FIRE FIGHTER'S GUIDE – AS4428.1 FF

1. VIEW NEXT/PREVIOUS ALARM

Press "NEXT" key once -

- The LCD will display the next alarm.

Press “PREV” key once -

- The LCD will display the previous alarm.

2. ACKNOWLEDGE DISPLAYED ALARM

Press "ACK" key once.

- LCD will display "ACKD" for the displayed alarm.
- The flashing alarm LED for the zone (if present) will go steady.
- If all alarms are acknowledged, the ALARM LED will go steady.

3. RESET DISPLAYED ALARM

Press "RESET" key once.

- LCD will display “PRESS ACK TO CONFIRM RESET”.
- Press the ACK key within 10 seconds to reset the alarm.
- The alarm LED for the acknowledged zone (if present) will turn off.
- If the final alarm is reset the LCD will display “No more events in alarm list”, and will display any isolated alarm, otherwise FF mode will be exited.

4. ISOLATE DISPLAYED ALARM

Press "ISOLATE" key once.

- LCD will display “PRESS ACK TO CONFIRM ISOLATE”.
- Press the ACK key within 10 seconds to isolate the zone.
- The isolated LED for the acknowledged alarm will turn on.
- If the final alarm is isolated, the LCD will display “No more events in alarm list”, and will display any isolated alarms, otherwise FF mode will be exited.

5. ISOLATE/DE-ISOLATE EXTERNAL BELL

- Press the "EXTERNAL BELL ISOLATE” key once.
  If the “External Bell Isolate” LED is off it will turn on steady.
  The External Bell will turn OFF if it is ON.
- If the "External Bell Isolate" LED is ON, it will turn OFF.
  If any un-isolated alarms exist, the External Bell will ring.
- The “External Bell Isolate” LED will flash if the External Bell is silenced from a remote location.

6. ISOLATE/DE-ISOLATE WARNING SYSTEM

- Press the "WARNING SYSTEM ISOLATE” key once.
  If the “Warning System Isolate” LED is off it will turn on steady.
  The Warning System will turn OFF if it is ON.
- If the " Warning System Isolate" LED is ON, it will turn OFF.
  If any un-isolated alarms exist, the Warning System will sound.

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VIGILANT MX4428
OPERATOR'S MANUAL

MX4428 PRODUCT MANUAL
VOLUME 10

Document Number: LT0249

Issue 3.29; 9 February 2015

- APPROVALS -

AUSTRALIAN STANDARD AS4428.1
- CSIRO Listing Number…… afp1446
NEW ZEALAND STANDARD NZS4512:2003
- FPA (NZ) Listing Number……..…… VF/117
AS/NZS 3548 1995 CLASS A

The MX4428 Fire Indicator Panel is manufactured for:

Tyco Fire Protection Products
17 Mary Muller Drive
Christchurch
NEW ZEALAND

Tel : +64-3-389-5096
Fax : +64-3-389-5938

INSTALLATION DETAILS

For your reference please complete the following information on the MX4428 Fire Indicator Panel supplied.

MX4428 FIP SUPPLIED BY	
MX4428 FIP INSTALLATION LOCATION	
CONTRACT/JOB NUMBER	
MX4428 SERIAL NUMBER	
MX4428 SYSTEM AS INSTALLED DRAWING NUMBER	Issue:
MX4428 SYSTEM PARAMETERS DRAWING NUMBER	Issue:
Date Panel Manufactured	
Date Panel Installed	
Date Panel Commissioned	
Maintenance Company	
Telephone	B.H. A.H.
Service Contact	
Site Contact or Registered User (include title)	
Company / Address	
Telephone	B.H.

EMC COMPLIANCE

WARNING: This product is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

TABLE OF CONTENTS

END USER LIABILITY DISCLAIMER

The MX4428 Fire Indicator Panel provides a configuration programming facility, which may be accessed via a programming terminal using a password.

Because this programming facility allows the user to define in detail the operation of the MX4428 System which is being customised, changes may be made by the user that prevent this installation from meeting statutory requirements.

Tyco therefore cannot accept any responsibility as to the suitability of the functions generated by the user using this programming facility.

AMENDMENTS

ISSUE	DATE	COMMENTS	ECN
3.00	01/03/01	Original for AS4428.1 Panel with Software Version 3.00.	
3.10	23/04/01	Updated for MX4428 Panel with Software Version 3.10.	
3.11	20/02/02	Revised Detector compatibility Appendix A	3254
3.12	13/06/02	Updated for MX4428 Panel with Software Version 3.12	3308
3.13	23/08/02	Prefix; Section 2.4.7, 4.3.10 and 7.1; Appendix A; Appendix C revised. MX4428 Software V3.13	3321 3327
3.14	14/05/03	MX4428 V3.14N/V3.14S software. Prefix; Section 8 add VLC800 device and FastLogic details	3401
3.15	01/03/05	Appendix A, add 614P, 614CH, 614I. Amendments to Sections 1.4, 3.4, 5.13, 6.6, 8.1.4, 8.3.2, 8.3.3.	3635
3.21	09/09/05	Updated for NZS4512:2003 and Version 3.21 software. “Trial Evacuation” becomes “(Trial) Evacuation”. Section 4.3.11 removed Battery Very Low. Revised 5.13 and added 5.14. Section 8.3.3 added. CO detector has no compensation.	
3.22	28/10/05	Added System Sensor detector 885WP-B to Table VI and VII in Appendix A.	ECS 1181
3.23	24/03/06	Appendix A add 614T, 814P	3731
3.24	01/11/06	Appendix A added ADR/ARR detector LED pulse information - ! symbol.	
3.25	08/05/08	Minor typographical fixes to symbols. Section 10.2 revised for AS 1851 changes. 814P added to Section 8.3.	3932
3.26	01/09/08	Amended Section 8.4.1. Added Section 10.4 and 10.4.1.	1308
3.27	06/04/11	Add Olympic batteries to Section 3.3. Revised 3.4 for new ME0476 5A PSU. Brand changed to TFPP and Vigilant. Section 6.6.4, Paragraph 1, third line – change “System Fault” to “Network fault”. 601FEx information updated. Section 7.5 Auto-Reset, added isolate zone before test and new responder versions produce only 1 alarm. Added C131A-Mk2, P131A-Mk2, T131A-Mk2 and 2251BAUS to Sections 8.1, 8.3 and A.2.2.	1542
3.28	27/01/12	For V3.22 firmware Section 4.3.1 -. Change to Note (b) on non-MAF zones driving MAF LED. Section 6.6.3 - added Foreign Point information, adjusted Dirty Alert test. Section 6.7.2 – noted System Fault Reset also clears Foreign Point and Dirty Alert indications in the Recall System Fault display. Section 7.5.4 – change to Note (f) – Auto-Reset Mode timeout also affected by zones entering Auto-Reset Test. Appendix A – A.1: added SAB801, SAM800, S271f+ detectors in Table, A.4 Table VII added S231f+.	4343
3.29	9/02/15	Added 850 detector series information, ADUs and upgrade networking.	

CHAPTER 1 INTRODUCTION

1.1 SCOPE

The MX4428 Fire Alarm System is a model of the F4000 Fire Alarm System that uses MX detectors and provides AS4428.1 features.

The MX4428 Fire Alarm System is very powerful and packed with many features. In spite of this, it is very user friendly and intuitive to use.

The LCD front panel provides a simple, menu driven interface to allow control of the FIP and, therefore, reference to this manual is rarely required for the experienced fire industry person.

This manual has been written to cover every aspect of the panel's operation and would normally be consulted for reference purposes only, or when there are abnormal situations.

NOTE: This manual describes operation of MX4428 FIPs fitted with Version V3.10N or later software and an LCD keypad. Network operation is covered in this manual (it previously was a supplementary manual) even though networking may not be enabled in all panels. Operators of F4000 systems without an LCD should use LT0057, as there are many differences in operation. Operators of F4000 systems with V2.0X software should use revision 1.1 of LT0117, F4000 systems with V2.2(N) software should use revision 2.23A of LT0117, and F4000 systems with V2.3x(N) software should use revision 2.35A of LT0117.

For the less experienced user, start by reading the chapter on "System Description".

The building owner's representative responsible for the fire alarm system should be fully aware of what is contained in this manual.

The Manual is structured into the following chapters:

Chapter 1: **Introduction**: An introduction to this manual, other MX4428/F4000 Product manuals and the standards relating to fire alarms.

Chapter 2: **System Description**; A description of the MX4428 system features and functions, and how networking alters a panel's operation.

Chapter 3: **Specifications**; A summary of MX4428/F4000 system specifications.

Chapter 4: **Interpreting the Display;** A description of display indications.

Chapter 5: **Operating Instructions – Brigade Functions;** A detailed description of the operation and function of keys for FIRE FIGHTER'S USE provided on the MX4428 LCD ("ACK", "RESET", "ISOLATE", "EXTERNAL BELL ISOLATE", and "WARNING SYSTEM ISOLATE").

Chapter 6: **Operating Instructions – System Functions;** A detailed description of the operation and function of keys provided on the MX4428 LCD FIP for system testing and information recall. For example, System Test, Lamp (LED) Test, System Fault Reset, External Bell and Warning System Test, External Bell and Warning System Isolate, and History recalls.

Chapter 7: **Operating Instructions – Zone Functions;** A detailed description of the operation and function of keys provided on the MX4428 LCD FIP for zone tests and functions.

Chapter 8: **Operating Instructions – Point Functions;** A detailed description of the operation and function of keys provided on the MX4428 LCD FIP for point functions.

Chapter 9: **Placing Into Operation;** A description of how to place a correctly aligned and adjusted system into operation. Also included is a System Commissioning Checklist.

Chapter 10: **Maintenance and Trouble-Shooting;** A guide on system maintenance procedures and trouble-shooting.

Appendix A: **Responder Compatible Actuating Devices;** A list of compatible actuating devices and detectors for the MX4428 FIP.

Appendix B: **AS1603 Keypad Fire Fighters Guide;** Instructions for use of an AS1603.4 Keypad in an AS4428.1 MX4428 FIP.

Appendix C: **Events List;** A brief explanation of the various events that can be generated by an MX4428 system and recorded in the history list and on the printer.

1.2 ATTACHMENTS

A FIRE FIGHTER'S GUIDE is fixed inside the front cover for quick reference in emergencies.

If the MX4428 AS4428.1 LCD FIP contains an AS1603.4 Keypad, refer to Appendix B for instructions on ensuring that the correct Fire Fighters Guide is used.

Your installation company should install the following documents inside the panel:

(a) An "AS INSTALLED" fire detection system diagram and/or summary, describing the installed layout of your MX4428 System.

(b) Other "AS INSTALLED" information, such as System configuration parameters.

(c) A Maintenance Log-Book.

1.3 ASSOCIATED DOCUMENTATION

1.3.1 PRODUCT RELATED

The following MX4428 (F4000) product manuals are available:

Volume 1, F4000 Operator's Manual, provides a complete guide to the operation and maintenance of the F4000 FIP and RDU panels, with Version 1.X software, according to Australian Standards AS1603 Part 4 and New Zealand Standard NZS4512. This manual is provided as standard with non-LCD F4000 FIP panels, and RDUs (LT0057).

Volume 2, F4000 Technical Manual, provides complete technical details on the F4000 system and Hardware/Software components, according to Australian Standards AS1603 Part 4, for servicing purposes (LT0069).

Volume 3, F4000 Engineering Manual, provides complete design details for correctly engineering the F4000 system to meet customer and standard specifications (LT0071).

Volume 4, F4000 Installation Manual, provides complete details for correctly installing and placing into operation the F4000 system (LT0070).

Volume 5, F4000 Programming Manual, provides details for correctly programming the F4000 system to meet the system engineering specifications (LT0072).

Volume 6, F4000 AAR Technical & Engineering Manuals, Volume 6-1 provides Technical details on the AAR and Addressable Devices, and Volume 6-2 provides Engineering Design information for correctly engineering the AAR loop (LT0095/LT0096).

Volume 7, F4000 LCD Operator's Manual, provides a complete guide to the operation and maintenance of F4000 LCD FIP panels with Version 2.X software, according to Australian Standards AS1603 Part 4, AS4050(INT), and New Zealand Standard NZS4512. From Issue 2.35A onwards LT0117 includes networked operation, previously covered in a separate manual LT0150 (LT0117/LT0118).

Volume 8, F4000 NZ Fire Indicator Panel Technical Manual, provides additional installation and technical information regarding the application of F4000 Analogue Addressable Fire Alarm Systems in New Zealand (LT0126).

Volume 9, MX4428 MPR Technical & Engineering Manuals, Volume 9.1 provides technical details on the MPR and Addressable devices, and Volume 9-2 provides Engineering Design information for correctly engineering the MPR loop (LT0139/LT0140).

Volume 10, MX4428 AS4428.1 LCD Operator's Manual, provides a guide to the operation and maintenance of MX4428 LCD FIP panels with Version 3.10 software, according to Australian Standard AS4428.1 and New Zealand Standard NZS4512. This manual (LT0249) is provided as standard with MX4428 LCD FIP panels.

Volume 11, MX4428 MXP Engineering/Technical Manual, Volume 11 (LT0273) provides technical details on the MXP and its addressable devices, and provides engineering design information for correctly engineering the MXP loop.

1.3.2 STANDARDS RELATED

This manual makes reference to the following Australian Standards:

AS1603.4 Automatic Fire Detection and Alarm Systems
Part 4 – Control and Indicating Equipment

AS1670.1 Automatic Fire Detection and Alarm Systems-
System Design, Installation, and Commissioning.

AS1851 Maintenance of Fire Protection Systems and Equipment.

AS4050(INT) Fire Detection and fire alarm systems – Fire Fighter's control and indicating facilities.

AS4428.1 Automatic Fire Detection and Alarm Systems. Control and Indication Equipment.

This manual makes reference to the following New Zealand Standard:

NZS4512 Automatic Fire Alarm Systems in Buildings.

1.4 TERMINOLOGY

The following abbreviations and terminology are used in this manual:

AAR	Analogue Addressable Responder
AC	Alternating Current
ACZ	Ancillary Control Zone
ADR	Advanced Detector Responder unit
ADU	Addressable Device Unit
"ALM"	Display abbreviation for ALARM
ARR	Advanced Relay (and Detector) Responder (ADR + RRM)
AS	Ancillary Supervision
AVF	Alarm Verification, or check alarm.
AZC	Alarm Zone Circuit, commonly referred to as "Detection Zone"
AZF	Alarm Zone Facility
CIE	Control and Indicating Equipment
DC	Direct Current
EEPROM	Electrically Erasable Programmable Read Only Memory
EOL	End Of Line device
EPROM	(U.V.) Erasable PROM
F	Flashing LED indicator
FF	Firefighter Facility
FF MODE	The LCD is displaying the alarms list. Key entry permitted as per AS4428.1
FIP	Fire Indicator Panel
"FLT"	Display abbreviation for FAULT
FRC	Flat Ribbon Cable
FSZ	Flowswitch Zone
GLOBAL	A function that may affect more than one zone.
IOR	Input Output Responder
"ISO"	Display abbreviation for ISOLATED
LCD	Liquid Crystal Display
LED	Light Emitting diode (Visual Indicator)
LOGICAL RESPONDER	A responder that communicates with the FIP. A physical responder may Function as a number of logical responders.
MAF	Master Alarm Facility
MAF ZONE	Any zone, Alarm or Ancillary Control, that is configured to signal the brigade in the event of an alarm or fault
MAPPING	Programming AZCs to turn on certain outputs
MCP	Manual Call Point (break glass switch)
MPR	Multi-Protocol Responder
MXP	*MX* Protocol Responder
O/C	Open Circuit
PCB	Printed Circuit Board
PHYSICAL RESPONDER	A single physical responder PCB connected to the loop, which may internally support a number of logical responders.
PROM	Programmable Read-Only Memory
PSU	Power Supply Unit
RAM	Random Access Memory
RF	Rapid Flashing LED indicator
RRM	Responder Relay Module
RDU	Remote Zone Display Unit
S/C	Short Circuit
SF	Slow Flashing LED indicator
VB	Abbreviation for Battery Backed Voltage.
VNB	Abbreviation for Non Battery Backed Voltage.
ZONE	Fire searchable area of building

CHAPTER 2 SYSTEM DESCRIPTION

2.1 SYSTEM COMPONENTS

2.1.1 OVERVIEW

The VIGILANT MX4428 is a fire detection system designed to cover a wide range of applications. It performs the functions of the Control and Indicating Equipment (CIE), as specified by the Australian Standard AS4428.1 for Automatic Fire Detection and Alarm Systems and the New Zealand Standard NZS4512 for Automatic Fire Alarm Systems in Buildings.

The MX4428 is a model of the F4000 Fire Alarm System that supports MX addressable devices.

Figure 2.1 shows a block diagram of the MX4428 System.

The MX4428 Fire Alarm System consists of the following main components:

(a) A Fire Indicator Panel (FIP) containing an LCD Display and

(b) A number of “Responders” located around a Communications Loop. These Responders, selected from a range of different types, provide the interface between the various detection devices and the MX4428 system.

(c) A number of optional Remote Display Units (RDUs) which mimic the FIP zone displays at locations remote from the FIP.

(d) Networking to other MX4428 panels or other Panel-link compatible products.

2.1.2 MX4428 FIRE INDICATOR PANEL (FIP)

The MX4428 FIP is the heart of the MX4428 system. It is microprocessor based and is the MASTER display, operator control and Brigade Interface unit of the system.

Specifically its functions are:

(a) To constantly communicate with all Responders via the communications loop, to retrieve data from them, to transmit commands to them, and to monitor their integrity at all times.

(b) To process the data obtained from the Responders and to generate displays and annunciations as specified by AS4428.1, NZS4512 and any additional requests as entered by the operator. This includes:

  (i) Up-dating the zone status LEDs to shown the ALARM, FAULT and ISOLATED conditions.

  (ii) Activating the relays that signal the Brigade, External Bell and Warning System.

  (iii) Controlling the relays used to drive auxiliary system devices such as HVAC, door holders etc.

  (iv) Controlling remote plant by sending control data via the communications loop to Responders fitted with output devices.

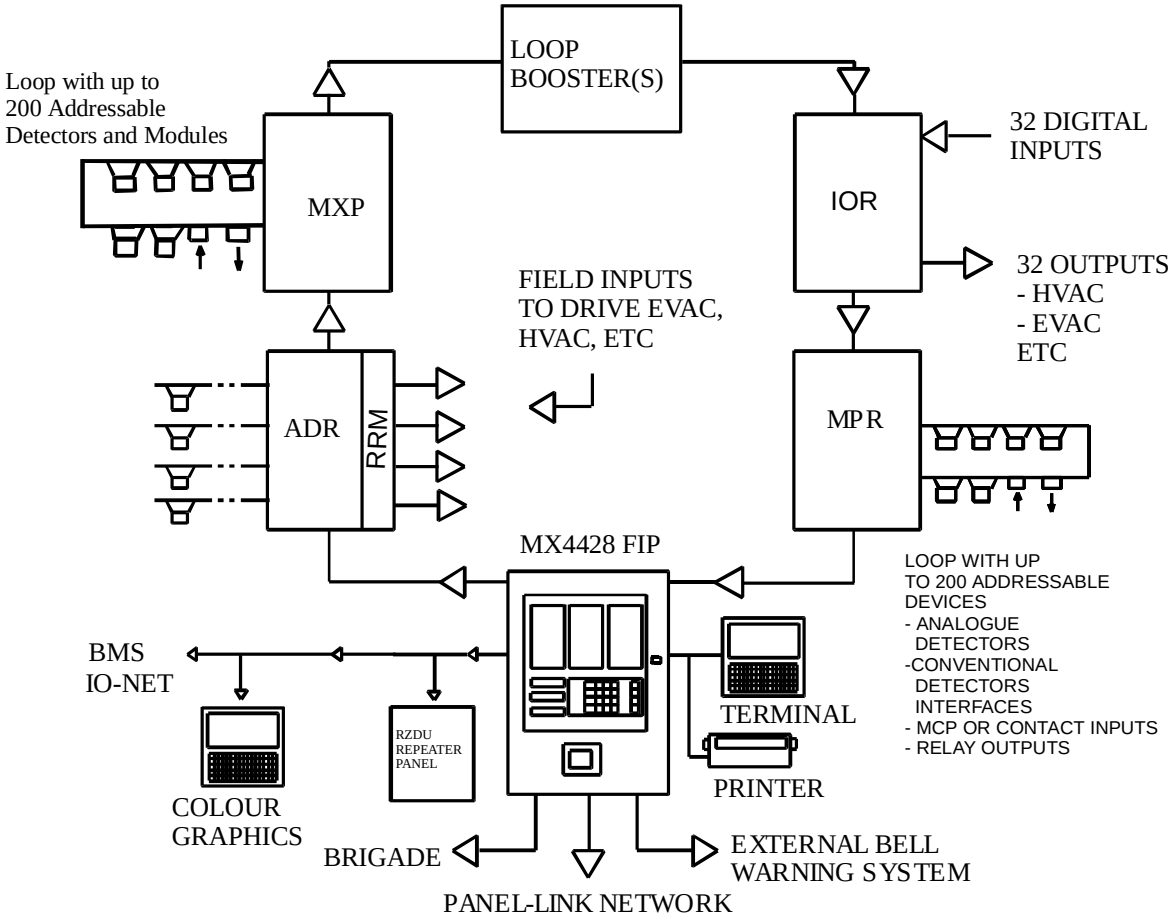

Figure 2.1
MX4428 System Block Diagram

(c) To provide a simplified operator/Brigade interface that allows personnel to easily control the day to day operation of the panel (e.g.: to acknowledge alarms, test zones, isolate zones, etc.).

(d) To monitor its own integrity and annunciate internal fault conditions.

(e) Send and receive signals from other devices on the RDU bus.

(f) Communicate status to, and receive status from other FIPs connected via a Panel-Link network.

(g) To provide a means of entering or modifying configuration data or “SYSTEM DATABASE” from a Programming Terminal. This defines what the specific MX4428 system consists of and how it should respond to inputs and control outputs.

2.1.3 RESPONDERS

The Responders are located around the protected premises and provide the interface between the detection devices and the MX4428 System. They are low power devices, deriving their power from the 4 core communications loop that runs from the FIP, through each Responder, and back to the FIP again. The MX4428 System can monitor and control a maximum of 127 Responders.

It is this loop system that makes the MX4428 System so adaptable since larger systems are implemented simply by extending the loop and adding more Responders in the appropriate places. The loop structure is such that it provides a very high degree of immunity against fault conditions. A short circuit between any two wires or an open circuit in any wire is detected and isolated so that the FIP is still able to power and communicate with all Responders.

To the “Operator” and “Fire Brigade”, the Responders are “transparent” in that they simply serve as data concentration points and have no operator features themselves.

2.1.3.1 ADVANCED DETECTOR RESPONDER (ADR)

The ADR is the standard alarm zone circuit processing unit of the MX4428 system. ADRs are therefore usually located near the zone circuit(s) they monitor. Up to four (4) Alarm Zone Circuits may be connected to each ADR to monitor the approved compatible actuating devices wired on the circuit.

The ADR may be upgraded to an “Advanced Relay (Detector) Responder” (ARR), with the addition of a plug-in Responder Relay Module (RRM). This adds four (4) relay outputs to the inputs provided on each ADR. Each relay can be programmed to operate on specific input conditions. Alternatively the relay may be configured to belong to an ANCILLARY CONTROL ZONE, so that operated, isolated and fault indications may be shown at the MX4428 FIP.

2.1.3.2 INPUT OUTPUT RESPONDER (IOR)

The Input/Output Responder (IOR) provides up to 32 digital inputs and up to 32 digital (or relay) outputs, depending on its setup and the termination boards attached to it. To the FIP, the IOR appears to be up to 8 ADRs (or ARR). The IOR is ideal for when a large number of switched inputs or outputs are required at the same location.

2.1.3.3 MULTI-PROTOCOL RESPONDER (MPR)

The Multi-Protocol Responder (MPR) allows up to 200 analogue addressable devices to be connected on a loop of its own. These devices may be analogue addressable smoke detectors, addressable thermal detectors, addressable device units (ADU) that provide specific input and output facilities, or addressable monitor and control modules. The addressable devices may be mapped to zones in the same way that ADR circuits are.

MPRs with V1.01 or earlier software are limited to devices using the EWD protocol, i.e. Nittan analogue addressable smoke detectors, ADUx I/O devices and the Z54A addressable base. The operation of these MPRs is similar to the AAR.

MPRs with V2.00 or later software are able to communicate with one of two device families (i.e. the EWD devices or the 130 series).

The device family is programmable on a per MPR basis, and an MX4428 system can support both EWD and “130 Series” MPRs on the same MX4428 responder loop. Details are listed in Appendix A.

2.1.3.4 MX PROTOCOL RESPONDER (MXP)

The MX Protocol Responder (MXP) allows up to 200 MX analogue addressable devices to be connected on a loop of its own. These devices may be analogue addressable detectors (with some combination of smoke, heat, and CO sensors) and addressable monitor and control modules. Additionally there are relay, sounder, and isolator bases available for the detectors. A full list is given in Appendix A. The addressable devices may be mapped to zones in a similar manner to ADR circuits.

2.1.4 REMOTE DISPLAY UNIT (RDU)

The MX4428 can monitor up to eight (8) Remote Display Units (RDUs), located at strategic points in larger premises, via its RZDU bus. Additional, non-monitored devices may be connected including RDUs, IO-Net boards that could be used, for example, to drive LEDs in a zone mimic display, and a co-located QE90 panel.

The range of AS4428.1 based RDUs includes the two smaller ADUs (Alarm Display Units), i.e., the Nurse Station Annunciator (NSA) and the Compact FF.

RDUs may be programmed to display all or only a selected range of the zones shown at the FIP. This could allow, for example, an RDU on each floor of the building to show only those zones on that floor.

The control functions of the RDU are also programmable, so that it may have only limited, local control, e.g., silence the buzzer, view alarms present, or it may remotely control the FIP to allow individual zone acknowledgement, reset and isolate commands via the FF, and zone reset, isolate, de-isolate and status recall from the standard menu system. It could also send Brigade Test, External Bell Isolate/ De-Isolate Warning System Isolate/De-Isolate, and Ancillary Isolate/De-Isolate commands to the FIP.

2.1.5 LOGGING PRINTER

A serial printer may be connected to the FIP to provide a log of events and operator actions. The FIP can be programmed to print any combination of the following event types:
(i) Zone Events, e.g. Alarm, Fault;
(ii) Zone Commands, e.g. Reset, Isolate;
(iii) Circuit & Point Events, e.g. Alarm, Fault;
(iv) A 24 hour “System Running” event.

The printer will always print System Events, e.g. communications failures, battery faults, etc.

The printout includes the time and date, the cause of the event (e.g. Zone, Circuit, RDU or FIP), and the event type. Events and commands for zones that have had a text name programmed also have the name printed. The FIP is able to store up to 200 events for printing, being the first 200 events to occur.

As events are printed, more events are able to be put into the list. If events cannot be put into the list because it is full, the FIP keeps count of those events it has had to discard.

When the FIP is next able to put more events into the list, it prints out the number of events it had to discard.

The FIP separately maintains an internal history of the 900 most recent events. This history can be viewed on the LCD and via the programming terminal. It can also be printed out, and used to reconstruct the printer log if the MX4428 FIP had to discard printer events.

2.1.6 PROGRAMMING/DIAGNOSTIC TERMINAL

The FIP also provides for the connection of a “PROGRAMMING/ DIAGNOSTIC TERMINAL”, usually a personal computer, to configure the system and provide service diagnostic functions.

This is a temporary system component, and is ONLY required by the installer during commissioning, or service. In normal system operation this could be replaced by the logging printer for recording events and operation of controls.

2.1.7 NETWORKING OF MX4428 FIPS

The network facility of the MX4428 allows it to communicate with other Panel-link compatible network devices, e.g. other networked MX4428, F4000 or F3200 fire panels, ADUs, NDUs, networked printers and Colour Graphic displays.

The networking feature allows for MX4428 to share:

(i) Alarm information for display and control of alarms on the LCD. Alarms on one FIP can be displayed at other FIPs and Colour Graphics displays. Alarms can be acknowledged, reset and isolated from the FIPs and Colour Graphics displays.

(ii) Output Logic status, allowing status and controls generated by the Output Logic at one FIP to be used by the Output Logic at another FIP, e.g. for extended AS1668 Fan Controls.

(iii) MAF Status, so that one FIP can be a common brigade interface point for a number of FIPs elsewhere on site.

(iv) Event Information for status monitoring and network event printing on network printers and Colour Graphics displays, e.g. Overviews.

(v) Alerting controls for activating, isolating and silencing the sounders, External Bell and Warning System on remote FIPs as a result of alarms or operator controls on the local FIP.

(vi) Zone Circuit and Point Status for monitoring applications.

(vii) Control of other FIP LCD/keypads.

Networked MX4428 FIPs allow an operator to send single zone and zone range reset, isolate and de-isolate commands to other FIPs; to recall and search for zone status on other FIPs; and to alarm, fault, and operate test zones on other FIPs.

Networked MX4428 FIPs allow an operator to send System commands to System, Battery and Bells test other FIPs, and to isolate and de-isolate External Bell, Warning System and ancillaries at other FIPs. Network MX4428 FIPs can receive commands sent by other devices on the network, e.g. Colour Graphics, for control and test purposes.

Networked MX4428 FIPs transmit local events and status onto the network for use by network printers and Colour Graphic systems to allow remote logging of events, e.g. one or more system-wide event printers.

The MX4428 System supports the addition of colour graphics display and control terminals on the network. These units can be programmed to show graphical displays on zone alarm or fault conditions. The operator can use function keys or the optional touch screen to generate commands to the FIP and thus have remote control of the zones and devices

Networked MX4428 FIPs are in most respects identical to a stand-alone FIP, except for the inclusion of a networking card and the addition of the panel number in zone and point numbering schemes. Note, however, that configuration of a network MX4428 may result in the functionality of the LCD being essentially the same as a non-networked MX4428.

Various network interface cards are available to suit different applications.

- Dual bus RS485 card – provides 2 paths using RS485 on copper cable.
- I-HUB – provides a ring network of up to 64 nodes. (MX4428 can monitor only 50 other panels)
- PIB – provides Internet Protocol (IP) networking over fibre optic cables or copper pair.

MX4428 FIPs can communicate and interact with both AS4428.1 compliant systems and AS1603.4 compliant systems on the same network.

2.1.8 PROTOCOL TRANSLATION MODULE (PTM)

The PTM is used with MX4428/F4000/F3200 networks and performs two functions:

(i) Interfaces a printer to the network for logging of events from panels on the network.

(ii) Interfaces “XL Graphics” colour graphics systems to the network.

2.1.9 PANEL-LINK MODBUS BRIDGE (PMB)

The PMB is used with MX4428/F4000/F3200 networks to provide an interface into the network for other systems that can use the Modbus protocol. It is able to pass system, zone and point statuses and values to the Modbus system. It can also be used to pass commands back to the FIPs.

2.1.10 I-HUB

The I-HUB provides RS485 protocol networking, typically in a ring, over a pair of copper wires or fibre-optic cable.

2.1.11 PANEL-LINK IP BRIDGE (PIB)

The PIB enables IP Networking using a special Ethernet switch providing a fault-tolerant ring using fibre-optic cable or copper pairs between switches.

**** PLEASE NOTE ****

If your building or occupancy requirements change, then the FIP may require reprogramming, so please consult your installation or maintenance company.

2.2 LCD KEYPAD INTRODUCTION

2.2.1 LCD KEYPAD

The FIP LCD keypad is shown in Figure 2.2 and is divided into two sections, namely:

(a) "FIREFIGHTER FACILITY" (FF): The area within the red border, containing 7 keys, 5 LEDs, and the LCD.

(b) All other keys and indicators used for zone resetting, isolating, testing and information recall functions.

The two keyboard sections are not, however, entirely independent and some functions require use of both keypad sections.

If a keypress is valid the sounder will give a short beep whenever a key is pressed. A longer duration error beep will sound to draw attention to illegal key presses. The FIP LCD may also display an error message. If this occurs, try the command or entry again.

