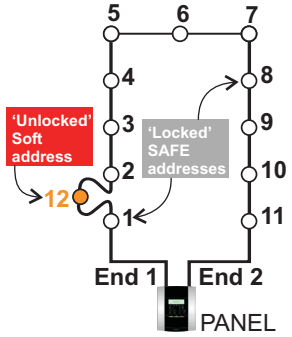


Insertion of new devices on a 'Saved' loop map

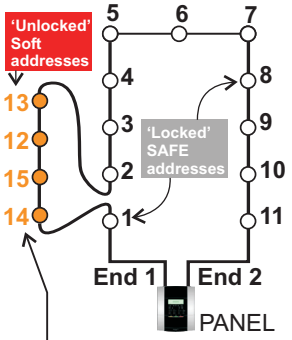
'Saved' loop map with no devices inserted on the loop.



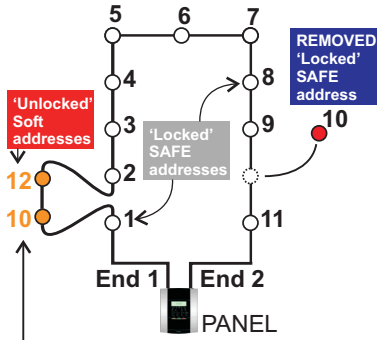
'Saved' loop map with 1 device inserted on the loop



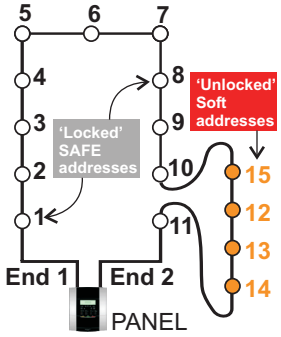
'Saved' loop map with 4 devices inserted on the loop



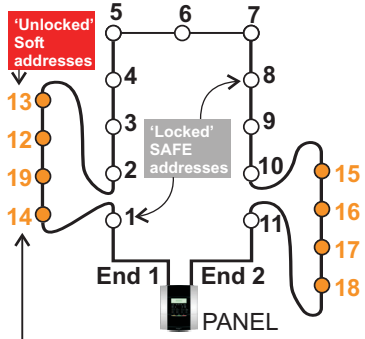
'Saved' loop map with 1 device removed and 2 devices inserted on the loop



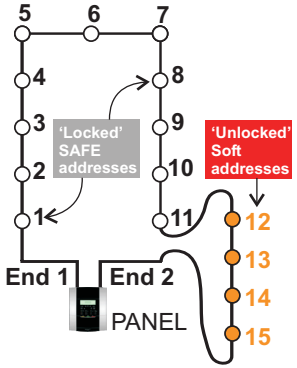
'Saved' loop map with 4 devices inserted towards the end of the loop



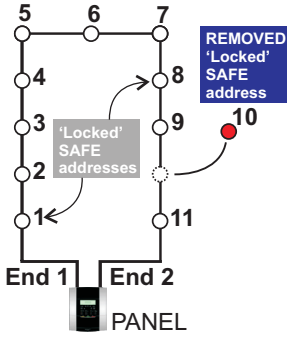
'Saved' loop map with 2 lots of inserted devices with second lot towards the end of the loop



'Saved' loop map with 4 devices inserted at the end of the loop



'Saved' loop map with 1 device removed from the loop



The sequence of soft addresses given to inserted devices might not be sequential.

It is important to note the addresses given to new devices that are inserted on an existing loop map may not be sequential, see illustration.

- ☐ After the inserted devices are allocated new addresses the new loop map must be saved (made SAFE) before using the commissioning tool to retrieve the new devices.
- ☐ To save the new loop map, see page 33. **Ensure you are fully aware of the physical location of the new devices using Find Device function at the panel, see page 26.**
- ☐ The existing site project file can then be opened on the Nano commissioning tool showing the existing devices and their configuration, ready for retrieval of the new devices. Using the 'Retrieve Loop Devices' icon and retrieve the new devices.
- ☐ Configure the new devices and then transmit the revised configuration to the panel.
- ☐ The revised system configuration and labels will need to be backed up to memory at the panel, see page 28.
- ☐ Test the revised configuration.

Difference between Nano panel at V1.00 and V1.3x

The differences between Nano panel with Main Controller at V1.00 and V1.3x are such that V1.3x covers the requirements of EN54 Part 2.

Zoning devices

A Nano panel having Main Controller at V1.3x will have all the detection devices in zones, with all other devices not zoned. For example:

The following devices can be placed in a Zone:

- ☐ All S-Quad Sensors
- ☐ Manual Call Point
- ☐ Beam Receiver
- ☐ Keyswitch Interface
- ☐ Single Input Interface

The following devices cannot be zoned.

- ☐ All S-Cubed
- ☐ Beam Transmitter
- ☐ Single LV Output Interface
- ☐ Single MV Output Interface
- ☐ 4 Channel LV Interface
- ☐ Mains Powered Interface

The *channels* on a Mains Powered Interface unit and a 4-channel LV Interface unit will have an associated zone regardless of whether they are inputs or outputs.

Feature changes

Features	V1.00	V1.3X
Zoned devices	All devices zoned	Only S-Quad, MCP, Beam Rx and Interface Inputs Zoned
Loop Maps	Just label shown	Label, spur level identification, SAFE address identification and condition codes shown
Channel Fires	Fire raised in Device Zone	Fire raised in Channel Zone
External Evacuate	Evacuates/Silences All sectors including PLANT	Behaves exactly as Sound/Silence Alarms buttons. This includes the action of Master Alarms and Fire relay if configured
Test Fires	Uses zone immediate C&E	Evacuate all enabled ALARM sectors

New features

- ☐ Fast find device, see page 26
- ☐ One man commission mode, see page 62
- ☐ Directly control sectors from sector status form, see page 63.
- ☐ Option for new fire to resound alarms, see page 58
- ☐ Interface pulse widths can be set for each signal, see page 59.

Difference between Nano panel at V1.3x and V2.xx

New features

- ☐ Calendar Mode supports 7 day Day/Night switching feature, see page 47.
- ☐ Proprietary Logo support, you can customise the logo to a site specific one using this feature, see page 69.
- ☐ Monitored line feature switch for S-Quad Devices, see page .

New functions

Supervisory interface input now supports: (also see pages 37 and 38)

- ☐ Verify Alarms
- ☐ Action Sector
- ☐ Zone test
- ☐ Class change
- ☐ Evacuate input

New Signal types supported for use with class change and test features: (also see page 59)

- ☐ 1/2 Second Pulse , 1/4 Second Pulse, 1 Second Pulse, Continuous and Nee-Naw

Nano panel now supports extra 'Channel Output' modes for 4 channel loop interfaces, can now be set to: (also see pages 37 and 38)

- ☐ Normally open or closed Relay Mode
- ☐ Normally On/Off LED mode

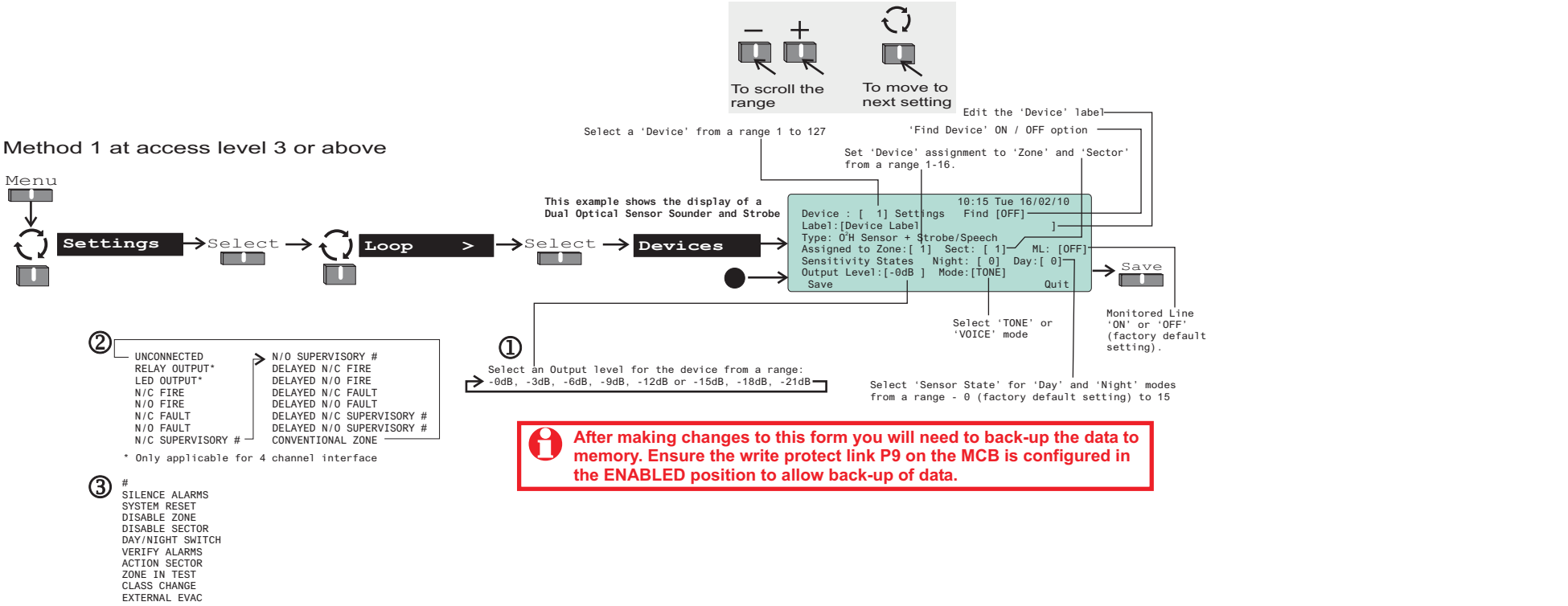
Changed Functionality

- ☐ Printer Baud Rate was previously 1200 and has been changed to 9600 to match the handheld printers default settings.
- ☐ RS485 port for use with Repeat indicator panel when configured as 'not fitted' at the Nano panel or via Configuration tool, will physically stop the Repeat indicator panel from working, see page 57.
- ☐ Evacuate input functionality now has a latching feature in addition to the non latching feature, see page 55.
- ☐ RS232 status and function settings now combined, see page 57.

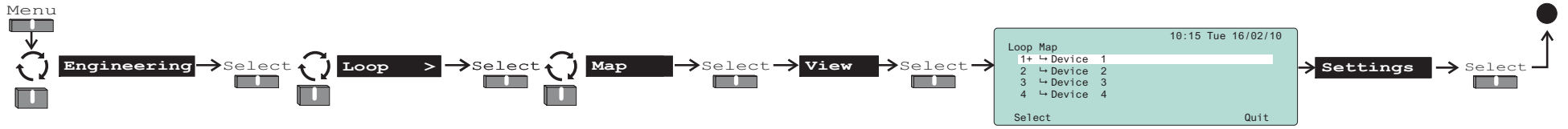
How to view or change 'Device configuration'

The Nano panel recognises the 34420 Interface Unit as having 1-Output channel only. The 'confirmation Input' channel of this interface unit is not recognised nor used when this unit is connected to the Nano loop circuit.

Two methods are shown for making changes to device configuration.



After making changes to this form you will need to back-up the data to memory. Ensure the write protect link P9 on the MCB is configured in the ENABLED position to allow back-up of data.



Typical device forms

Tee-Breaker

```
                              16:15 Tue 16/02/10
Device:[   2] Settings          Find:[OFF]
Label:[Device Label                          ]
Type: Tee-Breaker




  Save                                  Quit
```

Optical Heat Sensor and Strobe

```
                              16:17 Tue 09/03/10
Device:[  37] Settings          Find:[OFF]
Label:[Device Label                          ]
Type: OH Sensor + Strobe
Assigned to Zone:[ 1]   Sect:[ 2]  ML: [OFF]
Sensitivity States : Night:[ 0]    Day:[ 0]

  Save                                  Quit
```

Optical Heat Sensor Strobe

```
                              10:18 Tue 16/02/10
Device :[  4] Settings          Find:[OFF]
Label:[Device Label                          ]
Type: OH Sensor + Strobe
Assigned to Zone:[ 1]   Sect:[ 2]   ML: [OFF]
Sensitivity States   Night:[ 0]     Day:[ 5]
Output Level: [-21 dB]  Mode : TONE
 Save                                   Quit
```

①

Optical Heat Sensor

```
                              16:19 Tue 09/03/10
Device: [  5] Settings          Find:[OFF]
Label:[Device Label                          ]
Type: Optical Heat Sensor
Assigned to Zone:[ 1]            ML: [OFF]
Sensitivity States : Night:[ 0]  Day:[ 0]

  Save                                  Quit
```

Sounder Strobe

```
                              10:20 Tue 16/02/10
Device:[   6]  Settings         Find:[OFF]
Label:[Device label                          ]
Type: Sounder Strobe
Assigned to Sect:[ 2]
Output Level: [-0dB]  Mode: [TONE]

 Save                                   Quit
```

①

TONE
'VOICE'

Optical Sensor and Strobe

```
                              16:21 Tue 09/03/10
Device:[   7] Settings          Find [OFF]
Label:[Device Label                          ]
Type: Optical Sensor + Strobe
Assigned to Zone:[ 1]   Sect:[ 2]  ML: [OFF]
Sensitivity States Night:[ 0]      Day:[ 0]
Output Level:[-0dB ]  Mode :[VOICE]
  Save                                  Quit
```

①

TONE
'VOICE'

Single-Channel Input interface

```
                              10:22 Tue 16/02/10
Device: [  7] Settings          Find:[OFF]
Label:[Device Label                          ]
Type : Single Input Interface
Assigned to Zone:[ 1]  Sect:[15]
Mode:  [CONVENTIONAL ZONE                    ]
Supervisory function: [N/A]
 Save                                   Quit
```

②

Sounder

```
                              10:23 Tue 16/02/10
Device: [  8] Channel [1] Settings
Label:[Device label                          ]
Type: Sounder
Assigned to Sect: Sect [ 1]
Output Level: [-0dB ]

 Save                                   Quit
```

①

Four Channel LV Interface ◇

```
                              16:24 Tue 16/02/10
Device:[  10] Settings          Find:[OFF]
Label:[Device Label                          ]
Type: Four Channel LV Interface




  Save                                  Quit
```

◇ The Zone and sector settings are possible using Settings -> Loop -> Channel.

Single Input Keyswitch Interface

```
                              16:25 Tue 16/02/10
Device [  11] Channel [1] Settings
Label:[Device label                          ]
Type: Single Input Keyswitch Interface
Assigned to Zone:[12]  Sect:[12]
Supervisory Function: [DAY/NIGHT SWITCH ]

 Save                                   Quit
```

③

Sounder Strobe

```
                              16:26 Tue 16/02/10
Device [  13] Channel [1] Settings
Label:[Device label                          ]
Type: Sounder Strobe
Assigned to Sect:[ 1]
Output Level: [-0dB]

 Save                                   Quit
```

①

Optical Heat Sensor

```
                              16:27 Tue 16/02/10
Device:[  14] Settings          Find:[OFF]
Label:[Device Label                          ]
Type: OH Sensor
Assigned to Zone:[ 1]            ML: [OFF]
Sensitivity States Night:[ 0]  Day:[ 0]

  Save                                  Quit
```

Strobe

```
                              16:28 Mon 16/02/10
Device:[ 16] Settings           Find:[OFF]
Label:[Device Label                          ]
Type: Strobe
Assigned to Sect:[ 2]




  Save                                  Quit
```

Optical heat Sensor

```
                              16:29 Fri 16/02/10
Device:[   17] Settings         Find:[OFF]
Label:[Device Label                          ]
Type: OH Sensor
Assigned to Zone:[ 1]   Sect:[ 2]  ML:[OFF]
Sensitivity States : Night:[ 0]    Day:[ 0]
Output Level:[-0dB ]  Mode :TONE
  Save                                  Quit
```

①

Optical Sensor

```
                              16:30 Tue 16/02/10
Device:[   18] Settings         Find:[OFF]
Label:[Device Label                          ]
Type: Optical Sensor
Assigned to Zone:[ 1]           ML: [OFF]
Sensitivity States  Night:[ 0] Day:[ 0]

  Save                                  Quit
```

Heat Sensor + Strobe

```
                              16:31 Tue 16/02/10
Device:[   20] Settings         Find:[OFF]
Label:[Device Label                          ]
Type: Heat Sensor + Strobe
Assigned to Zone:[ 1]   Sect:[ 2]  ML: [Off]
Sensitivity States  Night:[ 0]     Day:[ 5]
Output Level:[-21dB]  Mode: TONE
  Save                                  Quit
```

①

Typical device forms continued

Dual Optical Heat Sensor + CO

```
                                16:32 Tue 09/03/10
Device:[  21] Settings          Find [OFF]
Label:[Device Label                          ]
Type: O²H + CO Sensor
Assigned to Zone:[ 1]                ML: [OFF]
Sensitivity States   Night:[ 0]   Day:[ 0]

   Save                                  Quit
```

Dual Optical Heat Sensor + CO Strobe / Speech

```
                                16:33 Tue 09/03/10
Device:[  22] Settings          Find [OFF]
Label: [Device Label                         ]
Type: O²H + CO Sensor + Strobe/Speech
Assigned to Zone [ 1]   Sect [ 2]  ML: [OFF]
Sensitivity States : Night:[ 0]    Day:[ 0]
Output Level:[-21dB ]  Mode:[TONE]
   Save                                  Quit
```

① TONE 'VOICE'

Beam Receiver

```
                                16:34 Tue 16/02/10
Device:[   24] Settings          Find:[OFF]
Label:[Device Label                          ]
Type: Beam Receiver
Assigned to Zone:[ 1]
Sensitivity States  Night:[ 0] Day:[ 0]
Gain:[63]
  Save                                  Quit
```

Beam Transmitter

```
                                16:35 Tue 16/02/10
Device:[   25] Settings          Find [OFF]
Label:[Device Label                          ]
Type: Beam Transmitter


  Save                                  Quit
```

Optical Heat Sensor + Sounder

```
                                16:36 Tue 09/03/10
Device:[  26] Settings          Find [OFF]
Label:[Device Label                          ]
Type: Optical Heat Sensor + Sounder
Assigned to Zone:[ 1]   Sect:[ 2]  ML: [OFF]
Sensitivity States   Night:[ 0]    Day:[ 0]
Output Level: [-0dB ]
   Save                                  Quit
```

①

Heat Sensor + Sounder

```
                                16:37 Tue 09/03/10
Device:[  27] Settings          Find [OFF]
Label:[Device Label                          ]
Type: Heat Sensor + Sounder
Assigned to Zone:[ 1]   Sect:[ 2]  ML: [OFF]
Sensitivity States    Night:[ 0]   Day:[ 0]
Output Level: [-0dB ]
   Save                                  Quit
```

①

S4-34440 Mains Powered Interface ◇

```
                                16:38 Tue 16/02/10
Device:[  29] Settings          Find:[OFF]
Label:[Device Label                          ]
Type: Mains Powered LV Interface


  Save                                  Quit
```

◇ The Zone and sector settings are possible via Setting -> Loop-> Channel.