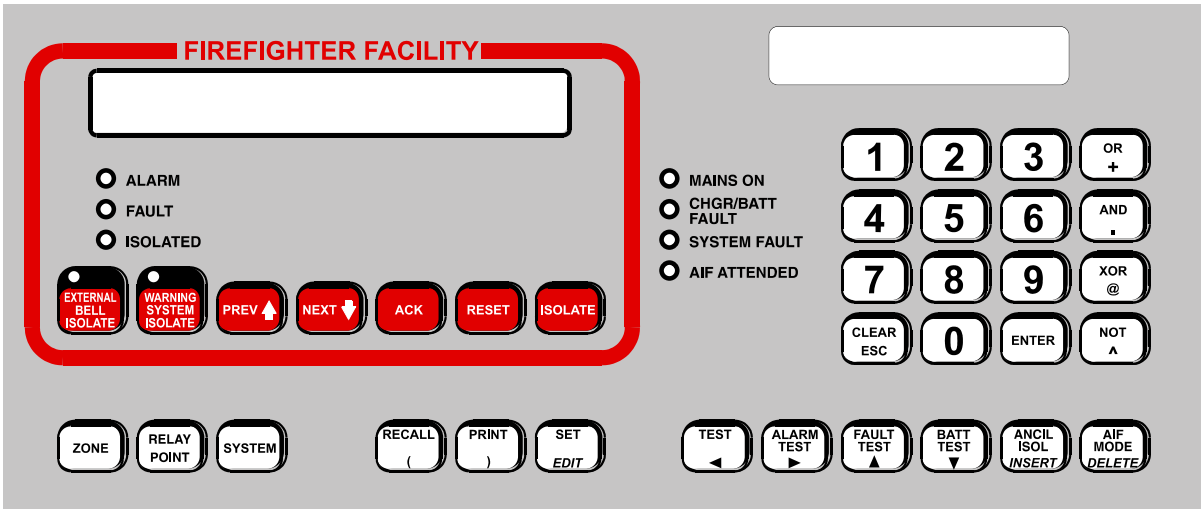

FIGURE 2.2
MX4428 AS4428.1 FIP KEYPAD LAYOUT

The MX4428 provides a range of functions for viewing alarms, and isolating, testing and resetting zones. In addition it includes many functions for recalling zone and point status, history, etc.

Most functions are selected by entering a command sequence on the keypad. This manual explains the more basic sequences. Other sequences may exist, which are often the same command sequence with the order of the keypresses altered, or special short cut sequences. Operators will discover these shortcuts primarily by using the keypad and gaining experience of its capabilities.

For more details on specific operating instructions refer to Chapters 5, 6, 7, and 8, for "Brigade", "System", "Zone", and "Relay Point" functions respectively.

2.2.2 MENU OPTION SELECTION

The menuing system on the LCD presents the options available by displaying an option number e.g. 1, followed by the option, e.g. RESET. Selection of any option is possible by two methods:

(a) Press the number key corresponding to the option required e.g. pressing the “1” key for the “1:RESET” option will select “RESET”.

(b) If the option has an equivalent key on the keypad, press that key, e.g. for the example in (a), pressing the “RESET” key would also select the “RESET” option. This may not be possible in some menus, to avoid ambiguities.

(c) If a “MORE” option is displayed, the “MORE” option can often be selected by pressing the same key that was used to access the particular menu.

2.2.3 LCD KEYPAD NUMBER ENTRY

When entry of a number is requested, a cursor will be displayed. The standard entry keys are the number keys, “0” to “9” and the “RELAY/POINT” or “AND/.” keys.
To enter a number, press each number key as required. The LCD will display each digit as it is entered. Pressing the “RELAY/POINT” or “AND/.” key displays a “.”. This is used to separate numbers, e.g. for zone ranges, or time and date entry.

If an error is made, pressing the “CLEAR” key will wipe any number entry made so far and allow the correct number to be entered.

If the “CLEAR” key is pressed when no number has been entered, the LCD keypad will “step back” to the menu or display what was shown before the number was requested.

Pressing the “ENTER” key signals that the number entry is complete, and that the number should be checked for validity. If it is valid, the next stage in the menu is displayed. Note that various shortcuts may also be permitted to end number entry and to automatically select an option from the next menu. Refer Section 2.2.4.

2.2.4 COMMAND ENTRY SHORTCUT

To allow operators to perform functions quickly, the LCD keypad provides some shortcut sequences. These allow faster access to functions by shortening the key entry sequences.

Some menus consist of 2 or more menu displays. The next set of options is displayed by selecting the “MORE” option. In a number of cases, menu options in a subsequent display can be selected by pressing the keypad key that equates to the selection in the subsequent display (not the number key that would be used to select the option if that menu was displayed).

As an example, the RECALL menu has two displays. The ZONE option is in the second menu display.

To access the recall zone menu, an operator can either:
(i) Press the “RECALL” key to access the RECALL menu,
Press the “RECALL” or “4” key to access the second display (MORE option),
Press the “1” or the “ZONE” key to access the “ZONE RECALL” display,

or alternatively,

(ii) Press the “RECALL” key to access the RECALL menu,
Press the “ZONE” key to access the ZONE RECALL menu.

In general, the “ENTER” key is pressed to indicate that entry of a number is complete. In some of cases, other keys may be pressed which have the same effect as the “ENTER” key, but also provide a shortcut by automatically selecting an option from the next menu.

For example, to Reset Zone 15, an operator may enter the following key sequences.
(i) “ZONE”, “1”, “5”, “ENTER”, “RESET”, or
(ii) “ZONE”, “1”, “5”, “RESET”.

The “NEXT” and “PREV” keys can be used in a number of menu options to change the selection. For example, when the zone function menu is displayed (“RESET, ISOLATE, RECALL, TEST, SET”) a zone number is displayed along with the zone description. Pressing the “NEXT” key will select the next numbered zone, pressing the “PREV” key will select the previous numbered zone. Any subsequent menu option entered will act upon the newly selected zone.

In some cases, the “NEXT” and “PREV” keys may not be valid, if stepping to the next or previous device would result in an invalid selection, e.g. zone testing an ACZ.

The Point number entry prompt has a special entry shortcut. If no point number has been entered when the “Enter” key, or any other valid shortcut key, is pressed the MX4428 automatically selects the first configured point, if any.

2.2.5 LCD INFORMATION DISPLAYS

When the LCD is not displaying the alarm list, isolated alarms, or being used for entry of a command sequence, it shows one of the following information displays:

(a) Base Display – in general, this shows the system name and current time and date. In addition, another field indicates the software version, whether the FIP has processing enabled, is Automatic testing, or Powering up. If off-normal conditions exist, totals of the off-normal states, or a fault action text, are displayed.

The actual display shown depends upon the current state of the FIP.

A special form of the base display is active whenever the Fault Sounder is operated. In this case, the LCD indicates that a fault is present, and displays a fault action text that will have been configured by the installer of the system.

Pressing any key will stop the fault sounder, which also clears the message from the display. An operator can then ascertain the source of the fault using the LCD keypad (e.g. off normal counts, fault recalls) and the status LEDs.

(b) Zone Recall Display – shows zone status for a particular zone. The “NEXT” and “PREV” keys can be used to select a different zone. The “next” and “previous” zone displayed depends upon the selected recall, e.g. all zones, only those zones in alarm, only those zones that are isolated, etc.

(c) Point Recall Display – shows either point status (alarm, fault, etc.), analogue values (current and tracked values, history), analogue levels (current levels and sensitivities), or detector % dirty information.

MX4428 treats ADR circuits and relays as points, thus their status can be recalled and searched.

The “NEXT” and “PREV” keys display the information for the next or previous point. The selection of the point depends upon the mode of the recall, either all points, or searches for point status meeting certain criteria e.g. points in dirty alert.

(d) History Recall Display – displays the stored event history. Newer and older events are displayed by pressing the “NEXT” and “PREV” key respectively.

Pressing the “CLEAR” key whilst in the Zone Recall, Point Recall or History Recall displays will make the system revert to the Base Display. All command sequences can be started from any of the displays. Note, however, that how some command sequences proceed is dependent upon which display was being shown. Refer Section 2.3.9 Starting Command Sequences from Different Information Displays.

2.2.6 STARTING COMMAND SEQUENCES FROM DIFFERENT INFORMATION DISPLAYS

The LCD keypad is usually in one of three modes:

(i) Alarm List display, or “FF”, when alarms exist in the fire alarm system.

(ii) Command Sequence Entry, when commands are being entered.

(iii) Information Display mode, when zone status, point status, time and date or history recalls are being shown.

Often, the pressing of a key to start a command sequence will have a different effect, depending upon what mode the LCD was in.

As an example, pressing the “ZONE” key whilst the time and date are being displayed, will result in a prompt for a zone number. If zone information was being displayed, however, the LCD keypad would assume that the zone being viewed is the zone to be selected, and no zone number would be requested.

If the LCD makes an assumption that is not correct, pressing the “CLEAR” key will allow an operator to recover to a position at which, for example, the required zone number can be entered, or, an alternative command sequence entered.

As an example, if zone status is displayed, and an operator wishes to reset system faults, then pressing the “SYSTEM” key, followed by the “RESET” key results in the required function being executed. However, if the “RESET” key had been pressed first, the LCD keypad would have queried whether the zone that was displayed should be reset. In the event of this occurring, pressing the “CLEAR” key will make the LCD keypad revert to the zone status display. The “SYSTEM RESET” command sequence can then be used to execute the required function.

Alternately, the “Clear” key can be pressed until the base display is obtained.

2.3 AUDIBLE TONES

Any requirement for operator intervention is signalled by the sounding of the FIP's internal buzzer. The buzzer can be activated in a number of different modes, each of which gives some indication as to the type of event that has occurred. The internal sounder provides the following audible tones in order of decreasing priority (see note below):

(a) ZONE / SYSTEM FAULT - Steady Tone

A continuous tone indicates that an un-isolated zone has gone into FAULT, or a system fault has been detected. Note that the Zone Fault buzzer can be disabled by programming, and the zone/system fault tone can be made lower priority than the zone alarm tone.

The fault buzzer will also re-sound 8 hours after silencing a fault or isolating a zone.

(b) KEYPAD "INPUT ERROR" - Long single beep

(c) KEYPAD "KEY ACCEPT" - Short single beep

(d) ZONE ALARM - Two Beeps per Second

A regular, two beeps per second tone, indicates that an un-isolated MAF mapped zone has gone into ALARM. Note that the Zone Alarm buzzer can be programmed to be disabled, or made the highest priority tone.

(e) TEST FAIL - Fast Pulsing Beeps

A 4 fast beeps then pause tone indicates that a zone, system, or power-up test has failed.

(f) PANEL FAULT / DOOR INTERLOCK - Slow Beeping

A long beep followed by a pause tone. This can indicate specific types of panel faults, please call service. If the FIP is not able to process alarms, if certain tests are operating or links are in incorrect positions, the buzzer will sound in this manner if the door is closed.

If the alarms list is displayed, pressing an FF key will silence the buzzer.

If the alarms list is not displayed, pressing any keypad key will silence the buzzer.

2.4 NETWORKED PANELS

2.4.1 NETWORK FIP & NETWORK ZONE NUMBERING

When MX4428 FIPs are networked together there must be a way to identify each FIP and the zones on that FIP.

In this manual, reference is made to “local” and “remote” panels. A local panel is the panel at which an operator is controlling the system from. Remote panels are all other panels on the network. This applies even if a number of networked panels are co-located.

When a networked FIP is configured, it is programmed with a unique number between 1 and 254. This is its System Identification Number, or SID. The SID is used to:

(a) Identify a specific FIP.
(b) Identify a zone on a specific FIP, by combining the SID and Zone number as detailed below.

For a networked MX4428, zone numbers and zone ranges fall into 3 formats:

(i) Zone number(s) less than 1000 are local zones, i.e. specific to the panel at which the number is being entered or displayed, e.g. Z57, Z135.189.

(ii) Zone number(s) greater than, or equal to, 1000 are network zones, e.g. Z32105 or Z17001.17095. The SID of the FIP that has the zone is the network zone number divided by 1000. The actual zone number on that FIP is the remainder after dividing by 1000. E.g.

	Z1057	is	Zone 57	on FIP number 1.
	Z35218	is	Zone 218	on FIP number 35.

Note that all zeros must be entered, e.g. for Zone 1 on Panel 2, the entry must be 2001, i.e. the intermediary 0’s are necessary.

(iii) Zone numbers less than 1000 preceded by the SID of the FIP that has the zone(s).
E.g. (a) Z57:1 – Zone 1 on Panel 57.
(b) Z2:135.208 – Zones 135 to 208 on Panel 2.
(c) Z61..72 – Zone 72 on Panel 61.
(d) Z85..24.154 – Zones 24 to 154 on Panel 85.

The SID comes before the colon “:” or double points “..”.
The zone numbers come after the colon or double points.

A colon is entered using the SYSTEM key. Double points are entered by pressing the RELAY/POINT or ‘AND/.’ key twice.

For MX4428, zone numbers can be entered in any of the above formats. However, MX4428 will reject any zone range that extends across more than one FIP, e.g. Z35097.36002 is illegal.

MX4428 always displays network zones in format (ii).

If a zone number or range is entered in formats (i) or (ii), and the SID is that of the local FIP, then the zone(s) may be converted back to format (i) for local processing.

When alarm events are sent from one FIP to another on the network, the zone number sent is automatically pre-formatted into the network zone format (ii) for display on the LCD.

2.4.2 ZONE FUNCTION CHANGES

The zone functions at a networked MX4428 are altered in the following ways:

(i) Network zone number and ranges entry is permitted, although not all functions can be executed on Network Zones.

(ii) Reset, Isolate and De-Isolate commands can be issued to Network Zones and Zone Ranges.

(iii) Zone tests can be issued to zones on other network FIPs.

(iv) The status of zones on other network FIPs can be recalled, and can be searched for, across the network.

2.4.3 SYSTEM FUNCTION CHANGES

The system functions at a networked MX4428 are altered in the following ways:

(i) When the SYSTEM key is pressed, a prompt is displayed allowing selection of either the local system or a system elsewhere on the network, and a command to silence network sounders.

(ii) The following functions can be initiated at a network MX4428 by another network panel.
- Ancillary Isolate/De-Isolate
- Battery Test
- External Bell Isolate/De-Isolate/Test
- Warning System Isolate/De-Isolate/Test
- System Test
- System Reset

(iii) A network MX4428 may be programmed to act as a common brigade interface point for a system, and/or display the off-normal totals for the whole network system.

(iv) A network MX4428 may be programmed to allow control of its External Bell and Warning System by other FIPs on the network and may control the Warning System, External Bell or Bells at other FIPs on the network. Alarms or (Trial) Evacuation (NZ) on other FIPs may turn the local External Bell and Warning System ON. The External Bell and Warning System may be silenced as a result of isolating the External Bell and Warning System at another FIP or activation of Silence Alarms at another FIP (NZ).

(v) A network MX4428 can recall an overview of the system status of other FIPs on the network.

(vi) A network MX4428 may be programmed to have its internal sounder silence-able as a result of the actions of remote operators.

(vii) A network MX4428 will annunciate specific fault conditions for faults on the network, e.g., another panel is disconnected, ring is broken, etc.

2.4.4 OPERATIONAL DIFFERENCES

For a network MX4428, operation of the LCD keypad is modified to take into account alarms in the FF list and the displayable totals that have come from other FIPs on the network.

In the following, alarms in the FF list include local and any remote alarms, and the totals are the combination of local and any remote totals.

(a) The Alarm LED will be on:
Flashing: Any unacknowledged alarm in the FF list, or any unacknowledged zone alarm on the local FIP.

Steady: If any alarms in the FF list all are acknowledged, or if the alarms total on the base display is not zero.

(b) The Fault LED will be on:
Steady: If the faults total on the base display is not zero.

(c) The Isolated LED will be on:
Steady: If the isolates total on the base display is not zero.

Flashing: If any point on the local FIP is isolated or a point on a network FIP is isolated and the MX4428 is combining MAF status.

(d) The FIP buzzer turns on:
Steady: Upon a local fault or system fault, or the occurrence of a fault on a networked FIP whose SID is programmed into the SID list of this FIP and the local FIP is programmed to display network totals. At the base display, the Fault Action Text will also be displayed.
Pulsing: Upon a new alarm (local or network) being put into the FF list, or a new MAF alarm on the local FIP.
Rapid Pulsing: Upon a local test failure, e.g. system test.

The FIP buzzer is cancelled:

- Whenever a key is pressed on the FIP keypad.

- For Alarms when there are no more alarms in the FF list or un-isolated alarms on the local FIP.

- For Faults when there are no more un-isolated faults on the local FIP, or on any networked FIPs which can turn the fault buzzer on at the local FIP

- Upon reception of remote System Fault Reset, FF commands or any commands, if enabled by programming. (Refer 3.10).

A number of keypad functions that take time to complete, e.g. zone isolate/de-isolate and zone searches, have a simple flashing asterisk that indicates that the function is still operating.

A significant point to note is that the networking of FIPs introduces delays when showing data and responding to commands. These delays did not exist where there was only a single FIP to be controlled, because the information was immediately on hand. With networks, this is not the case, and delays arise due to the time taken to access the information.

Consequently, allowance must be made for these delays when operating a networked FIP. The effect of these delays are noted below, and in the following sections for the affected keypad commands.

There may be a noticeable delay at times when a network MX4428 attempts to retrieve text and status from another network panel. If there will be a delay, MX4428 will display a minimal description on the LCD, e.g. Z1057 or Network Panel 75. The actual status will be shown when the true zone name text (if programmed at the remote FIP) is displayed.

Operators of networked FIPs must be aware that they should wait until the FIP has retrieved the information before issuing any command, partly to ensure that the command they send will not have an adverse effect, i.e. de-isolating a zone in alarm, and also because operators on other FIPs or colour graphics displays may also be trying to control the same zone.

Confusion can also arise due to the delay if a zone has just been isolated: the FIP may briefly indicate that the zone is not isolated. However, after at most a few seconds, the display will be updated to show the correctly isolated status.

Network MX4428 FIPs can combine the MAF status from other FIPs on the network. This combined status is then used to drive brigade relays, etc.

MX4428 has special handling for a Standby condition received from another FIP. Remote Standby conditions do NOT result in the local FIP's Standby relay de-asserting itself, rather, the remote Standby condition is treated as a System Fault, i.e. the fault relay activates, the System Fault LED turns on, and the fault buzzer may sound. Standby and System Fault from the other FIP can be viewed as separate items in the System Fault Display.

2.4.5 NETWORK COMMAND TRANSFERS & RESPONSES

Whenever entry of a network command is completed, the MX4428 attempts to send the command to the correct panel on the network. It will then wait for a response from the receiving panel.

The MX4428 LCD display will show messages during this time to indicate what is happening.

"Network Command Sent" – the MX4428 successfully stored the message for sending to the other panel. The MX4428 network driver will send the message across the network.

"Network Command NOT Sent" – the MX4428 could not send the message because of high network loading, or because the LCD display was still awaiting a response to its last request for data.

"Network Command Accepted" – the receiving MX4428 received the command and processed it.

Note that even though a remote panel accepts the command, it may not action it. In this case an exception message may be sent back to the originating panel – refer Section 2.4.6.

"Network Command NOT Accepted" – the receiving MX4428 received the command but did not process it. This may be due to a number of factors:

- The command was invalid because, for example, the zone number was invalid, or the command issued could not be executed on the command subject, e.g. trying to alarm test an ACZ.

- The command could not be executed because: a similar but mutually exclusive command was in progress (Reset); only one of the particular command could be executed at the same time (Alarm Test); or the receiving MX4428 was in a state which means that the command could not be executed. (No processing).

"Network Command NOT Ackd" – the receiving MX4428 should respond as soon as possible with an Accepted or NOT Accepted response. If network loading is high, or the remote MX4428 is busy or is off line, a response may not be received within the programmed time. If the time limit is exceeded, the local MX4428 displays the above message. Note that depending on the circumstances, the command may or may not have been received and processed.

2.4.6 NETWORK EXCEPTIONS

2.4.6.1 GENERAL

Network commands issued by one network FIP and sent to another may result in some event, error or "exception" that it is desirable to display at the source of the command. These exceptions may occur a significant period of time after the original command was sent and accepted. An operator may need to remember what commands were sent to a particular network FIP to be able to interpret the exception correctly.

As an example of an exception, a multi-zone de-isolation may leave some zones isolated, because some zones have an active alarm or fault status.

Exceptions have a level of priority assigned to them by the sender. An MX4428 can be programmed for which priorities of exceptions to display, and for which are ignored. Consequently, some MX4428s may only display more urgent exceptions, while others show both the more urgent and less urgent exceptions.

2.4.6.2 DISPLAY OF EXCEPTIONS AT AN MX4428 LCD FIP

When an exception is received by an MX4428, the following occurs:

(i) If the FF is not active:

(a) The LCD/keypad is interrupted from what it is displaying (although any background display processing (e.g. a search) still continues), and the LCD displays the SID number of the panel that sent the exception, with a "Press any key" prompt on the first line and the exception message received on the second line.

(b) Pressing any key will clear the exception display and the LCD keypad will revert to its original display.

(c) If the FF becomes active while an exception display is being displayed, the exception is automatically cleared.

(d) Any new exception received before the current exception is cleared will be ignored.

(ii) If the FF is active, the received exception is discarded, so as not to disturb the alarm information displayed.

2.4.6.3 MX4428 EXCEPTION EXAMPLES

Network MX4428s are able to generate the following exception messages:

"Not All Zones Isolated"
"Not All Zones De-Isolated"
The zone range de-isolation command processed did not de-isolate one or more zones because they were in alarm or fault, not all isolated as some zones programmed to not isolate.

"Zxxxxx Test Passed"
"Zxxxxx Test Failed"
"Zxxxxx Test Aborted"
"Zxxxxx Test Time Out"
The previous Zone test command issued to zone xxxxx had the noted result.

"System Test Passed"
"System Test Failed"
"System Test Aborted"
The previous System test command had the noted result.

"Battery Test Passed"
"Battery Test Failed"
"Battery Test Aborted"
The previous Battery test command had the noted result

2.4.7 NETWORK MX4428 LCD DISPLAYS

A network MX4428 may be programmed to display either its own off-normal totals or a combination of its own totals and the off-normal totals of other devices on the network. Consequently, some totals may exceed the maximum totals expected for a single MX4428 panel.

If there are no off-normals, the "base" display of the MX4428 LCD displays the system name, date and time, and MX4428 software version. The software version text can be replaced by text that indicates the operational state of the MX4428, e.g. testing, no processing, etc.

The number of texts that can be shown has been increased to handle the cases where tests have been started by operators at other panels on the network.

The texts are:

"MX4428 V3.xxN"	Default text.
"AUTOMATIC TESTING"	An automatic daily test is running.
"SYSTEM TESTING"	A remotely initiated system test is running.
"BATTERY TESTING"	A remotely initiated battery test is running.
"ACZ TESTING"	A remotely initiated ACZ test is running.
"ZONE TESTING"	A remotely initiated Zone test is running.
"RESETTING"	A local/remote reset is in progress.
"COMMISSION MODE"	System is in Commission Mode.

The Fault Action text will override the above texts if the fault buzzer turns on.

2.4.8 FAULTS

Depending on the network arrangement (equipment and cabling types) and the programming of the network interfaces different network faults could be annunciated.

Typically, a sub-panel will annunciate loss of communications (ScanF, LnkIA, or LnKIB faults – refer Section 6.6.3) with the main panel, and the main panel will annunciate loss of communication from any of its sub-panels. Additionally each panel may annunciate a ring break (e.g., via the I-HUB status or a local input on the MX4428 or other means) if the communications ring is broken/shorted at either side of that panel.

2.4.9 NETWORK FAULT FINDING

When any network fault exists, MX4428 annunciates a System Fault, signals fault to the brigade and turns on the System Fault LED. An operator who uses the System Fault Recall facility will then see in addition to any other faults “NetFlt” on Page 4 of the recall. The Network Panel System Fault pages will show which panels also have Network faults and/or are scan failed.

There are a number of faults that will turn on NetFlt and each generates a history/printer event as per Section 6.8.3 Printer/History events.

To discover the cause of the network fault, recall the history via the LCD keypad or a laptop, or review any event printouts. Network events have a time/date followed by “SID nnn”, where nnn is the SID of the remote panel that caused the event and will usually be between 1 and 254. A SID of 0 will most likely occur for the NET MSG DISCARDED event and indicates that a broadcast message, i.e. a message that it is intended all panels receive, has been discarded.

Most network faults are non-latching.

All network faults can be cleared by a System Fault Reset command. If the fault still exists, then it will be re-annunciated.

2.4.10 NETWORK ALERTING CONTROL

An MX4428 can be programmed to allow its Warning System and External Bell to be operated and controlled by other FIPs on a network.

The Warning System or External Bell can be operated or silenced due to alarms or operator actions at other FIPs, including the effects of remote NZ (Trial) Evacuation and Silence Alarms switches and remote Warning System and External Bell Isolates.

Additionally, the Warning System and External Bell activate and isolate states sent on to the network can be used by other FIPs (if so configured) to control their Warning System and External Bell, or in the case of AS1603.4 FIPs their Bells. Similarly, local NZ (Trial) Evacuation and silence alarms switches can control the alerting functions at other FIPs.

The isolate state is a non-volatile condition controlled by the front panel isolate button (and possibly any connected RDUs).

The silence state is generated by conditions external to the panel, for example in NZ mode operation of the External Silence alarms switches at the panel or a connected RDU, or a network silence state received from other panels on the network.

If Network Alerting control is enabled at the local FIP, its Warning System (WS) and External Bell (EB) are affected as follows, subject to system programming:

- A remote WS/EB alarm/activation condition will cause the local WS/EB to operate, so long as there are no silence states active and the WS/EB is not isolated.

- A WS/EB silence state will prevent the local WS/EB from operating, unless in NZ mode and there is a (Trial) Evacuation active that affects the WS/EB.

- A WS/EB (Trial) Evacuation in NZ mode (local or remote) will always operate the local WS/EB.

- A WS/EB network silence state is sent onto the network when the MX4428's WS/EB is isolated and the panel is programmed to send this as network silence, or in NZ mode when the local or any connected RDU's external silence alarms input is activated.

Note: Depending on system programming WS/EB activation may occur for WS/EB tests and/or Auto-Reset mode testing regardless of any silence or isolate condition.

The Warning System (WS) and External Bell (EB) Isolate LEDs have 4 distinct cadences which identify whether the WS/EB can operate, and, if not, why not.

OFF	- WS/EB will sound on alarm.
ON	- WS/EB is isolated.
SLOW FLASHING	- WS/EB is silenced remotely, i.e. RDU or another Network MX4428.
2Hz FLASHING	- WS/EB is silenced due to local silence alarms switch.

If the local MX4428 is configured to send a silence state whenever WS/EB is isolated, then isolating the local WS/EB will cause the local WS/EB Isolate LED to be ON steady, whereas the WS/EB Isolate LED on other MX4428s with Network Alerting Control enabled will be slow flashing, indicating they are remotely silenced.

Therefore, it is possible to have ALL MX4428 WS/EB Isolate LEDs slow flashing. To clear this condition it will be necessary to find all FIPs with Isolated WS/EB or local Silence Alarms using the LCD keypad System Fault Recall, and taking appropriate action to clear these.

Once all local and remote WS/EB Isolations and silence states have been removed, the local WS/EB will be able to operate.

Pressing the Local WS/EB Isolate key will cancel the effect of any (Trial) Evacuation and Silence Alarms that were generated by a remote panel that is now scan failed.

2.4.11 NETWORK SOUNDER CONTROL

All MX4428 FIPs silence their internal sounders when a key on the keypad is pressed (Refer section 2.3).

MX4428 FIPs may be additionally programmed to silence their sounders if they receive a System Fault Reset command from the network, an FF command is received, or a Network command is received, or when the sounder is silenced at any other panel on the network. Alternatively, Local Sounder Silencing due to any network command can be disabled.

CHAPTER 3 SYSTEM SPECIFICATIONS

3.1 SYSTEM CAPACITY

Input Circuits	- Up to 508
Circuit Detector Load (MAX)	- 2.5mA for Active EOL (FP0472 ADR) - 4.0mA for Active EOL (FP0523 ADR) - 4.0mA for Active EOL (FP0755 ADR-M) - 120μA for Passive 39k EOL (ADRs) - 1.5mA for DDM800 loop powered with low voltage detectors - 1.0mA for DDM800 intrinsically safe detector mode - 2.5mA for DDM800 all other detector modes
Display Zones	- Up to 528
Input to Zone Map	- Freely Programmable
Control Outputs	- Up to 508 plus Master Ancillary Relay
Maximum Responders	- 127 (max 16 MXPs or 32 MPRs)
Remote Display Units	- Up to 8 (additional mimics allowed)
Maximum LEDs per Unit	- 64-192 in 19” cabinets (256 in Extender)
Other Inputs	- Supervised MCP on cabinet (not large 19” cabinets)
FIP Relays	- Master Alarm (MAF) (2 OFF), Fault, Standby, Isolate, Bells, Ancillary
Relay Ratings	- FIP: 2A at 30 VDC RRM: 1A at 30 VDC
Serial Port	- Programmer Terminal/Printer
Serial Port Protocol	- XON/OFF 300, 1200, 9600 baud, 8 bits, no parity
Other Ports	- RDU, Spare and Network
Port Protection	- All to AS4428.1
Communications Loop	- 4 Wire (24 VDC, 0 VDC, TX, RX) - O/C and S/C Fault Tolerant
Alarm Response Time	- 3.8 seconds MAX (127 Logical Responders)
History Log	- 900 events
Printer Buffer	- 200 events
Mimic Driver	- ALARM LEDs

3.2 PHYSICAL

3.2.1 FIP, EXTENDERS, RDUS

Standard Cabinets

Cabinet Size	- 750 mm(H) x 550 mm(W) x 210 mm(D) + 20 mm MCP
Cabinet Material	- 1.2 mm Mild steel
Cabinet Finish	- Baked Epoxy painted
Cabinet Colour	- Cream Wrinkle BFF998 CW
Mounting	- Wall mount (4 Holes)
Access	- Outer door left hinged (L003 key locked) - Inner door right hinged. (fastened)
Shipping Weight	- 21 kg (not including batteries)
Cabinet Rating	- IP51

19" RAC Cabinets

Cabinet Size	- 18U – 885mm (H) x 575 mm(W) x 380 mm(D) - 885mm (H) x 575 mm(W) x 205 mm(D) - 21U – 1050mm (H) x 575mm (W) x 355mm(D) - 28U – 1330mm (H) x 575 mm(W) x 380 mm(D) - 1330mm (H) x 575 mm(W) x 205 mm(D) - 40U – 1865mm (H) x 575 mm(W) x 380 mm(D) - 1865mm (H) x 575 mm(W) x 205 mm(D)
Cabinet Material	- 1.6 mm Mild steel
Cabinet Finish	- Baked Epoxy painted
Cabinet Colour	- Cream Wrinkle BFF998 CW
Mounting	- Wall Mount 18U – 4 holes 21U – 4 holes 28U – 6 holes 40U – 8 holes
Access	- Outer door left or right hinged (L003 key locked) - Inner door right hinged (fastened)
Cabinet Rating	- IP51

NOTE: Special cabinet sizes, material or IP ratings are also available.

3.2.2 RESPONDER UNITS – ADR, AAR, MPR, MXP

Size	- 240 mm(H) x 180 mm(W) x 50 mm(D)
Material	- 1.0 mm Mild steel
Finish	- Galvanised
Mounting	- Surface/Wall mount
Access	- Cover by Screws
Shipping Weight	- 1.5 kg (not including RRM) – ADR/AAR/MPR/MXP
IP Rating	- IP51

3.2.3 RESPONDER UNITS – IOR

PCB Sizes	- IOR	270mm x 180mm
	16 Way Relay Board	470mm x 93mm
	16 Way Termination Board	140mm x 93mm
	32 Way Termination Board	270mm x 93mm
Weight	- IOR	300gm
	16 Way IOR Relay Board	260gm
	16 way Termination Board	90gm
	32 Way Termination Board	170gm
	Gear Plate	2.6kg

3.2.4 REMOTE DISPLAY UNIT (RDU)

3.2.4.1 WALL MOUNTING RDU WITH MAF

Size	750mm (H) x 550mm (W) x 210mm (D) * MCP is an additional 20mm.
Material	1.2mm and 1.6mm mild steel
Finish	Powdercoat BFF-998-CW Cream Wrinkle (Iron Phosphate pre-treat)
Shipping Weight	22kg

3.2.4.2 WALL MOUNTING LOW PROFILE RDU

Size	177mm (H) x 450mm (W) x 50mm (D)
Material	1.2mm mild steel
Finish	Powdercoat PR12/816C Grey (Iron Phosphate pre-treat)
Shipping Weight	3kg

3.2.5 PROTOCOL TRANSLATION MODULE (PTM)

Size	450mm (W) x 280mm (D) x 85mm (H)
Material	1.2mm mild steel
Finish	Cover: Powdercoat Cream Wrinkle BFF-998-CW (Iron Phosphate pre-treat)
	Base: Zinc Plate, Blue Passivate
Shipping Weight	3kg

3.2.6 PANEL-LINK MODBUS BRIDGE (PMB)

Size	295mm (H) x 240mm (W) x 80mm (D)
Material	1.2mm mild steel
Finish	Powdercoat Cream Wrinkle BFF-998-CW (Iron Phosphate pre-treat)
Shipping Weight	4kg

3.3 COMPATIBLE BATTERIES

The following series of batteries are compatible with the MX4428 FIP:

(a)	Sonnenschien A200 series	Up to 20 Ah
(b)	Sonnenschien A300 series	Up to 24 Ah
(c)	Power-Sonic PS12 series	Up to 24 Ah
(d)	Yuasa NP Series	Up to 24 Ah
(e)	Olympic	Up to 40 Ah

Note: The Ampere Hours (Ah) indicated are the maximum size that can be fitted in the main cabinet. Use of large batteries may limit what can be mounted at the bottom of the 19” rack.

3.4 ELECTRICAL

Mains	-	240 VAC +6% -10%, 50 Hz, 150W 0.6A (FP0874), 1.6A (ME0476 or PSU2406F) 3.2A (PSU2412F)
Internal Battery	- -	24 VOLT, Sealed lead-acid. Up to 24 Ampere Hour
Internal Charger (+VB)	-	27.3 VDC (nominal at 20 °C) Regulated
Non Battery Backed Supply	-	27.3 VDC (nominal at 20 °C) (+VNB)
Temperature Compensation	-	-36mV per Degree C
Supervision	-	Charger High/Low & Battery Low/Fail Battery Disconnect (V2.31 onwards)
Battery Test	-	Quiescent load
Maximum Load	- - -	2.5 Amps with FP0874 (up to 7.5A with slaves) 5.0 Amps with PSU2406F or ME0476 10.0 Amps with PSU2412F
Operating Voltage	-	21.1 to 28.2 VDC
Quiescent Panel Current	-	160mA (FIP)
AC Secondary Fuse F1	-	5.0 Amp (FP0874)
+VB Fuse	-	1.6 Amp (FP0874), 5A (ME0476, PSU 24xxF)
Bell Fuse	-	1.6 Amp (FP0874), 10A (ME0476, PSU 24xxF)
+VNB Fuse	-	1.6 Amp (FP0874), 5A (ME0476, PSU 24xxF)
Operating Temperature	-	-5 °C to 45 °C
Humidity	-	10% to 90% RH non-condensing
<u>ADR</u>		
Zone Circuit Voltage	-	20 VDC nominal
Circuit Alarm Current	- -	5 to 8.6mA (FP0472 ADR) 9.1 to 12.0mA (FP0523 ADR & FP0755 ADR-M)
Alarm LED Boost	-	20 VDC at 40 ms pulse via 470 Ohm (FP0472)
<u>IOR</u>		
Inputs	-	Clean contact, voltage-free, supervised.
Outputs	-	Open collector, pull-down, 100mA @ 30V.

3.5 INDICATORS

Zone LEDs (Optional)	- Red:	ALARM
	- Amber:	FAULT, ISOLATE
System LEDs	- Green:	MAINS ON
	- Red:	ALARM
	- Amber:	CHGR/BATT FAULT, SYSTEM FAULT, AIF ATTENDED, FAULT, ISOLATED, EXTERNAL BELL ISOLATED, WARNING SYSTEM ISOLATED.
Sounder	- Keypress, & key error - Pulsing ALARM / Steady FAULT - Slow Pulsing OFF-NORMAL condition with door closed.	
Diagnostic LEDs (Main Board / Amber)	- Watchdog - Display Fault - RDU Fault - Loop Fault - Software Fault	
Responders	- Status LED - MXP/MPR/AAR Analogue Loop Status LEDs	
New Zealand Mode Indicators	- Red :	FIRE
	- Amber :	DEFECT
	- Green :	NORMAL

3.6 KEYPAD CONTROLS

Keypad Type	- 35 key keypad plus 2 line by 40 character LCD
Zone Functions	- Alarm and Fault Test - Isolate - Reset - Auto-Reset Test Mode - Recalls
Ancillary Functions	- Test, Isolate, Reset
Point Functions	- Reset History/Tracking - Recalls - Set sensitivity - Isolate
System Functions	- Battery Test, Lamp Test - System Test (RDU Test) - System Fault Reset - Bell Test, Bell Isolate (FIP only) - System Fault/History Recalls - Set time and date - Set LCD password
Brigade Functions	- Acknowledge alarms - Reset acknowledged zones in alarm - Isolate acknowledged zones in alarm - Brigade Test
New Zealand Mode (External Keyswitches)	- (Trial) Evacuation - Silence Alarms

3.7 NETWORKING

Max Panels	Each MX4428 can monitor 50 other panels
Protocol	Panel-Link Multidrop or Point to Point; 9600 baud
RS485 Card	Dual RS485 bus on copper pairs
I-HUB	Fault-tolerant ring using RS485 on copper pair or fibre-optic cable
PIB	Fault-tolerant ring using IP Networking on fibre-optic cable or copper pair with Ethernet extenders

CHAPTER 4 INTERPRETING THE DISPLAY

4.1 RESPONDING TO ALARMS

WHEN ANY ZONE RED “ALM” LED INDICATOR, OR THE FF ALARM LED INDICATOR IS FLASHING, OR THE LCD IS DISPLAYING AN UNACKNOWLEDGED ALARM, PERFORM THE FOLLOWING OPERATIONS:

STEP 1 **DO NOT PRESS “ACK”, “RESET” , “EXT. BELL ISOL”, “WARNING SYSTEM ISOL” OR “ISOLATE” KEYS ON THE PANEL** until the Fire Brigade arrives. The “NEXT” key can be pressed to view the next zone alarm in the list. If the “NEXT” key is pressed, the internal sounder will silence.

STEP 2 INVESTIGATE THE ALARM (if possible by Fire Safety Crew), and implement appropriate fire control and extinguishing measures.
The **FIRE SEARCH AREA** will be indicated by a red flashing “ALM” LED indicator(s) adjacent to the location description of the alarm zone(s) or by the zone text displayed on the LCD.

STEP 3 Evacuate the areas if necessary.

STEP 4 **ADVISE THE FIRE CONTROL STATION** of both fires and false alarms.

STEP 5 **KEEP A MEMBER OF THE FIRE SAFETY CREW ON STANDBY** to direct fire fighters to the source(s) of alarm and inform them of measures already taken.

STEP 6 **RECORD ALL EVENTS IN THE LOG BOOK PROVIDED.**

** PLEASE NOTE **

The above procedure should only be executed by a trained fire officer, and may need to be modified in accordance with any special conditions applying to your MX4428 FIP installation.

4.2 DEALING WITH FAULTS

4.2.1 WHAT IS A FAULT?

A fault is any situation which prevents the panel from correctly performing its functions. Possible faults include defects in external wiring or power feed to the detectors, faulty detectors, component failures, faulty charger and low battery voltage.

In normal operation the only lit LED indicator should be the green “MAINS ON”. For New Zealand mode MX4428 panels the green “NORMAL” LED indicator should also be ON. If other indicators are active, or the “NORMAL” LED is OFF or flashing, this should be reported and promptly investigated.

4.2.2 RESPONDING TO FAULT SIGNALS

If a fault occurs, the fault sounder will operate (steady tone) unless it is configured to not turn on. If a zone fault exists, the FF “FAULT” LED will be ON. If a system fault exists, the “SYSTEM FAULT” LED will be ON. If a Battery/Charger fault exists, the “CHGR/BATT FAULT” LED will be ON or FLASHING.

If the LCD keypad is at the “base display”, the fault action text programmed by the installer will be displayed.

The “CLEAR” key or “ACK” key may be pressed in order to silence the panel’s fault sounder until a service technician arrives. When the sounder is silenced, any fault action text display will be cleared also. Note, the sounder will restart after 8 hours if the fault is not cleared.

If a fault or other off-normal condition exists, the LCD will display the number of Alarms, Faults, Isolates and Other off-normal conditions. Note that the totals take a few seconds to adjust when the number of off-normal states increases or decreases.

To determine the source of the fault conditions, use the following keypad commands:

Zone Status Searches command for zone faults	(refer Section 7.6.3)
Recall System Status command	(refer Section 6.6)
Recall History command	(refer Section 6.8)
Point Status Searches command	(refer Section 8.1.5)

Note that the Recall Zone Searches will show all zones that have faults, regardless of the Isolate status of the zone. The Recall History command can help to determine the sequence of fault conditions as the events are ordered chronologically.

Once the source of the fault has been determined, apply the basic trouble-shooting guidelines described in Chapter 10, then call your maintenance company.

NOTES: (a) Subsequent faults on the system will operate the fault sounder again.

(b) RECORD ALL EVENTS IN THE LOG BOOK PROVIDED.

4.3 SYSTEM INDICATORS

NOTE: In the following sections the following abbreviations are used to describe the LED indications:

OFF	=	LED unlit.
SF	=	LED flashing slowly (every 2 seconds).
F	=	LED flashing (every half a second).
RF	=	LED flashing rapidly (10 times per second).
ON	=	LED on steady.

4.3.1 "ALARM" LED INDICATOR

A Red indicator interpreted as:

(a) OFF The normal state.

(b) ON One or more zones are in alarm. This is regardless of whether the zone is isolated or de-isolated, or a MAF or non-MAF zone.

(c) F An unacknowledged alarm event is present in the FF alarm list or an unacknowledged MAF alarm exists that was not able to be displayed in the FF list.

4.3.2 "FAULT" LED INDICATOR

An Amber indicator interpreted as:

(a) OFF The normal state

(b) ON One or more zones are in fault (regardless of whether the zones are isolated or un-isolated). The faults total on the base display will be non-zero.

4.3.3 "ISOLATE" LED INDICATOR

An Amber indicator interpreted as:

(a) OFF The normal state

(b) ON One or more zones are isolated. The "ISOLATE" indicator is affected only by those zones numbered less than or equal to the programmed value of the Isolate Relay Maximum Zone. The isolates total on the base display will be non-zero.

(c) F One or more analogue points are isolated.

4.3.4 "MAINS ON" LED INDICATOR

A Green indicator interpreted as:

(a) ON The normal condition indicating mains power is present

(b) OFF An abnormal condition indicating that the mains supply to the FIP has been interrupted.

Possible reasons are:

i. The MAINS ON/OFF switch on the FIP Power Supply module is turned OFF.

ii. Fuse F1 on 1901-2 Power Supply Printed Circuit board is blown.

iii. The overload protection device on the switchboard has tripped.

iv. FIP Power Supply fault.

4.3.5 "CHGR/BATT FAULT" INDICATOR

An Amber indicator that is interpreted as:

(a) OFF The normal condition, indicating that the FIP's standby battery supply and its associated charger are both normal, if the mains supply is on.

(b) ON The charging circuitry is not working correctly or is wrongly set up. Note that a mains failure is not deemed to be a fault of the charger itself and does not cause the indicator to come on: OR

(c) F The battery is in a poor state of charge. This may be normal, for example after extended operation of the system in a mains failure condition, or may be abnormal, indicating a battery or charger fault: OR;

The battery is disconnected: OR;

The previously requested BATTERY TEST has failed.

Note: A successful BATTERY TEST will return the indicator to its normal OFF state.

Within 1 minute of the battery test failing, the indicator will reflect the current state of the battery/charger, which will be Normal or Fault.

(d) RF A manual BATTERY TEST is in progress.

4.3.6 "SYSTEM FAULT" LED INDICATOR

An Amber indicator that is interpreted as:

(a) OFF The normal condition, indicating that the system is fully operational.

(b) ON Indicates that a system fault (as opposed to a zone fault) has been detected.

The fault may be detected spontaneously, or as a result of a manually or automatically initiated SYSTEM TEST.

Carry out a System Status Recall (refer Section 6.6) to determine if the fault is local, or at a remote panel on a network. If the fault is on a remote panel it may be necessary to carry out a System Status Recall at that panel to determine the exact cause of the fault.

Note: More detailed diagnostics are only available via an event logging printer or programming terminal, or by reviewing the history log using the LCD keypad.

(c) SF The database is being downloaded to an Analogue Addressable Responder (AAR), Multi-Protocol Responder (MPR) or MX Protocol Responder (MXP). Only when this is complete is the system fully operational.

4.3.7 "EXTERNAL BELL ISOLATED" LED INDICATOR

An Amber indicator that is interpreted as:

(a) OFF Indicates that the External Bell is currently enabled i.e. will sound in the event of an alarm.

(b) ON Indicates that the External Bell is currently locally isolated, i.e. will NOT sound in the event of an alarm. Usually this is only used for test purposes.

(c) SF Indicates that the External Bell has been silenced due to another networked FIP having its External Bell isolated (if this feature is enabled).

4.3.8 "WARNING SYSTEM ISOLATE" LED INDICATOR

An Amber indicator that is interpreted as:

(a) OFF Indicates that the Warning System is currently enabled i.e. will sound in the event of an alarm.

(b) ON Indicates that the Warning System is currently locally isolated, i.e. will NOT sound in the event of an alarm. Usually this is only used for test purposes.

(c) SF Indicates that the Warning System has been silenced due to the activation of the silence alarms switch at an RDU or another networked FIP (New Zealand mode), or as a result of another networked FIP having its Warning System isolated (if this feature is enabled).

(d) F Indicates that the Warning System has been silenced due to the activation of the local external silence alarms switch at the FIP (New Zealand mode).

4.3.9 AIF ATTENDED INDICATOR

This amber indicator is currently not used. It does not light during Lamp Test.

4.3.10 "NORMAL" LED INDICATOR (NZ PANELS ONLY)

A Green indicator interpreted as:

(a) ON The normal state

(b) F The MX4428 is Normal, but the mains supply is off.

(c) OFF An un-isolated alarm or fault condition exists. In this case the appropriate FIRE or DEFECT indicator will be on flashing,

or

An abnormal condition exists, e.g. Processing Stopped, System Fault or EEPROM Write Enabled, or Commission Mode is in effect.

4.3.11 "FIRE" LED INDICATOR (NZ PANELS ONLY)

A Red indicator interpreted as:

(a) OFF The normal state

(b) F One or more un-isolated MAF zones is in alarm
Master Alarm relay is activated due to zone alarms.

4.3.12 "DEFECT" LED INDICATOR (NZ PANELS ONLY)

An Amber indicator interpreted as:

(a) OFF The normal state

(b) F One or more un-isolated MAF zones is in Fault; or a System Fault exists.

For example:
A communications fault exists
The External Silence Alarms input is active at the FIP or an RDU.
Battery low during test
Internal test failure
Processing has been disabled.

4.3.13 "BELLS ISOLATED" LED INDICATOR (AS1603 KEYPAD)

An amber indicator that may show the status of either the Warning System Isolate (4.3.7) or External Bell Isolate (4.3.8) depending on the panel's programming.

4.3.14 "ANCILLARY ISOLATED" LED INDICATOR (AS1603 KEYPAD)

An amber indicator that is interpreted as:

(a) OFF Indicates that ACZ 0 is enabled, and will operate the ancillary relay (if it is controlled by ACZ 0) according to the programmed control strategy.

(b) ON Indicates that ACZ 0 is isolated, i.e. will NOT operate the ancillary relay (if it is controlled by ACZ 0).

4.4 ZONE INDICATORS

NOTE: In the following sections these abbreviations describe the LED indications:

OFF	=	LED unlit.
SF	=	LED flashing slowly (every 2 seconds).
F	=	LED flashing (every half a second).
RF	=	LED flashing rapidly (10 times per second).
ON	=	LED on steady.

4.4.1 ZONE ALARM ("ALM") LED INDICATOR

A RED indicator per zone that is interpreted as:

(a) OFF For an Alarm Zone; The normal, non-alarm state.
For an Ancillary Zone; The normal, non operated state.

(b) ON For an Alarm Zone; Indicates the alarm condition has been acknowledged and if the zone is non-latching that the alarm condition still exists.

For an Ancillary Zone; Indicates that the Ancillary Control Zone has been activated.

(c) F For an Alarm Zone; Indicates a new, yet to be acknowledged, alarm has been detected or failure of self test e.g. unexpected alarm in the zone.

4.4.2 ZONE FAULT ("FLT") LED INDICATOR

An Amber indicator per zone that is interpreted as:

(a) OFF The normal state.

(b) ON Indicates a FAULT condition has developed in that zone.
For Alarm Zone; A detector line fault
For Ancillary Zone; An Ancillary Supervision fault.

(c) F Encountered during a SYSTEM TEST, to indicate that the particular zone failed its test sequence, or detected an unexpected alarm or fault.

NOTE: For New Zealand mode FIPs, zone defects (faults) are always non-latching, but the LED indicators are always latching. Thus, if the defect condition goes away, the zone status will be normal, but the defect indicator will remain ON until the zone is RESET.

4.4.3 ZONE ISOLATED ("ISO") LED INDICATOR

An Amber indicator per zone that is interpreted as:

(a) OFF The normal state; indicates that the zone is not isolated and that any alarm or fault conditions detected on that zone will generate Brigade signals, bell operation, and ancillary device operation as configured for that zone.

(b) ON Indicates that the zone is isolated. Alarm and fault conditions will still be displayed but will not initiate any control or annunciation functions.

(c) F Indicates that the zone is in "AUTO-RESET" mode.

4.5 LED PHASING

For FIPs with a large number of display boards, the power requirements can become excessive if too many of the LEDs are on. To reduce the power requirements, the FIP is able to "phase" the display boards.

The FIP calculates the number of LEDs on steady or flashing for all Display boards, but excludes Relay Driver boards. If this number rises above 255, then phasing starts. If it then falls below 249, phasing stops.

If phasing has started, then only 6 boards display their data at one time. All other LEDs on Display boards are turned off. Every second, one board is turned off, and another is enabled to turn on its LEDs. In this way, the 6 display board "window" is shifted around all of the display boards. If phasing is not enabled, then all boards show their data.

TIME	BOARD NUMBER							
	1	2	3	4	5	6	7	8
1		X	X	X	X	X	X	
2			X	X	X	X	X	X
3	X			X	X	X	X	X
4	X	X			X	X	X	X
5	X	X	X			X	X	X
6	X	X	X	X			X	X
7	X	X	X	X	X			X
8	X	X	X	X	X			

X = BOARD DISPLAYING DATA

FIG 4.1 PHASING OF DISPLAY BOARDS

At any time during phasing, a display board configured to be a Relay Driver board will never be turned off. When it is the Relay Driver board's time to be turned off, it will continue to display its data.

TIME	BOARD NUMBER							
	1	2	3	4	5	6	7	8
1			X	#	X	X	X	X
2	X			#	X	X	X	X
3	X	X		#	X	X	X	X
4	X	X	X	#		X	X	X
5	X	X	X	#			X	X
6	X	X	X	#	X			X
7	X	X	X	#	X	X		
8		X	X	#	X	X	X	

X = BOARD DISPLAYING DATA
# = RELAY DRIVER ALWAYS DISPLAYING DATA
FIG 4.2 PHASING OF DISPLAY BOARDS

4.6 CONTROL OF FIP BY MULTIPLE OPERATORS

For a standalone MX4428 FIP, only one operator can have control over the FIP as there is only one operator interface (the keyboard and LCD).

When an MX4428 FIP is connected to:

- RDUs
- NDUs
- Colour Graphics Displays
- Remote operator via the programming terminal, or
- Other panels via the Panel-Link network,

there may be more than one operator controlling the FIP. I.e. multiple operators could be trying to reset, isolate, test, etc., the zones or other controllable items at the same time.

Depending on the system programming, alarms in the FF alarm list may be acknowledged, reset or isolated, from any of the operator interface points.

Thus alarms in the FF list may disappear from the LCD because another operator has reset the zones in alarm from, for example, a colour graphics system.

Also, the internal sounder may silence as a result of receiving and/or actioning a remote operator's command.

The single keypad and LCD interface can be operated simultaneously by up to 3 users at a time:

- An operator physically at the FIP keypad/LCD.
- A remote operator connected via the programming terminal.
- A remote operator connected via the Panel-link network.

The physical LCD display will change in response to the actions of all operators combined.

CHAPTER 5 OPERATING INSTRUCTIONS – BRIGADE FUNCTIONS

5.1 BRIGADE OPERATION AND DISPLAY

When an alarms occurs, the FIP takes over the keypad and LCD to display the alarm. The keys that can be used are limited to those within the Fire fighters Facility (FF) and the "CLEAR" key.

When the FIP displays an alarm the following information is shown:

(i) The time at which the alarm occurred, or a preview of the cause of the alarm (programmable).
(ii) The zone alarm type.
(iii) Whether the alarm is acknowledged or not.
(iv) The total number of alarms and the sequence number of the currently displayed alarm.
(v) The zone number and location. The location may be a zone name, a detector name, or a combination of both.

The MX4428 FIP maintains a list of alarms in the order in which they occurred. In the absence of operator intervention, the LCD display will show the first alarm. All alarms in the list can be viewed, one by one, by pressing the "NEXT" or "PREV" keys.

Each alarm can be acknowledged when it is displayed by pressing the "ACK" key. The text "ACKD" appears on the display whenever an acknowledged alarm is viewed.

Once an alarm has been acknowledged, it can be removed from the alarms list by:

(i) Pressing the "RESET" key and then the "ACK" key within 10 seconds – the indicated alarm is RESET, and removed from the list; or
(ii) Pressing the "ISOLATE" key and then the "ACK" key within 10 seconds – the indicated alarm is ISOLATED, and removed from the list; or
(iii) The alarm condition being cleared from the detector on a non-latching zone.
(iv) The alarm being reset or isolated from an RDU or other network system or colour graphics system.

Once all alarms have been acknowledged, stepping through the alarm list (by using the "NEXT" and "PREV" keys) will include the display of isolated alarms including those on other networked AS4428 FIPs. On pressing "NEXT" at the most recent alarm, or "PREV" at the oldest alarm, a display will show the number of isolated alarms present and a prompt to search for these. Pressing "NEXT" will step into the display of isolated alarms (these are shown in numerical order).

The "EXTERNAL BELL ISOLATE" key may be used at any time to isolate or de-isolate the External Bell.

The "WARNING SYSTEM ISOLATE" key may be used at any time to isolate or de-isolate the Warning System.

After all alarms have been acknowledged, pressing the "CLEAR ESC" key will exit from the FF alarm list display even if there are still zones in alarm. After exiting, the FF alarm list display can be recalled by using the Recall Alarms List command from the base display.

5.2 SILENCING THE INTERNAL SOUNDER

5.2.1 FUNCTION

In FF mode (displaying an alarm) pressing any key in the FF area will silence the alarm (or fault) sounder. No other keys will silence the sounder. Thus to silence the sounder in FF mode it is best to use the Next or Prev keys, and use the opposite key to step back to the original alarm if there are multiple alarms present.

If the panel is not in FF mode then pressing any key will silence the alarm, fault, or test fail sounder.

Note: The External Bell is separately silenced by the “EXTERNAL BELL ISOLATE” key. The Warning System is separately silenced by the “WARNING SYSTEM ISOLATE” key.

5.2.2 OPERATING SEQUENCE

Press NEXT” 

or “PREV” key once. 

- the internal sounder silences.

NOTE:

If a key sequence was being entered, it may be necessary to re-enter number information or the last command, as the ”NEXT” or “PREV” key will, in addition to silencing the buzzer, perform any valid NEXT or PREV action.

Any fault action text displayed as a result of the buzzer turning ON for a fault will be automatically cleared by silencing the fault buzzer.

The sounder may also be silenced on receiving a remote operator command.

Note, the sounder will restart within 8 hours of being silenced if the fault or isolate condition remains.

5.3 ACKNOWLEDGE ZONE IN ALARM

5.3.1 FUNCTION

In “FF mode”, pressing the “ACK” key performs the following functions:

(a) The displayed alarm is acknowledged.

(b) The alarm sounder is silenced.

5.3.2 OPERATING SEQUENCE

Press “ACK” key once:

- The flashing red “ALM” LED indicator for the zone goes steady (ZONE ACKNOWLEDGED).
- Internal Sounder will be silenced.
- LCD displays “ACKD” for the currently displayed alarm.
- If there are no more unacknowledged alarms in the system, the ALARM LED goes steady.

NOTES:

(a) Subsequent non-isolated zone “ALARMS” or “FAULTS” on the system will re-operate the indications, and sounder, as appropriate.

(b) Even if an un-silenced FAULT condition exists, the sounder will be silenced.

However, the FAULT LED will be ON, indicating the presence of a zone fault in the system.

5.4 RESET ZONE IN ALARM

5.4.1 FUNCTION

In “FF mode”, pressing the “RESET” key and then the “ACK” key within 10 seconds performs the following:

(a) Acknowledges the alarm if it is not already acknowledged.
(b) RESETS the indicated zone.
(c) RESETS all circuits mapped to the indicated zone.
(d) Silences any alarm or fault sounder.
(e) Aborts Zone Test on any acknowledged zone under test.
(f) If no more un-isolated alarms exist, the External Bell and Warning System will turn OFF, if they were ON.
(g) The acknowledged zone alarm is removed from the alarm list.

5.4.2 OPERATING SEQUENCE

Press “RESET” key once:

- LCD displays “Press acknowledge to confirm reset”.
- Press “ACK” within 10 seconds.
- The displayed zone in the alarm list will be reset.
- If fitted, the red alarm indicator for the zone will be turned OFF.
- If there are no more un-isolated zones in alarm, then the Brigade alarm relay, External Bell and Warning System will be turned off.
- Sounder will be silenced.

NOTES:

(a) If the alarm condition on the zone input has not been removed, then a new alarm will be generated after the appropriate filtering time delay.

(b) Pressing “RESET” in the “FF mode” does not affect Zone or Ancillary Zone fault indications. Refer to the “Zone / Ancillary Reset” section in Chapter 7; “Operating Instructions – Zone Functions”.

(c) If a reset command is already in progress, the LCD will display “Cannot reset alarms at this time”. Wait until the original reset has completed and try again.

5.5 ISOLATE ZONE IN ALARM

5.5.1 FUNCTION

In “FF mode”, pressing the “ISOLATE” key and then the “ACK” key within 10 seconds performs the following:

(a) Acknowledges the alarm if it is not already acknowledged.
(b) ISOLATES the indicated zone.
(c) Silences any Internal sounder condition.
(d) If all alarms are isolated, then the External Bell, Warning System, Brigade Alarm relay and any ancillary relays will turn OFF.
(e) The acknowledged zone alarm is removed from the alarm list.

5.5.2 OPERATING SEQUENCE

Press “ISOLATE” key once:

- LCD displays “Press acknowledge to confirm isolate”.
- Press “ACK” within 10 seconds.
- The displayed zone in the alarm list will be isolated – shown by the corresponding amber “ISO” LED indicator turning ON.
- If all alarms are isolated then the External Bell, Warning System, Brigade alarm relay and any ancillary relays will turn OFF if ON.
- The Sounder will be silenced.

NOTES:

(a) Subsequent non-isolated zone ALARMS on the system will re-operate the alarm indications, alarm sounder and local bells.

(b) Subsequent non-isolated zone FAULTS on the system will operate the fault indication and steady fault sounder.

(c) To DE-ISOLATE alarm zones, FF mode must be exited, and the zone selected for de-isolation. Refer to the “Exiting FF mode” section in this chapter, and the “Zone Isolating / De-Isolating” section in Chapter 7 “Operating Instructions – Zone Functions”.

5.6 ISOLATING/DE-ISOLATING EXTERNAL BELL

5.6.1 FUNCTION

The isolate status of the External Bell can be changed at any time by pressing the "EXTERNAL BELL ISOLATE" key. This status is shown on the "EXTERNAL BELL ISOLATED" LED as per Section 4.3.7. If the LED is on steady, slow flashing or 2Hz flashing, the External Bell will not sound on an alarm. If the LED is OFF the External Bell will sound when an un-isolated alarm is present.

Isolating the External Bell can serve as a method to silence the External Bell whilst un-isolated alarms exist, or to allow testing of the panel.

De-isolating the External Bell allows the External Bell to turn on for subsequent alarms, and can serve to immediately turn the bell on again if any un-isolated zone alarm condition exists.

In networked systems isolating the External Bell on the local FIP may result in the External Bell on other FIPs being silenced, depending on how the system has been configured.

5.6.2 OPERATING SEQUENCE

Press the "EXTERNAL BELL ISOLATE" key once:

- If the External Bell was un-isolated:
- The "EXTERNAL BELL ISOLATE" LED turns ON steady.
- The bell, if ON, turns OFF.

- If the External Bell was isolated:
- The "EXTERNAL BELL ISOLATE" LED turns OFF.
- If any un-isolated alarm condition exists on a zone mapped to the External Bell the External Bell turns ON, unless the External Bell Isolate LED is flashing.

5.7 ISOLATING/DE-ISOLATING WARNING SYSTEM

5.7.1 FUNCTION

The isolate status of the Warning System can be changed at any time by pressing the "WARNING SYSTEM ISOLATE" key. This status is shown on the "WARNING SYSTEM ISOLATED" LED as per Section 4.3.8. If the LED is on steady, slow flashing or 2Hz flashing, the Warning System will not sound. If the LED is OFF the Warning System will sound when an un-isolated alarm is present.

Isolating the Warning System can serve as a method to silence the Warning System whilst un-isolated alarms still exist, or to allow testing of the panel.

De-isolating the Warning System allows it to turn on for subsequent alarms, and can serve to immediately turn the Warning System on again if any un-isolated zone alarm condition exists.

For New Zealand mode MX4428 FIPs, the Warning System Isolate LED key flashes if a Silence Alarms keyswitch has been turned on at the FIP (2Hz flash), or at any connected RDU or Networked FIP (slow flash). Refer to Section 5.13 for other consequences to operating the existing silence alarms keyswitch. Pressing the "WARNING SYSTEM ISOLATE" key will change the isolate state stored within the FIP, but the Warning System Isolate LED will remain slow or 2Hz flashing until the Silence Alarms keyswitch is turned off. At that time, the "WARNING SYSTEM ISOLATE" LED will turn OFF if the Warning System is not isolated by the keypad, or ON if the Warning System is isolated by the keypad.

In Australian or New Zealand network systems, isolating the Warning System on the local FIP may result in the Warning System on other FIPs being silenced, depending on how the system has been configured.

5.7.2 OPERATING SEQUENCE

Press the "WARNING SYSTEM ISOLATE" key once:

- If the Warning System was un-isolated:
- The "WARNING SYSTEM ISOLATE" LED turns ON steady.
- The Warning System, if ON, turns OFF.

- If the Warning System was isolated:
- The "WARNING SYSTEM ISOLATE" LED turns OFF.
- If any un-isolated alarm condition exists on a zone mapped to the Warning System the Warning System turns ON, unless the Warning System Isolate LED is flashing.

5.8 DISPLAYING THE ALARM CAUSE

5.8.1 FUNCTION

In “FF mode”, the information for the zone in alarm is normally displayed. However, it can be useful to know which circuit/point caused the alarm.

The LCD displays this information when the operator presses and holds the “RELAY/POINT” key. The time that the alarm occurred and the alarm type are replaced by the circuit/point that caused the alarm.

5.8.2 OPERATING SEQUENCE

To display the circuit/point that caused the alarm displayed, press and hold the “RELAY/POINT” key.

- The alarm time and type are replaced by the circuit/point that caused the zone to go into alarm.

To restore the alarm display, release the “RELAY/POINT” key.

- The alarm time and type are re-displayed.

NOTES: The FIP may be programmed to show a preview of the cause of the alarm on the main alarm display instead of the alarm time. If this feature has been enabled, when the “RELAY/POINT” key is pressed the alarm time is displayed along with the full alarm cause information.

MX4428 can be programmed to update the alarm cause text whenever a new alarm cause is detected. It can also be programmed to re-annunciate a zone alarm when a new cause is received, i.e. un-acknowledge a previously acknowledged alarm, activate the alarm sounder, and make the Master Alarm LED flash.

5.9 EXITING FF MODE

5.9.1 FUNCTION

While in FF mode, access to all other functions and displays is prevented. On occasion it may be necessary to de-isolate a zone or perform some other function. To do so, FF mode must be exited.

FF mode can be exited only when ALL alarms in the list have been acknowledged.

When FF mode is exited, the LCD shows the base display (totals). At this point, the required functions can be performed.

5.9.2 OPERATING SEQUENCE

Press the “CLEAR ESC” key once:

- If all alarms are acknowledged, FF mode is exited and the LCD shows the totals.

- If any alarms are NOT acknowledged, the sounder will produce an error tone, and FF mode will not be exited. It is necessary to acknowledge all alarms before FF mode can be exited.

NOTE: To re-enter FF mode to view the list of alarms, use the Recall Alarm List command. Refer 5.10 Recalling Alarms.