34440 Mains Powered Interface ◇

```
                                16:39 Tue 16/02/10
Device:[  30] Settings          Find:[OFF]
Label:[Device Label 34440 IF             ]
Type: Mains Powered Interface


  Save                                  Quit
```

◇ The Zone and sector settings are possible via Setting -> Loop-> Channel.

Voice Sounder

```
                                16:40 Tue 16/02/10
Device:[  31] Settings          Find:[OFF]
Label:[Device Label                          ]
Type: Voice Sounder
Assigned to Sect:[ 2]
Output Level: [-0dB]     Mode:[TONE]

  Save                                  Quit
```

① TONE 'VOICE'

Manual Call Point

```
                                16:42 Tue 16/02/10
Device: [  12] Settings        Find:[OFF]
Label:[Device label                          ]
Type:  Manual Call Point
Assigned to Zone:[ 1]


  Save                                  Quit
```

Single Output MV Interface

```
                                16:43 Tue 16/02/10
Device:[  15] Settings          Find:[OFF]
Label:[Device Label                          ]
Type: Single Output MV Interface
Assigned to Sect:[ 2]


  Save                                  Quit
```

Heat sensor

```
                                16:44 Tue 16/02/10
Device:[   20] Settings          Find:[OFF]
Label:[Device Label                          ]
Type: Heat Sensor
Assigned to Zone:[ 1]                ML: [OFF]
Sensitivity States   Night:[ 0]   Day:[ 0]

  Save                                  Quit
```

Single Output LV Interface

```
                                16:43 Tue 16/02/10
Device:[  55] Settings          Find:[OFF]
Label:[Device Label                          ]
Type: Single Output LV Interface
Assigned to Sect:[ 2]


  Save                                  Quit
```

Sensor States

The state in which the Fire sensors operate can be changed from the default factory set state to another state during commissioning. The environment in which the S-Quad device is installed will determine what state is applicable. # - Default state ~ EN54 : Part 7 :2000 * EN54 : Part 5 :2002

Device	LPCB approved sensor STATE *	Meets EN54 : Part 7 :2000 EN54 : Part 5 :2002
Dual optical & Heat sensor (S4-711 & S4-711-ST)	State 0 #	Medium optical smoke~ / Class A1 heat *
	State 4	Medium optical smoke~
	State 5	Medium optical smoke~ / Class B heat *
	State 8	Delayed medium optical smoke~ / Class A1 heat *
Dual optical, Heat & CO sensor (S4-911)	State 0 #	Medium optical smoke ~ / Class A1 heat *
	State 4	Medium optical smoke~
	State 9	Class A1 heat *
Heat sensor (S4-720)	State 0 #	Class A1 heat *
	State 5	Class B heat *
Heat Sounder (S4-780)	State 0 #	Class A1 heat *
	State 5	Class B heat *
Dual Optical Heat Sensor Speech strobe (S4-711-ST-VO & S4-771)	State 0 #	Medium optical smoke ~ / Class A1 heat *
	State 4	Medium optical smoke~
	State 5	Medium optical smoke ~ / Class B heat *
	State 8	Delayed medium optical smoke ~ / Class A1 heat *
Dual Optical Heat CO Sensor Speech & Strobe (S4-911-ST-VO)	State 0 #	Medium optical smoke ~ / Class A1 heat *
	State 4	Medium optical smoke~
	State 9	Class A1 heat *

All S-Quad range of sensor sounder devices meet CEA GEI 1 - 084 Requirements and test methods for input/output devices for use on the transmission paths of fire detection and alarm systems.

S-Quad Heat sensor states

- factory default state

State	Definition / Class	Application in / Suitable for:	Sensitivity a-high- to-e-none
State 0**#**	Class A1 heat	Area having high levels of smoke, dust or steam	a
State 13	Class A2 heat	Area where there is moderate temperature changes plus dust, smoke or steam present	b
State 5	High temperature Class B heat	Area having high ambient temperature plus dust, smoke or steam present	c
State 6	High temperature Class BS heat - with no rate of rise component	Area where there is rapid temperature changes plus dust, smoke or steam present	d
State 15	No detection		e

S-Quad Dual Optical Heat / Optical Heat sensor states

- factory default state

State	Definition / Class	Application in / Suitable for:	Sensitivity a-high- to--j-none
State 3	High sensitivity optical, Class A1 heat	Clean area or environment, where early detection is required	a
State 4	Medium sensitivity with no optical spike protection, Class A1 heat	General area as State 0 with less immunity to steam and dust for ease of testing using artificial smoke in normal operating mode, when test / commissioning mode is not active	b
State 0**#**	Medium sensitivity optical, Class A1 heat	General area	c
State 8	Delayed medium sensitivity optical, Class A1 heat	General application in area with transient steam, dust or smoke present	d
State 5	Medium sensitivity optical, Class B heat	Area having high ambient temperature with low dust, smoke or steam present	e
State 2	Low sensitivity optical, Class A1 heat	Areas with moderate dust, smoke or heat during working hours when used with timing function	f
State 11	Low sensitivity optical, Class B heat	Area having high ambient temperature, plus where moderate dust, smoke or steam present	g
State 6	Low sensitivity optical, Class BS heat	Area having high ambient temperature that changes, plus moderate dust, smoke or steam present	h
State 12	Class A1 heat only	Area where smoke, dust or steam occurs at times	I
State 15	No detection		j

S-Quad Dual Optical Heat CO sensor states

State	Definition / Class	Application in / Suitable for:	Sensitivity a-high- to-h-none
State 1	High sensitivity optical, Class A1 heat, high sensitivity gas	Clean area or environment where early detection is required with false alarm reduction	a
State 4	Medium sensitivity optical with no spike protection, Class A1 heat, medium sensitivity gas	General area as State 0 with less immunity to steam and dust for ease of testing using artificial smoke in normal operating mode, when test / commissioning mode is not active	b
State 0#	Medium sensitivity optical, Class A1 heat, medium sensitivity gas	General area where false alarm reduction is required for comprehensive fire detection	c
State 2	Medium sensitivity optical, Class A1 heat, low sensitivity gas	Applications with moderate dust, smoke (tobacco) or steam	d
State 9	Medium sensitivity gas, Class A1 heat	Area where high levels of smoke, dust or steam is often present	e
State 11	Medium sensitivity optical, Class B heat	Area with high ambient temperature, plus low levels of dust, smoke or steam present	f
State 12	Class A1 heat only	Area where smoke, dust, steam or gas occurs at times	g
State 15	No detection		h

S-Quad Optical sensor states

- factory default state

State	Definition / Class	Application in / Suitable for:	Sensitivity a-high- to-f-none
State 3	High sensitivity optical	Clean area or environment, where early detection is required	a
State 4	Medium sensitivity with no spike protection	General area as State 0 with less immunity to steam and dust to facilitate wittiness test	b
State 0#	Medium sensitivity optical	General area	c
State 8	Delayed medium sensitivity optical	General area with transient steam, dust or smoke present	d
State 2	Low sensitivity optical	Area with moderate dust, smoke or steam present	e
State 15	No detection		f

Beam sensor states

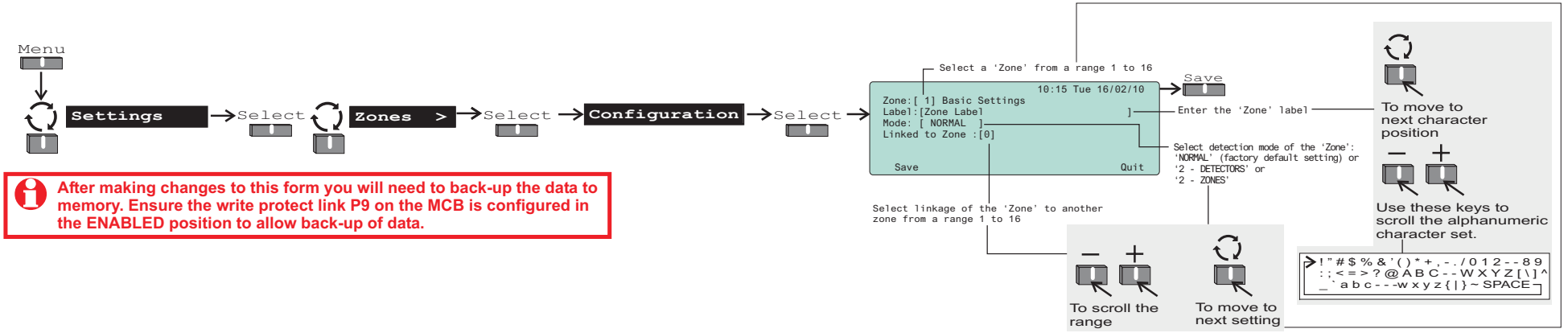
Beam sensor States	Ideal range minimum to maximum
4 or 5	2m - 30m
2 or 3	5m to 100m
0 or 1	12m tp 100m

LPCB approval
The Beam sensor STATES 0, 1, 2 and 3 are undergoing approval test at LPCB.

State	Definition	Application
State 0	Default detection	A **fire** is detected when there is a 50% (3dB) fall in signal level, however if the fall is by 90% (10dB) in less than 1second and is maintained for 40 seconds, then a **fault** is registered. This allows the Control panel to differentiate between a fire and a fault signal caused by accidental obscuration.
State 1	Normal sensitivity	A **fire** is detected when there is a 50% (3dB) fall in signal level, however if the fall is by 90% (10dB) in less than 1 second and is maintained for 40 seconds then a **fire** is registered.
State 2	Medium Sensitivity	A **fire** is detected when there is a 25% (1.3dB) fall in signal level, however if the fall is by 90% (10dB) in less than 1 second and is maintained for 40 seconds then a **fault** is registered.
State 3	Medium Sensitivity	A **fire** is detected when there is a 25% (1.3dB) fall in signal level, however if the fall is by 90% (10dB) in less than 1 second and is maintained for 40 seconds then a **fire** is registered.
State 4	High Sensitivity	A **fire** is detected when there is a 10% (0.5dB) fall in signal level, however if the fall is by 90% (10dB) in less than 1 second and is maintained for 40 seconds then a **fault** is registered.
State 5	High Sensitivity	A **fire** is detected when there is a 10% (0.5dB) fall in signal level, however if the fall is by 90% (10dB) in less than 1 second and is maintained for 40 seconds then a **fire** is also registered.
State 15	No detection.	This is a total disablement of the sensor.

How to set 'Zone' label, mode and link to another zone

You will need to be at access level 3 or above to set zone label, mode and link.



After making changes to this form you will need to back-up the data to memory. Ensure the write protect link P9 on the MCB is configured in the ENABLED position to allow back-up of data.

How to view 'Devices' assigned to a 'Zone' and change device configuration

You will need to be at access level 3 or above to view all the devices assigned to a zone and selectively look and change each device configuration.



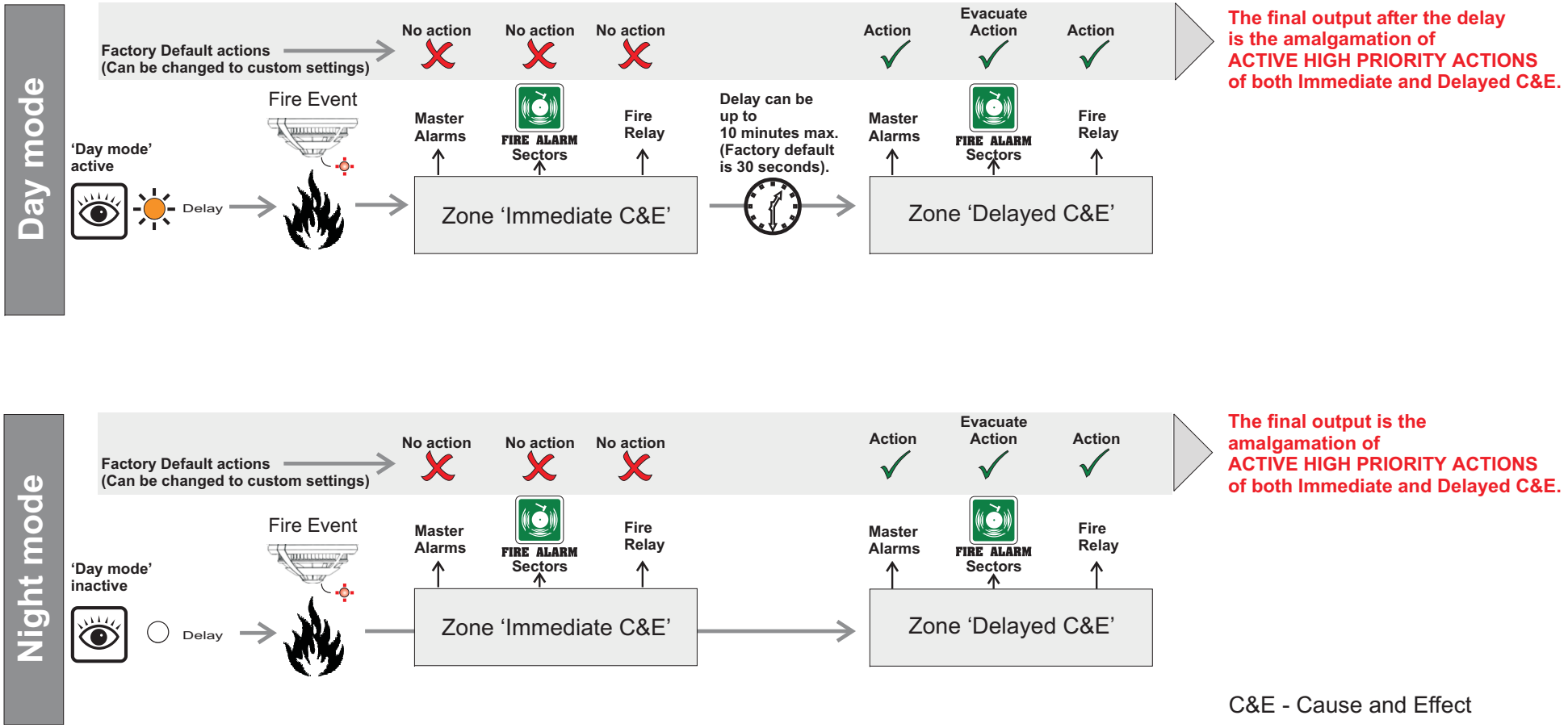
For the Selected device it is possible to view and change the device configuration.

A typical 'Device' view.
For information on editing 'Device details' see section headed 'Device details'.

How 'Cause and Effect' interact with 'Day and Night Modes'

This page illustrates the immediate and delayed Cause and Effect interaction with Day and Night modes.

- ☐ The immediate actions of a zone will always occur immediately in the event of a fire from the zone regardless of Day/Night mode status.
- ☐ The delayed actions of a zone will occur after the day mode delay has timed out when 'Day mode' is active. Additional verify delay will apply if it is set up and made active during day mode delay.

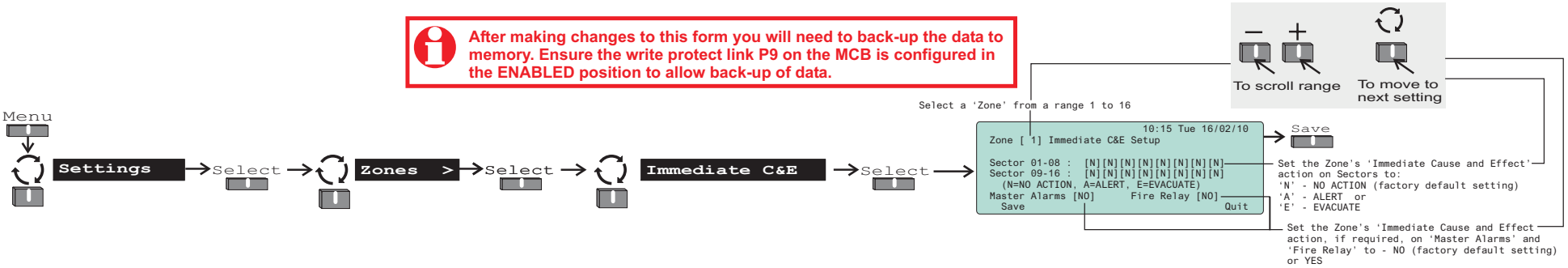


C&E - Cause and Effect

By configuring the immediate actions same as delayed actions it is possible to use the Day/Night mode switching to switch sensor sensitivity states.

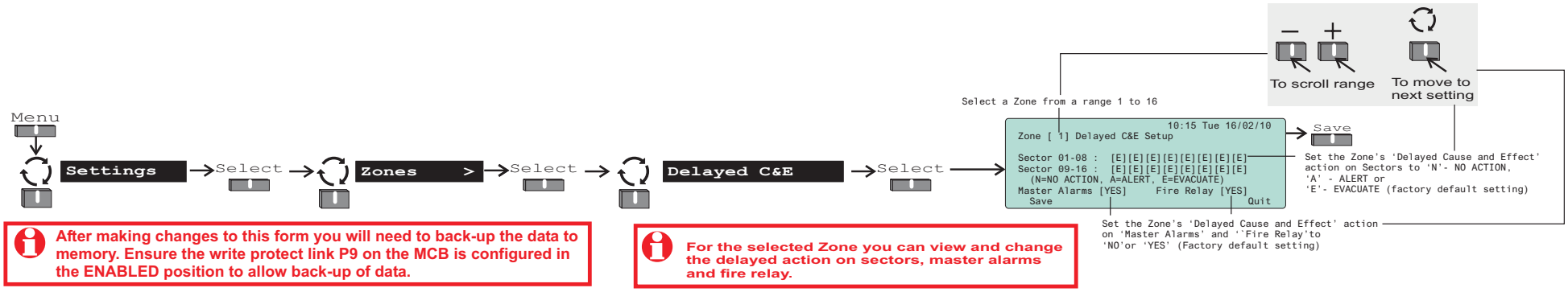
How to setup zone for 'Immediate Cause and Effect'

Using this form you can assign immediate zone action on sectors, master alarms and fire relay. You will need to be at access level 3 or above to setup immediate cause and effect.