5.10 RECALLING ALARMS

5.10.1 FUNCTION

It is possible for there to be un-isolated acknowledged alarms present in the FF queue, but the display is NOT in FF mode, for example, the operator has exited the FF to perform recall functions.

In addition an operator may wish to review all isolated alarms when there are no alarms in the FF queue.

The list of acknowledged alarms and isolated alarms can be recalled, and thus put the display into FF mode.

5.10.2 OPERATING SEQUENCE

Press the “CLEAR” key until any base or information recall display is shown.
Press the “RECALL” key followed by the “1” key to show the FF alarms list.

For FF Alarms and Isolated Alarms.

NOTE: If no un-isolated FF alarms exist, the LCD will briefly display “No more events in alarm list”. If any isolated alarms exist, these will be made available for recall, otherwise the LCD will revert to the base display.

5.10.3 NON FF ALARMS AND AS1603.4 ISOLATED ALARMS

It is possible to have zones not mapped to the FF (i.e. display only zones, e.g. flow switch). These might be displayed on LEDs only.

If such a zone goes into alarm the buzzer will not sound, the LCD will not automatically display the zone, but the FF ALARM LED will be on and the Alarms total will be non-zero.

If the MX4428 is connected to AS1603.4 FIPs on a network, isolated alarms on the AS1603.4 FIPs cannot be recalled in FF Mode.

To search for all zones in alarm (includes alarms on isolated zones on AS1603.4 panels and zones not mapped to the FF), press the “RECALL” key followed by the “4”, “1” and “2” keys.

For all alarms

5.11 BRIGADE TEST (AS1603 KEYPAD)

5.11.1 FUNCTION

The brigade test function produces an internal alarm condition which is signalled to the brigade and the FF Alarm LED turns on. Brigade Test may control ancillary relays if programmed to do so and the ancillaries are not isolated.

5.11.2 OPERATING SEQUENCE

Press and hold the “BRIG TEST” key for at least 2 seconds:

- The MAF alarm relay will activate, if un-isolated (i.e. not SYSTEM TESTING).
- Any un-isolated ancillary zones or outputs controlled by Brigade Test will activate.

Release the BRIG TEST key. After a short period:

- The MAF alarm relay will de-activate.
- Any ancillary zones or outputs activated by the brigade test will de-activate.

NOTE: The brigade alarm feature of the BRIG TEST key can be disabled via system programming. If so disabled, pressing the BRIG TEST key will not result in an alarm signal to the brigade, but controlled ancillaries will still operate unless isolated.

The Brigade Test function at an MX4428 may also be initiated from an RDU, if it has been programmed to do so.

5.12 BELLS ISOLATE (AS1603 KEYPAD)

MX4428 systems using AS1603 keypads have a Bells Isolate key instead of Warning System Isolate and External Bell Isolate keys.

System programming determines whether the “BELLS ISOLATE” key acts as if an AS4428 “WARNING SYSTEM ISOLATE” or “EXTERNAL BELL ISOLATE” key is pressed.

The Bells Isolate LED shows the isolate status of the Warning System or External Bell, based on the same system programming.

5.13 SILENCE ALARMS (NZ MODE)

NZ panels and RDUs generally have an external “Silence Alarms Brigade Use Only” keyswitch (key removable in the operated position) that allows the evacuation system to be turned off by Fire Brigade personnel.

Operation of this keyswitch will generate a defect condition. The switch has its key removable only in one position. Restoration of the silence alarms keyswitch to normal will automatically isolate any zone(s) in alarm.

If any zones are so isolated, then the System Fault LED will turn on, the fault relay will activate, and the AutIsoZ status will be included in the System Faults recall. Reset the zone alarms and de-isolate these zones.

The AutIsoZ status can be cleared via a System Faults Reset command, even though some zones may still be isolated.

5.14 (TRIAL) EVACUATION

NZ panels and RDUs are usually fitted with an external keyswitch (non-removable in the operated position) for (trial) evacuation. Operating this keyswitch causes the evacuation system to be activated and will override any silence alarms condition or Warning System/ External Bell Isolate condition. This control is normally used by building owners or occupiers to carry out an evacuation drill without calling the fire brigade.

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CHAPTER 6 OPERATING INSTRUCTIONS – SYSTEM FUNCTIONS

6.1 BATTERY TEST

6.1.1 FUNCTION

A battery test will disable the battery charger and place the panel load onto the battery for 60 seconds (Australia) or 10 seconds (New Zealand). Extra loads may be applied during the test periods.

A daily battery test of programmable duration 1 – 120 minutes (defaults to 60 minutes) begins at the Autotest time every weekday, with the exception of some programmable dates.

If a daily battery test or network initiated manual battery test is in progress, it can be cancelled by using the Battery Test Key.

6.1.2 OPERATING SEQUENCE – LOCAL PANEL MANUAL TEST

From any information display or base display press:

- The LCD displays “Testing battery. Press ACK to stop”.
- The “CHGR/BATT FAULT” indicator turns ON rapid flashing to indicate A battery test is in progress.

TO STOP THE BATTERY TEST WHEN RUNNING

- Press the “ACK” key.

IF THE TEST PASSES

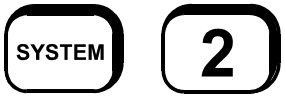
- If the battery voltage is still within specification after application of the test load for 60 seconds (Australia) or 10 seconds (New Zealand), then the test will terminate and the LED indicator will turn OFF.
- The LCD displays “Battery test passed. Press ACK key”.
- Press the “ACK” key to complete the test, and the LCD will revert to its previous display.

IF THE TEST FAILS

- If during the test a battery low is detected, the test will terminate and the “CHGR/BATT FAULT” LED indicator will flash.
- The LCD displays “Battery test failed. Press ACK key”.
- Press the “ACK” key to clear the display and flashing “CHGR/BATT FLT” LED indicator.

6.1.3 OPERATING SEQUENCE – NETWORKED PANEL MANUAL TEST

To conduct a battery test on a remote panel press:



and enter the SID for the remote panel.

Then press

to send the command to the remote panel.

6.1.4 BATTERY TEST ABORT – LOCAL PANEL

To cancel a network initiated manual battery test or daily battery test:
From any information display or base display, press

The LCD displays “Testing Battery. Press ACK to stop”.

To stop the test press

To exit without cancelling the test, press

6.1.5 NOTES

(a) The “CHGR/BATT FLT” LED indicator will flash for the rest of the test period if the battery test fails or until the test failure is acknowledged.

(b) Pressing the “ACK” key will turn OFF the “CHGR/BATT FLT” LED indicator if it is flashing, and clear the test fail message on the LCD.

(c) If the battery test failed, perform another “Battery Test” after 24 hours. If the battery test fails again please call your service company.

(d) It is not possible to initiate a Battery Test until FOUR (4) minutes after the end of a previously passed battery test. A KEY ERROR tone will be sounded, and the LCD will display “Cannot start battery test at present”.

(e) There is a 1:4 “Failure to Next Test” inhibit time ratio.
For example: If the test fails after 30 seconds, it is not possible to initiate another Battery Test until after 2 minutes (4 x 30 seconds).

(f) Pressing the “ACK” key at any time terminates the Battery Test.

(g) The default test load applied to the battery is the FIP itself. The FIP may be configured so that extra loads are applied during the test.

(h) The FIP will initiate an automatic battery test at the Autotest Begin time every day except Saturday, Sunday and for other programmed dates. At the same time an abbreviated System Test takes place (refer Section 6.5).

The testing period is in the range of 1 minute to 120 minutes (default 60 minutes). There is no indication on the LEDs but the LCD displays “Battery Testing”. The test failure indication will last for the remainder of the test period, unless it is cleared by using the Battery Test key as described above or by executing a SYSTEM FAULTS RESET.

During automatic battery test failure, the FIP will signal Fault to the brigade. An RDU will signal battery low to the FIP for a test failure.

(i) The MX4428 FIP can be programmed for battery connection monitoring. If enabled, a battery test is briefly applied every 15 to 60 seconds (depending on the programmed setting) to determine whether the battery is connected, i.e. it can supply power to the system. A fault is generated if the battery is disconnected or cannot supply enough voltage during the test.

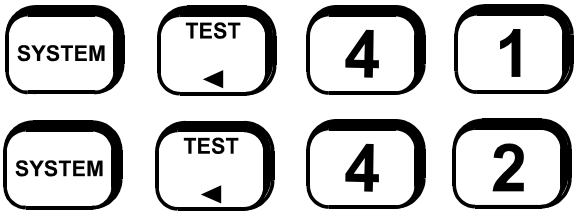
6.2 EXTERNAL BELL/WARNING SYSTEM TEST

6.2.1 FUNCTION

To operate the External Bell or Warning System Outputs for a period of five (5) seconds.

6.2.2 OPERATING SEQUENCE

From any information display or base display press:



To test the Warning System

or

To test the External Bell.

Note: For a networked panel after pressing SYSTEM a prompt will be given requesting whether the local panel or a remote panel should be tested. For the remote panel option a further prompt will be given for the SID of the remote panel. Enter the SID of the remote panel to be tested.

- The LCD briefly displays “Warning System Test Started” or “External Bell Test Started” as appropriate.

- The appropriate Output is turned on for 5 seconds.

6.2.3 NOTES

(a) The Warning System output/External Bell output will turn on, even if the Warning System or External Bell is ISOLATED, or externally silenced (New Zealand mode).

6.3 EXTERNAL BELL/WARNING SYSTEM ISOLATE OR DE-ISOLATE

6.3.1 FUNCTIONS

To change the isolation state of the Warning System or External Bell, either from de-isolated to isolated, during testing, or vice-versa on completion of tests.

6.3.2 OPERATING SEQUENCE – LOCAL PANEL

To Isolate or De-Isolate the Warning System or External Bell at any time, press:

To control the Warning System or

to control the External Bell.

- If the amber “ISOLATED” LED indicator was OFF, it will now be turned ON, to indicate the Warning System or External Bell is isolated.

- If the amber “ISOLATED” LED indicator was ON, it will now be turned OFF, to indicate the Warning System or External Bell is de-isolated.

- When the Warning System or External Bell is isolated, New Zealand mode FIPs will turn off the “NORMAL” indicator, and will slow pulse their internal sounder if the door is closed.

On New Zealand mode FIPs it is possible to silence the Warning System and/or External Bell via operation of the external Silence Alarms keyswitch on the FIP, an RDU, or another network MX4428. This will cause the “ISOLATED” LED to flash (2Hz or slow), and a fault (defect) to be signalled to the brigade.

A Warning System or External Bell isolate or de-isolate command may also be initiated by an RDU, if this function has been enabled during programming at the RDU. Operating the Warning System or External Bell isolate will increase the others total on the LCD display by one.

For network MX4428s, isolating the local Warning System or External Bell may result in the Warning System or External Bell on other FIPs on the system being silenced, depending on how the MX4428s have been configured.

6.3.3 OPERATING SEQUENCE – REMOTE PANEL

To Isolate/De-isolate the Warning System or External Bell at remote panel nnn, press:

Then press

For Warning System, or

for External Bell.

The isolation status of the output at the remote panel will be given and pressing the ACK key will invert this (e.g. change Isolated to De-isolated). If the remote panel accepts the command then the appropriate local LED will flash (or stop flashing) to indicate the received networked status.

6.4 LCD/LAMP (LED) TEST

6.4.1 FUNCTION

To momentarily turn all indicators on to visually inspect that they are working correctly and to test operation of the LCD.

6.4.2 OPERATING SEQUENCE

From any information display or base display, press:

Note: For a networked panel after pressing SYSTEM a prompt will be given requesting whether the local panel or a remote panel should be tested. As a remote panel cannot be LCD/LED tested, press the 1 key.

The display test can also be started by the TEST SYSTEM DISPLAYS command sequence.

For testing the LCD:

- a test pattern is displayed, activating all LCD elements on the first line. The “ACK” key must be pressed to continue the test.
- When “ACK” is pressed, the same test pattern is displayed on the second line of the LCD. The “ACK” key must be pressed again to complete the test.

For testing the system status indicators and display boards:

- The internal and external System Status indicators are turned ON.
- Each board of 16 Zone Indicators are then successively turned on and off.
- Visually check that every indicator is turned ON at some stage during this process.
- If any LED indicator does not light when the rest of the board is, please call service.

NOTE: Any boards configured to be Relay Driver Boards will not be tested during the Lamp Test.

On New Zealand mode FIPs a Lamp Test can also be started by momentarily shorting the LAMP TEST- input on the display extender board input to 0V.

The MX4428 can be programmed to activate the fault or alarm sounder when the system status indicators are being tested.

6.5 SYSTEM TEST

6.5.1 FUNCTION

The System Test checks the integrity of the system hardware and software.

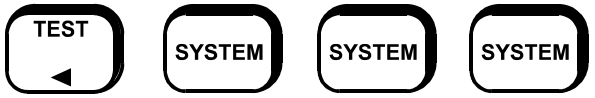
It applies simulated alarm and fault conditions to each circuit to check that the conditions are detected and processed correctly. Analogue addressable smoke detectors and devices that support testing are also tested to verify that an alarm condition can be generated by each device.

An abbreviated System Test is started at the Autotest time every weekday, with the exception of some programmable dates.

6.5.2 OPERATING SEQUENCE

From any information display or base display on a non-networked FIP, press:

From any information display or base display on a networked MX4428, press:



to perform a local test, or

to perform a test at SID nnn.

For local tests:

- The LCD displays “Testing system. Press ACK to stop”. Pressing “ACK” will abort the test.

- The “Warning System Isolated” and “External Bell Isolated”, and “BELLS ISOLATED” and “ANCIL ISOLATED” (AS1603 keypad), LED indicators are turned ON to indicate that the Alerting outputs and ANCIL output have been automatically isolated for the duration of the test.

- The Master Alarm Facility is also automatically isolated, however this is not indicated.

- Consequently, if any un-isolated MAF alarm or fault conditions exist, the MAF will stop signalling these conditions to the brigade for the duration of the test.

For remote tests,

- The MX4428 sends the System Test command. The remote system may accept the command and start a test or reject the command if it cannot start the test.

6.5.3 TEST OPERATION

The MX4428 System Test operates as follows:

6.5.3.1 MEMORY TEST:

A test of the EPROM, RAM and EEPROM components of each microprocessor system is initiated. If this test fails the buzzer sounds its test fail cadence, the SYSTEM FAULT indicator comes ON and the LCD displays a test fail message. Pressing “ACK” silences the buzzer and clears the fail message from the LCD, but the SYSTEM FAULT indicator does not turn OFF until the completion of a successful memory test.

6.5.3.2 FAULT AND ALARM TEST:

The system test then applies “FAULT” and “ALARM” test signals to all enabled responder inputs. The test is deemed complete when all Responders report that their tests have passed.

The test fails either if all Responders do not complete their tests within a certain time, or if at any time any of the tested circuits go into the incorrect state. If a failure is detected, this is annunciated by the test fail cadence on the buzzer, a flashing FLT indicator on the failed zone, and a fail message on the LCD. This suspends the test.

Press “ACK” to silence the buzzer and clear the fail message from the LCD. This aborts the test. The SYSTEM FAULT indicator remains ON and can only be turned off by a successful re-test.

If there is a test failure on a circuit input then the FLT LED indicator for the zone comes on flashing if the applied test alarm or test fault signals were NOT detected; or the ALM and FLT LED indicators come on flashing if there are any unexpected alarms or faults respectively.

The ideal response to a system test is no new zone indicators ON rather than any indicators on flashing, and a “System test passed. Press ACK key” message on the LCD.

If the system includes AARs, MPRs or MXPs a successful test can take up to 2.5 minutes, otherwise about 1 minute is required.

6.5.4 TEST ABORT

Pressing the “ACK” key during the test terminates the SYSTEM TEST.

Detection of an ALARM condition which seems unrelated to the applied test alarm (i.e., possibly a genuine alarm) holds the test at the affected Responder and causes the ALM and FLT indicators to flash for the zone in alarm, along with the FLT indicators for zones mapped to by the circuit under test on the same responder.

However, since it is not established that it is a genuine alarm no MAF/ANCIL/BELL or other mapped outputs will be activated. Pressing the “ACK” key takes the FIP out of test mode, turning off the ALM indicator and buzzer if the alarm is no longer present. The system reverts to normal operation. If the alarm is still present, this will be detected and annunciated in the usual way.

Detection of FAULT conditions which are unrelated to the applied test fault conditions are treated similarly, except that just the fault indicator of the suspect zone, and the zones mapped to by the circuit under test on the same responder, come on flashing.

If the circuit under test is not mapped to a displayed zone, only the Service company can determine the circuit failure from the internal log or by reviewing the history on the LCD.

If the circuit under test is not mapped to a zone at all, then the test is not terminated by a failure but indicated at the end of the test by the buzzer and LCD “Test Fail” message. Again the circuit failure can only be determined from the internal log, or by viewing the history on the LCD.

6.5.5 NOTES

(a) System Test is not possible if any unacknowledged alarm or fault exists; or if an automatic test sequence, battery test, zone test or auto-reset zone test is in progress. ADR S/W earlier than Version V1.04 will fail the test if any circuit is in alarm or fault at the start of the test.

(b) System Test bypasses any programmed time delays.

(c) If there is a test failure the “SYSTEM FAULT” indicator is left ON until a successful test (SYSTEM or AUTOMATIC) is performed. However, this cannot be done until the alarm or fault that terminated the test is cleared. Refer note (a) above.

(d) During Self Test and for a brief time afterwards, the refresh of data to RDUs is suspended, to ensure that any test failure information is not sent to the RDUs, and incorrectly interpreted as true ALARM or FAULT conditions.

(e) The daily abbreviated System Test consists of memory tests at the FIP, responders and RZDUs, plus an optional simulated alarm test at the responders. The zone LEDs are unaffected by this test and RDU data transmission is unaffected. The daily test starts at the Autotest begins time every day except Saturday, Sunday and for other programmed dates.

At the same time as the daily System Test begins, a daily battery test also begins (refer Section 6.1).

6.6 RECALL SYSTEM STATUS

6.6.1 FUNCTION

Allows an operator to view on the LCD the current causes of a “SYSTEM FAULT” indication and other system statuses.

These include problems with the FIP, any Responder or RDU that could be connected to the FIP, or another panel on a networked system.

6.6.2 OPERATING SEQUENCE

From any information display or base display, press:

The display will pause briefly while the FIP searches for the first system status. If none is found, a brief message is displayed saying so, and the LCD reverts to the base display.

If a system fault exists, the LCD will display it. To view the next fault, press:

To view the previous fault, press:

6.6.3 SYSTEM FAULTS AND STATUS

The search for system status first tests for any FIP faults and status, followed by responder and RDU faults, and finally any Network FIP faults and status.

The LCD display shows faults using a “Page” format, where each page is capable of displaying a number of different faults, but only those faults that are actually present are displayed. There are up to 5 pages of faults for the FIP, 1 page per responder, 2 pages per RDU, and up to 5 pages for each FIP on the network.

The display is “real time”, and the display updates once per second. Consequently, if a fault is transitory, the display will show and blank the fault indication as the fault occurs and clears.

If all faults have cleared before the NEXT or PREV key is pressed again, the display will briefly display a message indicating that there are no more system recalls, and then it will revert to the base display.

The information that can be displayed for each fault page is as follows:

FIP Page 1

SWFlt	-	A Software Fault was latched.
E2CRC	-	The FIP has detected a bad database.
STstF	-	The System failed its Powerup, Self or Automatic Test.
Brk1	-	No messages received by the FIP on Channel 1.
Brk2	-	No messages received by the FIP on Channel 2.
NoPrc	-	FIP processing has been stopped.
FRsp0	-	At some time, a foreign responder 0 was detected.

FIP Page 2

WdogL	-	The FIP has a latched watchdog indication.
DispF	-	There is a fault with the FIP LED display chain.
ChgrF	-	There is a Charger Fault at the FIP.
LpPwr	-	The FIP has detected a responder loop power fault.
BatLo	-	The FIP has a battery low condition.
BatFl	-	The FIP has a battery fail condition.

FIP Page 3	-	NZ Mode FIPs Only
Tevac	-	(Trial) Evacuation active at FIP or RDU.
SilAlm	-	Silence Alarms active at FIP or RDU.
ExtDef	-	FIP External Defect Active.
ExtEvc	-	FIP External Evacuation Defect Active.
LatBVLo	-	FIP has latched a battery very low condition (V3.15 or earlier)
AutIsoZ	-	FIP isolated some zones when Silence Alarms keyswitch restored (V3.16 or later)
Abnml	-	FIP has an abnormal condition, e.g. EEPROM write enabled.

FIP Page 4

NetFlt	-	Network Fault present. Refer 6.6.4.
CmnPtI	-	A point on this FIP is isolated.
BattDis	-	The battery is disconnected.
MainsFl	-	The mains has failed.
Dirty	-	One or more analogue detectors on this FIP are in Dirty Alert.
Frgn	-	One or more foreign detectors have been discovered.

FIP Page 5

Wopr	-	Warning System is operated.
Wiso	-	Warning System is isolated.
Wsil	-	Warning System is silenced.
Walm	-	A zone mapped to the Warning System is in alarm.
Bopr	-	External Bell is operated.
Biso	-	External Bell is isolated.
Bsil	-	External Bell is silenced.
Balm	-	A zone mapped to the External Bell is in alarm.

Responders	-	On a per Responder Basis
Prly	-	Responder has opened its Power Relay.
Scan	-	FIP is not receiving data from this responder.
Forgn	-	Responder is un-configured, or more than one of same address.
TypeM	-	Type mismatch between actual responder type and the type stored in the FIP database, or a database is being sent to an analogue Responder that cannot process it correctly.
Brk1	-	No messages received by Responder on Channel 1.
Brk2	-	No messages received by Responder on Channel 2.

RyBd - Relay Board fault.
L2F - Analogue responder fault e.g. Top Board Fault, Power Line 2 Fault, Responder fault or device type mismatch.

RDUs Page 0 - On a per RDU Basis
Forgn - Reply received from an un-configured RDU.
BatLo - Battery low at RDU.
SysFt - System fault at RDU. (Displays fault, programming error, all zones isolated etc.)
BatFl - Battery fail at RDU.
Scan - FIP is not receiving data from this RDU.
StstF - RDU failed its self test.
ChgrF - Charger fault at RDU.

RDUs Page 1 - On a per RDU Basis
MCPFlt - RDU MCP is in Fault
MCPAlm - RDU MCP is in Alarm
SilAlm - The RDU is asserting Silence Alarm
Tevac - The RDU is asserting (Trial) Evacuation

Network Panels Page 0
ScanF - The Local Panel is not receiving any data from the Remote panel.
LnkIA - The Local Panel is not receiving channel A test data from the Remote panel.
LnkIB - The Local Panel is not receiving channel B test data from the Remote panel.
SysFlt - The Remote Panel has a system fault.
NetFlt - The Remote Panel has a network fault.
Stdby - The Remote Panel has a standby condition.

Network Panels Page 1
Abnml - The Remote Panel has an Abnormal status present.
BellI - The Remote Panel's bells are isolated.
Tevac - The Remote Panel is asserting (Trial) Evacuation.
SilAlm - The Remote Panel is asserting Silence Alarms.
BrigT - The Remote Panel is asserting Brigade Test.
SysFRcl - The Remote Panel has information that should be recalled on its own LCD display using the System Fault or System Status recall command.

Network Panels Page 2
CmnPtI - The remote panel has a point isolated
TstFlI - The remote panel is signalling a test fail condition.
SysTst - The remote panel is currently executing a system test.
PSUFlt - The remote panel has a PSU Fault (charger/battery/mains).
Rsetng - The remote panel is resetting zones.
AS1603 - The remote panel is an AS1603.4 type panel
AS4428 - The remote panel is an AS4428.1 type panel.

Network Panels Page 3
Wopr - The remote panel Warning System is operated.
Wiso - The remote panel Warning System is isolated.
Wsil - The remote panel is asserting a Warning System silence condition.
Walm - The remote panel has a zone in alarm mapped to its Warning System*
Bopr - The remote panel External Bell is operated.
Biso - The remote panel External Bell is isolated.

Bsil - The remote panel is asserting an External Bell silence condition.
Balm - The remote panel has a zone in alarm mapped to its External Bell*

* Some panels may include other conditions
.

6.6.4 NETWORKED PANELS

If the local panel detects a network fault (e.g. it fails to receive messages from a remote panel that it is expecting to receive from), or it receives a signal from a remote panel saying that it has a network fault, then NetFlt will be shown on page 4 for the local panel.

If the cause of the fault was determined by the local panel (as distinct to receiving the signal from the remote panel) then the actual type of fault will be logged to the printer and the history. If the cause was signalled by the remote panel, then the status will be indicated on one of the pages 0-3 for the remote panel.

If SysFRcl is shown for a remote panel, it may be necessary to carry out a Recall System Fault at that panel to determine the exact cause of the fault.

AS4428.1 FIPs on a network show “AS4428” on the Network Panels Page 2 display. They also send Warning System and External Bell status onto the network, and this is displayed as per Network panels Page 3. These FIPs may also transmit a BellI (Bells Isolate) status (Network Page 1) depending on their “legacy bells” setting.

AS1603.4 FIPs are shown as “AS1603” on the Network Panels page 2 display. These FIPs only send Bell Isolate status onto the network. Any Warning System or External Bell status displayed for AS1603 panels is the result of the local FIP mapping the Bell status to the Warning System or External Bell according to the local panel’s legacy bells setting. While this is not true AS1603 status, the display does reflect the effect that the AS1603 Bells status may have at the local FIP.

6.7 SYSTEM FAULT RESET

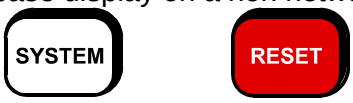
6.7.1 FUNCTION

To reset, if possible, a latched System Fault as shown by the front panel “SYSTEM FAULT” indicator.

The specific cause, or causes, of the “SYSTEM FAULT” indication can be determined by a “RECALL SYSTEM FAULT” command, or sometimes be seen on the internal diagnostic indicators.

6.7.2 OPERATING SEQUENCE

From any information display or base display on a non networked MX4428, press:



From any information display or base display on a networked MX4428, press:

To perform a local System Fault Reset; or

To perform a System Fault Reset at SID nnn.

On a System Fault Reset…….

- The “WATCHDOG”, “DISPLAY FAULT”, and “SOFTWARE FAULT” LED indicators on the Main Board clear and “Recall System Fault” Dirty Alert and Foreign Point indications clear (they latch to assist service personnel during trouble shooting).

- If an FIP loop power fault exists, the FIP immediately disconnects power to the loop on line 2 (so long as no other conditions exist that require that power be connected). The FIP then tests as to whether the loop fault has cleared or not.

- If a particular fault condition no longer exists its indication is cleared.

For remote FIP System Resets, the MX4428 sends the system reset command. The remote system may accept the command and action it, or it may reject the command.

6.7.3 NOTES

(a) System Fault Reset should only be performed by Service Technicians or authorised fire safety personnel.

(b) System Fault Reset should only be performed after a “Recall System Fault” command has been used to determine the cause of the fault and any appropriate service action has been taken.

(c) If the fault is a network fault then it will be cleared irrespective of whether it is still present or has cleared. Thus if any faults still exist they will be re-annunciated soon thereafter.

6.8 RECALL HISTORY

6.8.1 FUNCTION

The FIP keeps a list of the last 900 events in chronological order. The RECALL HISTORY command allows an operator to view the historical list of events stored in the FIP, and to move forwards and backwards through the list. When either end of the list is reached, the LCD automatically shifts to the other end of the list and displays whether the event is the newest or oldest.

6.8.2 OPERATING SEQUENCE

From any information display or base display, press:

The display will show the most recent history event.

To access the event that occurred before the event displayed, press:

If the “PREV” key is pressed when the event displayed is the oldest event, the LCD will briefly display a message indicating that the event to be displayed is the most recent event and then it displays that event.

To access the event that occurred after the event displayed, press:

If the “NEXT” key is pressed when the event displayed is the most recent event, the LCD will briefly display a message indicating that the event to be displayed is the oldest event on record, and then displays it.

6.8.3 PRINTER/HISTORY EVENTS

The event printer output and history log for networked MX4428s include only local events, i.e. events and alarms from other panels are not logged. A Network Printer that prints network events is available with the Protocol Translation Module (PTM), or Network Display Units (NDU) or Networked F3200 FIPs.

There are, however, a number of additional events that can be produced by a networked MX4428. Those events relating to a remote panel are identified by a description of SID XX, where XX is the SID of the panel that caused the event.

The new events are:

(i) NET SCAN FAIL/NORMAL – FAIL: the specified panel failed to communicate on the network due to it being offline or there being a problem with the network cabling; NORMAL: the panel began communicating again.

(ii) NET FOREIGN DEVICE – an unexpected panel is communicating on the Panel Link Network for Link Integrity testing.

(iii) NET COMMAND ACCEPTED – a network command was received from the specified panel and validated for further processing. The events immediately following this event may have been the result of executing the received command.

(iv) NETWORK EVENT QUEUE OVERFLOW – the local MX4428 was generating events faster than it could send them onto the network. Some events will have been lost. The lost events may have been recorded on the event printer or in the history log. This event should occur only in cases of extreme network loading, many events occurring on the FIP simultaneously or a network cable fault.

(v) NET MSG DISCARDED – the local MX4428 discarded a message that was repeatedly sent to another device on the network that did not acknowledge it. To allow other messages to be sent on the network, the unacknowledged message was discarded. Messages should be discarded only in cases of extreme network loading, if the system addressed does not exist or if it is currently off line, or if network cables are broken.

This event immediately generates a System Fault that will automatically clear itself 30 seconds after the last discard occurred.

Note that discards from SID 0 indicate that an acknowledgement to a broadcast was not received.

6.9 SET SYSTEM TIME

6.9.1 FUNCTION

Allows an operator to set the time in the real-time clock within the FIP.

6.9.2 OPERATING SEQUENCE

To set the time, press:

The current time is displayed. Enter the new time, in 24 hour format. To separate the hours from the minutes, press the POINT key.

E.g. To set the time to 13:52, press:

If the time is in the correct format and is a valid time, the FIP real time clock will be set to the new time. The display reverts to the SET SYSTEM menu, so that other changes can be made, if desired.

6.9.3 NOTES

Due to hardware limitations, the seconds of the real time clock cannot be entered. Whenever the time is set, the seconds are forced to zero. Consequently, the time should be entered before the minute occurs, and the “ENTER” key pressed at the start of that minute.

The MX4428 FIP can be programmed for automatic daylight saving adjustment of the real-time clock.

On a network one panel may be set up as the time/date master. Setting the time or date at that panel will result in the new time/date being sent to other panels on the network. The time/date master will also send out the time/date to other panels at 11:30pm each day and on daylight saving changes.

6.10 SET SYSTEM DATE

6.10.1 FUNCTION

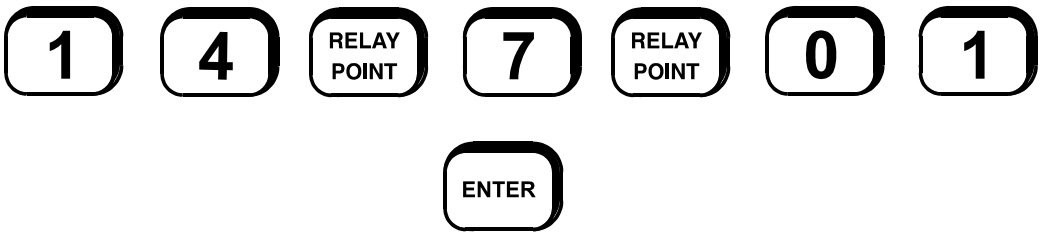
Allows an operator to set the date in the real-time clock within the FIP.

6.10.2 OPERATING SEQUENCE

To set the date, press:

The current date is displayed. Enter the new date. To separate the day, month and year numbers, press the “POINT” key.

E.g. To set the date to 14/07/01, press:



If the date is in the correct format and is a valid date, the FIP real time clock will be set to the new date. The display reverts to the SET SYSTEM menu, so that other changes can be made, if desired.

6.10.3 NOTES

The MX4428 FIP can be programmed for automatic daylight saving adjustment.

On a network one panel may be set up as the time/date master. Setting the time or date at that panel will result in the new time/date being sent to other panels on the network. The time/date master will also send out the time/date to other panels at 11:30pm each day and on daylight saving changes.

6.11 GLOBAL RESET

6.11.1 FUNCTION

To issue a Global Reset command to reset all un-isolated zones in alarm (if any) and to signal RESET to the output logic.