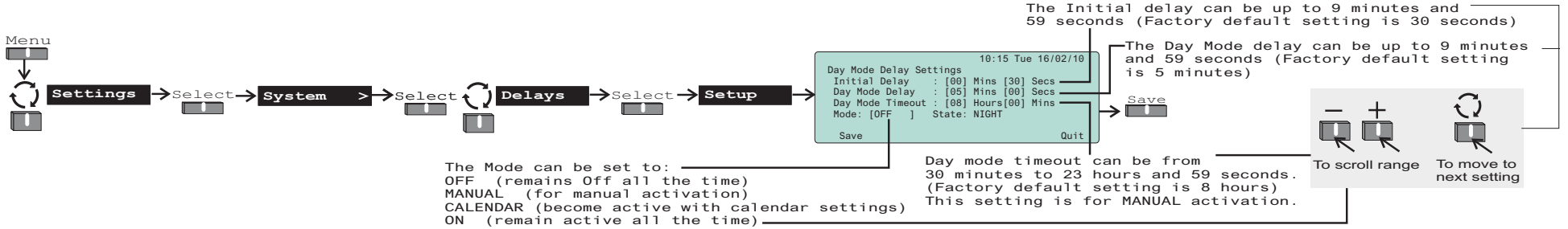
How to setup zone for 'Delayed Cause and Effect'

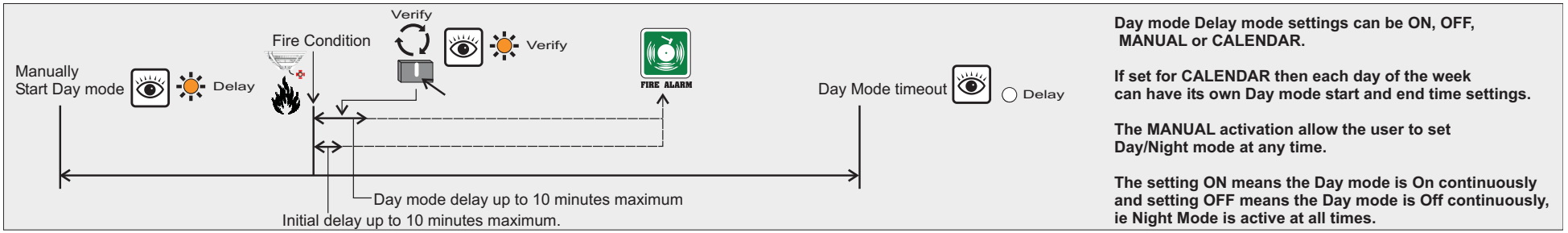
Using this form you can assign delayed zone action on sectors, master alarms and fire relay. You will need to be at access level 3 or above to setup delayed cause and effect.



How to set up 'Day mode' delays and timeout

Using this form you can set up the Day mode delays to include initial delay, day mode delay and day mode timeout duration. You will need to be at access level 3 or above to set-up Day mode settings.





Day mode Delay mode settings can be ON, OFF, MANUAL or CALENDAR.

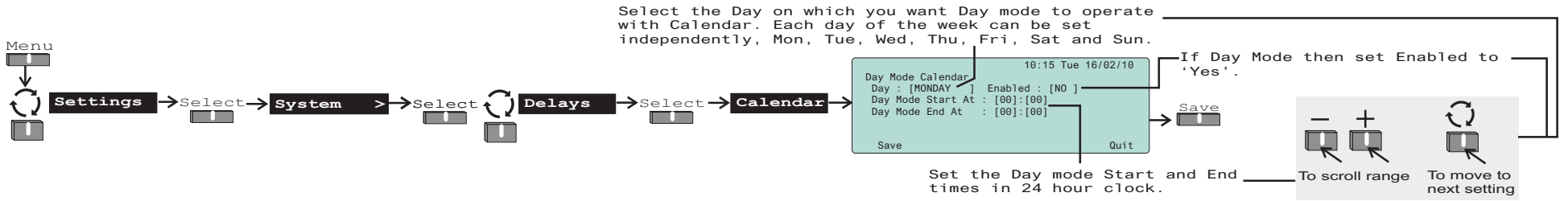
If set for CALENDAR then each day of the week can have its own Day mode start and end time settings.

The MANUAL activation allow the user to set Day/Night mode at any time.

The setting ON means the Day mode is On continuously and setting OFF means the Day mode is Off continuously, ie Night Mode is active at all times.

How to set the 'Calendar'

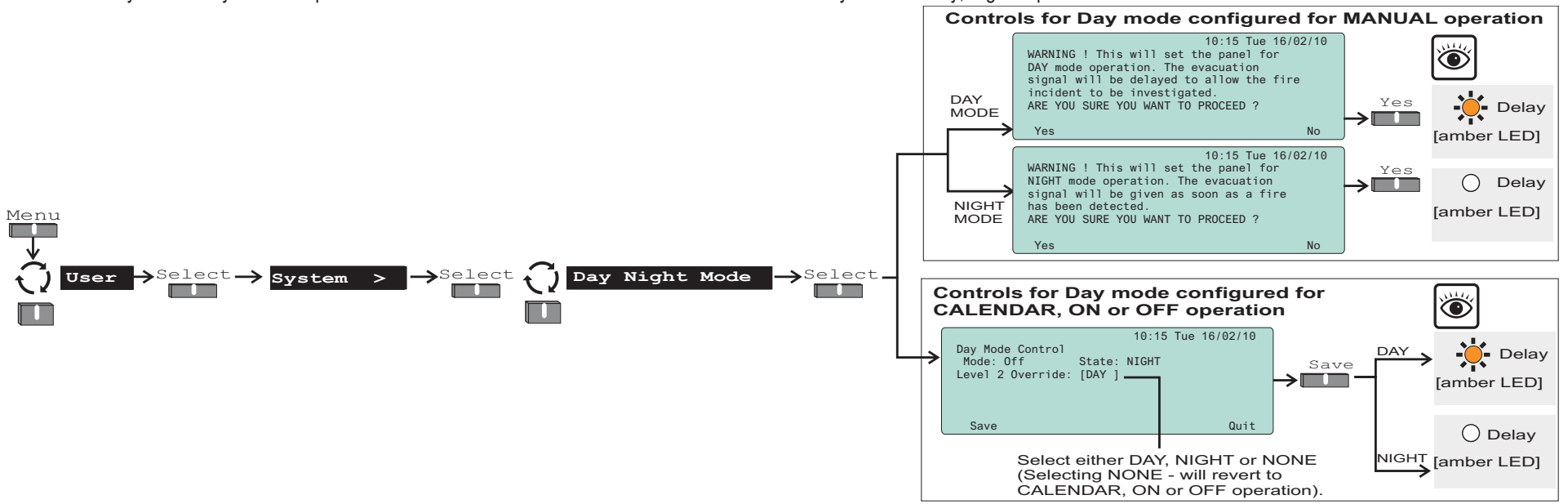
Using this form you can set the CALENDAR to operate Day mode at a specific start time and end time settings for automatic operation of the Day mode.





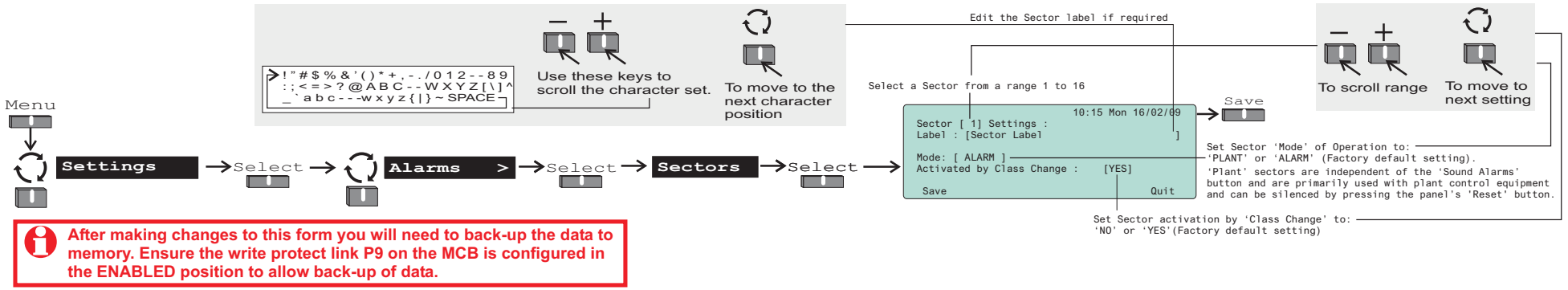
How to manually control 'Day' mode operation

You can manually control Day mode to operation. You will need to be at access level 2 or above to manually switch to Day, Night or preset mode.



How to set-up 'Sector' mode, label and activation

You will need to be at access level 3 or above to set-up a sector.

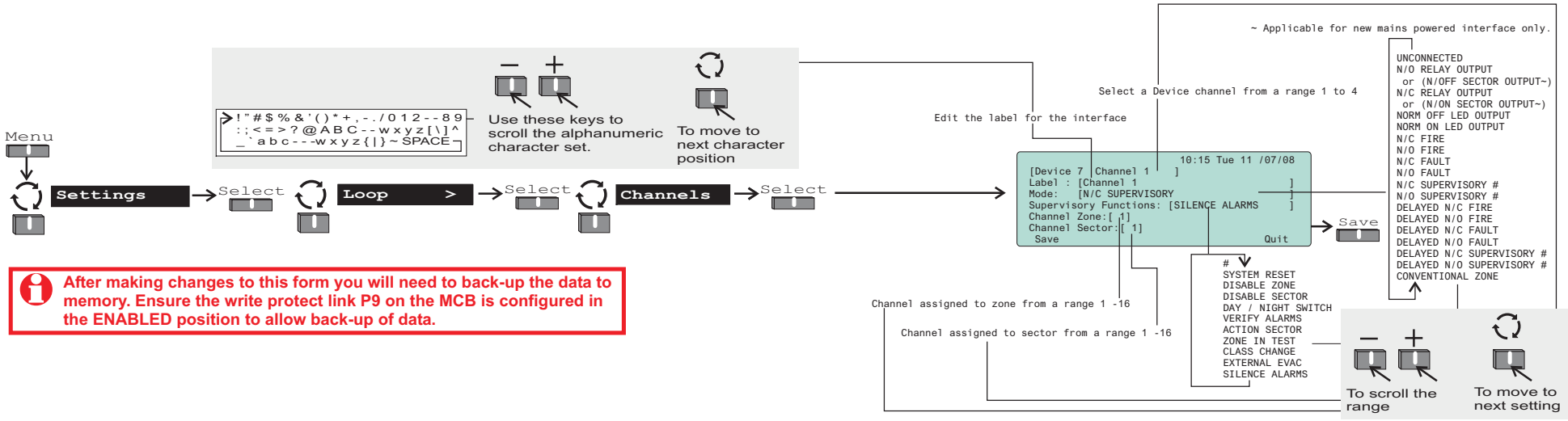


After making changes to this form you will need to back-up the data to memory. Ensure the write protect link P9 on the MCB is configured in the ENABLED position to allow back-up of data.

How to set-up 4-channel interface devices on the loop

You can configure any 4-channel interface devices on the loop. You will need to be at Access level 3 or above to setup a 4-channel interface device on the loop. This form allows you to set-up the channel label, mode and assignment to zone and sector.

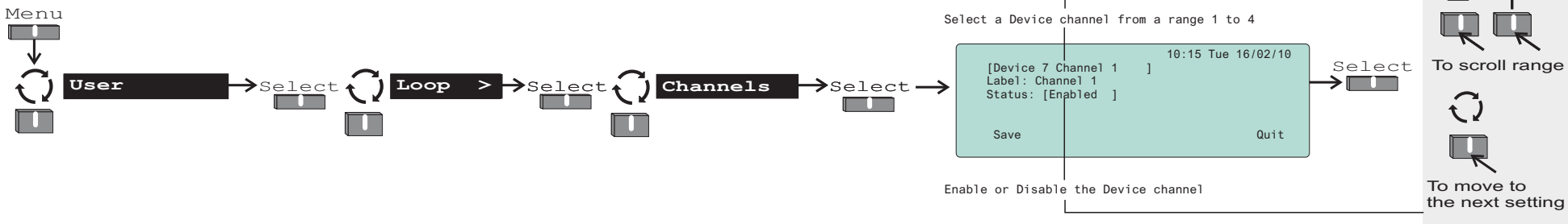
Note the channel 'Mode' settings are only applicable for the 4-channel LV interface units. The mains powered 4-channel interface unit can only be configured using the hardware switches.



After making changes to this form you will need to back-up the data to memory. Ensure the write protect link P9 on the MCB is configured in the ENABLED position to allow back-up of data.

How to enable/disable a channel of a 4-channel interface device

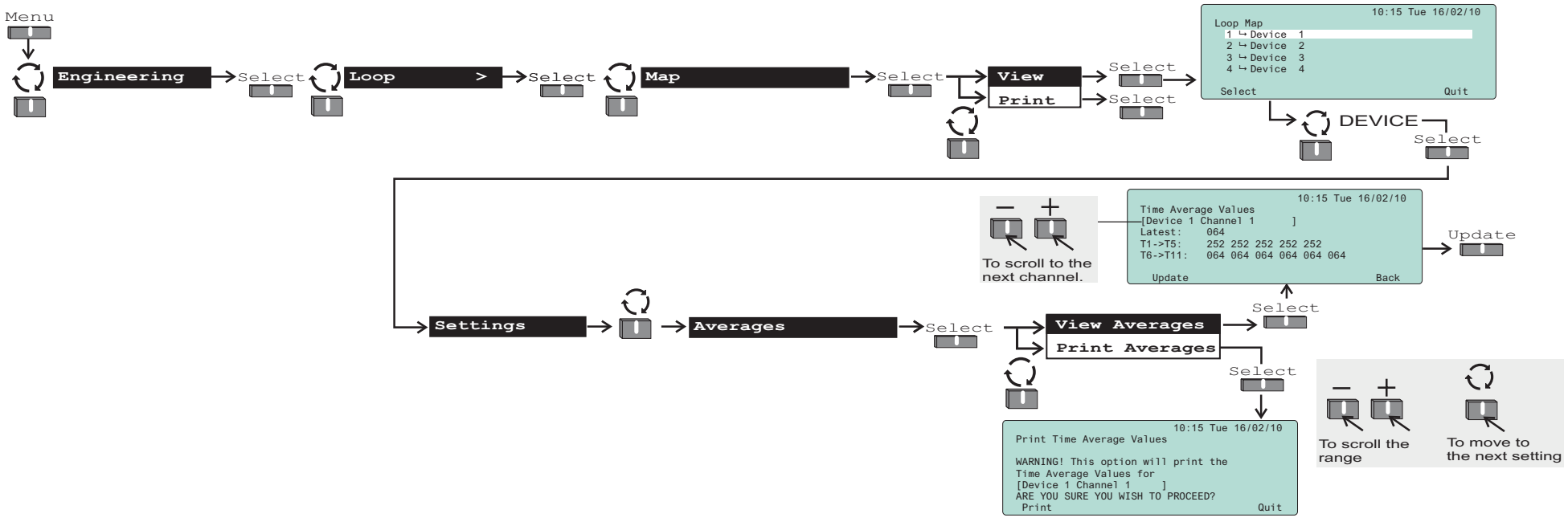
You can enable or disable a channel of a 4-channel interface unit. You will need to be at access level 3 (factory default) unless it is configured for operation at access level 2 during commissioning.



How to view or print device 'Time averages'

Ensure all the dust covers have been removed from every sensor heads and the system is allowed to operate for at least 24 hours to obtain accurate time average and condition code readings.

You will need to be at Access level 4 to view or print time average data of devices on the loop, if printing ensure a printer is connected to the panel.



Time averages explained

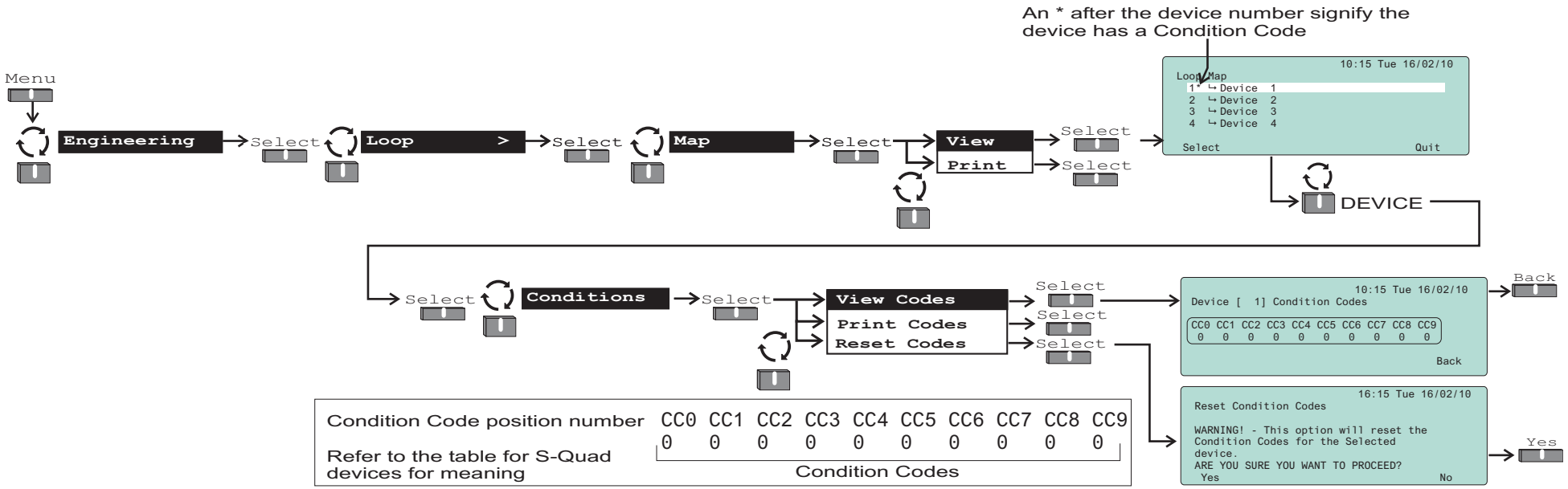
The time averages provide sensor performance data with the display showing the latest time average value, foreground (fast) time average values T1 to T5 and background (slow) time average values T6 to T11. These values are used by the panel to make fire detection decision.

	Foreground (fast) time average readings					Background (slow) time average readings					
T_{Latest}	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11
On demand	80mS	320mS	1.28S	5.12S	20.48S	1.36min	5.46min	21.84min	1.45hr	5.82hr	23.3hr
	Normally reads 252, unless there is activity on this channel.										

Device type S-Quad	Analogue Channels	Typical Time average T_{latest} (new)
Heat Sensor	2 - heat	66
Heat Sensor Sounder	2 - heat	66
Dual Optical Heat Sensor	1 - optical (forward) 2 - heat 4 - optical (backward)	25 66 40
Dual Optical Heat Sensor Strobe	1 - optical (forward) 2 - heat 4 - optical (backward)	25 66 40
Dual Optical Heat Sensor Sounder	1 - optical (forward) 2 - heat 4 - optical (backward)	25 66 40
Dual Optical Heat Sensor Speech Strobe	1 - optical (forward) 2 - heat 4 - optical (backward)	25 66 40
Dual Optical Heat Sensor CO	1 - optical (forward) 2 - heat 3 - CO 4 - optical (backward)	25 66 25 40
Dual Optical Heat Sensor CO Speech Strobe	1 - optical (forward) 2 - heat 3 - CO 4 - optical (backward)	25 66 25 40

How to view Sensor 'Condition Codes'

The condition codes provide information about a sensor device. A code indicates small changes in the environmental condition, sensor mechanism and how the sensor performs in the system. You will need to be at access level 4 to view sensor condition codes.



To ensure that the sensor condition codes are meaningful, all existing codes must be cleared and the system left undisturbed for at least 24 hours. To clear the condition codes Power-down and then Power -up the loop and then Start Detection, see page 24. Alternatively use the clear condition codes option on each device that currently has a code.

Code definition

There are ten different conditions possible for each sensor type, although not all of them are defined. Each condition code has a range of 0-3.

Condition Code	Meaning
0	This condition is OK.
1 or 2	Suggests preventive maintenance is required, where necessary, to avoid possible false alarms.
3	The sensor is faulty. A fault condition indication is given at the control panel. A message reading ‘Sensor Out of Specification’ is displayed.

A sensor having a code 3 is automatically disabled by the system to prevent false alarms.

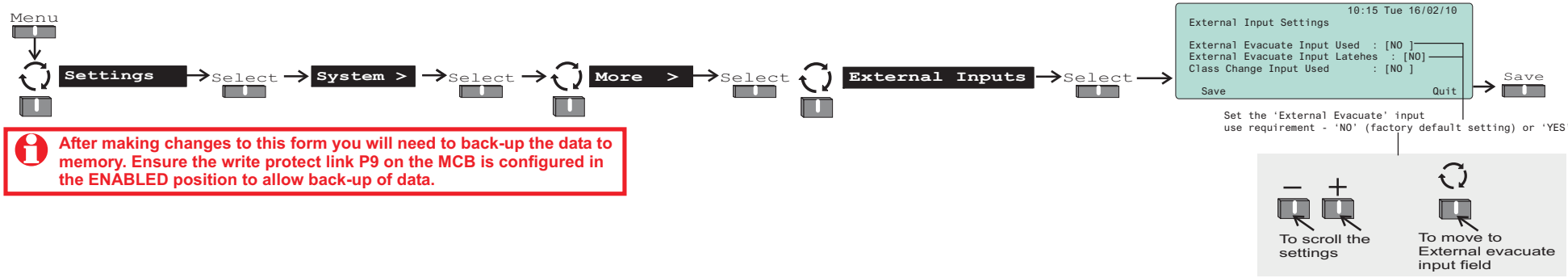
Condition codes positions 0 1 2 3 4 5 6 7 8 9	Meaning	Action
1 0 0 0 0 0 0 0 0 0 or 0 1 0 0 0 0 0 0 0 0 or 1 1 0 0 0 0 0 0 0 0	This is the sub-fire band and if set should be taken as showing that the sensor is at its optimum sensitivity for its location.	No action need be taken.
2 0 0 0 0 0 0 0 0 0 or 0 2 0 0 0 0 0 0 0 0 or 2 2 0 0 0 0 0 0 0 0	A sub-fire has been generated which would suggest that the sensor was either too sensitive for its environment or that the sensor type may be incorrect for the location.	Action should be to check location and alter sensor state or type as required. This should only be done with the knowledge of the customer. Remember to backup all changes to states data.
0 0 0 0 1 0 0 0 0 0 or 0 0 0 0 2 0 0 0 0 0 or 0 0 0 0 0 1 0 0 0 0 or 0 0 0 0 0 2 0 0 0 0	This shows that the sensor time averages are close to acceptable limits.	On commissioning the sensor should be replaced. A sensor with code 2 is worse than code 1. On maintenance sensors with code 2 should be replaced.
0 0 0 0 0 0 1 0 0 0 or 0 0 0 0 0 0 2 0 0 0 or 0 0 0 0 0 0 0 1 0 0 or 0 0 0 0 0 0 0 2 0 0	This shows that high frequency noise events have been detected by the system. A code 1 shows one event and a code 2 shows more than one event.	The device should be replaced. On maintenance, a sensor with code 2 should be replaced. If it reoccurs then check the environment.
0 0 0 0 0 0 0 0 1 0 or 0 0 0 0 0 0 0 0 2 0	This shows device hardware faults. A '1' for code 1 and more than one for a code 2.	The sensor should be replaced.
0 0 0 0 0 0 0 0 0 1 **or** 0 0 0 0 0 0 0 0 0 2	This shows that transmission faults are being noted. Code 2 is worse than code 1.	The device should be replaced. If it reoccurs then check the environment.

Condition Codes for S-Quad Sensors

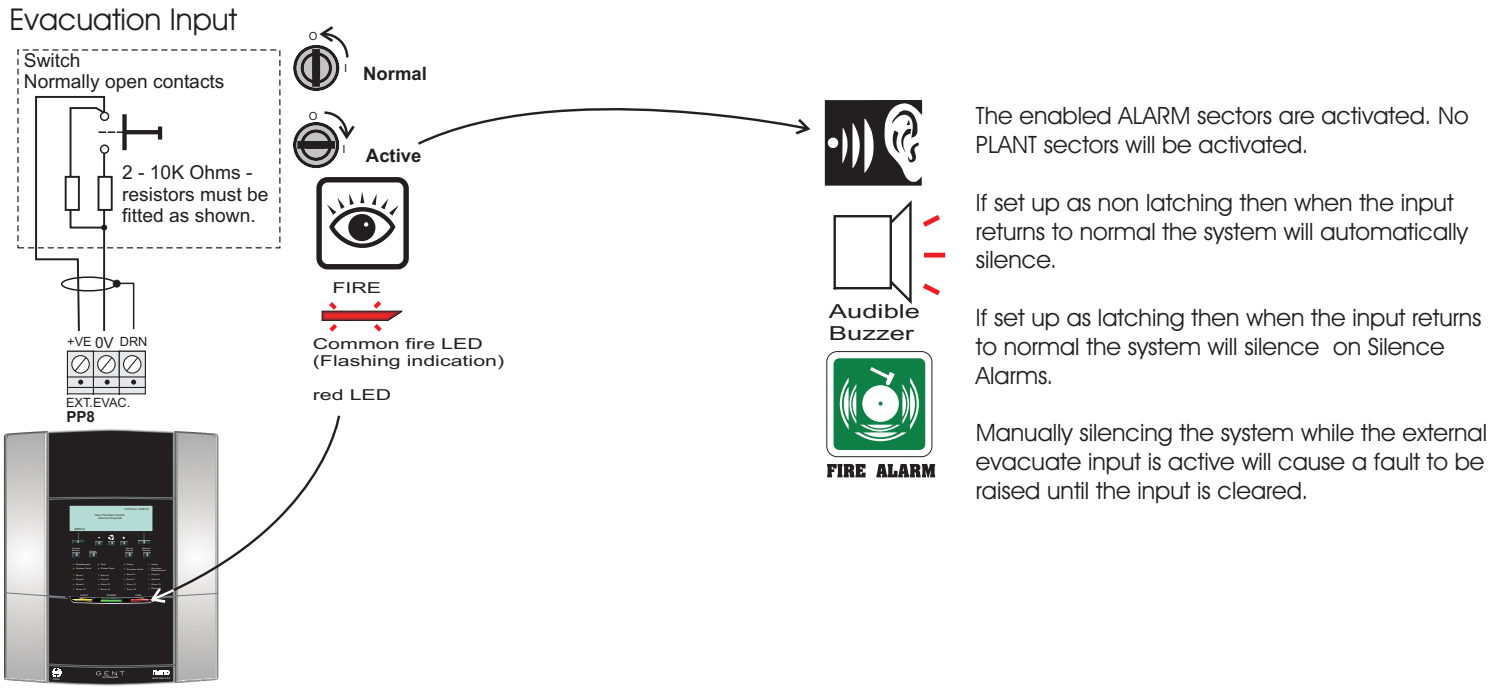
Gen type	Pos. No.	Description	Condition codes			
			Normal band	Sub fault band		Fault band
			0	1	2	3
ENVIORNMENT	CC0	Optical subfire	None	Small signal sensed [Check location, state & type]	Subfire [Check location, state & type]	
	CC1	Heat subfire	None	Small signal sensed [Check location, state & type]	Subfire [Check location, state & type]	
	CC2	Gas subfire	-	Small signal sensed [Check location, state & type]	Subfire [Check location, state & type]	
	CC3		-			
SENSOR	CC4	Optical/Gas channel drift or out of range	OK		Close to acceptable limit	Out of limits [Clean/replace]
	CC5	Heat channel drift or out of range	OK			Out of limits [Clean/replace]
	CC6	Optical/Gas channel noisy (High freq)	OK	Single HF noise event detected	Multiple HF noise seen (Check location and report)	
	CC7	Heat channel noisy (High frequency)	OK	Single HF noise event detected	Multiple HF noise seen (check location and report)	
DEVICE	CC8	Device firmware	OK	Isolated fault [Note/report]	Repetitive fault [Note / report / replace]	Total failure [Replace]
	CC9	Device transmission	OK	Low error rate	Medium error rate [Report]	High error rate [Replace]

How to set up an 'External Evacuate input'

The External evacuate input operates in the same way as the Sound/Silence buttons. The input can be set as a latched or non latched input.
You will need to be at access level 3 or above to set up the external evacuate input.



After making changes to this form you will need to back-up the data to memory. Ensure the write protect link P9 on the MCB is configured in the ENABLED position to allow back-up of data.



The enabled ALARM sectors are activated. No PLANT sectors will be activated.

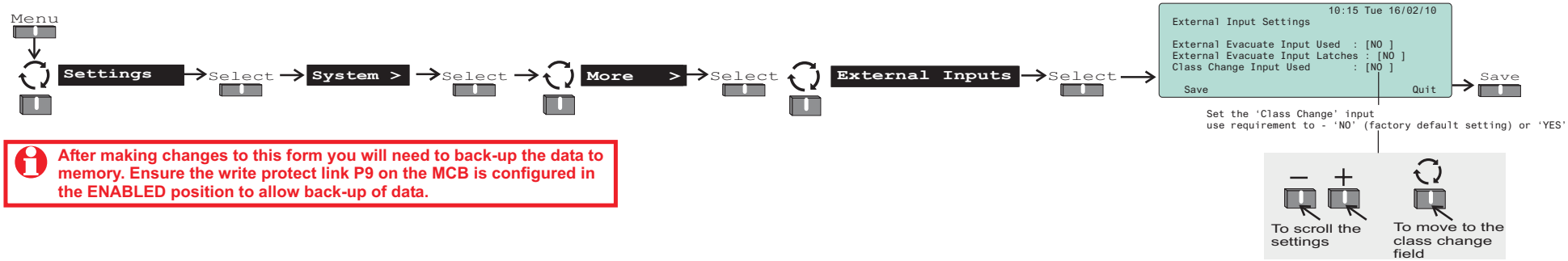
If set up as non latching then when the input returns to normal the system will automatically silence.

If set up as latching then when the input returns to normal the system will silence on Silence Alarms.

Manually silencing the system while the external evacuate input is active will cause a fault to be raised until the input is cleared.

How to set-up the 'Class Change input'

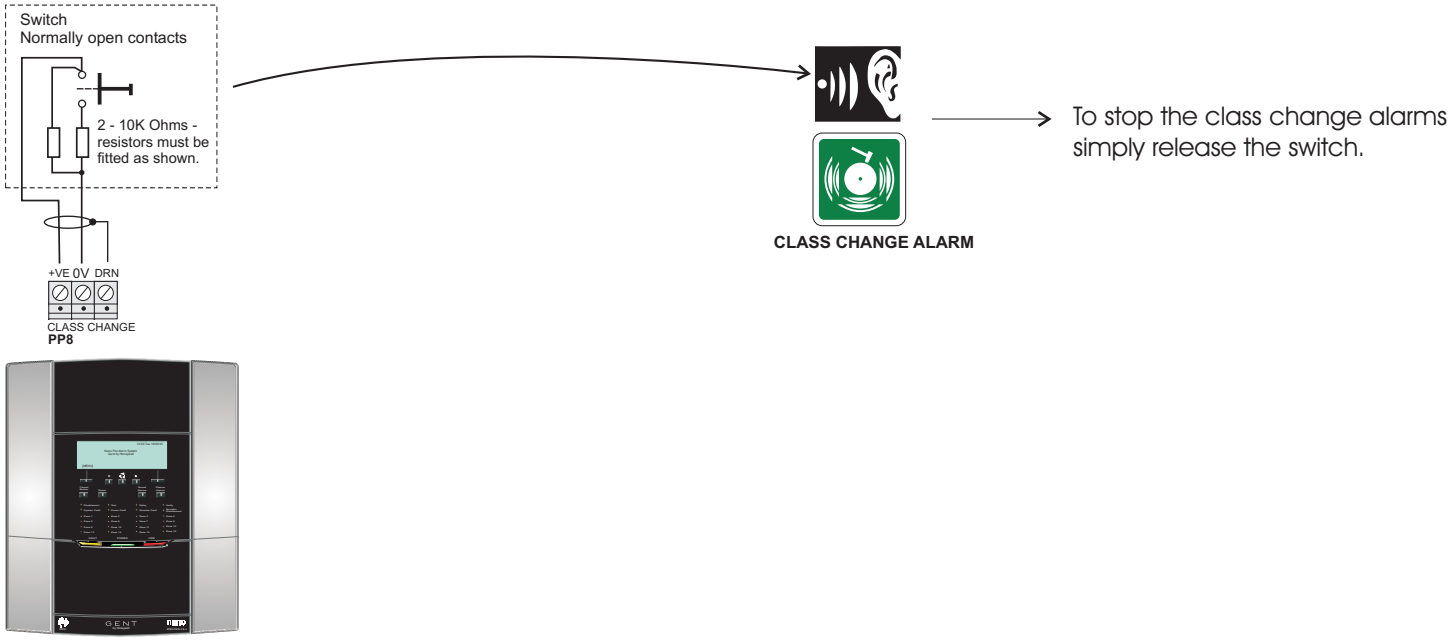
The class change input application is used in schools to output a class change alarm via the sounders in selected sectors to signify end of class.
You will need to be at access level 3 or above to configure class change input.



After making changes to this form you will need to back-up the data to memory. Ensure the write protect link P9 on the MCB is configured in the ENABLED position to allow back-up of data.

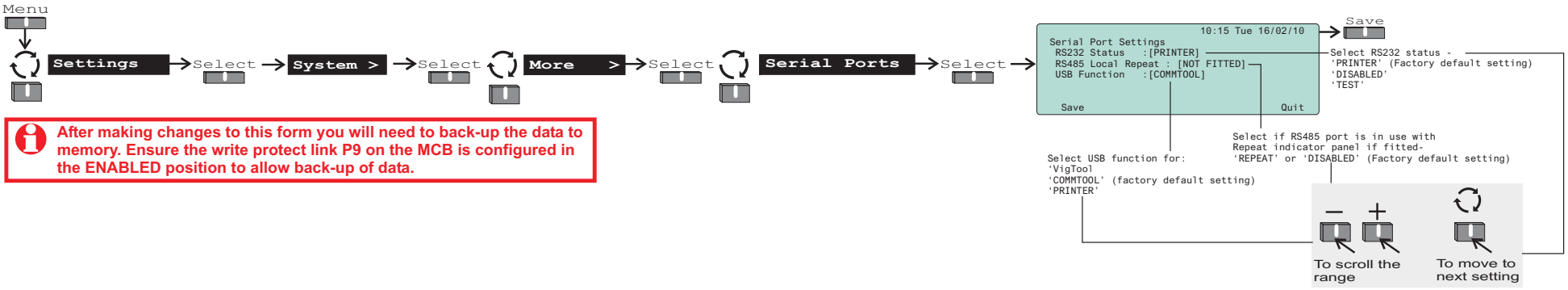
You will also need to assign class change to activate sectors see section headed 'How to set-up 'Sector' mode, label and activation'.

Class Change

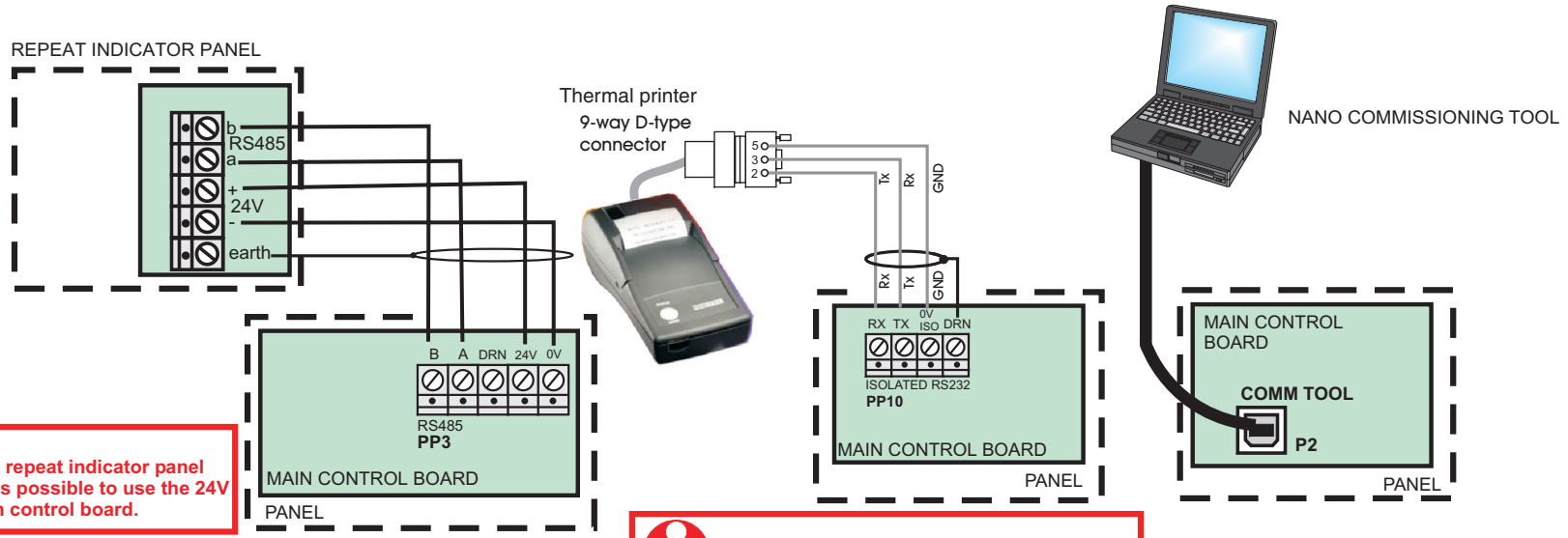


How to set up RS-232 and RS-485 serial and USB ports

The RS232 port is used to connect an external printer to the control panel for printing active events and loop map. The RS485 port allows up to 4 repeat indicator panels to be connected to the control panel for repeat indication and messages of system events. Note some messages displayed at the repeat indicator panel are worded slightly different but they mean exactly the same, see Appendix C. The USB port is for the Commissioning tool. You will need to be at access level 3 or above to set-up the serial ports.