6.11.2 OPERATING SEQUENCE

To issue a global reset from a base display, other than a Zone or Point Recall, press:

6.11.3 NOTES

(1) This command can be accessed from any base display or data recall display except for the Zone or Point Recall displays.

Press the “CLEAR” key to exit from a Zone or Point Recall display to the base display before entering the Global Reset command.

(2) The Global Reset command will result in all un-isolated zones in alarm being reset. This may result in events being removed from the FF Alarm List.

6.12 GLOBAL ISOLATE

6.12.1 FUNCTION

To issue a Global Isolate command to isolate all un-isolated zones in alarm (if any) and to signal ISOLATE to the output logic.

6.12.2 OPERATING SEQUENCE

To issue a global isolate from a base or information recall display, other than a Zone or point Recall, press:

6.12.3 NOTES

(1) This command can be accessed from any base display or data recall display except for Zone Recalls and Point Recalls.

Press the “CLEAR” key to exit from a Zone Recall or Point Recalls display before entering the Global Isolate command.

(2) The Global Isolate command will result in all un-isolated zones in alarm being isolated. This may result in events being removed from the FF Alarm List.

6.13 RECALL SYSTEM CRCS

6.13.1 FUNCTION

Allows an operator to view on the LCD the Database CRC and the time and date the database was last changed, and also the software version number.

This information can be used as part of an AS1851.8 testing schedule, and to provide for detection of tampering with the system configuration.

6.13.2 OPERATING SEQUENCE

From any information display or base display, press:

The Recall System CRCs display may also be accessed by the SYSTEM RECALL 3 command sequence from the base display.

The LCD will display on the top line the database CRC, the time and date that the database was last altered, and on the bottom line the MX4428 panel software version number.

NOTE: Programming terminal database changes will change the database and thus the numbers displayed as a part of this recall.

Thus, if the database is changed, the new numbers should be recorded in the log book and the service company advised.

Recall system CRCs is not supported for remote panels.

6.14 BRIGADE TEST

6.14.1 FUNCTION

The Brigade Test function turns on the Brigade alarm relay (if programmed to) i.e. signals alarm to the Brigade and turns on the “ALARM” LED. For a network system, the brigade signalling may be at a remote panel, in which case a command is sent across the network to operate the alarm relay, but the local alarm LED will still turn on after the 3 key has been held for 2 seconds.

6.14.2 OPERATING SEQUENCE

For a non-networked MX4428, press the following key sequence, holding down the final “3” key for 2 seconds:

For a networked MX4428, press the following key sequence, holding down the final “3” key for 2 seconds:

- The alarm relay will activate (if programmed to).
- The “ALARM” LED will turn on (if the relay is programmed to operate).

Release the “3” key.

After a short period:

- The MAF alarm relay will de-activate and the “ALARM” LED will turn off unless there are other alarms present.

NOTE

The MAF alarm relay operation of the “Brigade Test” function can be disabled via system programming. If so disabled, pressing the Brigade Test key sequence will not result in an alarm signal to the brigade, but the Brigade Test token in the output logic will still become TRUE, and an event will be logged to the history and printer.

Brigade Test is a local-only command.

6.15 NETWORK SOUNDER SILENCE

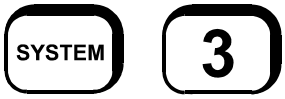
6.15.1 FUNCTION

The Network Sounder Silence function is only available to networked MX4428s.

It sends a message to all devices on the network requesting that they silence their sounders.

6.15.2 OPERATING SEQUENCE

To issue a network sounder silence from a base or information recall display, press:



NOTES

(1) This command can be accessed from any base display or data recall display, except FF Mode.

(2) The Network Sounder Silence command will result in a message being broadcast onto the network requesting that devices silence their sounders. Not all receivers of this message may silence their sounders, due to their programming or firmware capability.

6.16 AIF MODE

This key, although present on the keyboard currently has no functionality.

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CHAPTER 7 OPERATING INSTRUCTIONS – ZONE FUNCTIONS

7.1 ZONE ALARM OR FAULT TEST

7.1.1 FUNCTION

To test the circuit inputs of a selected alarm zone and send test alarm signals to the Brigade. Two tests can be performed:

(a) A fault simulation test, or
(b) An alarm simulation test.

These tests apply, where possible, a real alarm or fault condition to the responder or detector input. Otherwise, the test simulates an alarm or fault input.

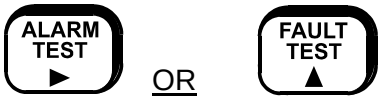
WARNING: This test performs a true zone test: time delays operate, and all outputs operate, including the MASTER ALARM OUTPUT, unless the zone is isolated. Alternatively the Auto-reset mode test can be used to test individual detector operation.

Testing a Local Zone is covered in Section 7.1.2 and a Remote Networked Zone is covered in Section 7.1.4.

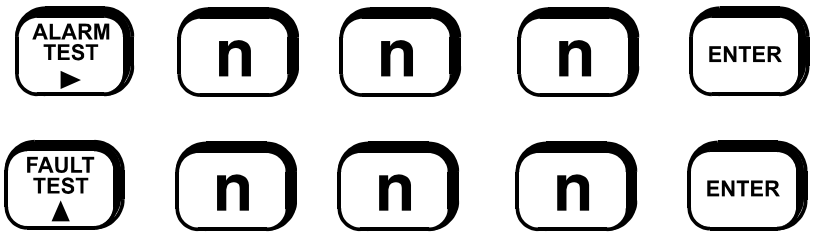
7.1.2 OPERATING SEQUENCE (LOCAL ZONE)

SUGGESTION: To prevent mapped outputs from operating "ISOLATE" the zone first. Refer to "Zone Isolate or De-Isolating" section.

From the zone status recall display for the zone to be tested, press:



From other information displays or the base display, press:



where nnn is the number of the zone to test.

- The relevant test signal is applied to all circuits on the zone.

- Once all the circuits have gone into the test state, the relevant zone indicator and sounder are turned on, if the zone is not isolated. FF mode may be entered if the zone being alarm tested is mapped to the MAF.

  The LCD displays a test pass message, and pressing the "ACK" key clears the test.

- If any circuit does not enter the correct state in response to the test signal, then the test fails, the relevant zone indicator stays OFF and the buzzer sounds its "TEST FAIL" cadence. The LCD displays a test fail message, and pressing the "ACK" key clears the test. To abort the test before it completes press the "ACK" key.

7.1.3 NOTES

(i) An Alarm detected on the zone under test when one is not expected (e.g. during the FAULT test) is processed normally and the test aborted. Similarly, faults during the ALARM test activate the fault sounder and may terminate the test.

(ii) During the zone test sequence any other zones to which the tested circuits are mapped behave as they normally would given FAULT and ALARM conditions.

(iii) All alarm processing delays (AVF sequences, etc.) are still active so the alarm response time may be up to 60 seconds, depending on the circuit type.

(iv) An AVF delay sequence initiated by a zone alarm test continues if the zone test is aborted by the “ACK” key before the test has passed. That is a second alarm test on the same zone within 120 sec will give an instant alarm.

(v) The test condition is automatically removed from the circuits after 120 seconds.

(vi) For Flow Switch Zones the test relay will operate for 2 minutes. If no alarm is received within that time, the test will fail.

(vii) It is not possible to start a zone test if there is an un-acknowledged alarm or fault present; or if there is an Auto, System, Battery, Zone or Auto-Reset Test in progress.

(viii) The MX4428 logs all circuit activations during the test. The test can fail due to a circuit not entering or being incapable of entering the required test state. If this happens, comparison of the circuit events in the history log and the circuits programmed to activate the zone will determine which circuits failed the test.

Also, Flow Switch Zones cannot be tested if they do not have any relay programmed for alarm testing.

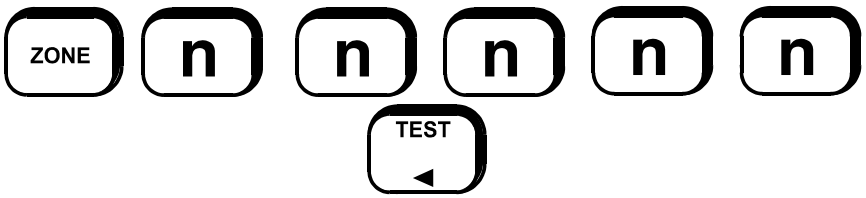
7.1.4 OPERATING SEQUENCE (NETWORKED ZONE)

SUGGESTION: To prevent mapped outputs from operating “ISOLATE” the zone first.

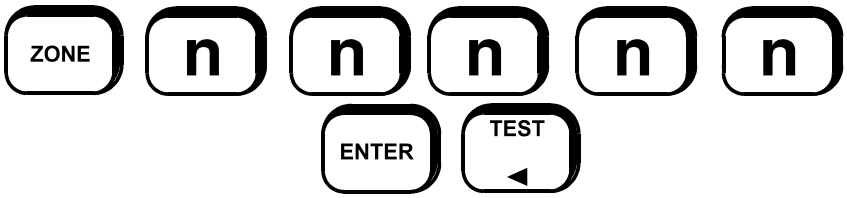
From the zone status recall display for the zone to be tested, press:

and then refer to the test options below.

From other information displays or the base display, press:



OR



Where nnnnn is the number of the network zone to be tested. (Refer Section 2.4.1 for networked zone numbering).
If nnnnn is a network zone, the network test prompt is displayed, querying for the type of test to be performed:

Press  for alarm test

 for fault test

 for operate test

 for auto reset test

 to abort a test in progress

The MX4428 will then send the test command to the FIP with the selected zone on it.

The LCD will display the network zone with a message saying “Network Command Sent”. After a brief period the message should change to “Network Command Accepted”, and the test will begin. Refer to Section 2.4.5 for a description of these and other possible LCD display messages.

If an exception occurs at the remote FIP, e.g. a test failed, then an exception display may be received indicating the reason why. Refer to Section 2.4.6 for a description of Exception Messages.

Notes:

(i) The effect of the test command depends upon the receiving FIP type, e.g. how the zones will be tested, how other zones/FIPs, etc., are affected by the test, and so forth.

(ii) If an MX4428 receives a test command it will process it as if an operator at that FIP had initiated the command. If the LCD at that MX4428 is at its base display, then the LCD will indicate that a test is in progress. It will not display the abort prompt that would normally be displayed for a locally initiated test.

(iii) If the network zone number entered corresponds to a local zone, the LCD/keypad test menu continues as if a local zone number had been entered. The network zone test menu is not used, thus no network messages are displayed.

7.2 ZONE OR ANCILLARY ISOLATE OR DE-ISOLATE

7.2.1 FUNCTION

To isolate or de-isolate a zone or group of zones. Section 7.2.2 covers a single zone at this panel (local), Section 7.2.3 covers a range of local zones, Section 7.2.5 covers a single networked zone and 7.2.6 covers a range of networked zones.

7.2.2 OPERATING SEQUENCE – SINGLE ZONE

To isolate the zone shown on a zone status recall display, press:

To isolate or de-isolate zone nnn from any other information display or base display, press:

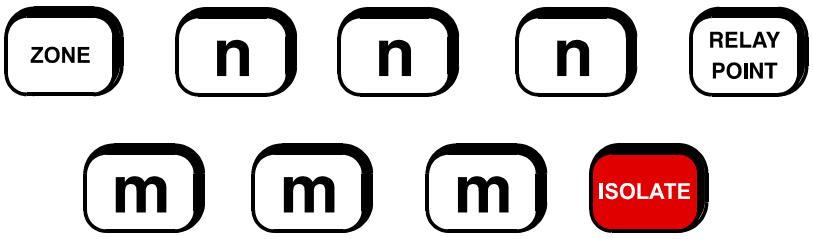
The LCD displays the current isolate status of the zone. Pressing the “ACK” key changes the isolate state. Pressing the “CLEAR” key aborts the Isolate/De-isolate command.

7.2.3 OPERATING SEQUENCE – ZONE RANGE (LOCAL)

To isolate a range of zones when a zone recall is being displayed, press the:

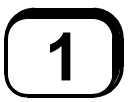
key until the LCD is at the base display.

To isolate a range of zones from information displays other than zone recalls, or from the base display, press:



The LCD will display the selected range of zones, i.e. zone nnn to zone mmm inclusive, plus the options to isolate or de-isolate the range.

To isolate the range of zones, press:



To de-isolate the range of zones, press:

The LCD will display the selected range of zones, plus the choice of Alarm zones, Ancillary Control zones, or All zones. To isolate or de-isolate...

Alarm Zones only, press:

Ancillary Control Zones only, press:

All Zones, press:

7.2.4 NOTES

(a) Isolated zone(s) will register and indicate alarm and faults but are prevented from operating system outputs.

(b) If the zone is in Auto-Reset mode, a zone de-isolate command will exit Auto-Reset mode and leave the zone isolated.

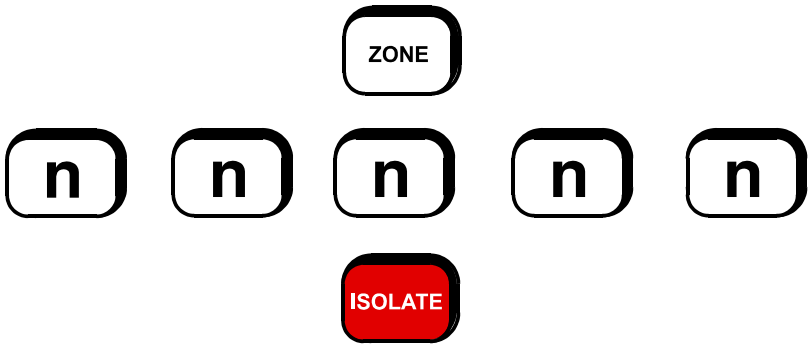
(d) De-isolating a zone in alarm (or fault) will cause the alarm (fault) to be actioned as if it had just occurred.

(e) For zone range de-isolate commands, any zones that are off-normal, i.e. Alarm, Operated or Fault, will not be de-isolated, and at the end of the command the LCD will display “Not All Zones De-Isolated”. Use the Zone Status search functions to determine which zones did not get de-isolated.

(f) For zone range isolate commands, any zones that are programmed to be un-isolatable will not be isolated, and at the end of the command the LCD will display “Not All Zones Isolated”. Use the Zone Status search functions to determine which zones did not get isolated.

7.2.5 OPERATING SEQUENCE – SINGLE NETWORK ZONE

To isolate or de-isolate network zone nnnnn, from the base display press:



The LCD will display the selected network zone, and the current isolate status of the zone is retrieved from across the network. There may be a delay of a few seconds before this is displayed. Wait until the data is displayed before proceeding.

When the status has been retrieved it is displayed on the LCD with an appropriately chosen prompt to isolate or de-isolate the zone.

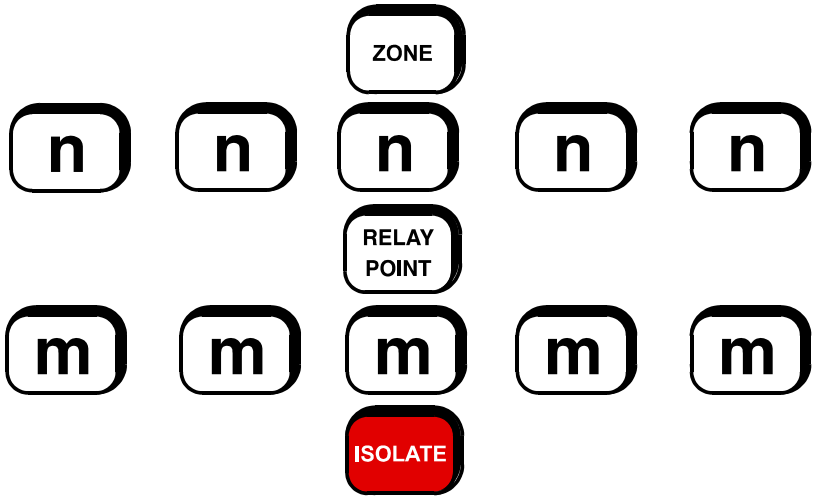
To isolate or de-isolate the network zone, press:

The LCD will display the network zone with a message saying “Network Command Sent”. After a brief period the message should change to “Network Command Accepted”. Refer to Section 2.4.5 for more detail on these and other possible LCD display messages.

7.2.6 OPERATING SEQUENCE – NETWORK ZONE RANGE

If a zone recall is being displayed, then press the CLEAR key repeatedly until the LCD is at the base display.

To isolate a range of network zones, press:



The LCD will display the selected range of zones, i.e. zone nnnnn to zone mmmmm inclusive, plus the options to isolate or de-isolate the range.

To isolate the range of zones, press:

To de-isolate the range of zones, press:

A prompt is then given to isolate or de-isolate...

Alarm Zones only, press:

Ancillary Control Zones only, press:

All Zones, press:

The LCD will display the network zone range with a message saying “Network Command Sent”. After a brief period, the message should change to “Network Command Accepted”. Refer to Section 2.4.5 for more details on these and other possible LCD display messages.

Note that if the remote MX4428 is unable to isolate or de-isolate all of the zones due to some of them having an alarm or fault status or being un-isolatable, an exception message can be received indicating this. Refer to Section 2.4.6 for a discussion of Exception Messages.

7.2.7 NOTES

(i) The effect of the isolate/de-isolate command depends upon the receiving FIP type, e.g. which zones will be isolated/de-isolated, how a zone is affected by isolation/de-isolation, and so forth.

(ii) If an MX4428 receives a network isolate/de-isolate command:

(a) Isolated zone(s) will register and indicate alarm and faults but are prevented from operating system outputs.

(b) If the zone is in Auto-Reset mode, a zone de-isolate command will exit Auto-mode and leave the zone isolated.

(c) An un-silenced alarm indication will go steady on isolate and any alarm will become un-silenced on De-Isolate.

(c) For zone range de-isolate, zones that are in Alarm, Operate or Fault will <u>not</u> be de-isolated, and at the end of de-isolation the MX4428 will send an exception message to the source of the command indicating that not all zones were de-isolated.

(d) For zone range isolate, zones that are un-isolatable will <u>not</u> be isolated, and at the end of the MX4428 will send an exception message to the source of the command indicating that not all zones were isolated.

(iii) Isolate/De-Isolate commands to network zones that are on the local panel will be implemented as if the command has been entered using the local zone numbers. The network will not be used, and no network messages will be displayed.

7.3 ANCILLARY TEST

7.3.1 FUNCTION

To test the operation of “ACZ 0” or any other Ancillary Control Zone (ACZ), if configured.

If the ACZ to be tested is on a remote panel, use the networked zone command (refer Section 7.1.4).

7.3.2 OPERATING SEQUENCE

From a zone recall display which is displaying the ACZ to be tested, press:

To test ACZ nnn, from other information recalls or the base display press:

- The selected ancillary control zone is automatically isolated during this test, as indicated by the ACZ “ISO” indicator (if fitted).

- The LCD displays “Press ACK to test operate this ACZ”.

- The actual outputs are not operated unless the “ACK” key is pressed within the next 30 seconds. Press the “ACK” to activate the outputs for 5 seconds.

Press the “CLEAR” key during the 30 second delay to cancel the command.

On completion of the test the ancillary control zone returns to its pre-test isolate state.

7.3.3 NOTES

(a) An attempt to test an already operated ACZ results in an error beep and no test is initiated.

(b) It is possible to test only one ACZ at a time. (Note that one ACZ may include more than one relay, depending on the number of relays mapped to that zone).

(c) An Ancillary Test cannot be started if there is an un-acknowledged alarm or fault present; or if an Auto, System, Battery, Zone or Auto Reset Test is in progress.

7.4 ZONE OR ANCILLARY RESET

7.4.1 FUNCTION

A Zone Reset command performs the following functions:

(a) For Alarm Zones:

- Resets all circuits mapped to the selected zone.
- Clears ALARM and FAULT conditions and indications.
- Silences the alarm and fault sounder, if no other alarms or faults exist.
- Removes the Zone from Zone Test.
- Returns the Zone from Auto-Reset mode to normal operation.

(b) For Ancillary Control Zones:

- Resets any latched “FLT” indicator for the zone(s).

7.4.2 OPERATING SEQUENCE – SINGLE ZONE

From zone recall displays, to reset the displayed zone press:

- The LCD will query if this is the zone to be RESET. Press “ACK” to reset, or “CLEAR” to abort.

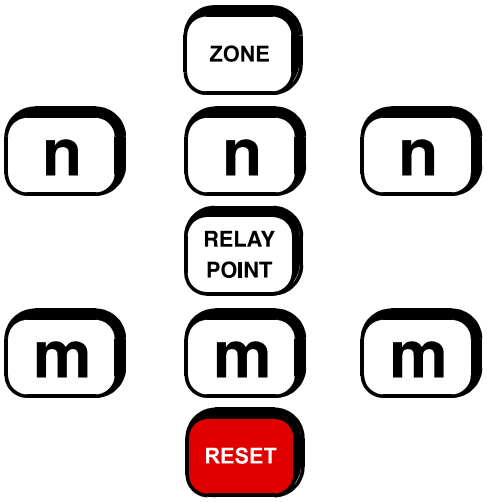
To reset zone nnn, from all other information displays, or the base display, press:

A networked zone may also be reset – refer Section 2.4.1 for networked zone numbering.

- Any red alarm or amber fault indicators that were steady or flashing will be turned OFF and the alarm circuit(s) reset.
- Any amber fault indicators that were showing will be turned OFF.

7.4.3 OPERATING SEQUENCE – ZONE RANGE

To reset zone numbers nnn to mmm, from the base display press:



This command can also be used on networked zones – refer to Section 2.4.1 for network zone number entry.

For networked zones the LCD will display the network zones with a message saying "Network Command Sent". After a brief period the message should change to "Network Command Accepted". Refer to Section 2.4.5 for more details on these and other possible LCD display messages.

If an exception occurs at the remote FIP, then an exception display may be received indicating the type of exception. Refer to Section 2.4.6 for a discussion of Exception Messages.

7.4.4 NOTES

(a) If any circuit is still in alarm or fault, then after the circuit input delay and the zone reset delay the zone will return to alarm or fault – call service.

(b) For New Zealand mode FIPs, zone defects (faults) are always non-latching, whereas the LED indicators are always latching. Thus, a zone may be NORMAL, even though the DEFECT LED indicator is ON. In this case, the LED indicator can be cleared by resetting the zone.

(c) The effect of a network zone reset command is dependent upon the type of FIP that receives the command.

(d) If a network zone reset command is received by an MX4428...

    (i) If any circuit that is reset remains in alarm or fault, then the zone(s) mapped to by the circuit will also return to alarm or fault.

    (ii) If the amber fault indicator reappears, then isolate the zone and call service.

    (iii) For New Zealand mode FIPs, zone defects (faults) are always non-latching, whereas the LED indicators are always latching. Thus, a zone may be NORMAL, even though the DEFECT LED indicator is ON. In this case, the LED indicator can be cleared by resetting the zone.

(e) Network range commands must be limited to a single panel. Refer to Section 2.4.1 for network zone numbering.

(f) Reset commands to network zones that are on the local panel will be implemented as if the command had been entered using the local zone numbers. The network will not be used, and no network messages will be displayed.

7.5 AUTO-RESET MODE

7.5.1 FUNCTION

Auto-Reset mode allows testing of all detectors on an Alarm Zone Circuit without the need for a second person resetting alarms at the FIP. Auto-Reset mode is supported by all versions of MX4428 responders, including ADRs, IORs, MXPs and MPRs.

Auto-Reset mode isolates the zone from outputs, and automatically resets detectors in alarm on the circuits being tested. It is recommended that the zone is manually isolated before starting Auto-Reset mode, so that when Auto-Reset mode is terminated (manually or automatically), the zone remains isolated. The zone should be left isolated for at least five minutes after the last detector was smoke tested, because smoke can linger in detectors and produce new alarms for several minutes after they have been tested. Once any final alarms have been reset, the zone can be de-isolated.

From MPR version 3.00 onwards and MXP version 1.16 onwards, these responders will produce only one alarm for each smoke or heat sensor when the zone is in Auto-Reset mode. Earlier versions of these responders are likely to produce multiple alarms for a single smoke test, due to smoke lingering in the detector.

The MX4428 can be programmed to operate the Warning System, External Bell and/or some other device for 4 seconds when a zone in Auto-Reset mode goes into the alarm condition.

WARNING: If a circuit is mapped to two or more zones, then it is necessary to isolate the other zones or ancillary control zones, otherwise alarms or outputs could be inadvertently activated.

To put a networked zone into Auto-Reset mode, refer to Section 7.1.4.

7.5.2 OPERATING SEQUENCE

It is strongly recommended that before initiating Auto-Reset mode on a zone, that the zone be isolated as described in section 7.2.

From zone recall displays, to Auto-Reset test the displayed zone that is not an ACZ, press:

From all other information displays, or the base display, press:

to auto-reset test Zone nnn, if Zone nnn is NOT an ACZ.

7.5.3 TEST OPERATION

While in the AUTO-RESET mode the zone is automatically isolated from all mapped outputs.

On operation of a detector and after the 2 second transient suppression delay the zone circuit will go into the alarm condition and stay in that condition for 8 seconds to allow the detector LED to be checked. The detector circuit is then reset for 15 seconds to allow smoke or heat to clear.

Note, that for some responders each detector sensor will generate only one alarm during Auto-Reset mode.

When the zone goes into alarm, the Warning System, External Bell or some other outputs (depending on system programming) may operate for 2 to 4 seconds.

To assist with identification of the detectors that are wired to particular alarm zones, the zone alarm indicators at the panel latch in this mode of operation, flash when an alarm condition is present on the circuit and go steady on the removal of the alarm condition.

If a fault occurs on a zone in Auto-Reset mode, then the Fault LED latches on steady until the end of Auto-Reset mode, even if the zone is programmed as non-latching.

Resetting or Isolating the zone will cancel the Auto-Reset test mode for the zone.
Also, if an operator attempts to test a zone already in Auto-Reset mode, the LCD will query whether the auto reset test for that zone should be stopped. To do so, press the “ACK” key, and the zone will be removed from Auto-Reset mode. Note the warning below.

7.5.4 EXIT TEST

To exit the test, RESET the zone as per Section 7.4.

WARNING:
During the test a detector on the zone may have gone into a permanent alarm. E.g. a fusible link heat detector could have been excessively exposed to heat during the test. Before resetting the zone, wait for some minutes and ensure that the ALARM LED is STEADY. If it is flashing during this period investigate for faulty detectors.

De-isolate the zone only when all alarm conditions have been cleared on the zone.

NOTES

(a) Multiple zones can be set to “AUTO-RESET” mode at the same time.

(b) “AUTO-RESET” mode cannot be entered if there is any Zone, Ancillary, Automatic, System, or Battery Test in progress.

(c) If any zone is in “AUTO-RESET” mode then it is not possible to perform a Zone, Ancillary, System or Battery Test.

(d) All programmed input time delays (e.g. alarm verification) are overridden to allow the basic operation of the detectors to be easily tested.

(e) The internal sounder is not operated by a zone in “AUTO-RESET” mode.

(f) All zones in “AUTO-RESET” mode will automatically return to normal operation after ONE HOUR from the latter of: a) any new zone being put into Auto-Reset test, or b) an alarm received on any zone in “AUTO-RESET” mode. However no reset signal is applied to the alarm zone circuits.

(g) This test is similar to the New Zealand FP4 and FP4000 fire alarms non-latching mode, except that with MX4428, only the selected zones are in Auto Reset test mode. All other zones function normally.

7.6 ZONE STATUS RECALLS

7.6.1 FUNCTION

Allows an operator to recall the status for a specific zone, or search for those zones meeting a specified criteria, e.g. in fault or alarm.

7.6.2 OPERATING SEQUENCE – ZONE STATUS

To recall a specific zone's status, press:

where nnn is the zone number. A networked zone may also be recalled, refer Section 2.4.1 for zone numbering details.

The first line of the LCD will show the zone number and any zone name programmed for that zone.

Note that there may be a delay between requesting a network zone status and display of the true status, due to network delays. In this case, MX4428 will display default text, i.e. just the network zone number, until the data is received. The display will update with the zone name and status when it is received.

The second line displays the zone alarm type text for that zone, followed by its status.

The status consists of any of the following:

Prealm	- the zone is in prealarm.
Alarm	- the zone is in alarm.
Oprte	- the ACZ is operated.
Fault	- the zone is in fault.
Isol	- the zone is isolated.
Test	- the zone is currently being tested.
Arst	- the zone is currently being auto reset tested.
Reset	- the zone is currently being reset.
Normal	- the zone is none of the above.

The status returned by non-MX4428 FIPs may be different.

To view the status of other zones, press:

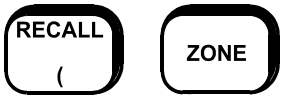
to view the status of the next zone.

To view the status of the previous zone.

7.6.3 OPERATING SEQUENCE – ZONE SEARCHES

The zone search functions allow an operator to query the local FIP and other networked FIPs for zones meeting specified status criteria, e.g. in alarm.

To start a search from the base display, or any information display, press:



Then select the option required. Valid options are:

Menu 1:

1	Status	-	zone status (Refer 7.6.2)
2	Alarms	-	search for any zones in alarm, whether or not they are isolated.
3	Faults	-	search for any zones in fault, whether or not they are isolated.
4	More	-	accesses Menu 2.

Menu 2:

1	Isolates	-	searches for any zones that are isolated.
2	Off Normal	-	searches for any zones that are not normal.
3	Pre-alarm	-	searches for any zones that are in pre-alarm.
4	More	-	accesses Menu 1.

The MX4428 searches itself for a zone that meets the specified criteria from ACZ 0 up to the programmed maximum LCD zone. If none is found the MX4428 then polls the other FIPs on the network to determine whether they have any zones that meet the criteria.

Once a zone is found that meets the criteria specified, the LCD display reverts to a zone status display for that zone. When the NEXT or PREV key is pressed, the search continues for the next or previous zone, respectively, that meets the original search criteria. The LCD displays “Searching” while this takes place.

If no zones matching the criteria are found, the LCD briefly displays a message, and reverts to the base display.

Note that due to network and remote FIP processing delays, a zone search command may take some time to complete, especially for larger systems with no zones that match the search status.

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CHAPTER 8 OPERATING INSTRUCTIONS – POINT FUNCTIONS

8.1 ANALOGUE RECALLS

8.1.1 FUNCTION

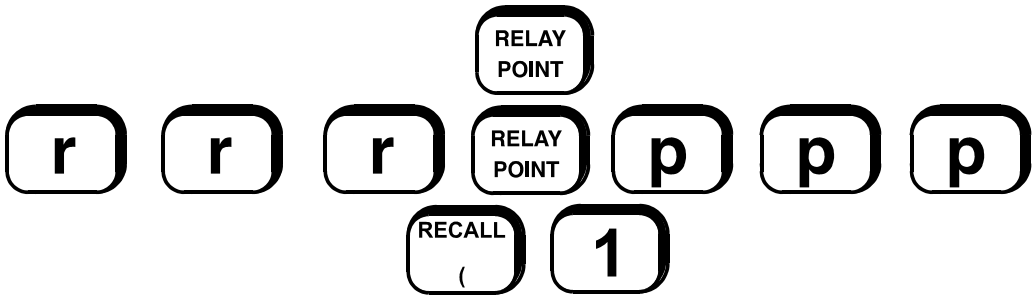
Allows an operator to recall the status or analogue values for a particular point, or, with AAR, MPR or MXP support, search for those points meeting a specified criteria, e.g. in Dirty Alert or in Pre-alarm.

When viewing a recall for a specific point, pressing the 1, 2, 3 or 4 keys will make the recall show Status, Analogue Values, Analogue Levels and % Dirty, respectively, for that point. This functionality is not available when running Point Status or Point % Dirty searches.

In the following Point Functions, if no point number is entered or the point does not exist, then the first or next configured point will be automatically used.

8.1.2 OPERATING SEQUENCE – SPECIFIC POINT STATUS

To recall a specific point's status, press:



where rrr is the responder number and ppp is the point number.

The FIP will display the status of the point. Only those states that are active are shown. The possible displays for a point are:

PreAlm	-	the point is in pre-alarm.
Alarm	-	the point is in alarm.
Fault	-	the point is in fault.
Dirty	-	the point has exceeded contamination limits and needs cleaning.
Scan1	-	the responder cannot communicate with the point on Line 1.
Scan2	-	the responder cannot communicate with the point on Line 2.
NodeF	-	the responder cannot communicate at all with the point.
Isol	-	the point is isolated.
CBF	-	the output device has failed to operate.
Oprte	-	the output point is operated.
Normal	-	the point has none of the above off normal conditions.

The LCD briefly shows an asterisk, "*", in the top right hand corner of the display when the data is updated.