After making changes to this form you will need to back-up the data to memory. Ensure the write protect link P9 on the MCB is configured in the ENABLED position to allow back-up of data.

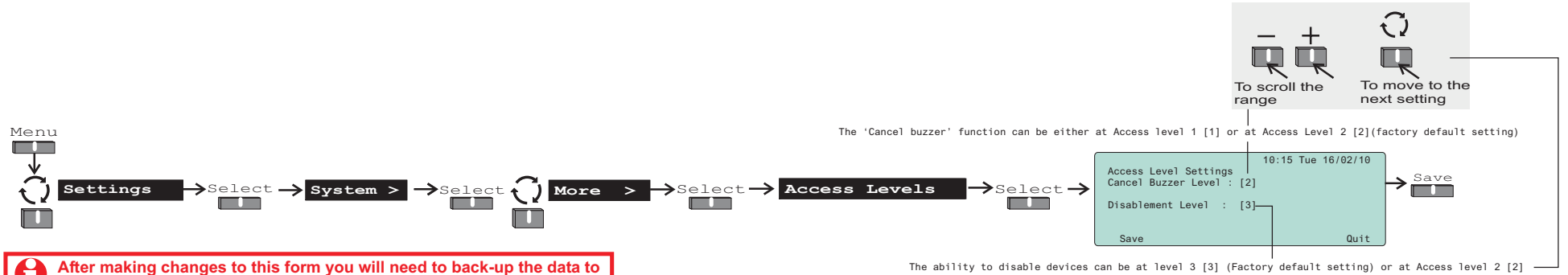


If there is only one repeat indicator panel connected then it is possible to use the 24V supply on the Main control board.

The panel's RS-232 port is set at 9600 baud.

How to change access levels of 'Buzzer' & 'Device Disablement'

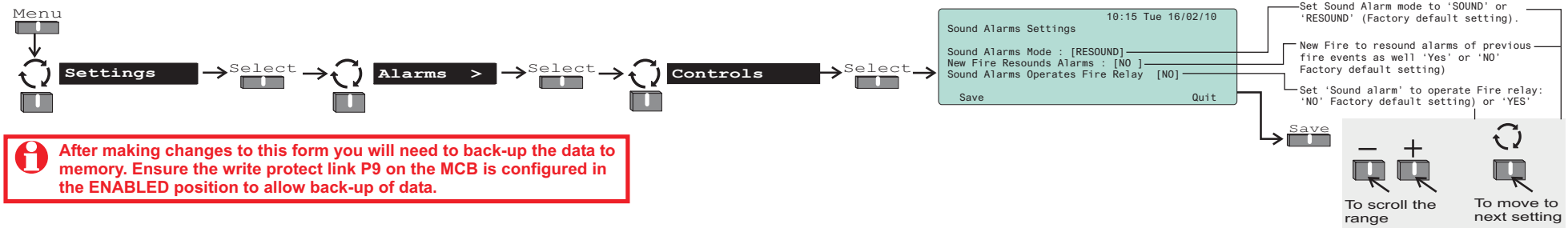
By default the buzzer can be cancelled at access level 2 and devices plus interface channels can be disabled at access level 3. It is possible to change the access levels of these controls, however you will need to be at access levels 3 or above to make these changes.



After making changes to this form you will need to back-up the data to memory. Ensure the write protect link P9 on the MCB is configured in the ENABLED position to allow back-up of data.

How to change the 'Alarm Controls' settings

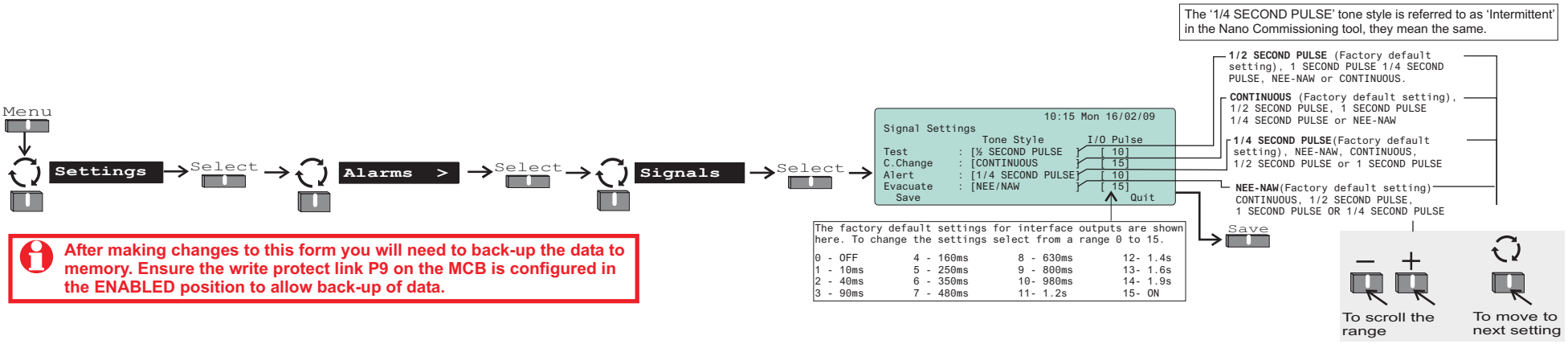
After alarms have been silenced during or following a fire condtion the same alarms can be activated again by pressing the 'Sound Alarms' button, providing the 'Resound' mode is configured. In the same scenario if configured for 'Sound' mode and on pressing the 'Sound alarms' button it will activate all the sector alarms. The Fire relay can be configured to be active with the 'Sound alarms' button. You will need to be at access level 3 or above to change 'Sound alarms' button settings.



After making changes to this form you will need to back-up the data to memory. Ensure the write protect link P9 on the MCB is configured in the ENABLED position to allow back-up of data.

How to change the 'Signal' Settings

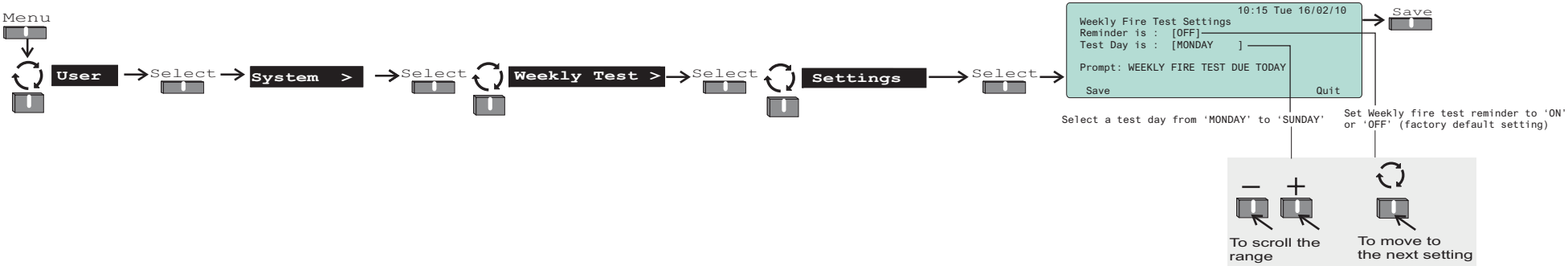
The tone style and Interface output pulse settings of Evacuate, Alert and Class Change signals can be changed from factory default settings. You will need to be at access level 3 or above to make changes to signal settings.



After making changes to this form you will need to back-up the data to memory. Ensure the write protect link P9 on the MCB is configured in the ENABLED position to allow back-up of data.

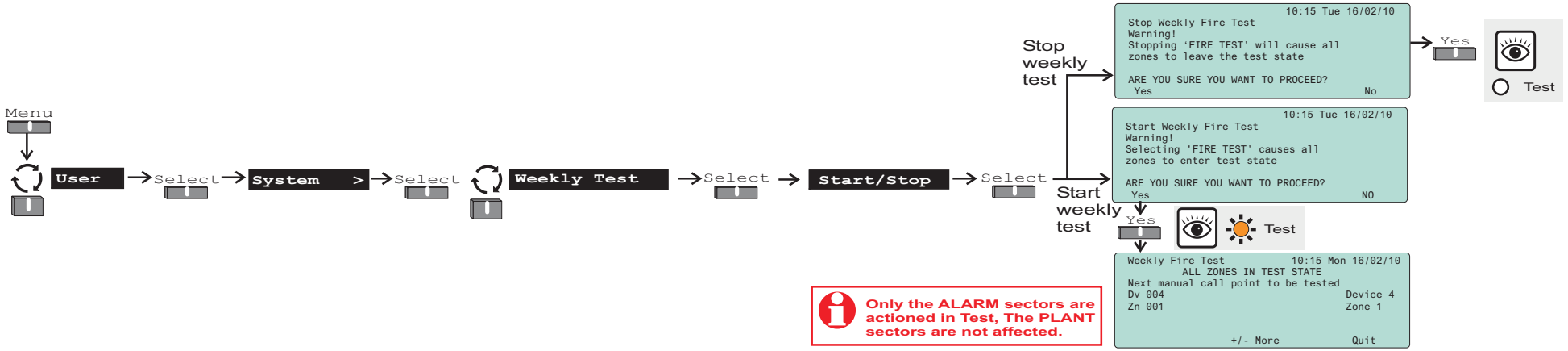
How to set up weekly 'Fire test reminder'

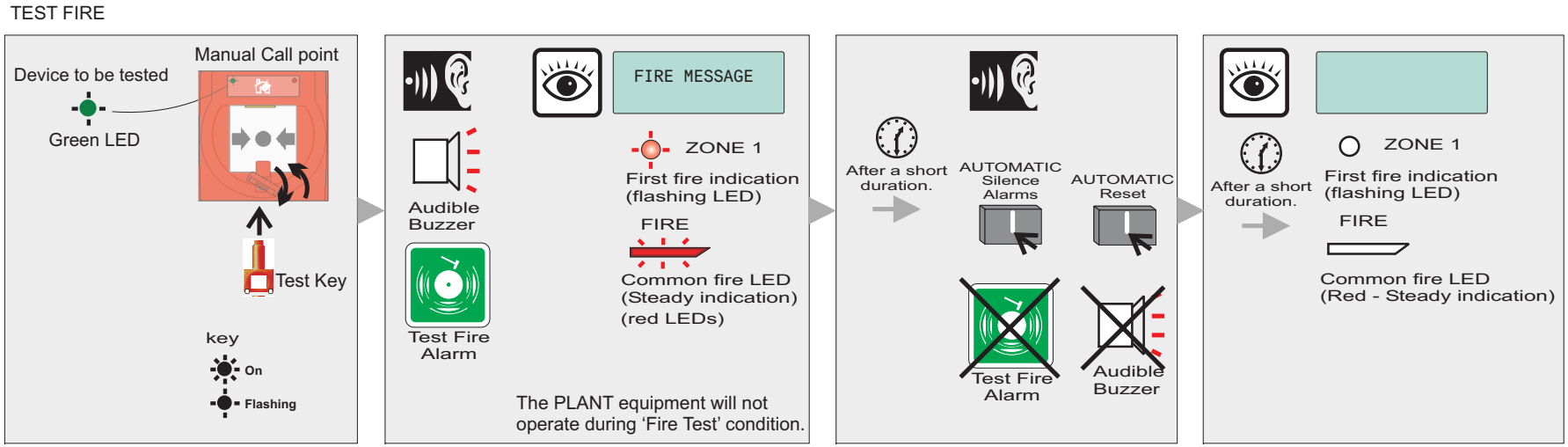
A fire test reminder message can be configured to appear on the display on a specified day of the week to remind 'responsible person' to conduct a weekly fire test on the system. The message is displayed at the beginning of the reminder day and is automatically removed the next day. You will need to be at access level 3 or above to set up a weekly fire test reminder.



How to start or stop a 'Weekly test'

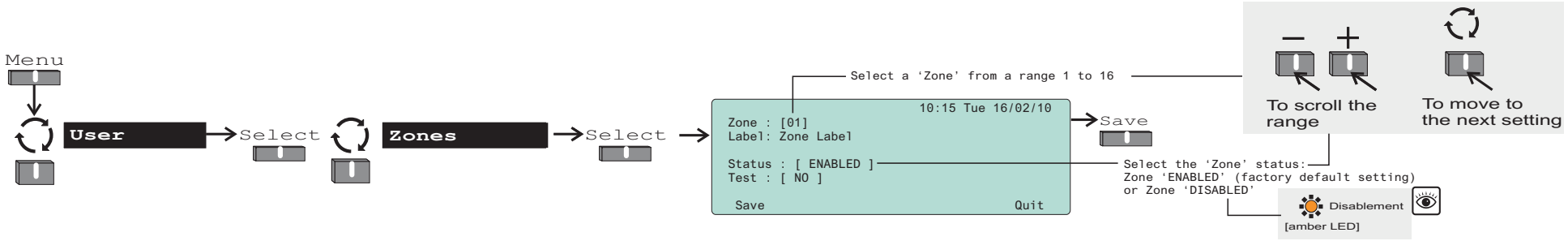
On starting a weekly fire test function the system enters the zone test mode and identifies the next device to be tested. You will need to be at access level 2 or above to stop or start weekly test.





How to 'Enable' or 'Disable' a Zone

You can manually disable a zone to prevent system going into a fire condition in the event of a fire being detected in the zone. ~You can reenable the disabled zone at anytime. You will need to be at Access level 2 or above

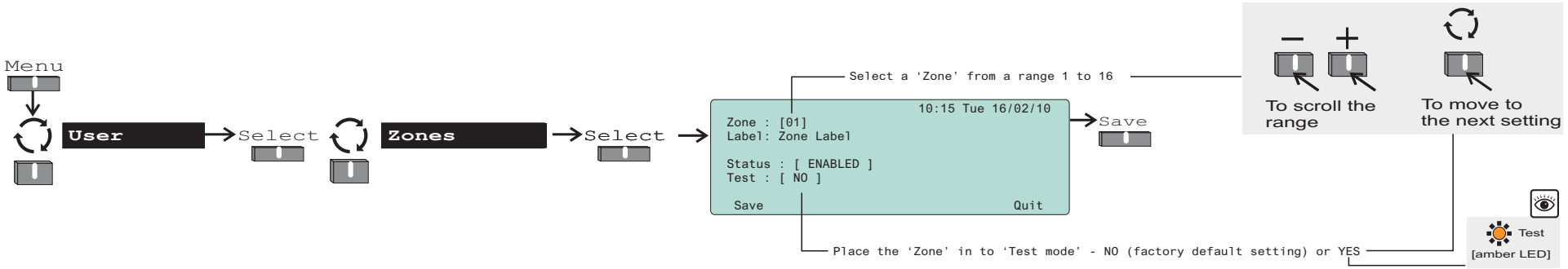


How to place a Zone in 'Test Mode'

The Zone 'Test mode' function is used when testing devices in a zone. It allows the engineer to test zones without having to return to the panel to silence alarms and reset.
While the panel is in the Zone Test mode and following a fire event the alarm sounds for 5 seconds and then automatically performs the silence alarm sequence and thereafter a panel reset. The panel inhibits the operation of delays and fire relay. For information on how to conduct a fire test see page 60.

☐ All zones of the system that are not in test mode will operate normally.

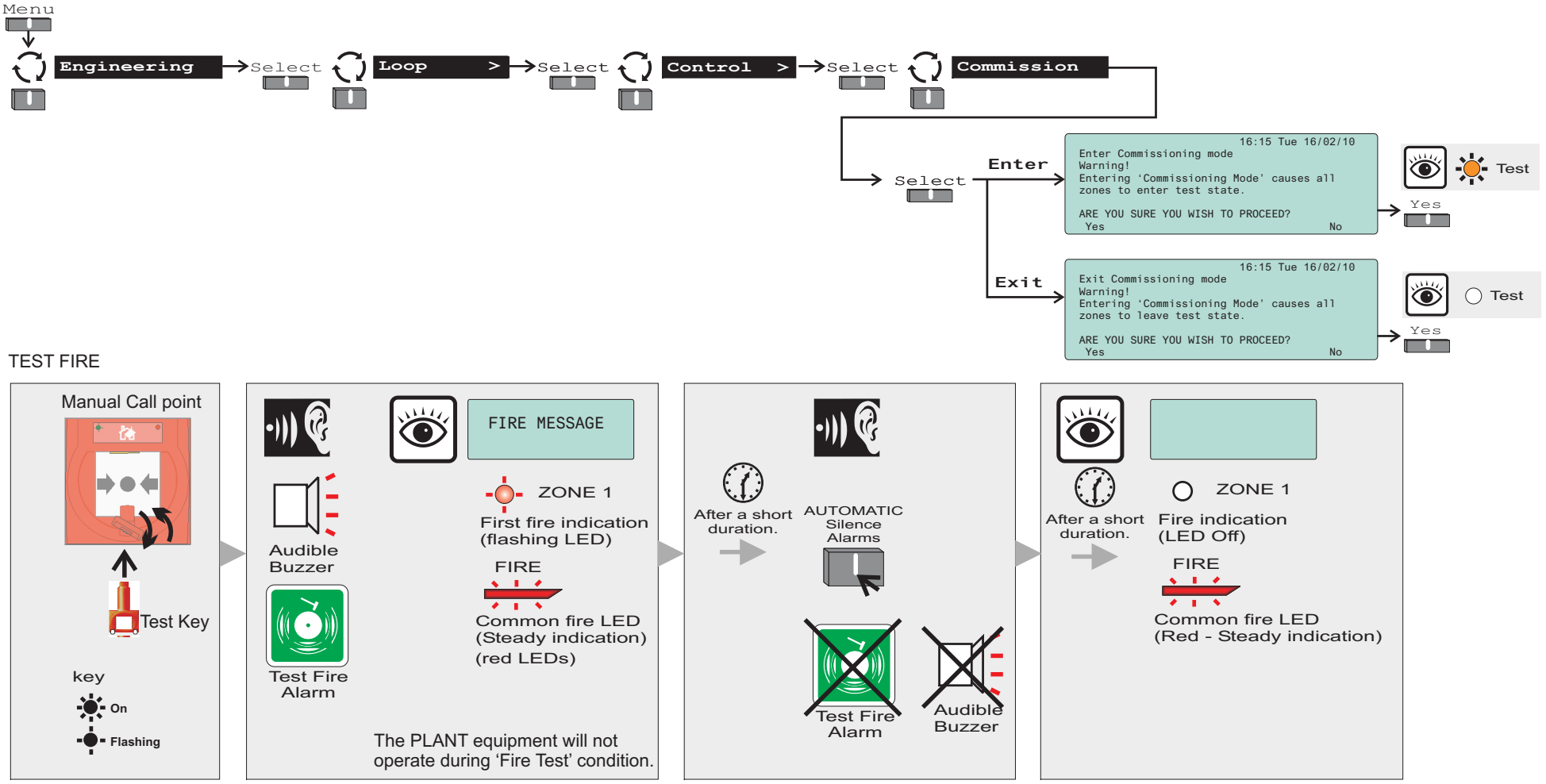
On completion of all commissioning work, switch Off the Zone Test mode and notice the Test indicator also switches Off.



Only the ALARM sectors are actioned in Test, the PLANT sectors are not affected.

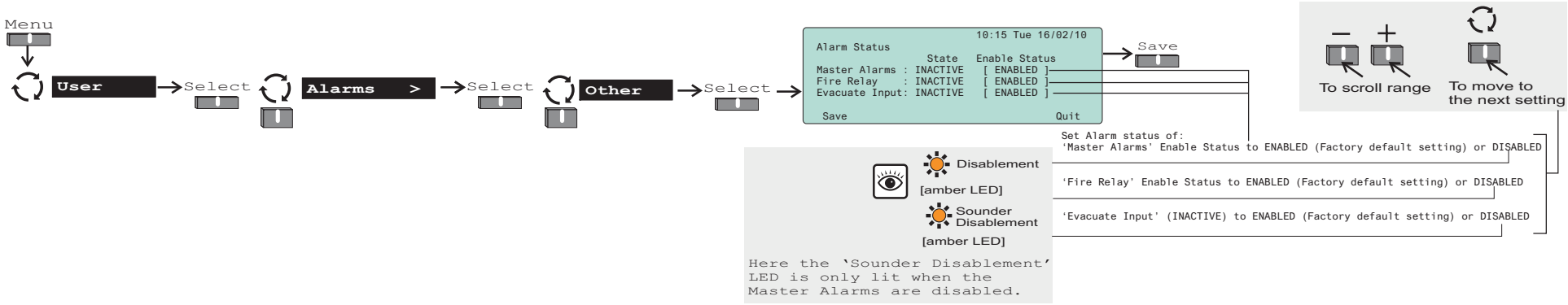
How to place the system in 'Commissioning mode'

You can place all the zones of the system in test state by entering the Commissioning mode, which causes all the zones of the system to enter test state. Notice the common fire light will remain lit until you exit the Commissioning mode. To enter the Commissioning mode you need to be at access level 4.



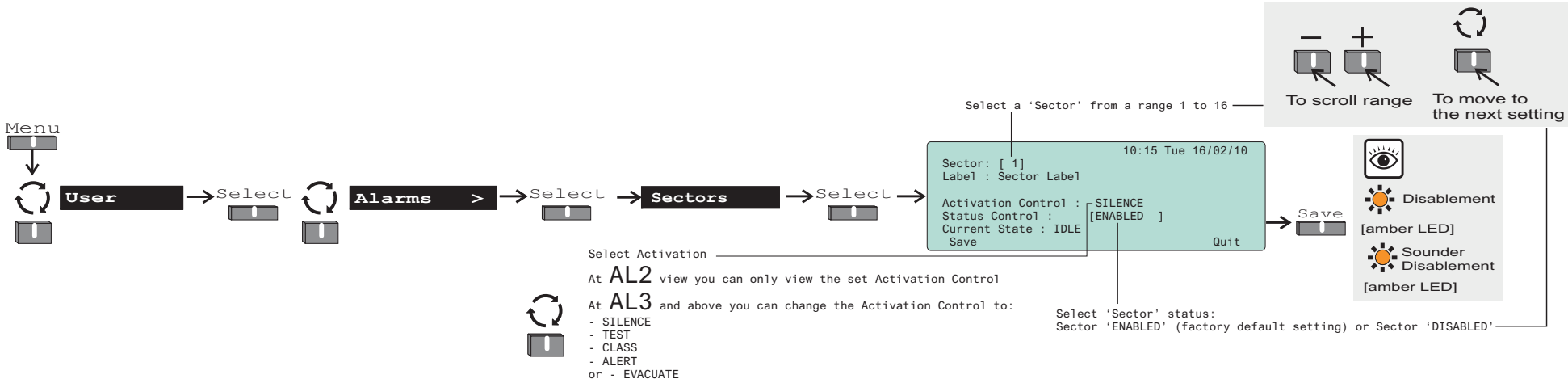
How to enable/disable Master alarms, Fire relay and Evac. input

You can manually enable or disable the master alarms, fire relay and evacuate input. You can also view the current state of master alarms, fire relay and evacuate input. You will need to be at access level 2 or above to enable or disable these functions.



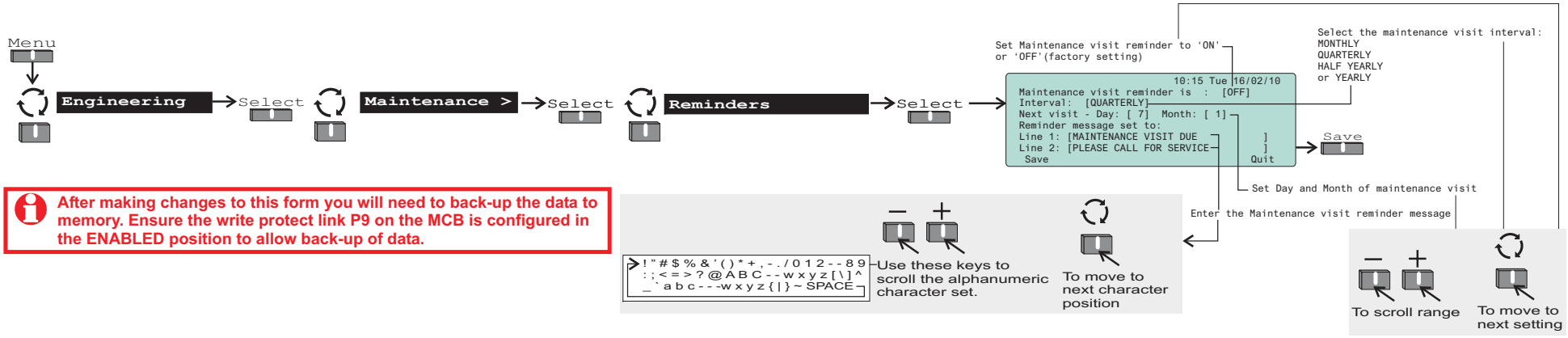
How to enable or disable and set a Sector activation control

You can manually enable or disable alarm activation control and view current state of the sector. You will need to be at access level 2 or above to enable or disable sectors. You will need to be at access level 3 or above to change the sector activation control..



How to set up 'Maintenance visit reminder'

The maintenance visit reminder will appear on the display to remind responsible person(s) to arrange for the system to be maintained by the servicing organisation. The message is displayed at the beginning of the reminder day and is automatically removed after 7 days. You will need to be at access level 4 to set up the reminder.



After making changes to this form you will need to back-up the data to memory. Ensure the write protect link P9 on the MCB is configured in the ENABLED position to allow back-up of data.

How to return 'System Configuration' to factory default settings

It is possible to reset the system configuration to factory default settings. You will need to be at access level 4 to use this function.



Note: Only the labels are retained.

After configuration has been reset you will need to back-up the data to memory. Ensure the write protect link P9 on the MCB is configured in the ENABLED position to allow back-up of data.

After the configurations are reset you will need to power down and power up the panel.

How to return all 'Labels' to factory default settings

It is possible to reset all the labels entered back to factory default settings. You will need to be at access level 4 to reset labels.



After labels are reset you will need to back-up the data to memory. Ensure the write protect link P9 on the MCB is configured in the ENABLED position to allow back-up of data.

How to return the 'Configuration and Labels' to factory default settings

It is possible to reset all the labels entered and system configuration back to the factory default settings. You will need to be at access level 4 to reset configuration and labels.



After labels and configurations are reset you will need to back-up the data to memory. Ensure the write protect link P9 on the MCB is configured in the ENABLED position to allow back-up of data.

After labels and configurations are reset you will need to power down and power up the panel.

How to return all 'Access level PIN codes' to factory settings

The Access levels 2, 3 and 4 PIN codes are reset to factory default settings. You will need to be at access level 4 to reset all PIN codes.
Factory default settings:
Access level 2 code: 0 0 0 0 (Customer Mode)
Access level 3 code: 3 3 3 3 (Engineering Mode)
Access level 4 code: 4 4 4 4 (Maintenance Mode)



After making changes to this form you will need to back-up the data to memory. Ensure the write protect link P9 on the MCB is configured in the ENABLED position to allow back-up of data.

How to clear all Logs

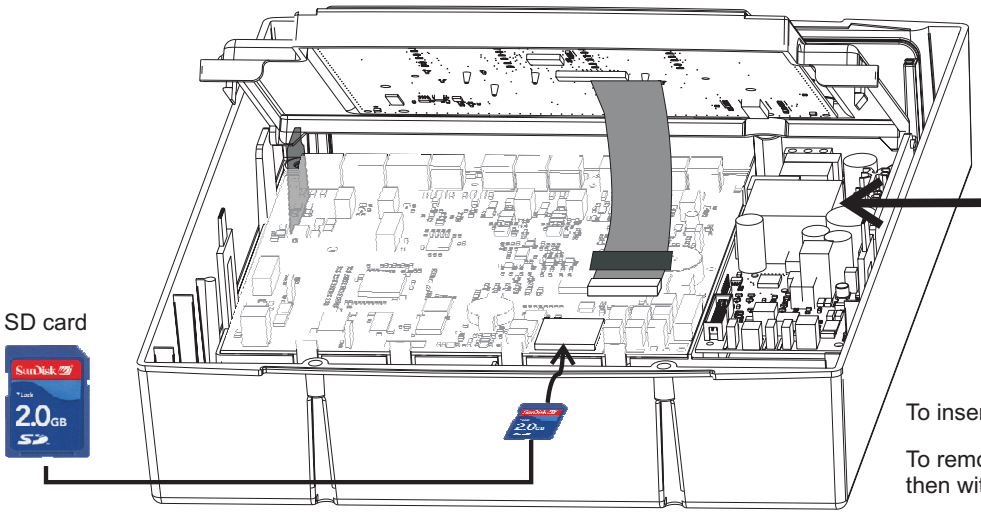
All the active and historic logs held at the panel can be cleared out. You will need to be at access level 4 to clear logs.



How to access the SD card slot on Main Control Board

The SD card slot is located on the Main Control card inside the panel enclosure.

A VIEW OF THE ELECTRONIC MODULE



You will need to remove the battery located on the right hand side in the enclosure to gain access to the SD card slot.

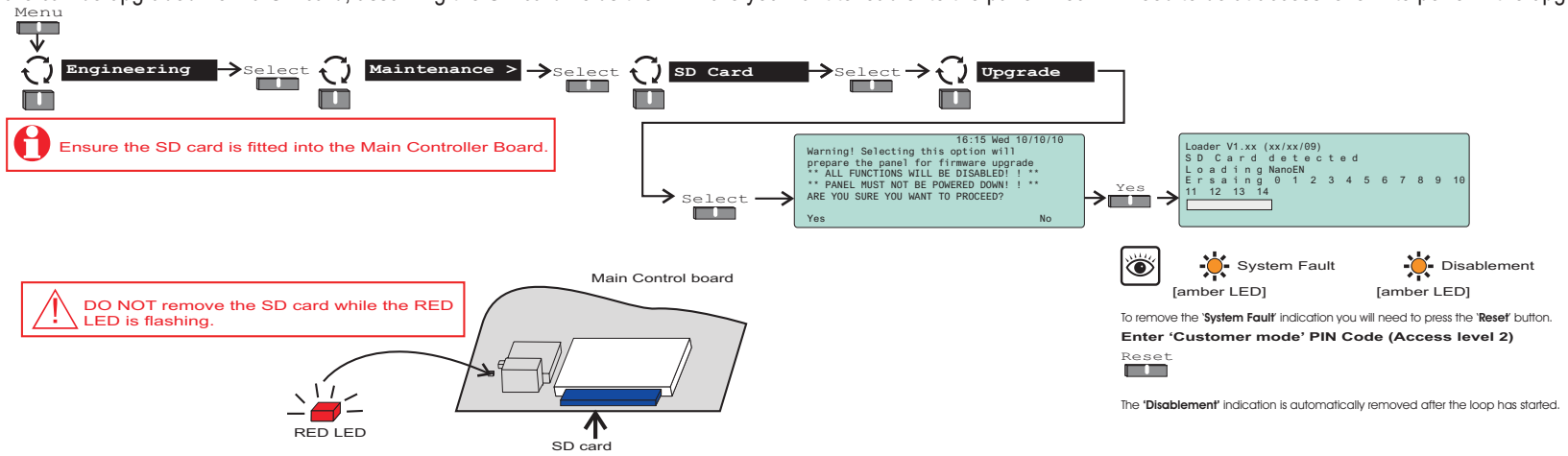
WARNING
Removal of cover exposes live parts
DANGER

To insert the SD Card: Push the card into the slot and release to lock the card.

To remove the SD Card: Push the SD card into the slot and release, then withdraw the card from the slot.

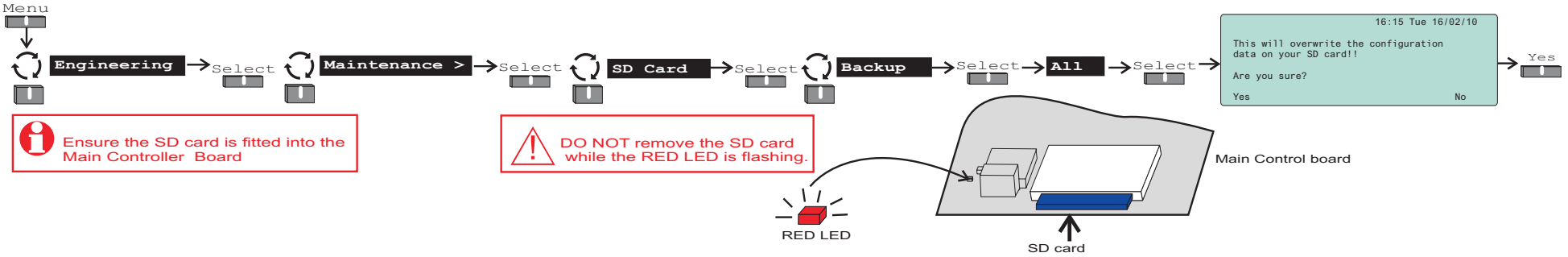
How to upgrade the panel firmware from a SD card

The panel firmware can be upgraded from a SD card, assuming the SD card holds the firmware you want to load onto the panel. You will need to be at access level 4 to perform the upgrade.



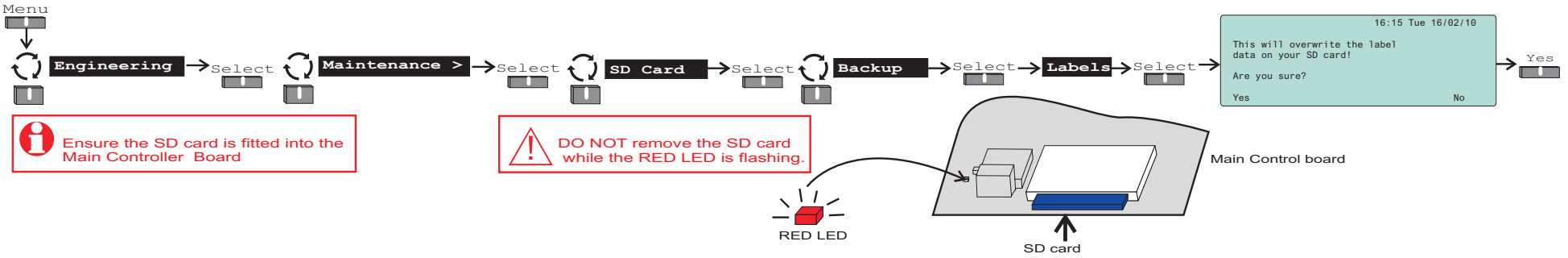
How to back up all system configuration and labels to a SD card

The system configuration data and labels can be backed up to a SD card. You will need to be at access level 4 to perform this back up.



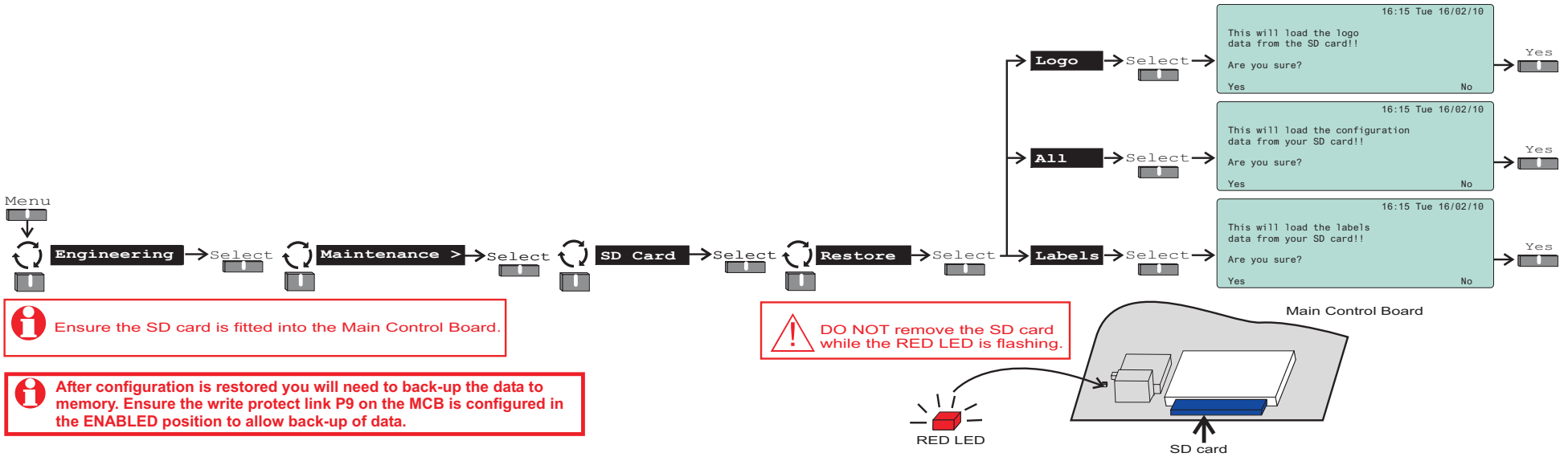
How to back up all labels to a SD card

The system labels can be backed up to a SD card. You will need to be at access level 4 to perform this back up.