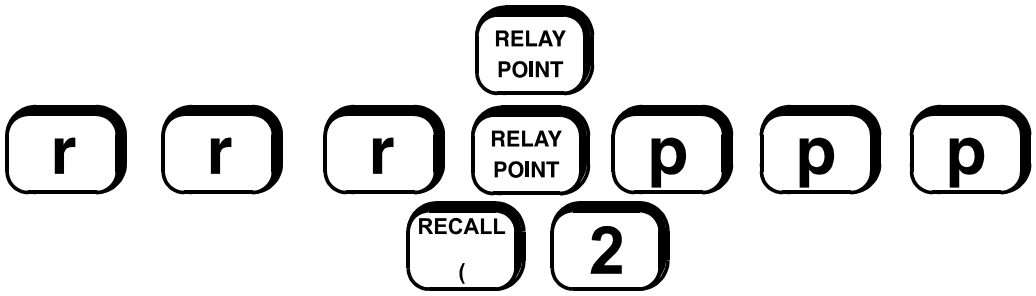
To view the status of other points, press:

to view the status of the next configured point.

To view the status of the previous configured point.

8.1.3 OPERATING SEQUENCE – SPECIFIC POINT ANALOGUE VALUES

To recall a specific point's raw analogue values, press:



where rrr is the responder number and ppp is the analogue point number.

If this command is entered for an ADR/ARR point, the display will show "No Recall Information Available".

The FIP will poll the responder for the analogue values for the point and display them. The LCD briefly shows an asterisk, "*" ,in the top right of the display whenever new data for one of the analogue values is received. The FIP polls for the current value more often than the other analogue values.

To view the analogue values of other points, press:

to view the analogue values for the next configured point.

to view the analogue values for the previous configured point.

The analogue value display shows the point type and for multi-sensor devices their operating mode.

The operating mode display is formatted as "pp-q", where

pp can be:	En	- Smoke/CO enhanced by thermal Rate of Rise
	Nm	- Normal Smoke/CO operation
	Ho	- Heat only operation
q can be:	X	- Thermal alarms disabled
	A	- Type A Rate of Rise with default alarm sensitivity
	B	- Type B Fixed Temperature with default alarm sensitivity
	R	- Rate of Rise with individual alarm sensitivity
	F	- Fixed Temperature with individual alarm sensitivity

Note: a device with disabled Thermal alarms can still use Rate of Rise to enhance the Smoke/CO alarm algorithms.

Additionally, there are four values labelled as: CV; TV or ROR; HH or H%; HL or HR or TC. The type of data displayed for each of the four values is dependent upon the point type, and in some cases the responder type. Table 8.1 and the following information describe the possible values. Refer to the AAR/MPR/MXP Technical Manuals for descriptions of these values.

For CV displays, the following types of data are shown:

CV	- Current Value (smoothed raw value).
RAW	- Raw Value (not smoothed).
TC	- Temperature CV (smoothed and converted to degrees).
SLTP	- Step Limited Temperature.

For TV/ROR displays, the following types of data are shown:

TV	- Tracked Value (heavily filtered raw value).
ROR	- Temperature Rate of Rise.
SLROR	- Step Limited Temperature Rate of Rise.
RAW	- Raw Value (not smoothed).

For HH/H% displays, the following types of data are shown:

HH	- History High of CV.
SLHH	- History High of Step Limited CV.
SLH%	- History High Percentage of Step Limited CV.

For HL/HR/TC displays, the following types of data can be shown:

HL	- History Low of CV.
SLRORHH	- History High for Step Limited Temperature Rate of Rise.
TC	- Temperature CV.
SLHL	- History Low of Step Limited CV.

For EWD devices, all values are displayed in the range 0-31. For 130 series and MX devices, all values are displayed in the range 0-255.

A detector's CV value shows the current level of smoke/CO/temperature. This value is used in the generation of Pre-alarms, but Alarms are generated after the CV has been further processed by the Count-of-3, SmartSense, or FastLogic algorithms (in general the slope limited values).

The other values are calculated from CV directly, or result from the output of the Count-of-3, SmartSense, or FastLogic algorithms. Refer to Table 8.1 and the relevant manual.

H% values (shown only for 850PH/814PH(FL), 850PC/801PC/814CH and VLC800 detectors) are a combination of the actual percentage of alarm level reached and an indicator of which sensor produced that level. They are interpreted as follows:

- To calculate the actual percentage of alarm, round down to the nearest 5%, e.g. 91% becomes 90%, 47% becomes 45%.

- To determine which sensor produced this level, use the remainder from the above calculation, e.g. 91% becomes 1, 47% becomes 2.
- 0 = Smoke or CO
- 1 = Fixed Temperature
- 2 = Temperature Rate of Rise

The Count-of-3, SmartSense, or FastLogic algorithms produce an output that is used to generate alarms, and the maximum and minimum of that value is reflected in a detector's HH, H% and HL values.

Note: Some devices do not show values that directly relate to TV, HH or HL. In general these are input/output modules, and call points. Refer to Table 8.1.

DEVICE TYPE	CV	TV/ROR	HH/H%	HL/HR/TC
C7xA	CV	TV	HH	HL
P7xA	CV	TV	HH	HL
ADU002A	CV	-	HH	HL
ADU003A	RAW	-	-	-
ADU004	RAW	-	-	-
ADU006	CV	-	HH	HL
Z54A	CV	-	HH	HL
C131A (& Mk2)	CV	TV	HH	HL
P131A (& Mk2)	CV	TV	HH	HL
P132A *3	CV (Step Limited)	TV	HH	HL
T131A-A *1 (& Mk2)	TC	ROR	HH	HL
T131A-A *2 (& Mk2)	SLTP	SLROR	SLHH	SLRORHH
T131A-B *1 (& Mk2)	TC	ROR	HH	HL
T131A-B *2 (& Mk2)	SLTP	SLROR	SLHH	SLRORHH
ADC130	RAW	-	-	-
ADM13X	RAW	-	HH	HL
850PC / 801PC	CV (CO)	CV (Smoke)	% Dirty (Smoke)	TC
850P(FL)/850PH(FL) 814P(FL)/814PH(FL)	CV (Smoke)	TV (Smoke)	SLH%	TC
850H / 814H / Virtual Heat Point	TC	ROR	SLHH	SLRORHH
814CH / Virtual CO + Heat Point	CV (CO)	TV (CO)	SLH%	TC
814I	CV	TV	SLHH	SLHL
CP820 / CP830 / MCP820 / MCP830	RAW	-	HH	HL
CIM800 (combined inputs)	RAW (Input 1)	RAW (Input 2)	HH (Both)	HL (Both)
CIM800 (split inputs)	RAW (Input)	0	HH	HL
MIM800	RAW	-	HH	Hl
MIM801	RAW	-	HH	HL
DIM800	RAW (Input 1)	RAW (Input 2)	HH (Both)	HL (Both)
DDM800	RAW (Input A)	RAW (Input B)	HH (Both)	HL (Both)
SAB801	-	-	-	-
SAM800	-	-	-	-
RIM800	-	-	-	-
SNM800	RAW (EOL)	RAW (Supply)	HH (EOL)	HL (EOL)
LPS800	Analogue i/p 0 (while not operated)	Analogue i/p 1 (while not operated)	History High of analog i/p 0 (while not operated)	History Low of analog i/p 0 (while not operated)
VLC800	CV	TV (Fixed)	H%	-
S271f+	CV	-	HH	HL
AZM800 (Real – Smoke)	Analogue Input AI0	-	HH	HL
AZM800 (Virtual – Heat)	Analogue Input AI1	-	HH	HL

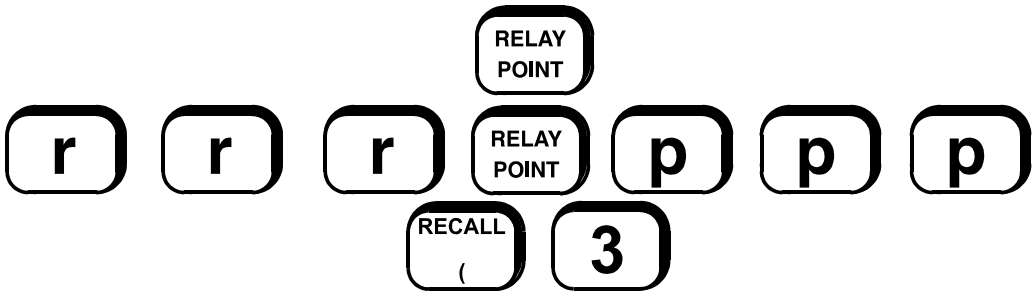
*1 = For MPR V2.00
*2 = For MPR V2.10 or later
*3 = For MPR V2.21 or later

'-' indicates not supported, value of 0 displayed.

TABLE 8.1
ACTUAL INFORMATION RETURNED FOR ANALOGUE VALUES RECALL

8.1.4 OPERATING SEQUENCE – SPECIFIC POINT ANALOGUE LEVELS

To recall a specific point's analogue levels in appropriate units press:



where rrr is the responder number and ppp is the analogue point number.

The FIP will poll the AAR, MPR or MXP for the required information for the point and display the analogue levels. The LCD briefly shows an asterisk, "*" ,in the top right of the display whenever data for the analogue levels is updated.

The raw analogue value display (option 2) shows the data "as sent" from each point. This may include the effect of detector contamination, etc.
The Analogue Level display (option 3) removes these effects, and displays (using appropriate units) the actual level of smoke being detected (for smoke detectors), carbon monoxide (for CO detectors), temperature (for thermal detectors) and temperature rate of rise (for thermal detectors with ROR enabled). For multi-sensor devices, the device's current temperature is also displayed. Also shown is the appropriate pre-alarm and alarm sensitivities for the detector. Note: for multi-sensor devices only the Smoke/CO sensitivities are displayed.

Note that the temperature reading of the T131A heat detector is only accurate in the range of 50°C to 70°C. At room temperature (e.g. 25°C) the error in the temperature reading is typically ±10°C. If the temperature displayed is 20°C then the actual temperature could be anywhere below 30°C. If the temperature displayed is below 20°C, then the value returned by the sensor is invalid and a fault may be generated. The temperature reading of 850H/814H, 850PC/801PC/814CH and 850PH/814PH detectors is ±2°C.

There may be a brief delay before the current level (CL) value is displayed, while the FIP is retrieving all of the information required before the CL calculation can be made. Similarly these may be a delay before any multi-sensor device's Current Temperature (TC) is displayed.

If this command is entered for an ADR/ARR point, the display will show "No Recall Information Available".

Display Formats

The display for analogue detector analogue levels is:

CL:m n PS:p AS:q xxx T:tC

where m = Detector's current analogue level
n = Type A or C thermal detector rate of rise
p = Detector's pre-alarm sensitivity
q = Detector's alarm sensitivity
xxx = Appropriate units for current level and sensitivity, i.e. %/m, MIC X,

DegC, Coppm, FL%/m (FastLogic), or %ALM (VLC800)

T:tC = Shown only for multi-sensor devices, Current Temperature t in °C.

Analogue points that are not smoke, CO or heat detectors display current levels as:

CL:0 PS: AS:

I.e. CL is forced to 0 and the sensitivities are left blank as they are not appropriate.

To view the current levels of other points, press:

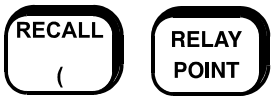
to view the analogue levels for the next configured point.

To view the analogue levels for the previous configured point.

8.1.5 OPERATING SEQUENCE – POINT SEARCHES

The point search functions allow an operator to search for points meeting specified status criteria, e.g. in dirty alert. (Note that the AAR must support the search functions. If the AAR does not support these functions, the search will complete with no points found. MPRs and MXRs support all of the search functions. The FIP itself processes searches on behalf of ADRs and ARRs).

To start a search from the base, or any information display, press:



Then select the option required. Valid options are:

Menu 1:

1	Status	-	specific point status and analogue value recalls (Refer 8.1.2, 8.1.3 and 8.1.4).
2	Alarms	-	search for any points in alarm.
3	Pre-alarm	-	search for any points in pre-alarm.
4	More	-	accesses Menu 2.

Menu 2:

1	Faults	-	searches for any points in fault.
2	DirtyAlrt	-	searches for any detectors in the dirty alert state.
3	Off Normal	-	searches for any points with off-normal status.
4	More	-	accesses Menu 3.

Menu 3:

1	Isolate	-	searches for isolated points.
2	% Dirty	-	searches for detectors exceeding a specified level of contamination.
4	More	-	accesses Menu 1.

When the point status search option has been selected, the search begins and the LCD displays “Searching....”

If the % Dirty search option is selected, a prompt requests entry of a % Dirty value. Enter a number between 0 and 100. The search will find all detectors that have a calculated % Dirty value greater than or equal to the entered number.

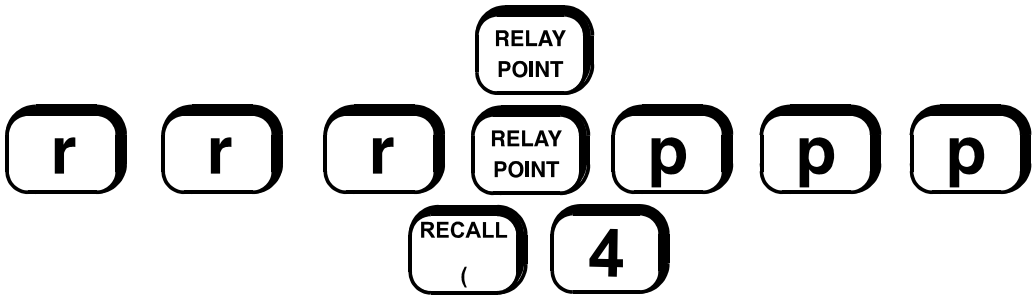
The FIP queries each responder for any points meeting the selected criteria.

Once a point is found, the LCD display reverts to a point status recall for that point, or the % Dirty Detector display if % Dirty Search was selected. When the “NEXT” or “PREV” key is pressed, the search continues for the next or previous point, respectively, that meets the original search criteria.

If no points are found, the LCD briefly displays a message, and reverts to the base display.

8.1.6 OPERATING SEQUENCE – SPECIFIC POINT DETECTOR DIRTY LEVEL

To recall a specific point’s % Dirty level press:



where rrr is the responder number and ppp is the analogue point number.

The FIP will access its internal database for the required information for the point and display the % Dirty level.

The LCD briefly shows an asterisk, “*”, in the top right of the display whenever data for the % Dirty display is updated.

% Dirty information is displayed only for MPR and MXP smoke detectors. For all other points there is no % Dirty level, thus the MX4428 displays “No Recall Information Available”.

Display Formats

The display for point detector dirty levels is:

%D: m% TV:n CM:p UT:q AS:r

Where m = Detector’s current % Dirty level
n = Detector’s Tracked Value
p = Detector’s Maximum Clean Air Level
q = Detector’s Upper Tracking Limit
r = Detector’s Alarm Sensitivity

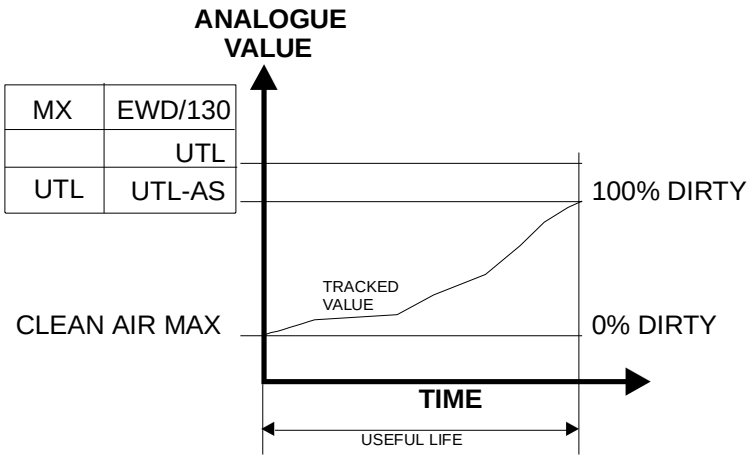
To view the % Dirty levels of other points, press:

to view the % Dirty level for the next configured point.

To view the % Dirty level for the previous configured point.

NOTES:

One measure of the useful life of a detector is how far its Tracked Value (TV) has shifted from its "as manufactured" clean air value "Clean Air Max" towards the Upper Tracking Limit (UTL). UTL, combined with the detector's Alarm Sensitivity "AS" (EWD/130 Series devices only), determines the maximum TV at which the detector's sensitivity is unaffected. The increase in TV over time is usually a result of contamination.



The % Dirty level of a detector is then determined by calculating how far between Clean Air Max and UTL(MX) or UTL-AS (EWD/130 series) the TV is.

Searching for detectors that are more than, say, 80% dirty allows for cleaning of those detectors before they start becoming more sensitive, and/or Dirty Alert is signalled for that detector.

The % Dirty display uses data stored at the FIP. It does not poll the responders for necessary data, but instead relies upon the responders to refresh the required data. As a result, there is a short time between the starting of responder polling, or after a database transfer to a responder, and the display of useful % Dirty values. A TV display of 255 will usually indicate that the refreshing of a point has not been started. Recalling the point's raw values before recalling its % Dirty level will speed up the display of useful % Dirty values.

AARs and MPR V1.X cannot refresh the required data, thus % Dirty cannot be calculated for detectors connected to these responders.

With the C131A-Mk2 ionisation detector the compensation is done within the detector, and the tracked value does not change until the detector goes dirty. Therefore the % Dirty for the C131A-Mk2 will always be 0, even when the detector is signalling Dirty Alert. Additionally, the C131A-Mk2 will go into fault when it reaches Dirty Alert (as the analogue value it produces for Dirty Alert is actually in the fault band).

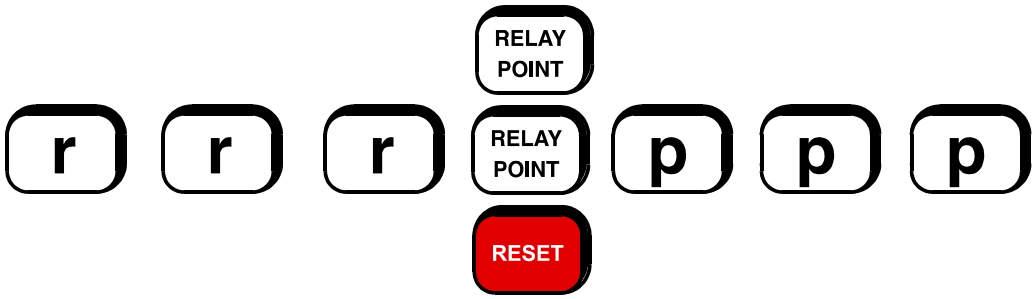
8.2 ANALOGUE DETECTOR HISTORY, TRACKING, DEVICE RESET

8.2.1 FUNCTION

Allows an operator to reset the analogue history or tracked value for a detector, or turn the detector's LED off.

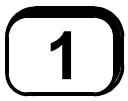
8.2.2 OPERATING SEQUENCE

To reset an analogue detector's History or Tracked Value, or to apply a reset to the detector itself, press:



where rrr is the responder number and ppp is the analogue point number.

The LCD prompts for the type of reset required, press:



to reset the point, i.e. turn LED off, and force detector to normal.

To reset the detector history high and low values.

To reset the detector tracking, history high and low values.

8.2.3 NOTES

(1) The analogue history can be used to see fluctuations in a detector's analogue value, and allow adjustment of the sensitivity accordingly.

(2) When a detector is replaced its history and tracked value should be reset. This ensures that the actual sensitivity of the detector is not increased or decreased due to the tracked value of the previous detector. If the tracked value was not reset, the result could be false alarms, or alternatively, annunciation of a true alarm may be significantly delayed.

It is important that the detector is in clean air for 5 minutes before and 5 minutes after the reset tracking command is entered. If this condition is not met, the detector tracked value could be unnecessarily elevated, which may delay annunciation of alarms.

(3) For ADR and ARRs, the input points (1-4) can be reset. Output points (5-8) cannot be reset, and resets of tracked value and history on any points (1-8) cannot be done as these functions are not supported.

8.3 RECALL DETECTOR SENSITIVITIES

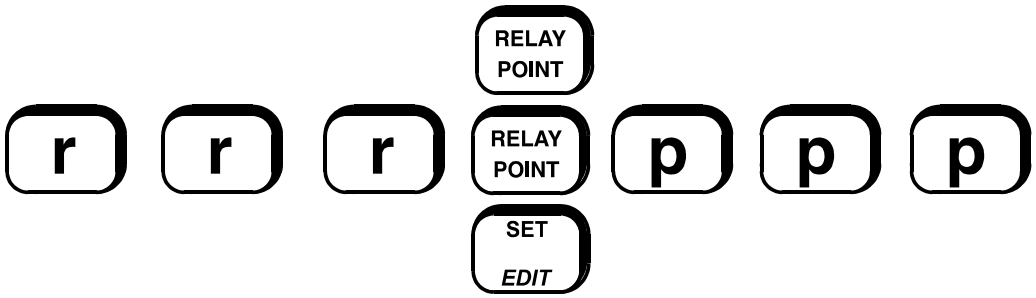
8.3.1 FUNCTION

To allow an operator to view the Pre-Alarm and Alarm Sensitivities of analogue detectors.

8.3.2 OPERATING SEQUENCE

From the point recall status display for the specified point, press:

From the base display or any other information display, press:



where rrr is the responder number (1-127) and ppp is the point number (1-200).

The FIP will check to see that the point rrr.ppp is in fact an addressable detector for which the alarm or pre-alarm sensitivity can be viewed.

The LCD will display the point number and type, and prompt for viewing of or changes to the pre-alarm or alarm sensitivity. Press:

To view the Pre Alarm sensitivity, or

To view the Alarm sensitivity.

The LCD then displays the point number and type, along with current setting for the selected sensitivity.

The current setting is displayed in the form “t sss uuu” where:

t = D – Default sensitivity
A – Alternative sensitivity
I – Individual sensitivity

sss = the sensitivity setting.

Uuu = the appropriate units: MIC X, %/m, DegC, Coppm, FL%/m (FastLogic), %ALM.

Some devices, e.g., ADR inputs, do not support sensitivities, while for others the sensitivity cannot be programmed or easily determined, e.g., 850PHFL/814PHFL FastLogic prealarm sensitivity. In these situations MX4428 displays “Not adjustable”.
For 814PHFL, all Fastlogic sensitivity settings correspond to a nominal sensitivity of 8%/m

obscuration when tested to the AS 2362 method 17-2001 sensitivity test.

Press:

to step back one menu level.

To step to the next analogue detector.

To step to the previous analogue detector.

8.3.3 ANALOGUE LEVEL VERSUS SMOKE AND CO DENSITY

Analogue smoke and CO detectors measure the amount of smoke or CO in their chamber and convert it to a number. This number is sent to the AAR, MPR or MXP, and processed to determine what condition exists.

For smoke detectors the analogue responder compares the current number returned by the detector with a heavily filtered historical number, thereby cancelling the effects of contamination. The result of the comparison is an indication of the actual amount of smoke present. The CO detector returns the actual level of CO present (no compensation is allowed). When the amount of smoke or CO exceeds the programmed sensitivity setting an alarm condition is annunciated.

The sensitivity setting for a detector can be adjusted to allow it to respond to smoke or CO sooner, or alternatively, to respond to smoke or CO later, e.g. to reduce the effect of phenomena that produce conditions similar to smoke or CO.

To **increase** the detector sensitivity to smoke or CO (i.e. generate alarm earlier), the sensitivity setting is **decreased**.

To **decrease** the detector sensitivity to smoke or CO (i.e. generate alarm at a higher level of smoke), the sensitivity setting is **increased**.

The analogue thermal detectors return numbers that correspond to temperature. An alarm is generated when the measured temperature exceeds the programmed sensitivity setting. In addition, Type A detectors monitor the rate that the temperature is rising, and if it exceeds the programmed limit for Rate of Rise, an alarm condition is annunciated.

The default sensitivities and approved sensitivity ranges for the various detectors and modes are shown in the following tables.

MX4428 FACTORY DEFAULT SENSITIVITY SETTINGS [1]					
	DEFAULT			ALTERNATIVE	
DEVICE	PRE-ALARM	ALARM	RATE OF RISE	PRE-ALARM	ALARM
C7xA	0.35MICX	0.42MICX	-	0.19MICX	0.27MICX
P7xA	5.4%/m	7.1%/m	-	5.4%/m	7.1%/m
C131A	0.33MICX	0.39MICX	-	0.19MICX	0.23MICX
C131A-MK2	0.33MICX	0.4MICX	-	0.19MICX	0.23MICX
P131A	6.4%/m	8.0%/m	-	4.9%/m	6.0%/m
P131A-MK2	6%/m	6.0%/m	-	6.0%/m	6.0%/m
P132A	1.0%/m	2.0%/m	-	-	-
2251BAUS	6%/m	6.0%/m	-	6.0%/m	6.0%/m
T131A-A (& Mk2)	50°C	63°C	14C/min	-	-
T131A-B (& Mk2)	50°C	63°C	0C/min [2]	-	-
850PH [6] 850P [6] [9]	56°C	5.3%obs/m / 63°C	A2R		
850PHFL [6] 850PFL [6] [9]		MEDIUM (2.9%obs/m)	A2R		
814PH [3] [4] [6] 814P [2] [4] [6] [9]	9.3%/m/56°C	12%/m/63°C	(12C/min) 14C/min	7%/m	8%/m
814PHFL [4] [6] 814PFL [4] [6] [9]	-	MEDIUM (8%/m[8])	(12C/min) 14C/min	-	-
850H	56°C	63°C	A2R / CR	-	-
814H [4]	56°C	63°C	(12C/min) 14C/min	-	-
850PC (801PC[11])	56ppm/56°C	13.4%obs/m / 66ppm / 63°C	A2R		
814CH [3] [4] [5]	32ppm/56°C	38ppm/63°C (0.30 MICX)	(12C/min) 14C/min	56ppm	66ppm (0.60 MICX)
814I	0.26 MICX	0.39 MICX	-	0.19 MICX	0.22 MICX
VLC800 [7]	68%ALM	100%ALM	-	-	-

Note (1): These defaults are based upon the results of approval tests in an Australian standard smoke room.

(2): A Rate of Rise setting of zero disables Rate of Rise monitoring.

(3): The alternative sensitivity for multisensor devices is for smoke/CO only. There is no alternative heat sensitivity.

(4): For Rate of Rise, the first value in brackets is the Prealarm level, the second is the Alarm level.

(5) For 814CH alarm sensitivities, the MICX values are approved settings for the device when approval tested as an ionisation smoke detector.

(6) By default, 850PH/814PH and 850PHFL/814PHFL devices do not alarm on temperature rate of rise.

(7) The actual sensitivity for VLC800 is set at the VLC800.

(8) All MX FASTLOGIC settings correspond to a nominal sensitivity of 8% Obs/m when tested to AS2362 Method 17-2001 Sensitivity test.

(9) The 850PH/814PH settings also apply to the 850P/814P settings, with the exception of the heat alarm thresholds, as there is no heat sensor in an 850P/814P.

(10) Even though the same sensitivity settings apply in, and are shown by, the

MX4428 for the P131A and the P131A-Mk2 detectors, the MPR automatically adjusts the sensitivity for the P131A-Mk2 from 8%/m to 6%/m.

(11) The 801PC is listed for NZ use only.

The C131A, P131A, P132A, 850PH, 814PH, 801PC, 850PC, 814CH, 814I, 814H, 850H, and VLC800 smoke detectors have an approved range of sensitivity as noted below.

DETECTOR	APPROVED SENSITIVITY RANGE
C131A	0.15 to 0.39 MICX
C131A-MK2	.15 – 0.4 MICX
P131A	5.2 to 9.0%/m
P131A-MK2	6%/m
P132A	0.5 to 8.0%/m (0.5 to 4.0%/m recommended)
2251BAUS	6%/m
814PH/814P	8.0 to 12.0%/m
814PHFL/814P	LOW, MEDIUM, HIGH (8.0%/m) (2)
850PH/850P	Low – 5.3%obs/m, Normal – 4.5%obs/m, High – 3.9%obs/m
850PHFL/850PFL	Low – 3.2%obs/m, Medium – 2.9%obs/m, High – 2.7%obs/m
850PC/801PC (4) (CO)	Universal – 34ppm, Resilient – 66ppm
850PC/801PC (4) (Smoke)	Universal – 11%obs/m, Resilient – 13.4%obs/m
814CH	23 – 66 CO ppm(1)
814I	0.2-0.4 MICX (AUS) 0.2-0.6 MICX (NZ)
814H, 814PH (heat), 814CH (heat), 814PHFL (heat)	60-93°C (AUS) 50-80°C (NZ)
850H, 850PH (heat), 850PC (heat), 850PHFL (heat)	63°C & 93°C (850H only)
VLC800 (3)	0.005%/m – 20%/m

(1) For the 814CH 66ppm is outside the approved range for this detector as an ionisation detector. However it is an acceptable value as a CO detector.

(2) All three MX FASTLOGIC settings correspond to a nominal sensitivity of 8% Obs/m when tested to AS2362 Method 17-2001 Sensitivity test.

(3) Adjustment of the sensitivity of a VLC800 within the approved sensitivity range is made at the VLC800 itself.

(4) The 801PC is listed for NZ use only.

Note that when detectors are used for AS 1668.1 smoke control the maximum permitted sensitivity is 8%/m.

Note that the performance of detectors may be affected by air velocity, temperature, altitude and applied voltage.

8.4 POINT ISOLATION

8.4.1 FUNCTION

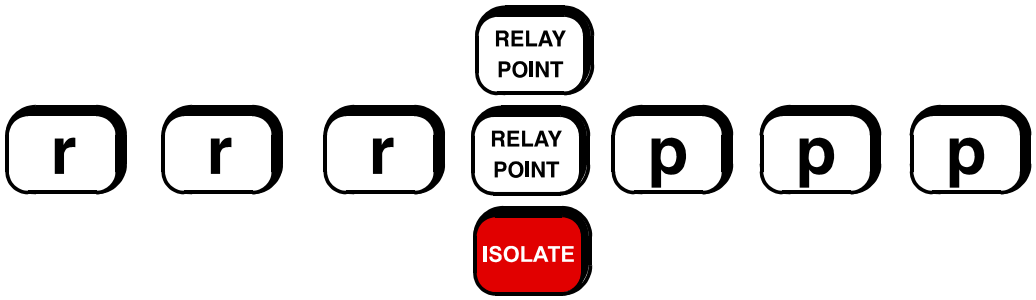
Allows an operator to isolate points on an MPR or MXP. The isolation status is stored and maintained at the responder, and is recallable on the FIP display.

An isolated point continues its normal operation, except that its status does not affect any circuits or zones.

Isolating a point also allows a dirty or faulty device to be replaced with a new one and for the address of the new device to be automatically re-addressed to that of the removed one. Refer Section 10.4.

8.4.2 OPERATING SEQUENCE

To isolate a point, press:



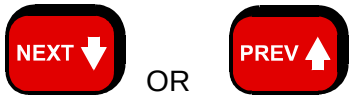
where rrr is the responder number and ppp is the analogue point number.

The LCD displays the current alarm, fault and isolate status for the point. To change the isolate state, press:

The display will show that the command has been sent to the responder.

When confirmation has been received from the responder, the LCD display reverts to a point status display. It may take a few seconds for the new point isolate status to be shown.

The point selected can be stepped forwards or backwards by pressing:



8.4.3 NOTES

(1) The LCD will immediately display “Responder type cannot isolate points” if the point is on a responder NOT configured for point isolation. The LCD will display “Responder ignored isolate/de-isolate cmd” if an isolate/de-isolate command is not confirmed (usually due to misconfiguration of the system).

(2) Point Isolation status is stored in the responder’s database, and may be lost if the responder is powered down for a long period. If this happens, all points become de-isolated.

CHAPTER 9 PLACING INTO OPERATION

9.1 GENERAL

This chapter describes the correct procedure to place into operation a correctly aligned and adjusted MX4428 LCD FIP.

Before undertaking any activities, inspect the cabinet interior and check that all panel equipment is securely mounted, and that all cables are connected at the appropriate points.

The FIP's main components are accessed when the inner door is opened.

(a) MAINS POWER SUPPLY/BATTERY CHARGER

A modular unit capable of supplying power to run the FIP, attached Responders, auxiliary devices, and to charge the standby batteries as required by AS4428.1 or NZS4512.

(b) MAIN BOARD

Contains all the FIP processing power and interfaces to all system inputs and outputs. It provides:

i. Communication links to the Responders, RDUs, programming terminal, etc.
ii. Output status data to the FIP indicators, relays to signal the Brigade, activate External Bell or Warning System, control ANCIL 0, etc.
iii. Inputs from the FIP keypad.