How to restore 'Config', 'Labels' or 'Logo' from a SD card

A previously saved system configuration data, labels and proprietary Logo file on a SD card can be restored to the panel. You will need to be at access level 4 to load configuration stored on a SD card.



How to use a SD card to log 'Historic Events' for diagnostics

Up to **64 million historic events** can be stored on to a **1G byte regular SD card** when it is left inserted in the SD card slot on MCB. The SD card must have a folder named **nanologs** to enable the panel to create and store historic log to a text file in the folder. The text file on the SD card can be opened and viewed via a card reader connected to a PC. The historic log of the panel is unaffected by the introduction of SD card to keep a large store of historic events.

Tests on installed equipment

Preparation

☐ Check to ensure *access* will be provided to areas where installed equipment is to be tested, such as locked or secure areas.

☐ Ensure all sensor *dust covers* are removed from sensor devices.

☐ Tests may be made easier by having: sensor extractor tool, smoke poles, smoke canister, heat gun, beam obscuration filter, sensor removal kit and MCP test key, plus keys to open system equipment.

Site occupants

☐ Before undertaking any of these tests and to prevent unnecessary building evacuation, ensure:

- all affected personnel on the site are informed, via a responsible person that the fire alarm system is being commissioned.
- where there is a link to an alarm receiving centre, the appropriate action should be taken to ensure they are informed that tests are being carried out on the system.

S-Quad Sensors

☐ Each S-Quad should be tested for correct operation in the event of fire.

☐ The Sound and Speech part of the S-Quad should be checked to ensure each device outputs the correct signal at the appropriate volume level and ensure the strobe operates at the required flash rate.

☐ The sound levels in the areas should be tested in accordance with the British Standard requirements and to meet the site specific needs as agreed with the customer.



1. When testing heat sensors DO NOT use a heat gun for the test in a hazardous environment.

2. Recommended test equipment and methods must be used to fire test flame detectors off interface unit.

4. When smoke testing fire sensors using artificial smoke, avoid excessive spray to prevent accumulation of sticky residues on sensor, see instructions on the smoke canister.

5. The beam sensors should be tested using obscuration filters to simulate smoke at default sensitivity.

The BS5839:Part 1 recommends that all sensors are tested for correct operation.

☐ Unless otherwise instructed all sensors should be tested.

☐ Each sensor should also be checked for any physical obstacles that would inhibit the operation of the sensor in the event of a fire.

☐ Where practical, each *conventional flame detector* operating via an interface unit should be functionally tested.

Manual Call Points

☐ Each *call point* should be tested for correct initiation of a fire event.

Interface Units

1. In some instances it may not be possible to functionally test input / output circuits off an interface unit, such as when it is connected to plant equipment.

2. Ensure the contact rating of interface output circuits are adequate for the external equipment load requirement.

3. Fit a mains voltage warning label where mains supply is being switched.

Plant equipment

☐ Tests should be carried out following customer consent. It may also be necessary to obtain third party consent.

☐ All tests on Plant equipment should have been agreed during the project design stage.

Tests

☐ Each interface should be tested for the following:

- Battery disconnection*
- Mains supply disconnection*
- Input line open circuit
- Input line short circuit
- Input line detector fire*
- Input line MCP fire*#
- Output line open circuit ~
- Output line short circuit ~
- Output line operation ~

* - not applicable for the **loop powered interface unit**, but input tests are applicable for **loop powered interface used as a zone input**.

- a fire from a **manual call point or detector** connected to a loop powered interface used as a zone input cannot be differentiated.

~ - the output of the **MV interface** operates with **assigned sector.** The output is a set of **voltage free contacts** which are not fault monitored.

Interfaced equipment test

☐ The external equipment connected to the system via an interface unit should be tested as per project specification.

Keyswitches Interface

☐ The keyswitch interface should be configured for correct operation and tested as per project specification.

☐ Check on operating the keyswitch the adjacent LED is lit.

S-Cube

☐ Depending on the type of S cubed device being tested check to ensure correct output sound tone, speech message and strobe rate are given.

☐ Each S-Cubed should be tested for correct operation in the event of fire.

☐ The sound levels in the areas should be tested in accordance with the British Standard requirements and to meet the site specific needs as agreed with the customer.

Repeat indicator panel

Each *repeat panel* should be tested for the following:

☐ Cancel Buzzer

☐ System event messages and indications

☐ Display of active event log

Appendix A - Message Action List

There are some fault events that are not self clearing and will require manual intervention.

Latching fault events

The following faults are identified as latching events.

- ☐ Slave devices lost (associated with Tee breaker)
- ☐ Loop allocation fault
- ☐ Invalid loop configuration

How to clear a latching fault event

To clear a 'latching fault' it is necessary to re-allocate the loop circuit by **Power-down, Power-up** and **Start detection** method, see page 24.

Repairable fault events

- ☐ Loop (partial) short circuit.

How to repair this type of fault event

To repair the fault at the control panel use the repair function, see page 30.

Message Action list

Only the messages that are applicable will appear on the display of the control panel.

Message	meaning..	..possible action
24V supply failed	The panel power supply has failed	Check the mains fuse and wiring. Replace PSU..
Allocation HW Error	Device loop breaker relay has not closed or End-2 is faulty or relay is stuck i.e. closed. The device may not be correctly fitted.	Check the device connections and replace if necessary.
Allocation TX Error	The panel is not getting a response when communicating with a device on the loop circuit.	Check the device. Also check cable routing and length (measure resistance and capacitance of cable).
Batteries Discharged	The panel 12V 7Ahr batteries are discharged.	Replace batteries in the panel.

Message	meaning..	..possible action
Batteries Disconnected	The panel 12V 7Ahr batteries are discharged.	Check the wiring
Charger Fault	Charger circuit has failed.	Replace the PSU.
Class Change input O/C	There is an open circuit fault on the class change circuit.	Check the class change circuit wiring and remove the open circuit fault. Also check if the end of line resistors are fitted correctly.
Class Change input S/C	There is a short circuit fault on the class change circuit.	Check the class change circuit wring and remove the short circuit fault.
Configuration data not saved	The configuration data has been saved.	Save the configuration data.
Detection device removed	Sensor device has been removed.	Replace the removed device.
Device Battery fault	The battery has failed the load test at the interface device.	Check and replace the battery if necessary.
Device CO sensor failed	There is a fault with the CO sensor on S-Quad.	Replace the device
Device CO sensor near end of life	The CO cell is nearing the end manufacturer recommended life expectancy (S-Quad).	Replace the device
Device configuration error	Indicates that the loop device has detected invalid configuration data.	Reprogram the device at the commissioning tool or panel.
Device EEPROM check failed	Indicates that the device has detected a corruption in its configuration data.	Replace device.
Device FLASH check failed	Applies to S-Quad voice variants.	The device has detected an error in the FLASH chip containing the Voice messages.
Device lost	There is no reply on ends 1&2 of the device.	Check the device connections.
Device Mains Failed	Failure of mains supply to mains powered interface unit.	Check mains supply connections and the mains fuse.
Device Power Fault	The failure of an internal power supply rail.	Replace the device.
Device Replaced is faulty	Tx fault re-finding device.	Check connections to device / base and also device type etc.
Device replaced is wrong type	The device replaced is of a different type.	Replace like for like device.
Device ROM check failed		Replace device

Message	meaning..	..possible action
Device sounder failed	There is a fault with the sounder hardware on the S-Cube or S-Quad device.	Replace the device
Device speech failed	There is a hardware fault possibly associated with the voice chip on the speech S-Cube or S-Quad	Replace the device
Device strobe failed	There is a fault with the strobe hardware on the S-Cube or S-Quad device.	Replace the device
Duplicate addressing occurred	Two devices on a loop have the same locked address.	Change one of the device with locked address.
External Evacuate input O/C	There is an open circuit wiring fault on the evacuate input circuit.	Check the wiring and rectify the fault.
External Evacuate input S/C	There is an short circuit wiring fault on the evacuate input circuit.	Check the wiring and rectify the fault.
Interface channel open circuit	The interface wiring is open circuit, the end-of-line is not seen	Check the interface wiring and rectify the fault.
Interface channel short circuit	The interface wiring is short circuit.	Check the interface wiring and rectify the fault.
Loop map changed	The map is different to that previously allocated.	Check and confirm difference with backup map.
Loop V supply failed	The loop voltage is too high or too low.	Check the loop voltage values in diagnostics. If readings are not normal then replace the PSU if necessary.
Loop wiring ground break	A test has shown a break on the 0V line. The test is conducted every minute.	Check wiring of 0V around loop.
Loop wiring open circuit	The loop wiring is open circuit.	Check the loop wiring and rectify the wiring.
Loop wiring partial short circuit	There is a partial short circuit fault on the loop circuit	Check wiring after the partially shorted device.
Loop wiring short circuit	The loop has a short circuit after the specified device.	Check wiring after the indicated device.
Lost slave Device	There is no reply on ends 1&2 of the device.	Check the slave device connections and replace if necessary.
Mains supply failed	The mains supply to the PSU has failed.	Check mains fuse and replace PSU if necessary.
Master alarm 1 fuse failed	The master alarm circuit 1 fuse has failed.	Check the master alarm fuse on the Main Control Board and replace the fuse.

Message	meaning..	..possible action
Master alarm 1 open circuit	There is an open circuit fault on the master alarm circuit 1.	Check the wiring and ensure the end of line unit is fitted to the circuit.
Master alarm 1 short circuit	There is a short circuit fault on the master alarm circuit 1.	Check the master circuit wiring and remove the short circuit fault.
Master alarm 2 fuse failed	The master alarm circuit 2 fuse has failed.	Check the master alarm circuit 2 fuse on the Main Control Board and replace the fuse.
Master alarm 2 open circuit	There is an open circuit fault on the master alarm circuit 2.	Check the wiring and ensure the end of line unit is fitted to the circuit.
Master alarm 2 short circuit	There is a short circuit fault on the master alarm circuit 2.	Check the master circuit wiring and remove the short circuit fault.
MCP glass broken whilst disabled	Glass is broken or device has been triggered.	Check device and reset element or replace glass as necessary.
No devices found on loop	No devices found on End 1 or End 2.	Check wiring of loop circuit.
Panel earth fault	There is an earth fault at the panel.	Find and remove the faulty connection to earth,
Power supply comms failed	The main processor cannot communicate with the internal power supply module	Check the connection, If this fails to solve the problem, then it could be a failure of the Main Control Board or the Power Supply Unit. Replace the faulty item.
Power supply internal fault	The system has detected a fault with the power supply module.	Replace the PSU module.
Printer lost	The external printer has not been seen and is ‘lost’.	Check the connections to the printer. Also check for paper jam in the printer mechanism.
Regulated DC supply high	The internal regulated voltage from the power supply is too high.	Replace the PSU module.
Repeat panel supply failed	The 24v DC repeat panel output supply has failed.	This could be as a result of a short circuit on the repeat panel cable or a fault with the repeat panel itself. Either of these would cause the output panel fuse to blow. Investigate the cause of the fault and replace the fuse.
Sounder circuit failed	There is a fault with the sounder hardware on the S-Cube or S-Quad.	Replace the device

Message	meaning..	..possible action
Speech circuit has failed	There is a hardware fault possibly associated with the voice chip on the speech S-Cube or S-Quad	Replace the device
Strobe circuit has failed	The strobe circuit on the S-Quad or S-Cube device has failed.	Replace the device
Too many devices on loop	The user has attempted to connect more than the permitted 127 devices to the loop.	Ensure that only 127 devices are connected.

Appendix B - General Guidelines

Labels

- ☐ Labels are given to identify location of areas on a site.
- ☐ A previous created label can be modified.
- ☐ for manual call points enter text MCP in the label description.
- ☐ a *32 character label* can be given to a device, each Input/Output line, zone or sector
- ☐ A **supervisory input** *channel label* of an *interface unit* will be displayed at the *control panel* when an interface input has operated.

Sectors

- ☐ There can be up to 16 Alarm or Plant sectors
- ☐ a sector is a collection of devices having a common action.
- ☐ a sector that is actioned ON will activate its alarm devices, such as interface outputs, S-cube and Visual and audible part of an S-Quad.
- ☐ a sector signal can be Continuous (factory default for Class Change), 0.25 second pulse (factory default for Alert), Nee-naw (factory default for Evacuate) or 0.5 second pulse (factory default for Test)
- ☐ Alarm sectors operate automatically with 'Sound Alarms' and 'Silence Alarms' buttons
- ☐ Plant sectors are independent of the 'Sound Alarms' button and are primarily used with plant control equipment and can be silenced by pressing the 'Reset' button.
- ☐ A loop powered interface outputs can be assigned to a sector.
- ☐ Alarm sounders and interface outputs are restricted to one sector only.
- ☐ The fire plan on power up is known as 'one out all out'. This is when sector 1 has all the sounder and output devices of the system. A fire event will activate evacuate on all interface outputs and alarm sounders in the system.
- ☐ A sector can be assigned for activation by class change.
- ☐ It is advisable to build a fail safe mechanism when sectoring. If for any reason certain sector assignment has been lost due to system power-down and subsequent NVM recovery conflicts on system power up, the sounders will still operate in a fire condition.
- ☐ the fail safe mechanism will involve leaving Sector 1 free from any device assignment, as any devices that lose their sector assignment will default to Sector 1.

Day Mode delays

- ☐ a Day Mode delay can be:
  - switched ON / OFF manually at the panel
  - or preconfigured to operate ON, OFF or with CALENDAR

Zones

- ☐ A zone has a collection of trigger devices that are located in the same general area. It may be used for one or all three of the following:
  - for illumination of zonal fire at the panel
  - for common disablement purposes
- ☐ a device may only be assigned to one zone.
- ☐ input/output lines of an interface can be assigned individually to zones.
- ☐ a zone is a collection of devices, sharing a common label
- ☐ zones default to normal operation and can be configured for coincidence operation
  - coincidence of 2 detector operation in a zone or
  - coincidence of 2 zone
- ☐ disabling a zone will disable the sensors within that zone
- ☐ all devices default to zone 1



The exceptions are devices that cannot be zoned, see page 36.

Fire relay

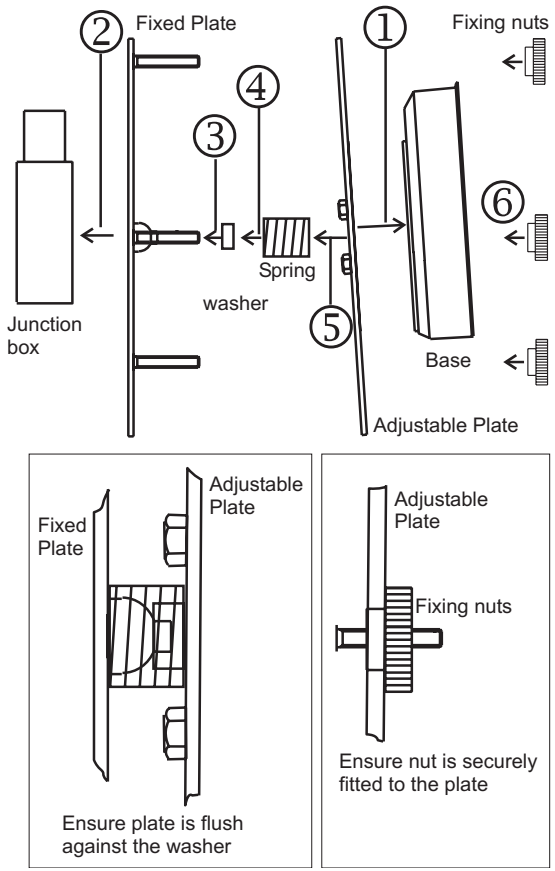
- ☐ The 'Fire relay' is not enabled (factory default) and can be enabled to operate with zone fire. The relay is normally de-energised.

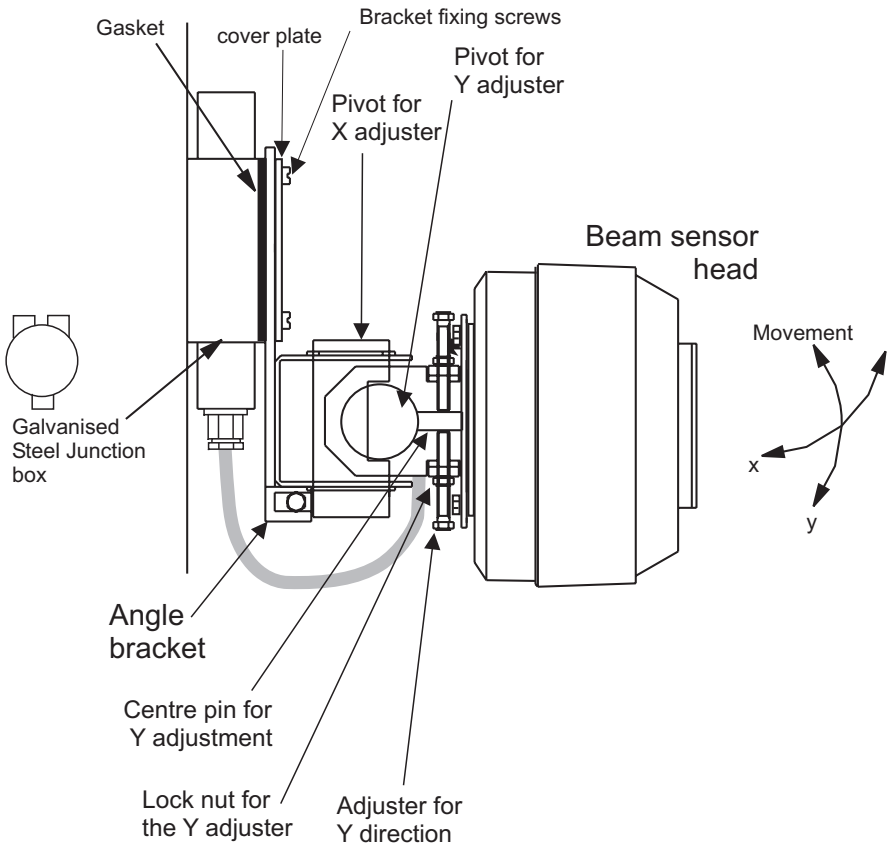
Appendix C - old Beam sensor

FOR INSTRUCTIONS ON THE S4 BEAM SENSOR PAIR AND BRACKETS SEE INSTRUCTIONS SUPPLIED WITH THE PRODUCTS.

Parallel bracket assembly

Steps ① to ⑥.





These procedures assume that each beam sensor heads is mounted on an angle brackets. The procedures for other assemblies of the beam sensor pair are similar.

Before aligning the sensor heads check to ensure the *bracket* and *base* fixing screws are securely fitted. After alignment, ensure the pivot pins and adjusters are secure.

a. Using the adjuster on the bracket, roughly align one head to face the other head. To do this:

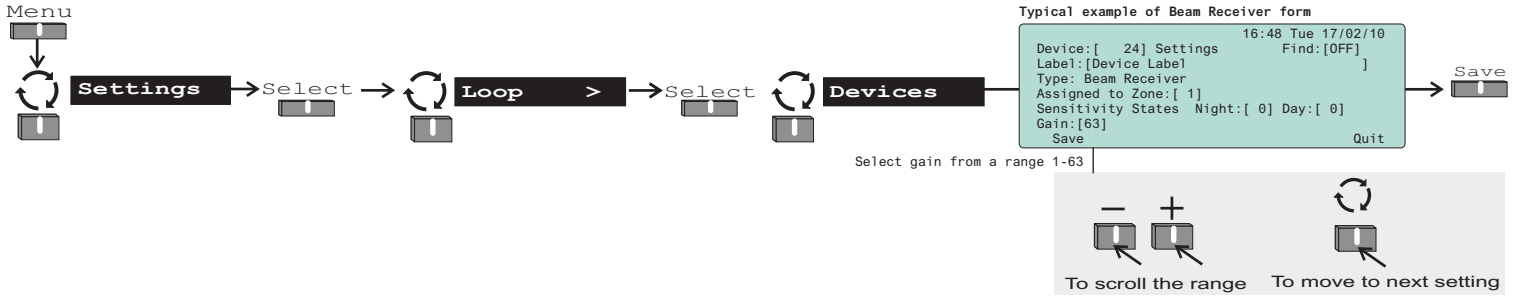
- slacken the locknuts to unscrew the Y- adjusters
- to make a large adjustment remove the centre pin of the Y pivot
- align the head in the Y-axis to face the opposite head
- secure the centre pin into the appropriate Y-pivot to enable adjustment
- turn the adjusters to meet the centre pin and lock the axis adjusted using the lock nuts.
- repeat procedure for the X-adjusters
- repeat the whole procedure for the opposite head.

b. Select a gain from the table for the required path. Set the gain at the beam receiver head.

Gain value	Path Distance
6-9	2m
29-33	10m
56-60	100m

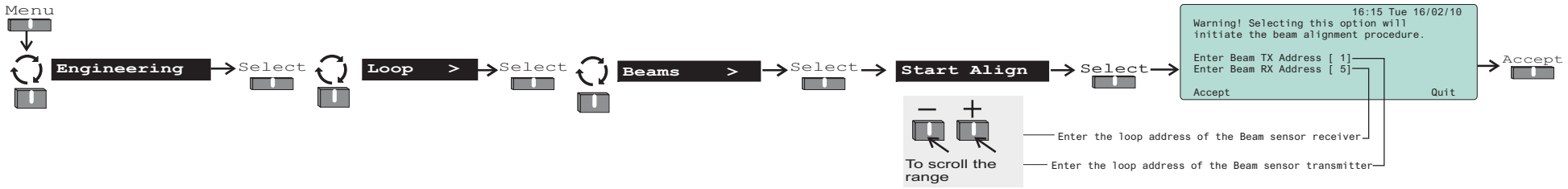
DO NOT 'Power-Down' the loop or control panel or reset the Main Control Board until gain change is acknowledged.

You will need to be at access level 3.

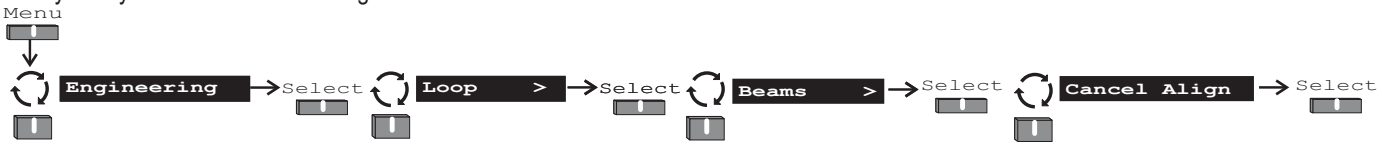


c. Enter the beam transmitter and receiver loop addresses and activate the beam alignment.

You will need to be at Access level 4.



At any time you can cancel Beam Alignment



d. Note the LEDS on the heads will flash once every 2 seconds:
   - a 1.9 seconds LED flash will be seen for a large signal
   - a 100mS LED flash will be seen for a small signal.

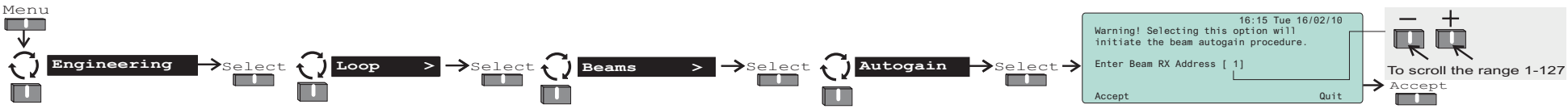
e. Adjust the transmitter head in X and Y directions to obtain a long LED flash signal, allow at least 3 seconds for the flash rate to change. Then lock the adjusters using the lock nuts.

f. Repeat the above at the receiver head and obtain a maximum flash length.

g. Check the time average of the receiver head is between 140-170, see section on time averages. The time average value it should be between **140-170 bits**. After each adjustment wait for 5 seconds for a change in the reading.

Where a time average reading of above 200 bits is read then carry out an autogain for fine adjustment.

You will need to be at Access level 4.



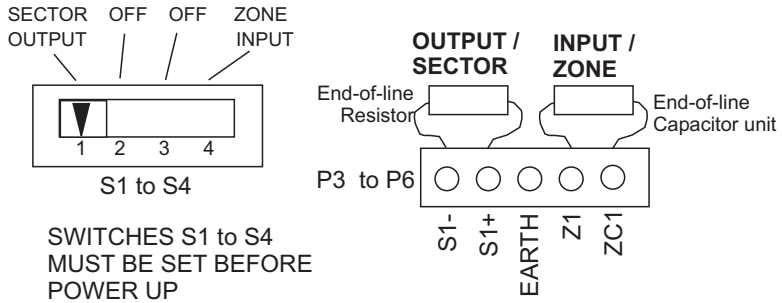
h. For fine adjustment unlock the lock nuts to allow Y axis adjustment and using the adjusters move the transmitter head in Y direction, then:
   - stop on reaching a time average reading 5 bits below the peak value
   - while counting the number of turns, adjust in the opposite direction to reach 5 bits below the peak value
   - finally turn the adjuster half the number of counted turns, towards the peak and then stop
   - secure the axis adjusted using the lock nuts

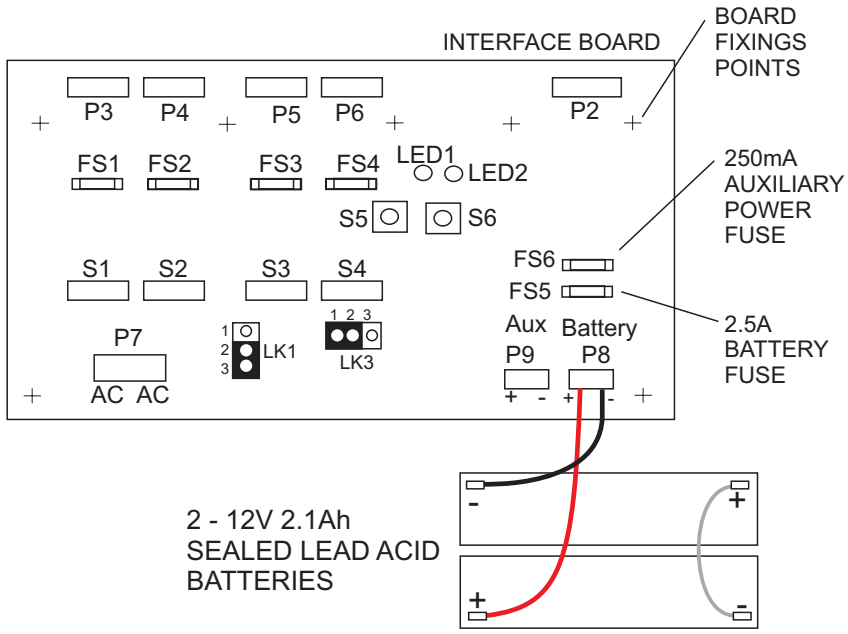
i. Repeat h) for adjustment in the X direction.

j. Repeat h) and I) at the receiver head.

k. Carry out a final **Autogain**. Then recheck the time average reading is within 140 to 170 band. Back up the appropriate adjustment to the flash memory, see page 28.

Appendix D - old Mains powered interface unit





FOR INSTRUCTIONS ON THE NEW MAINS INTERFACE REFER TO THE LEAFLET SUPPLIED WITH THE PRODUCT.

Ratings

Zone (input)	24V nominal 2mA maximum
Sector (output)	24V nominal 500mA maximum (500mA total for all sectors)
Auxiliary power output	24V nominal 250mA maximum
LED1 (green)	When lit it indicates local mains power is healthy
LED2 (yellow)	When lit it indicates communication with loop circuit has failed

Link	Position	Meaning
LK1	1 - 2 #	Normal zone voltage
LK1	2 - 3	Low zone voltage ‘Reduces the zone voltage by 4V for Thorn detectors’
LK3	1 - 2#	Fail safe **disable**
LK3	2 - 3	Fail safe **enable**

- factory settings

S5 - rotary switch	0 -GENT detectors
S6	Reset push button (fail safe)

Fail safe mode

- ☐ In this mode if there is a **loop communication failure** lasting over *1 minute* duration, then all the outputs of the unit are activated (switched On). The outputs deactivate on restoration of loop communication. On pressing the reset button on the PCB you can restore outputs to their normal state.
- ☐ If there are **three communication failures** over *10 minutes* duration the outputs will be **latched On**, in this case the unit must be powered down and powered up again to unlatch and restore the unit for normal operation.

Dual-in-line switches

☐ Decide on the switch settings required for DIL switches S1 to S4. The switches can be set for *input, output or not used* (off) position.

End-of-line units

☐ Connect the end-of-line (EOL) units to IO lines to allow fault free IO lines to be seen during allocation of addresses.

Links

☐ Set as necessary the links LK1 and LK3 plus the rotary switch on the interface board.

The mains terminals are located behind a metal cover inside the interface unit enclosure.

☐ Connect the mains supply and power-up the unit, notice that LED1 (green) and LED2 (yellow) are lit.

☐ Connect the battery and fit the battery restraint bracket.

Rotary switch

The rotary switch can be set to any one of its 16 positions, 0 to F.

☐ Normally the rotary switch is factory set for *conventional SMS detectors* connected to interface input lines. Other settings are available to allow detectors from other manufacturers.

All input circuits must have *End-of-line units* fitted, irrespective of manufacture of detector.
On changing the rotary switch setting, the interface unit must be completely powered-down, both mains and battery supply, and then powered-up again. Also the loop on which the unit resides must be reallocated.

Other manufacturer's MCP

☐ Where an input circuit is required to have other manufacturers, manual call points MCP, then a ***3.9V zener diode*** should be fitted in series with the ***contacts*** of the MCP. There should be no other components fitted to the MCP contacts.

Where NITTAN detectors and manual call point are installed on an input circuit, the system will not be able to differentiate between a fire from a call point or detector.

IO Line tests

☐ Test the IO line as per project specification. The tests should be based on the type of equipment interfaced, for example the interface may control air-conditioning system, escalator, fire door release or sprinkler system.

Rotary switch (S5) setting	detector manufacturer	detector range	comment	link LK1 on interface board	type of detectors tested
0	SMS	7800 range		1-2	whole range
1	Hochiki or Apollo	CD range Series 20		1-2	optical and heat
2	Menvier	Series 700		1-2	optical
3	Nittan	NH-G Series		1-2	Heat
4	Notifier	EC range	**Without** resistor fitted to detector base	1-2	Heat
5	Thorn	Series 300		2-3	Optical
6	GENT	7800 range		1-2	whole range
7	GENT			1-2	whole range
8	GENT			1-2	whole range
9	GENT			1-2	whole range
A	GENT			1-2	whole range
B	GENT			1-2	whole range
C	GENT			1-2	whole range
D	GENT			1-2	whole range
E	GENT			1-2	whole range
F	GENT			1-2	whole range

Index

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3V lithium battery 15

A

Access levels 10, 20, 66
Address allocation 23
ALARM Sector. 10
As fitted wiring drawings 6
Auto Gain. 81

B

Back up. 28, 68
Beam Alignment 81
Beam sensor 79, 80, 81
Buzzer 58

C

Calendar 47
Cause and Effect 45
Class Change input. 10, 56
Clear all logs 66
Clear loop map 33
Clock 21
Condition Codes 52, 53, 54

D

Day mode. 45, 47
Day Mode delays. 77
Delayed Cause and Effect 46
Device configuration 37, 38, 39, 44
Diagnostics 29
Disable Sector 63
Disable Zone 61
Disconnect device 19
Display Test 22
Dust cover 6

E

Earth fault 32
Enable Sector. 63
Enable Zone 61
External Evacuate input 55, 63

F

Factory default settings. 65
Find Devices 26
Fire relay 63, 77
Fire Relay. 10
Fire test reminder. 59
Firmware 22
Fuses 17

G

Gain value 80
Ground Break. 31

H

Historic log 22

I

Immediate Cause and Effect 46
IT Power systems. 19

L

Labels. 77
Latching faults 72
Link - Memory protect 14
Load configuration 69
Log of historic events 69
Loop Cable Capacitance 30
Loop Cable Resistance 30
Loop Ends 18
Loop Map. 25
Loop Status. 25

M

Maintenance visit reminder 64
Master Alarms 63
Master Alarms 13

N

Night mode. 45
Normal mode. 10

P

Panel buzzer 14
PIN codes. 66
PLANT Sector 10
Positive line 32
Power-down 24
Power-up 24
PRINTER. 10

R

Repair. 30
Repairable fault. 72
Resound mode 58
RESOUND mode. 10
Restore 28
RS-232 port. 10, 57
RS-485 port. 10, 57

S

SAFE 33
Save loop map 33
SD card slot. 67
Sector activation 63
Sectors 48, 77
Sensor States 40, 41, 42, 43
Short Circuit 31
Site data 29
Sound alarm 58
Sound mode 58
Start Detection 24
System Configuration 64

T

Time averages 50, 51
Trimmer Tool. 20

U

UNSAFE 33
Upgrade. 67
USB port 10, 57

W

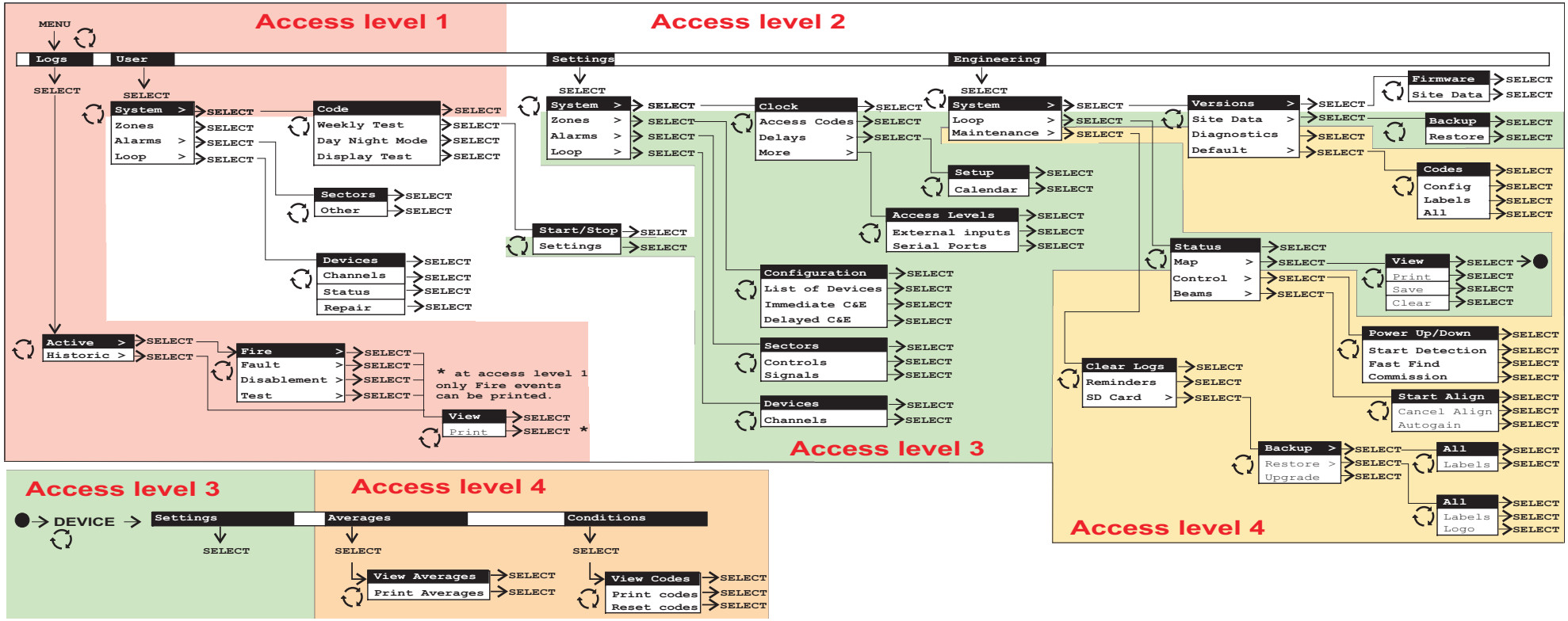
Weekly test 60

Z

Zone Test 6
Zone Test Mode 61
Zones 44, 77

Notes

Quick reference menu map



At the end of their useful life, the packaging, product and batteries should be disposed of via a suitable recycling centre and in accordance with national or local legislation.

WEEE Directive:
At the end of their useful life, the packaging, product and batteries should be disposed of via a suitable recycling centre.
Do not dispose of with your normal household waste. Do not burn.

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GENT by Honeywell
Hamilton Industrial Park, Waterside Road, Leicester LE5 1TN, UK
Telephone +44 (0) 116 246 2000
Fax (UK): +44 (0)116 246 2300