(c) LCD KEY BOARD

Provides the keypad for operator / Brigade control of the FIP, plus LEDs indicating the state of selected common and supervisory outputs (e.g. – MAINS ON, SYSTEM FAULT, etc.), and an LCD display.

(d) LED DISPLAY BOARD

An optional module used to display the ALARM, FAULT and ISOLATE conditions of up to 16 zones. 64 zones can be displayed per 7U module and the total number of zones per cabinet will depend on the cabinet size. The ALARM, FAULT and ISOLATED conditions of each zone are indicated by separate LED indicators.

(e) NZ MODE DISPLAY EXTENDER BOARD

A module fitted to New Zealand mode FIPs only. This provides the extra NORMAL, FIRE and DEFECT indications, and other output and inputs required for New Zealand mode operation. It mounts in the same manner as a standard MX4428 Display board.

9.2 MAINS ISOLATE SWITCH

To switch the MX4428 LCD FIP panel ON or OFF, first open the front protective door and the inner display door.

The “MAINS ISOLATE SWITCH” is located at the top of the cabinet rear. It controls the mains power supply to the panel, including the battery charger. Its normal position is ON, and should only be turned OFF (i.e. MAINS ISOLATED) when testing that the FIP will run on batteries, or for maintenance.

NOTE: The Battery is not disconnected by the “MAINS ISOLATE SWITCH”.

9.3 POWER UP

To place a correctly installed MX4428 LCD FIP into operation, perform the following steps:

STEP 1 Ensure that the Mains Isolate Switch is OFF.

STEP 2 Ensure that 240 VAC is available to the panel from the mains distribution switchboard.

STEP 3 Turn the Mains Isolate Switch ON.

STEP 4 For a New Zealand mode FIP the “NORMAL” LED should be off and the “FIRE” and “ALARM” LEDs should be flashing. The “CHGR/BATT FAULT” and “DEFECT” LEDs should also be flashing. Press the “RESET” key followed by the “ACK” key to turn off the ALARM, “FIRE” and “CHGR/BATT FAULT” LEDs. The “DEFECT” LED should remain flashing.

STEP 5 Check that the keyboard green “MAINS ON” LED indicator is illuminated.

The LCD should be displaying the “Powering Up” message, the time and date and any programmed system name.

Wait until the “Powering Up” message is replaced by “A fault is present in the system” and the ‘CHGR/BATT FAULT” LED starts flashing. Note that as Battery Disconnect monitoring is enabled, there will be a Battery Disconnect fault present until the batteries are connected.

STEP 6 Install and connect the Batteries. After 30 seconds the “CHGR/BATT FAULT” should disappear (if the battery is charged), and for an NZ panel the NORMAL LED comes on.

STEP 7 Perform a Battery Test.
If Battery Test fails; check battery connections; if battery flat, leave for 24 hours and retest.

STEP 8 Perform a System Test.

9.4 COMMISSIONING CHECKLIST

The following commissioning checklist should be copied and completed upon commissioning of the MX4428 FIP LCD. It should be placed with other System Configuration Information.

9.4.1 CABINET

A)	Cabinet colour – Standard Cream Wrinkle (BFF 998 CW)…….....	
	- Other.....……..……..	
B)	Cabinet undamaged (Paint OK).....……...	
C)	Doors aligned OK.....……...	
D)	Windows undamaged and fitted correctly.....……..	
E)	MCP fitted and undamaged.....……..	
F)	Cabinet Door locks firmly.....……..	
G)	Cabinet Sealed – To dust level only (check top entries)...……..	
	- To other: Specify.....……..	
H)	Display Window undamaged and fitted correctly.....……	

9.4.2 POWER SUPPLY

A)	Number of Power Supplies Fitted (1 to 3).....….....	
B)	- If more than 1, Configuration Master/Slave/Slave OK.....	
C)	Mains Wired correctly, Cover secured.....……..	
D)	“Mains Isolate Switch” and “Mains Earth” labels fitted...……	
E)	Mains Earth wired correctly and securely fitted.....……	
F)	Mains Voltage Level – 240 VAC +6% -10%.....……	VAC
G)	Charger Voltage at Batt + (27.25 – 27.35 VDC).....…….	VDC
H)	Quiescent Panel Current (FROM BATTERY).....……	A
I)	Panel ALARM current (TWO ZONES, FROM BATTERY).....…..	A
J)	Battery Fitted – Type..... : Rating	Ah

9.4.3 MAIN BOARD

A)	Fitted correctly and securely on standoffs.....	
B)	Main PSU Loom fitted correctly.....	
C)	PSU Monitor FRC Loom fitted correctly.....	
D)	LCD/Keyboard FRC Looms fitted correctly.....	
E)	MCP wires fitted to J18 (MCP).....	
F)	Microswitch wires fitted to J40 (Inner Door).....	
G)	If fitted, Outer Door switch wired to J41.....	
H)	Earth wires fitted correctly (2 off).....	
I)	If fitted, Bell Monitor Board fault connect to ODR……..……	

9.4.4 DISPLAY(S) / KEYBOARD

A)	Total Number of Display Boards : _____ fitted OK.....……..	
B)	Display LEDs aligned OK and all intensities similar .....…….	
C)	Indicators hard against display window .....……..	
D)	FRC connectors secure .....……..	
E)	“Last Board Link” in place .....(NOT APPLICABLE NZ MODE)……..	
F)	Zone Identification Label fitted behind display .....……	
G)	Unused display windows masked with paper .....……..	
H)	System Status LEDs on Keyboard aligned OK .....……	
I)	Keypad Operation OK .....……..	
J)	NZ Display Extender Fitted (NZ Panels Only) .....……	

9.4.5 OPERATION

A)	Normal Operation – Only “MAINS ON” LED ON	
	Plus NORMAL Indicator (NZ Mode Only)	
B)	System Test OK.....	
C)	Battery Test OK	
D)	Display Test OK	
E)	External Bell Test OK.....	
F)	Warning System Test OK.....	
G)	FIP MCP Programmed to Zone 1; Other: _____OK	
	RDU MCPs Programmed to 1:Z____ 2:Z____ 3:Z____ 4:Z ____	
	5:Z____ 6:Z____ 7:Z____ 8:Z ____	
H)	Operate MCP(s), Alarm generated.....	
I)	External Bell Operated	
J)	Warning System Operated.....	
K)	External Bell Isolate function and indication OK.....	
L)	Warning System Isolate function and indication OK.....	
M)	Sounder operates on alarm & fault OK	
N)	“RESET” clears ALARM condition OK	
O)	Standby, Fault, Isolate, Alarm Relays operate OK	

9.4.6 INSTALLATION CHECKLIST

A)	All detectors listed in Appendix A	
B)	Number of detectors per circuit not exceeded	
C)	Detectors suitable for environment.....	
D)	Detectors and FIP located according to standards	
E)	Measure and Record AZC alarm & fault voltages	
F)	Open and Short circuit each EOL – fault & alarm generated.....	
G)	Alarm and Fault test all AZC zones.....	
H)	Switch on/off AC 5 times – No false alarms	
I)	All detectors generate alarm on correct zone	
J)	All MCPs generate alarm on correct zone	
K)	All Ancillary Control Zone outputs tested	
L)	MAF test to Fire Control Station	
M)	All zones labelled according to location / function	
N)	Australian or New Zealand Mode	
O)	New Zealand Mode – Display Extender	
	- Brigade Connections OK	
	- Silence Alarms flashes Warning System Isolate OK.....	
	- (Trial) Evacuation Operates Warning System OK.....	
	- RDU Silence Alarms and (Trial) Evacuation (if applicable)	
	- External Defect OK.....	
	- External Evac Defect OK.....	
	- Lamp Test OK.....	
	- LEDs & Ancillary Outputs NORMAL OK.....	
	FIRE OK.....	
	DEFECT OK.....	

9.4.7 FINAL CHECK

A)	As Installed Information Drawings Provided	
B)	As Installed Configuration Parameters provided	
C)	Installation Info completed on Pg ii of Operator's Manual.....	
D)	Presentation (Interior neat, clean)	
E)	Manufacturer's Rating Label completed	
F)	Operator's Manual Provided.....	
G)	Log Book Provided (Commissioning Details Entered)	
H)	Copy of this check list Completed	
I)	Panel Serial Number	
J)	Main Board Serial Number	
K)	PSU PCB Serial Number	
L)	Keyboard Serial Number	
M)	Display Board(s) Serial Number(s)	

COMMISSIONING CHECKLIST COMPLETE => PASSED

- Date of Test: _____
- Name of Tester: _____
- Signature: _____
- Owner Representative: _____
- Signature: _____

CHAPTER 10 SYSTEM MAINTENANCE & TROUBLE SHOOTING

10.1 SYSTEM MAINTENANCE

The MX4428 System is designed for high reliability and minimum maintenance.

In Australia, however, in order to comply with the requirements of AS1851, the owner/occupier (or a nominated representative) must carry out system tests on a regular basis.

In New Zealand, regular testing must be carried out to comply with NZS4512 parts 402 and 403. This is normally carried out by approved fire alarm contractors.

10.2 AS 1851 TESTING REQUIREMENTS

10.2.1 AS 1851 TESTING - GUIDE FOR MX4428 – SUGGESTED TEST METHODS

The MX4428 and its associated equipment must be tested at regular intervals. Test criteria, service intervals, and record keeping requirements are specified in the appropriate Standard, the latest being AS 1851-2012.

The following sections suggest how service persons may perform some of the required inspections and tests, where the method may not be immediately obvious or where special operations for particular features will be required. The references in the tables to "AS 1851 Item Number" refer to Table 6.4.1.2 through 6.4.1.5 in AS 1851-2012. References to just Section x.y refer to sections in this manual.

Note; this is not intended to be used as a complete list of AS 1851 service requirements, nor as a complete test schedule.

It is strongly recommended that the MX4428 System Test is performed at the end of each monthly test and at the end of each service call. Refer to Section 6.5 for instructions.

10.2.2 MONTHLY TESTS

FIRE DETECTION AND ALARM SYSTEM, SPECIAL HAZARD SYSTEMS AND SMOKE HAZARD MANAGEMENT SYSTEMS

AS 1851 Item No	Description	Action required and pass/fail criteria	Test Facility, Procedure, Notes
1.4	Fire Alarm	SIMULATE an alarm condition and confirm that all required common or general visual and audible indications operate and the external alarm is activated. Where the system is monitored ensure the alarm has activated the alarm signalling equipment. Where CIE is a sub-indicator panel, confirm that the alarm condition is indicated at the FIP.	Refer Section 7.1. Failure of the alarm relay should be treated as a critical defect – refer AS 1851-2012, Section 1.5.6.
1.5	Occupant warning system	SIMULATE an alarm and confirm the alarm initiates the occupant warning system including any visual warning devices (VWD).	Alarm Test as per Item 1.4, or Warning System Test as per Section 6.2. Failure should be treated as a critical defect – refer AS 1851, Section 1.5.6.

Continued…

AS 1851 Item No	Description	Action required and pass/fail criteria	Test Facility, Procedure, Notes
1.6	Isolate/Disable	INITIATE an isolate/disable condition at the fire indicator panel and confirm that all required common or general visual and audible indications operate. Where the system is monitored, ensure the isolate is received by the monitoring service provider alarm signalling equipment. Where the panel is an SIP, confirm that the isolate/disable condition is indicated at the FIP as either a fault or isolate/disable.	Refer Section 7.2. Failure of the isolate relay should be treated as a non-critical defect – refer AS 1851-2012, Section 1.5.6.

10.2.3 SIX-MONTHLY TESTS

FIRE DETECTION, ALARMS AND CONTROLS FOR SPECIAL HAZARD SYSTEMS

AS 1851 Item No	Description	Action required and pass/fail criteria	Test Facility, Procedure, Notes
2.4	Local control station (LCS) discharge inhibit switch	TEST the operation of each inhibit or auto/manual switch and confirm that: (a) It prevents the automatic discharge of suppression system. (b) Stops and resets the normal system discharge sequence. (c) Causes the illumination of a visual indicator at the LCS and the system FIP. (d) Causes an audible indication. (e) Does not override the operation of the manual discharge switch.	Refer Section 10.2.10 for suggested test procedure.
2.5	Local control station (LCS) manual initiate switch	TEST the operation of the manual initiate switch and confirm normal system discharge sequence, including fire and evacuation alarms, time delays equipment shutdowns, and that it overrides the LCS discharge inhibit switch.	Refer Section 10.2.10 for suggested test procedure.
2.6	System inoperative visual warning device (VWD)	CONFIRM the system inoperative VWD operates for: (a) Operation of a service switch (discharge initiating circuit electrical isolation). (b) Fault in the discharge actuator circuit. (c) Operation of a lock-off valve (where fitted). (d) Operation of a manual inhibit switch (where fitted). (e) Isolation or fault in any part of the fire detection or control system that prevents the automatic or electrical manual discharge of the suppression system.	Refer Section 10.2.10 for suggested test procedure.
2.7	System operation and logic	TEST the system logic (e.g. dual detector operation or dependency on more than one alarm) and confirm that the operation of • VWDs • audible alarms • directional valve signal/output • equipment fire mode signal/output • HVAC fire mode signal/output • system discharge actuator • system discharge actuator • system discharge actuator • door and damper release and • ancillary controls is in accordance with the approved design.	Refer to the baseline data and test appropriately.

Continued…

AS 1851 Item No	Description	Action required and pass/fail criteria	Test Facility, Procedure, Notes
2.8	Actuator circuit faults	TEST each supervised actuator circuit to ensure a fault is registered at the FIP.	Refer Section 10.2.10 for suggested test procedure.
2.9	Actuator	TEST the function of each actuator and ensure that each actuator operates correctly. Ensure that each actuator has been mechanically isolated or temporarily removed from the suppressant supply to prevent unintended discharge. For non-resettable actuators (e.g. pyrotechnic types) substitute the actuator with a load of equivalent value and CONFIRM the operating current is in accordance with baseline data.	Refer to the actuator manufacturers documentation for test instructions.

10.2.4 ANNUAL TESTS

Before proceeding with Annual Tests, check that the installed MX4428 software is up to date (refer Section 6.13). If it is not, consider installing the current version of software.

Also check the site specific configuration details are up to date and in the log book. Use the Recall System CRCs – refer to Section 6.13. If these do not match the database most recently commissioned and recorded in the log book – then ascertain why and correct as necessary.

FIRE DETECTION AND ALARM SYSTEM, SPECIAL HAZARD SYSTEMS AND SMOKE HAZARD SYSTEMS

AS 1851 Item No	Description	Action required and pass/fail criteria	Test Facility, Procedure, Notes
3.5	Panel switches and keypads	TEST the operation of each control.	Refer Section 10.2.9.
3.6	Visual indicators	TEST the operation of each visual indicator and alphanumeric displays.	Display Test as per Section 6.4.
3.7	Battery	MEASURE system quiescent and maximum alarm currents in accordance with Appendix F. Calculate the required battery capacity and CHECK the nominal capacity of the installed batteries is not less than the calculated capacity. Verify that the measured currents are the same as recorded in the baseline data.	The MX4428 battery test functions do not meet the requirements of this test. A separate test method must be used. Refer Section 10.2.6.
3.8	Fire Detectors	TEST detectors as specified in Appendix G and confirm correct alarm zone indication. Where the detectors are used as part of special hazards systems 100% of the detectors shall be functionally tested yearly.	Zone in-situ test mode may be used to speed up testing of devices in a zone. Refer Sections 7.5 and 10.2.8.
3.9	Audibility	TEST the occupant warning system and check the signals are distinctly audible in all areas of the building. NOTE: In order to reduce the disturbance to occupants an acceptable means of conducting this test is to provide an audio signal other than the warning signal at a reduced sound pressure level. Where the FIP is connected to a sound systems and intercom systems for emergency purposes (AS 1670.4) or EWIS (AS 2220.2) test in accordance with Table 6.4.3.2.	If a T-GEN 50 is used to generate the alert tone you can either select the low level test tone or play background music via the background music input.

Continued…

AS 1851 Item No	Description	Action required and pass/fail criteria	Test Facility, Procedure, Notes
3.15	Service life	Inspect detectors, equipment or other items having a defined service life and report where the service life is exceeded or will be exceeded before the next scheduled service.	Unless accurate records have been kept of the installed detectors, their location and manufacture date, CO detectors will require manual inspection to determine their expiry date. Refer to manufacturer's data.
3.18	Interfaced system Initiation	Simulate alarm(s) to verify that each interface transmission path initiates the corresponding interfaced system(s) in accordance with the approved design	Referring to the baseline data check that a test alarm (refer Section 7.1) on each appropriate zone activates the required output device.

SMOKE HAZARD MANAGEMENT SYSTEMS—ADDITIONAL ACTIVITIES
CAUTION: TAKE PRECAUTIONS TO PREVENT UNACCEPTABLE VENTILATION SYSTEM CHANGES

AS 1851 Item No	Description	Action required and pass/fail criteria	Test Facility, Procedure, Notes
3.19	FFCP latching and reset	CHECK that after initiation by a signal from the FIP, the FFCP remains operating in the fire mode until reset by the reset switch on the FFCP.	Trigger the FFCP with zone alarm test on the FIP. Then reset the FIP and check the FFCP is still operating in fire mode. Press FFCP fire mode reset to clear.
3.20	Manual override controls	CHECK that manual override ON-AUTO-OFF control operates. NOTE: Manual override should function in normal mode and fire mode.	Check operation between the FFCP and the field equipment.
3.21	Airflow fault indicator	CHECK the operation of the airflow fault Indicator	
3.22	Open-circuit fault indicator	CHECK the operation of the air-handling equipment interconnecting cable open-circuit fault indicator.	
3.23	Closed-circuit fault indicator	CHECK the operation of the air-handling equipment interconnecting cable closed-circuit fault indicator.	
3.24	Electrical	CHECK the operation of the electricity phase-fail fault indicator.	
3.25	Fan-running indicator	CHECK the operation of the fan-running indicator.	
3.26	Fan-stopped indicator	CHECK the operation of the fan-stopped indicator.	
3.27	Fan fault indicator	CHECK the operation of the fan-fault indicator.	

SPECIAL HAZARD SYSTEMS—ADDITIONAL ACTIVITIES
CAUTION: TAKE PRECAUTIONS TO PREVENT THE DISCHARGE OF THE SYSTEM DURING THESE TESTS

AS 1851 Item No	Description	Action required and pass/fail criteria	Test Facility, Procedure, Notes
3.28	Status monitoring	TEST the each suppression system status monitored function (e.g. container level, pressure switches, pump controllers, isolation valves) and CHECK each monitored function indicates at the suppression system control panel.	Replace the actuator with a test actuator (with indicator) during testing. The discharge time delay can be measured during the Special Hazard Test (refer Section 10.2.10 step 6).
3.29	Suppression system directional valves	SIMULATE the system operation and confirm that each electrical directional valve operates according to the approved design.	
3.30	Discharge time delay	TEST and RECORD the system discharge sequence and confirm the time delay period is in accordance with the approved design.	
3.31	Agent release indication	TEST the agent release detection device (e.g. pressure switch) and confirm the operation of the agent release is indicated at the FIP.	

10.2.5 FIVE-YEARLY TESTS

FIRE DETECTION AND ALARM SYSTEMS

AS 1851 Item No	Description	Action required and pass/fail criteria	Test Facility, Procedure, Notes
4.2	Supervised circuits	TEST each input and output supervised circuit for any condition that prevents the transmission of the required signal and ensure a fault is registered at the FIP.	Apply o/c and s/c faults on the field wiring where appropriate and verify faults are generated at the FIP.
4.3	Fault	SIMULATE a circuit fault condition at the FIP and confirm that all required common or general visual and audible indications operate. Where such faults are monitored, ensure the fault has activated the alarm signalling equipment. Where the panel is an SIP confirm that the fault condition is indicated at the FIP.	Refer Section 7.1. Failure of the fault relay should be treated as a non-critical defect – refer AS 1851-2012, Section 1.5.6.
4.5	Power supply supervision	Where the system is monitored, REDUCE the CIE operating voltage to trigger a power supply supervision fault and CONFIRM that it is received by the monitoring service provider. Where the panel is an SIP or a distributed power supply, confirm that the power supply supervision fault condition is indicated at least as a fault at the FIP.	This test requires equipment external to the MX4428. Refer Section 10.2.7.
4.7	Interface and control test	CONDUCT a functional test with each system interface in accordance with the building's systems interface diagram and CHECK that each interfaced system responds to the signal in accordance with the approved design. See Appendix D.	Refer to the baseline data for details. See Appendix D of AS 1851-2012.

Continued…

AS 1851 Item No	Description	Action required and pass/fail criteria	Test Facility, Procedure, Notes
4.9	Monitoring connection	Where the system is monitored, TEST that the loss of each of the monitoring links is indicated at the monitored site.	For networked systems break/short each communication line between a sub FIP to the main FIP and check that a fault is indicated at each FIP. If the FIP is fitted with an ASE consult the monitoring company regarding testing the fault monitoring of the ASE's communication links.
4.10	Alarm verification facility	TEST one detector of each type per circuit with alarm verification facility enabled to check that it functions in accordance with the approved design.	To test AVF put the detector into alarm using appropriate test apparatus (e.g., test smoke/gas or Solo in-situ tester) and check the following: i) The detector's indicator turns on ii) The indicator turns off for at least 5 seconds iii) The indicator turns on again within 60 seconds and the FIP goes into alarm.

10.2.6 BATTERY LOAD DISCHARGE TESTING (AS 1851 ITEM 3.7)

The MX4428 Fire Alarm panel has no provision for load discharge testing of the battery at the levels required for yearly testing to AS 1851-2012.

Refer to AS 1851-2012 Appendix F for the battery capacity test method.

10.2.7 PSU SUPERVISION (AS 1851 ITEM 4.5)

MX4428 does not include built-in facilities to carry out this test. A suitably rated bench power supply connected to the MX4428 battery terminals with main power turned off may be used instead.

Ensure the panel is normal – i.e., no faults and no system conditions that cause the Standby relay to be de-energised are present.

Reduce the bench power supply output voltage to below the minimum operating voltage and check the Standby relay de-energises.

If the PSU supervision signal is monitored, confirm that it is received at the monitoring service or at the main CIE. The status of the PSU/Batt can be observed in the System Status recalls (refer Section 6.6). This will indicate a BatFl condition when the system voltage is below the minimum operating voltage.

10.2.8 DETECTOR SENSITIVITY TEST (AS 1851 ITEM 3.8)

Item 3.8 of AS 1851-2010 requires that the sensitivity of all smoke, CO and flame detectors be checked to ensure each is within the required range.

For collective (conventional) smoke detectors this will usually mean the detector must be tested using a calibrated test medium that can confirm the sensitivity of the detector for checking against the manufacturer's data or the listed sensitivity. If accredited test equipment is not available or suited to do this testing in the field, or it is preferred to not do the testing in the field, the detectors could be sent to a clean and calibrate service.

For analogue addressable smoke detectors on MX4428, it is not necessary to actually test each detector with a calibrated medium to confirm its sensitivity as MX4428 has built-in functions that assist in doing this. MX4428 maintains a constant sensitivity for each detector, tracking any changes in the clean air value (with no smoke) as the detector ages or becomes contaminated by dust, etc. If the detector's clean air value has shifted so far that MX4428 cannot compensate any further, the detector is put into a Dirty condition, indicating it needs cleaning or replacing. This sensitivity verification does not replace the need to test the detectors in-situ using an un-calibrated medium for a go/no-go test.

To satisfy the sensitivity test of analogue smoke detectors it is necessary to check:

1. Each detector is still programmed with its approved design sensitivity. Use the MX4428 Datafile CRC recall function (refer Section 6.13) to confirm the database CRC and time/date details for the panel are the same as that most recently commissioned. If they are not, determine why, but in any case check that the currently programmed sensitivity of each detector is as required. Refer Section 8.3.

2. Each detector has not reached, nor is close to reaching, its Dirty limit. MX4428 has a built-in function that can search for dirty detectors or those above a specified % Dirty. Refer Section 8.1.5. Use this method to determine any detectors that are dirty (appear in the DirtyAlrt Recall) or the level of contamination (%Dirty Recall) is close to 100%, e.g., say above 80%). Replace the detectors with new or cleaned detectors and repeat the process to make sure all detectors are now well within range.

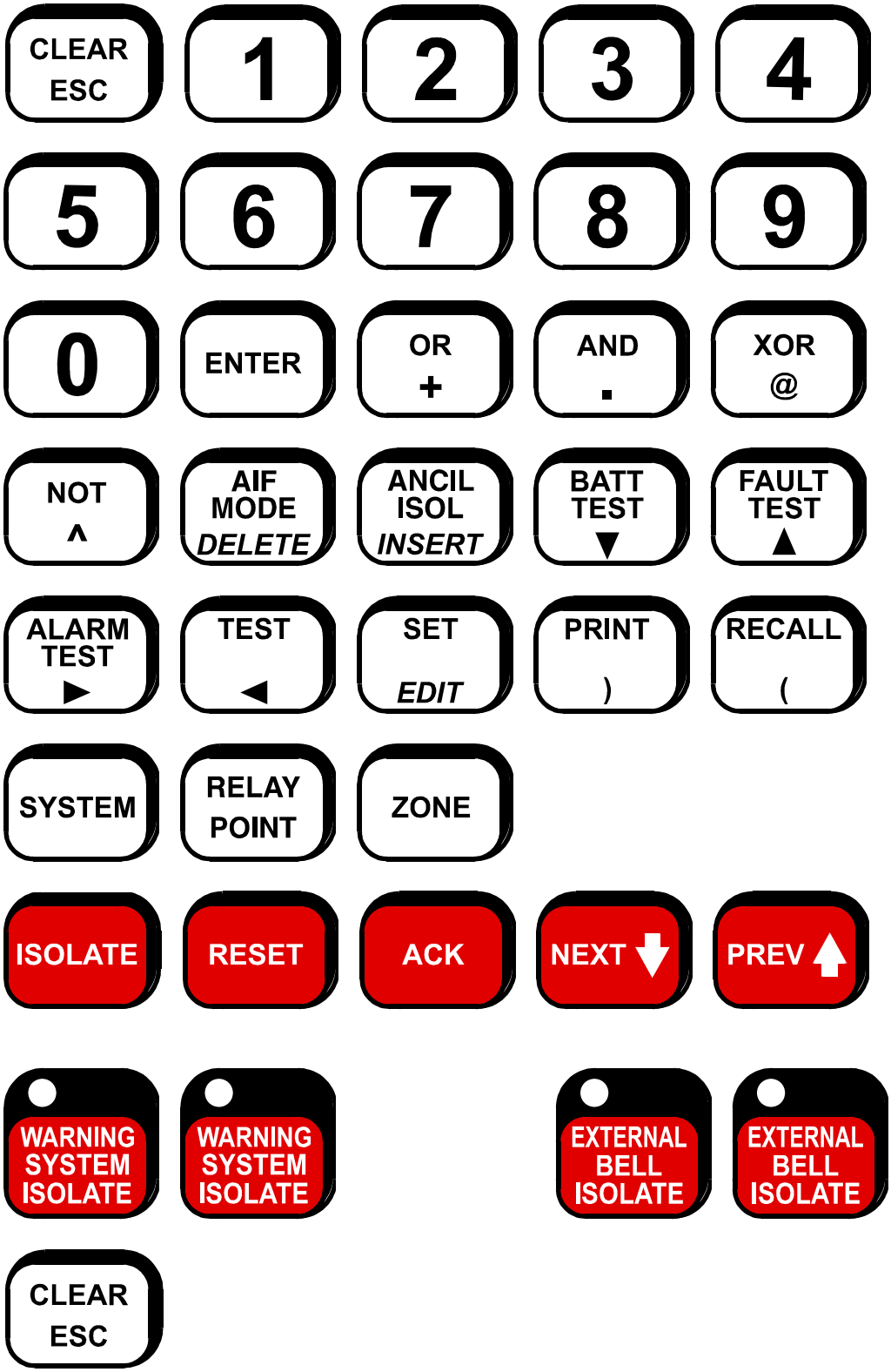
3. Each detector can generate an alarm condition. A zone alarm test can be used to confirm each detector can generate an alarm by utilising an internal remote test function. All the 130 series detector have an internal remote test function. The 801PC *MX* triple sensor detector has no internal remote test function. For the 850 series *MX* addressable detectors series detectors all the sensors mapped to the zone will be tested with the internal remote test function. For all other MX addressable detectors only the non-heat sensors have the internal remote test function.

4. All detectors will need to be in-situ tested with a suitable method (e.g., test gas, etc.) to ensure they can detect an alarm.

10.2.9 KEYBOARD TEST

Usually pressing keys on the MX4428 keyboard will cause things to happen to the panel.

The following sequence can be used to test the keyboard without affecting anything. Press each key in order and check a beep is heard (it may be short or long) for each keypress.



10.2.10 SPECIAL HAZARD TEST

The following test procedure may be adapted to carry out the six-monthly service schedule for special hazard systems items 2.4 -2.6.

1. Take whatever precautions are necessary to prevent the system from accidental discharge.
2. Replace the actuator with a test actuator that includes an activation indicator (e.g., LED).
3. Put the LGCS INHIBIT GAS RELEASE switch in to the INHIBIT position and check that the LGCS sounder and GAS INHIBITED LED turn on.
4. Place the two automatic fire detection zones into test alarm (refer Section 7.1) on the FIP and check that the GAS INITIATED LED on the FIP remains off.
5. Test activate the LGCS GAS RELASE MCP and check that the GAS INITIATED LED on the FIP turns on.
6. Measure the time delay from the GAS INITIATED LED turning on to the test actuator activating. Check that the delay period is correct. Note that this is required as part of the annual test (refer item 3.30).
7. Verify that the required equipment is shut down.
8. Place the LGCS GAS RELEASE MCP and the INHIBIT switch in the normal position and reset the FIP. Check the LGCS GAS ISOLATED and GAS INHIBITED LEDs are off, the FIP goes back to normal and the test actuator deactivates.
9. Place the GAS DISCHARGE ISOLATE switch in the ISOLATE position. Check that:
   (a) the GAS ISOLATED LED on the LGCS turns on,
   (b) the GAS ISOLATED LED on the FIP turns on,
   (c) the SYSTEM INOPERATIVE LED on the FIP turns on,
   (d) the SYSTEM INOPERATIVE AVI turns on (if installed).
   Return the GAS DISCHARGE switch to the NORMAL position. Check that the panel returns to normal.
10. Disconnect the test actuator. Check items 9a-9d. Reconnect the test actuator and reset the FIP. Check that the panel returns to normal.
11. Activate the lock-off valve (if fitted). Check items 9a-9d. Deactivate the lock-off valve and reset the FIP. Check that the panel returns to normal.
12. Isolate one of the two automatic fire detection zones. Check items 9a-9d. De-isolate the automatic fire detection zones. Check that the panel returns to normal.
13. Place one of the two automatic fire detection zones in to test fault (refer Section 7.2). Check items 9a-9d. Return the automatic fire detection zone to normal. Check that the panel returns to normal.
14. Restore all circuits and panel switches to normal. Finally reconnect the actuator and reset any latched faults.

10.3 TROUBLE-SHOOTING

10.3.1 PRELIMINARY INVESTIGATIONS

To prevent unnecessary service calls, or in the event of a genuine call, to save time and provide the service company with accurate data the owner/occupier can carry out the following checks before requesting service:

a) UNWANTED ALARMS: Make a note of the affected zone(s). It will also be helpful if you record the time of the unwanted alarm.

b) FAULTS: If the fault sounder operates, make a note of all indicators alight at the time. Press the “CLEAR” key to silence the fault sounder if necessary. Note that doing so will automatically clear any fault action text displayed.

The LCD keyboard has a number of commands to allow the source of a fault or alarm to be determined i.e.

- **Zone Status Searches** (refer Section 7.6.3) allow an operator to determine the source of zone alarms, faults and other off-normal conditions.

- **System Fault Recall** (refer Section 6.6) displays the individual faults that cause the “SYSTEM FAULT” LED to turn on.

- **Recall History** (refer Section 6.8) allows an operator to review recent events at the FIP to further clarify the off-normal events e.g. to determine the particular circuit that put a zone into fault, or to determine the chronological order of events.

- **Point Status Searches** (refer Section 8.1.5) allow an operator to determine the status of points and to search for off normal points in the system, e.g. fault, alarm, pre-alarm, dirty alert, etc.

Table 10.1 gives a summary of typical fault conditions, reasons, and suggested actions to be taken.

TABLE 10.1
Trouble-Shooting

CONDITION	POSSIBLE REASONS	ACTION
"MAINS ON" LED OFF	MAINS SWITCH OFF	Turn Mains Switch ON
	REPORTED POWER BLACKOUT	Check that LED turns ON when power is restored
	ACCIDENTAL TRIPPED CIRCUIT BREAKER	Reset Circuit Breaker & check "MAINS ON" LED
	NONE OF ABOVE	CALL SERVICE COMPANY
CHGR/BATT FAULT LED STEADY – "CHARGER HI/LO"	CHARGER VOLTAGE HIGH - Damage to Battery Possible	CALL SERVICE COMPANY
	CHARGER VOLTAGE LOW - Battery will not charge correctly	
CHGR/BATT FAULT LED FLASHING – "BATTERY FLT"	BATTERY DISCONNECTED	Re-connect Battery leads
	BATTERY CHARGE LOW OR BATTERY TEST FAIL	Check Again in 24 Hours
	BATTERY MALFUNCTION	CALL SERVICE COMPANY
"SYSTEM FAULT" LED ON	DISPLAY FAULT SOFTWARE FAULT on FIP RDU FAULT on FIP LOOP FAULT on FIP SCAN FAIL on RDU NETWORK FAULT	CALL SERVICE COMPANY Refer Section 6.6 to use SYSTEM FAULT RECALL to determine cause.
ANCILLARY CONTROL ZONE IN FAULT – Cannot clear on reset	Ancillary Output Circuit is open circuited	Check Load Device Check Terminal Wiring Check External Wiring CALL SERVICE COMPANY
	Ancillary Relay faulty or shorted	
ZONE IN FAULT - Cannot clear on zone reset	FAULTY DETECTOR FAULTY EOL WIRING FAULT	CALL SERVICE COMPANY
NORMAL LED OFF (New Zealand Only)	Zone Alarm or Fault Write Protect Link in Write Enable Position System Fault Exists Processing Disabled	CALL SERVICE COMPANY

10.3.2 PREVENTION OF FALSE ALARMS

All fire detection systems rely on their ability to identify atmospheric or environmental changes brought about by the presence of fire. They employ various types of sensors to monitor specific conditions. These devices signal a warning when an abnormal condition exists, indicating either the actual presence of a fire or the immediate likelihood of an outbreak.

Detectors monitor a number of phenomena, which include smoke, heat, flame, pressure, or the presence of combustion products such as gases. However, some or all of these conditions may appear in different locations when there is no fire present. For example:

(a) **HEAT SOURCES**; The sudden increase in local temperature when a furnace door is opened can trigger heat sensors.

(b) **DRAUGHTS**; Wind-induced surges of steam or dust can cause smoke detectors to generate an alarm signal.

(c) **ENVIRONMENT CHANGES**; Changes to wall partitions, Air-Duct position or air velocity can cause detectors to be forced into continuous alarm.

(d) **UNUSUAL ACTIVITIES**; Portable welding units can activate flame detectors, while spray-painting ‘drift’ can trigger smoke detectors.

It is therefore highly recommended that the service company be notified of any proposed physical, environmental or occupancy changes.

10.4 AUTOMATIC RE-ADDRESSING OF MX DEVICE

Isolating a point also allows a dirty or faulty *MX* device to be replaced with a new device of the same type, without the need for a special service tool. The MXP responder (with version V1.14 firmware onwards) will automatically re-address a new (previously-unaddressed) *MX* device for a failed one if that point is isolated. This task can be carried out by the customer or any service company without the need for any special tools.

Re-addressing 130 Series or EWD devices is simply a matter of rotating the rotary dials or moving the dipswitches on these types of devices.

10.4.1 PROCEDURE FOR AUTOMATIC DETECTOR RE-ADDRESSING

For the automatic re-addressing function to operate, the following conditions must be met:

- One, and only one, device on the MXP's loop must be non-responding, i.e., in the Node Fail state (e.g., the faulty detector has been removed from its base).
- This device has been isolated at the MX4428 panel.
- A replacement (brand new, i.e., has address 255) device of the same type has been connected to the loop (e.g., the new detector has been plugged into the base that the faulty detector was removed from).

Assuming these conditions have been met, the new device will then be addressed with the address of the missing device within 10 seconds, and the "NodeF" fault will clear shortly thereafter. The device can then be de-isolated at the MX4428 panel.

Follow the procedure below to replace an existing dirty or faulty device with a new one, and to have the new one automatically re-addressed with the existing device's address:

1. Check that there are no *MX* devices already in the Node Fail state on that *MX* loop (other than possibly the one being replaced).
2. Point Isolate the device to be replaced.
3. Remove the dirty/faulty device from its base, or disconnect it from the *MX* loop wiring.
4. Fit the new replacement device of the same type to the base, or *MX* loop.
5. Wait for a burst of activity on the device's LED and then for it to start flashing every 5 seconds (provided LED flashing on Poll is enabled for the MXP).
6. Return to the MX4428 and check the point status for the device. It should be Isol and not NodeF (any Dirty state may still be present).
7. Do a Reset Tracking command and a Reset History command on the point to re-initialise the detection algorithms.
8. De-isolate the point.

APPENDIX A

A.1 MXP ACTUATING DEVICE COMPATIBILITY

Device Type	Description	Max No. Per Loop
850PH	Photoelectric Smoke/Heat detector	200
850P	Photoelectric Smoke detector	200
850H	Heat detector	200
850PC	Photoelectric Smoke/CO/Heat detector	200
801PC	Photoelectric Smoke/CO/Heat detector	200
814P	Photoelectric Smoke detector	200
814PH	Photoelectric Smoke/Heat detector	200
814CH	CO/Heat detector	200
814I	Ionisation detector	200
814H	Heat detector	200
CP820	Call point	200
CP830	Call point	200
MCP820	Call point	200
MCP830	Call point	200
MIM800/MIM801	Mini Input Module	200
CIM800	Input Module	200
DIM800	Detector Input Module	200
DDM800	Universal Fire & Gas Detector Module	8 (loop) / 59 (external)
RIM800	Relay Interface Module	200
SNM800	Sounder Notification Module	200
LPS800	Loop Powered Sounder Module	33 or less
VLC800	VESDA Laser Compact – 800MX	125
SAB801	Sounder Addressing Beacon	100
SAM800	Sounder Addressing Module	200
S271f+	Flame Detector	200
4B-I	Isolator Base	200
5BI	Isolator Base	200
814IB	Isolator Base (Obsolete)	128
814RB	Relay Base	200
814SB	Sounder Base (Low/Med/High volume)	48/30/24
802SB	Sounder Base (Quiet/Loud)	200/50

The actual maximum number of devices per loop depends on the mixture of types, cable type and cable length. Refer to the MX4428 Product Manual Volume 11, MXP Engineering/ Technical Manual (LT0273) for further information.

A.2 MPR ACTUATING DEVICE COMPATIBILITY

A.2.1 MPR IN EWD MODE

Device Type	Max. No Per Line	Max No. Per Loop
C71A/C72A/C73A	40	200
P71A/P72A/P73A	40	200
ADU002	40	200
ADU003A	40	200
ADU004A	40	40
ADU006	40	40
Z54A	40	200

The actual maximum number of devices and types per line/loop depends on the mixture of types, cable type and cable length. Refer to the F4000 Product Manual Volume 9-2, MPR Engineering Manual for further information.

A.2.2 MPR IN 130 SERIES MODE

Device Type	Max. No Per Line	Max No. Per Loop
C131A / C131A-MK2	40	99
P131A / P131A-MK2	40	99
P132A	40	99
T131A / T131A-MK2	40	99
ADC130	40	99
ADM130/1/3	40	99
Z134A	40	99
2251BAUS	40	99

The actual maximum number of devices and types per line/loop depends on the mixture of types, cable type and cable length. Refer to the F4000 Product Manual Volume 9-2, MPR Engineering Manual for further information. Note that the 130 Series mode cannot be selected for MPRs with Version 1.X software.

A.3 AAR ACTUATING DEVICE COMPATIBILITY

Device Type	Max. No Per Line	Max No. Per Loop
C71A/C72A/C73A	40	200
P71A/P72A/P73A	40	200
ADU002	40	200
ADU003A	40	200
ADU004A	40	40
ADU006	40	40
Z54A	40	200

The actual maximum number of devices and types per line/loop depends on the mixture of types, cable type and cable length. Refer to the F4000 Product Manual Volume 6-2, AAR Engineering Manual for further information.

Note that Z54A devices must be configured as ADU002 devices on AARs.

A.4 ADR/DIM800 ACTUATING DEVICE COMPATIBILITY

The following detectors, as well as hard contact devices, are compatible with the various MX4428 System ADVANCED DETECTOR RESPONDERS and the DIM800 module (DIM). The responders and EOL modes are indicated as follows:

2.5 = 2.5mA ADR (FP0472 and PA0452)
4mA = 4mA ADR (FP0523 and PA0497)
ADR-M = ADR-M (FP0755 and PA0815)
P = Pulsing (Active) EOL mode using EOL002Z or EOL002B
R = Resistive (Passive) EOL mode using 39k resistor

1) The maximum number of detectors per AZF/AZC allowed by AS1670.1 is 40.

2) Detectors shown in brackets have the same characteristics as the current models.

3) Detectors indicated by a **"+"**, which are used in **HOSTILE CLIMATIC ENVIRONMENTS**, may be directly connected to the panel if they are not required to be intrinsically safe.

4) Detectors marked **"*"** are obsolete and should not be used in new installations.

5) Detectors indicated by a **"&"** normally use an incandescent lamp which will have a low intensity when used with this panel. Contact supplier for a replacement LED kit.

6) The B111B beam and V41B/V42B flame detectors require power from the fused +24 VDC supply.

7) The DIM800 requires an external 24V PSU for correct operation. Refer to the MXP Engineering/Technical Engineering Manual LT0273.

8) Detectors marked ! require the ADR/ARR LED Pulse to be enabled in the F4000/MX4428 database for the particular detector/responder combination.

9) Note the Simplex range of detectors marked "@" must not have their Remote indicator outputs wired in common with most Tyco, Minerva and Olsen detectors.

Table I - Minerva Range with all ADRs and DIM800

DETECTORS CERTIFIED WITH MX4428 FIP		MAX NO.				DIM
TYPE	DESCRIPTION	4mA & ADR-M P	2.5 P	4mA & ADR-M R	2.5 R	-
614CH	CARBON MONOXIDE & HEAT DETECTOR	40	20 !	1	1	32
614I	IONISATION DETECTOR	40	25 !	1	1 !	38
614P	PHOTOELECTRIC DETECTOR	38	24 !	1	1 !	25
614T	TYPE A, B, C, D HEAT DETECTOR	40	-	1	-	23
MD614	HEAT DETECTOR	40	40	2	2	40
MF614	IONISATION DETECTOR	40 !	25 !	1	1 !	30
MR614	PHOTOELECTRIC DETECTOR	40 !	25 !	1	1 !	22
MR614T	HIGH PERFORMANCE DETECTOR	40 !	21 !	1	1 !	21
MU614	CARBON MONOXIDE DETECTOR	40 !	40 !	2	2 !	40
T614 or T614 MK2	TYPE A, B, C, D HEAT DETECTOR	40	-	1	-	23
ALL WITH M614, 5B, 4B BASE						

Table II - Simplex Range with ADR-M and DIM800

DETECTORS CERTIFIED WITH MX4428 FIP		MAX NO. ADR-M		DIM
TYPE	DESCRIPTION	P	R	-
4098-9612 @	HEAT DETECTOR TYPE B	40	1	24
4098-9613 @	HEAT DETECTOR TYPE A	40	1	24
4098-9614 @	HEAT DETECTOR TYPE D	40	1	24
4098-9615 @	HEAT DETECTOR TYPE C	40	1	24
4098-9618EA @	HEAT DETECTOR	40	1	24
4098-9619EA @	HEAT DETECTOR	40	1	24
4098-9621EA @	HEAT DETECTOR	40	1	24
4098-9603EA @	IONISATION DETECTOR	40	1	24
4098-9601EA @	PHOTOELECTRIC DETECTOR	40	1	24
ALL WITH 4098-9788EA BASE @ Remote Indicator Output cannot be commoned with Tyco 614 Series and most other Tyco/ Olsen detectors.				

Table III - SU0600 Manual Call Point with ADR-M

DETECTORS CERTIFIED WITH MX4428 FIP		MAX NO. 4mA ADR-M ONLY	
TYPE	DESCRIPTION	P	R
SU0600	MANUAL CALL POINT	40	24

Table IV - Tyco Detector Range

DETECTORS CERTIFIED WITH MX4428 FIP (SSL # 131)			MAX NO. ADR			
TYPE	DESCRIPTION	BASE	4mA & ADR-MP	2.5mA P	All R	DIM
B111B	BEAM TYPE SMOKE DETECTOR (SEE NOTE 7)	-	40	40	40	40
C23B *&	IONISATION SMOKE DETECTOR	Z23	40 !	25 !	1 !	0
C23BEx *	IONISATION SMOKE DETECTOR (IS)	Z23	40 !	25 !	1 !	0
C24B	IONISATION SMOKE DETECTOR	*1	40 !	25 !	1 !	40
C29B	IONISATION SMOKE DETECTOR	*1	40 !	40 !	2 !	40
C75B	IONISATION SMOKE DETECTOR	Z72	40 !	40 !	4 !	0
FW81B	HEAT DETECTOR CABLE FW68 (IS)	-	1000m	1000m	1000m *2	1000m *3
P24B	PHOTOELECTRIC SMOKE DETECTOR	*1	40 !	25 !	1 !	24
P29B	PHOTOELECTRIC SMOKE DETECTOR	*1	33 !	20 !	1 !	20
P61B *	PHOTOELECTRIC SMOKE DETECTOR (REV J)	-	40 !	10 !	0	0
P75B	PHOTOELECTRIC SMOKE DETECTOR	Z72	40 !	40 !	1 !	0
P76B	PHOTOELECTRIC SMOKE DETECTOR NON-LATCHING	Z72	18 !	12 !	1 !	0
P136	DUCT SAMPLING DETECTOR NON-LATCHING	-	8 !	5 !	-	5
R23B &	INFRARED FLAME DETECTOR	-	30 !	19 !	4 with DCA001	0
R24B	DUAL SPECTRUM INFRARED FLAME DETECTOR	-	13 !	3 !	0	3
R24BEX +	DUAL SPECTRUM INFRARED FLAME DETECTOR (IS)	-	13 !	3 !	0	0
T54B +	PROBE TYPE E HEAT DETECTOR (IS OR FLAMEPROOF)	-	40	40	40	40
T56B	HEAT DETECTOR TYPES A, B, C, D (IS WITH Z55 BASE)	*1	40 !	40 !	40 !	40
V41B +	ULTRAVIOLET FLAME DETECTOR (NOTES 3, 4, 7, 8)	-	40	40	40	40
V42B +	ULTRAVIOLET FLAME DETECTOR (FLAMEPROOF – NOTE 3)	-	40	40	40	40
DLO1191A	BEAM DETECTOR	-	1 !	0	0	0
	SHORT CIRCUIT DEVICE	-	40	40	40	40

*1 Bases = Z54, Z54B Mk2, Z55B, Z56, Z500

*2 Use 33k ELD instead of standard 39k

*3 Use 3k3 ELD instead of standard 4k7

Table V - HOCHIKI Detector Range

DETECTORS CERTIFIED WITH MX4428 FIP (SSL # 131)			MAX NO. ADR		
TYPE	DESCRIPTION	BASE(S)	4mA & ADR-MP	2.5mA P	All R
DCA-B-60R	HEAT DETECTOR TYPE A	1	40 !	40 !	40 !
DCA-B-90R	HEAT DETECTOR TYPE C	1	40 !	40 !	40 !
DCC-A	HEAT DETECTOR TYPE A	2, 4	40 !	40 !	-
DCC-C	HEAT DETECTOR TYPE C	2, 4	40 !	38 !	-
DFE-60B	(DFB-60B) HEAT TYPE B	1	40 !	40 !	40 !
DFE-90D	(DFB-90D) HEAT TYPE D	1	40 !	40 !	40 !
SIF-A	IONISATION SMOKE	1	40 !	40 !	4 !
SIH-AM	IONISATION SMOKE	1	40 !	40 !	4 !
SLK-A	PHOTOELECTRIC SMOKE	1	40 !	40 !	1 !
SLG-AM	PHOTOELECTRIC SMOKE	1	40 !	40 !	1 !
HF-24A	ULTRAVIOLET FLAME	-	17 !	3 !	0
DCD-A	HEAT DETECTOR TYPE A	3	40 !	-	-
DFJ-60B	HEAT DETECTOR TYPE B	3	40 !	-	-
DCD-C	HEAT DETECTOR TYPE C	3	40 !	-	-
DFJ-90D	HEAT DETECTOR TYPE D	3	40 !	-	-
SIJ-ASN	SMOKE DETECTOR	3	40 !	-	-
SLR-AS	SMOKE DETECTOR	3	40 !	-	-

Base types: 1 = YBC – RL/4AHA 2 = YBF – RL/4AH4M
3 = YBO – RL/4A 4 = YBC – R/3A

Table VI
ZAU401 (Rev 2) Detector Compatibility

DETECTORS CERTIFIED WITH ZAU401 (REV 2)		MAX NO.
S231i+	FLAME DETECTOR (IS)	5
S231f+	FLAME DETECTOR (FLAMEPROOF)	5
S231i+	FLAME DETECTOR (IS) WITH IS REPEATER	5
S231f+	FLAME DETECTOR (FLAMEPROOF) WITH IS REPEATER	5
FV411f/2f/3f	FLAMEVISION FLAME DETECTOR	2
885WP-B @	WEATHERPROOF HEAT DETECTOR TYPE B	40

@ Remote indicator output cannot be used in common with Tyco 614 series or the Minerva M614 series (and most other Tyco/Olsen) detectors.

Table VII
Unlisted (CSIRO) Detector/ADR Combinations

UN-LISTED DETECTOR COMBINATIONS		MAX NO. ADR				
TYPE	DESCRIPTION	4mA & ADR-MP	2.5mA P	All R	ADR-MIS	DIM
S121	FLAME DETECTOR (IS)	40	23	1	36*1	0
S231f+	FLAME DETECTOR	*4	*4	*4	*4	7
FV411f/2f/3f	FLAME DETECTOR	*4	*4	*4	*4	3
C29BEx	IONISATION SMOKE DETECTOR AND Z52B, Z55B, Z56N, Z500N NON-INDICATING BASE				40*1	
MF301Ex	IONISATION DETECTOR (IS)				36*1	
MR301Ex	OPTICAL DETECTOR (IS)				36*1	
MR301Tex	HPO DETECTOR (IS)				36*1	
MS302Ex	FLAME DETECTOR (IS)				36*1	
885WP-B @	WEATHERPROOF HEAT DETECTOR TYPE B	40	40 !	2 !	-	40
601FEx	FLAME DETECTOR (IS)	6*2			2*3	
MX301 DETECTORS WITH M300 BASE						

@ Remote indicator output cannot be used in common with Tyco 614 series or the Minerva M614 series (and most other Tyco/Olsen) detectors.
*1 ADR-M only, requires IS Isolator and ADR-M programmed as Cct Type 1 or 4.
*2 Non-IS application. Direct connection.
*3 Use special ADR-M PA0844 & IS Isolator.
*4 Requires ZAU401. See Table VI.
Blank combinations have not been assessed for compatibility.

A.5 INTRINSICALLY SAFE DETECTION

Fire detection in intrinsically safe or hazardous areas may require special detector types, bases, wiring practices, and approved and compatible isolating repeaters.

The actual maximum number of detectors per circuit in a particular installation may be less than the number shown, depending on the hazard type, and the inductance and capacitance of the circuit.

Refer to the appropriate standards, Installation and Technical manuals and Product Bulletins for details.

Table VIII lists approved combinations that may be used in IS applications. Note isolating repeaters may also be required.

Unapproved combinations are included in Table VII.

On ADRs only Active EOL modes may be used and the EOL type must be an EOL002Z.

Table VIII
Listed IS Detectors

DETECTOR	BASE	RESPONDER	QTY
C23BEx	Z23	ALL	20
C29BEx	Z94C	ADR-M *2	40
R24BEx	-	ALL	3
T54B	-	ALL	40
T56B	*1	ALL	40
V41B	-	ALL	40
V42B	-	ALL	40
FW81	-	ALL	1000m
S/C DEVICE	-	ALL	40

*1 = Non-indicating base Z55, Z56N, Z500N
*2 = ADR-M only, circuit Type 1 or 4

A.6 DDM800 AUSTRALIA ACTUATING DEVICE COMPATIBILITY

All Cerberus/Olsen detectors listed here for use with the DDM800 are compatible with the Z52B, Z54B, Z54B Mk2, Z56, and Z500 bases. In addition, the T56B heat detector is also compatible with the Z55B, Z56N, and Z500N bases.

Table IX – DDM800 Collective Detector Compatibility (Australia)

Brand	Model	Type	Maximum No. per Circuit
Standard Voltage Detectors (Modes 2, 3, 4, 5, 6)			
-	Hard Contact Devices (T54B, B111, etc.)		40
Kidde	Firewire	Linear Heat Detector	5000 metres
Olsen	C24B	Ionisation	40
Olsen	C29B	Ionisation	40
Olsen	P136	Duct Sampling Unit	7
Olsen	P24B	Photo	25
Olsen	P29B	Photo	20
Olsen	R23B	Flame	19
Olsen	R24B	Flame	12
Olsen	T56B	Heat	40
Protectowire	Protectowire	Linear Heat Detector	2000 metres
SAFE	ThermoCable	Linear Heat Detector	5000 metres
Simplex	4098 – 9601EA	Photo	25
Simplex	4098 – 9603EA	Ionisation	31
Simplex	4098 – 9618EA	Heat Type A	31
Simplex	4098 – 9619EA	Heat Type B	31
Simplex	4098 – 9621EA	Heat Type D	31
System Sensor	885WP-B	Weatherproof Heat Type B	40
Tyco	601F[1]	Flame	5
Tyco	601FEx	Flame	5
Tyco	614CH	CO & Heat	35
Tyco	614I	Ionisation Smoke	40
Tyco	614P	Photo Smoke	40
Tyco	614T	Heat Type A, B, C, D	29
Tyco	SU0600	15V MCP	40
Tyco	T614	Heat Type A, B, C, D	29
Tyco/Minerva	MD614	Heat	25
Tyco/Minerva	MF614	Ionisation Smoke	32
Tyco/Minerva	MR614	Photo Smoke	25
Tyco/Minerva	MR614T	HPO Smoke	21
Tyco/Minerva	MU614	CO	40
Tyco	FV411f/2f/3f	Flame Detector	3
Low Voltage Detectors (Modes 7, 9)			
-	Hard Contact Devices (T54B, B111, etc.)		40

[1] Not a CSIRO listed combination.

Kidde	Firewire	Linear Heat Detector	5000 metres
Protectowire	Protectowire	Linear Heat Detector	2400 metres
SAFE	ThermoCable	Linear Heat Detector	5000 metres
System Sensor	885WP-B	Weatherproof Heat Type B	30
Tyco	614CH	CO & Heat	21
Tyco	614I	Ionisation Smoke	25
Tyco	614P	Photo Smoke	25
Tyco	614T	Heat	17
Intrinsically Safe Detectors (Mode 11)			
-	Hard Contact Devices (T54B, etc.)		40
Kidde	Firewire	Linear Heat Detector	5000 metres
Olsen	C29Bex	Ionisation Smoke	24
Protectowire	Protectowire	Linear Heat Detector	2400 metres
SAFE	ThermoCable	Linear Heat Detector	5000 metres
Tyco	601FEx	Flame	2
Tyco	MD601Ex	ROR Heat	18
Tyco	MD611Ex	Fixed Temperature Heat	18
Tyco	MDU601Ex	Enhanced CO & Heat	12
Tyco	MF601Ex	Ionisation Smoke	16
Tyco	MR601Tex	HPO Smoke	7
Tyco	MU601Ex	CO	12
Tyco	S231i+	Flame	2

A.7 DDM800 NEW ZEALAND ACTUATING DEVICE COMPATIBILITY

Table X – DDM800 Collective Detector Compatibility (New Zealand)

Brand	Model	Type	Maximum No. per Circuit
Standard Voltage Detectors – Loop Powered or Regulated Supply Reqd. (Modes 2, 3, 4, 5, 6)			
Cerberus	A2400	Beam Photo	1
Cerberus	D900	Fixed Temperature & ROR Heat	15
Cerberus	D920	Fixed Temperature & ROR Heat	15
Cerberus	F716	Ionisation Smoke	100
Cerberus	F906	Ionisation Smoke	166
Cerberus	F910	Ionisation Smoke	61
Cerberus	R716	Photo Smoke	20
Cerberus	R906	Photo Smoke	20
Cerberus	R910	Photo Smoke	16
Cerberus	R936	Photo Smoke	15
Cerberus	S2406	IR Flame	12
Cerberus	S610	IR Flame	15
Kidde	Firewire	Linear Heat Detector	5000 metres
Protectowire	Protectowire	Linear Heat Detector	2000 metres
SAFE	ThermoCable	Linear Heat Detector	5000 metres
System Sensor	1151	Ionisation Smoke	45
System Sensor	1400	Ionisation Smoke	25
System Sensor	1451	Photo Smoke	20
System Sensor	2151	Photo Smoke	55
System Sensor	2351E	Photo Smoke	50
System Sensor	2351TEM	Photo Smoke & Heat	38
System Sensor	2400	Ionisation Smoke	16
System Sensor	2451	Photo Smoke	16
System Sensor	4351E	Fixed Temperature Heat	38
System Sensor	5351E	Fixed Temperature & ROR Heat	41
Tyco	601F	Flame Detector	5
Tyco	601FEx	Flame Detector	5
Tyco	614CH	CO & Heat	35
Tyco	614I	Ionisation Smoke	41
Tyco	614P	Photo Smoke	41
Tyco	S231f+	Flame	7
Tyco	FV411f/2f/3f	Flame	3
Tyco/Minerva	MF614	Ionisation Smoke	32
Tyco/Minerva	MR614	Photo Smoke	25
Tyco/Minerva	MR614T	HPO Smoke	21
Tyco/Minerva	MU614	CO	51
Tyco/Vigilant	1841	Indicating MCP	138

Tyco/Vigilant	Indi-V*IGIL* Mk II	Heat	83
Low Voltage Detectors (Modes 7, 8, 9, 10)			
Kidde	Firewire	Linear Heat Detector	5000 metres
Protectowire	Protectowire	Linear Heat Detector	2400 metres
SAFE	ThermoCable	Linear Heat Detector	5000 metres
System Sensor	2351E	Photo Smoke	30
System Sensor	2351TEM	Photo Smoke & Heat	23
System Sensor	4351E	Fixed Temperature Heat	23
System Sensor	5351E	Fixed Temperature & ROR Heat	25
Tyco	614CH	CO & Heat	21
Tyco	614I	Ionisation Smoke	25
Tyco	614P	Photo Smoke	25
Tyco/Vigilant	1841	Indicating MCP	83
Tyco/Vigilant	Indi-V*IGIL* Mk II	Heat	50
Intrinsically Safe Detectors – Loop Powered or Regulated Supply Reqd. (Mode 11)			
Cerberus	F911Ex	Ionisation	26
Kidde	Firewire	Linear Heat Detector	5000 metres
Protectowire	Protectowire	Linear Heat Detector	2400 metres
SAFE	ThermoCable	Linear Heat Detector	5000 metres
System Sensor	1151EIS	Ionisation	26
System Sensor	5451EIS	Fixed Temperature & ROR Heat	7
Tyco	601Fex	Flame	2
Tyco	MD601Ex	ROR Heat	18
Tyco	MD611Ex	Fixed Temperature Heat	18
Tyco	MDU601Ex	Enhanced CO & Heat	12
Tyco	MF601Ex	Ionisation	16
Tyco	MR601TEx	HPO Smoke	7
Tyco	MU601Ex	CO Detector	12
Tyco	S231i+	Flame	2
The following are permitted only when O/C = Fast Alarm is configured (the default).			
-	N/C Hard Contact Devices (T54B, 27120 DETECT-A-FIRE, V*IGIL*, FP0330 non-indicating MCP, etc.)		40
NZ Legacy Smoke – Loop Powered or Regulated Supply Reqd. (Mode 12)			
All detectors, except MCPs and heat detectors, as listed for Standard Voltage detector modes, plus those listed below.			
Tyco/Vigilant	Indi-V*IGIL* Mk I	Heat	104
Tyco/Vigilant	Indi-V*IGIL* Mk II[2]	Heat	83
The following are permitted only when S/C = Fast Alarm is configured (the default).			
Tyco/Vigilant	PA0443 CCM	Conversion module for N/C heat detectors and MCPs	104

[2] For NZ Legacy Smoke circuits, the Indi-V*IGIL* Mk II must have a 4.7-7.5V zener diode fitted as per Product Bulletin NZ221A. The method described in Product Bulletin NZ208D of using a 100Ω is acceptable provided the configuration, S/C = Fast Alarm, is active. However, it must be noted that the latter method is not compliant from NZS4512:2003 onwards.

NZ Legacy Combined Mode – Loop Powered or Regulated Supply Reqd. (Mode 13)		
All detectors, except MCPs and heat detectors, as listed for Standard Voltage detector modes, plus those listed below.		
-	Open circuit heat detectors and MCPs (clean contact)	Unlimited

It should be noted that if the 614xx series of detectors have their remote indicator output shorted, the alarm voltage may fall into the fast alarm band. Whilst not preferable, this is acceptable as an alarm is generated, albeit with no AVF.

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APPENDIX B
AS1603 KEYPAD FIRE FIGHTERS GUIDE

The MX4428 FIP can be programmed to use an AS1603 keypad (identifiable by the presence of a Brigade Test key inside the red bordered area).

If an AS1603 keypad is used the standard FF Fire Fighters Guide must be replaced by the guide in this appendix.

To do so, remove the following AS1603 Fire Fighters Guide from the manual, and cut to size to fit over the AS4428 Fire Fighters Guide in the front of the manual.

Tape the AS1603 guide over the AS4428 guide. It is recommended that the taping be done in such a way that access to the AS4428 guide is still possible.

FIRE FIGHTER'S GUIDE – AS1603 FFCIF

1. VIEW NEXT/PREVIOUS ALARM

Press "NEXT" key once -
- The LCD will display the next alarm.

Press “PREV” key once -
- The LCD will display the previous alarm.

2. ACKNOWLEDGE DISPLAYED ALARM

Press "ACK" key once.
- LCD will display "ACKD" for the displayed alarm.
- If all alarms are acknowledged, the ALARM LED will go steady.

3. RESET DISPLAYED ALARM

Press "RESET" key once.
- LCD will display “PRESS TO CONFIRM RESET”.
- Press the ACK key within 10 seconds to reset the alarm.
- If the final alarm is reset the LCD will display “No more events in alarm list”, and will display any isolated alarm, otherwise FFCIF mode will be exited.

4. ISOLATE DISPLAYED ALARM

Press "ISOLATE" key once.
- LCD will display “PRESS ACK TO CONFIRM ISOLATE”.
- Press the ACK key within 10 seconds to isolate the zone.
- The isolated LED for the acknowledged alarm will turn on.
- If the final alarm is isolated, the LCD will display “No more events in alarm list”, and will display any isolated alarms, otherwise FFCIF mode will be exited.

5. ISOLATE/DE-ISOLATE EXTERNAL BELL

- Press the "BELLS ISOLATE” key once.
- If the “BELLS ISOLATE” LED is off it will turn on steady. The Bells will turn OFF if it is ON.
- If the " BELLS ISOLATE " LED is ON, it will turn OFF. If any un-isolated alarms exist, the Bells will ring.

6. BRIGADE TEST

Press and hold the “BRIG TEST” key for at least 2 seconds. If enabled:
- The FIP will signal Alarm to the brigade.
- Any ancillary functions controlled by MAF ALARM will turn ON, unless they are isolated.

APPENDIX C
EVENTS LIST

C.1 SUPPORT FOR EVENTS IN MX4428

This appendix contains a comprehensive list of events that can be generated by the MX4428 and sent to the printer, the history log and the Panel-link network.

The MX4428 can buffer up to 200 printer events, 100 events sent to the network, and the last 900 events in the history.

C.2 CIRCUIT EVENTS

03/05/01 08:53 CCT 28/1 ALARM

03/05/01 08:53 CCT 28/1 NORMAL

03/05/01 08:53 CCT 28/1 FAULT

03/05/01 08:53 CCT 28/1 FAIL AUTOMATIC TEST 0

(Responder 28, Circuit 1 failed automatic test fire. Error code suffix may be 0 or 1.
0 = the circuit was not normal so the test was not applied
1 = the circuit failed to detect the fire state.)

03/05/01 08:53 CCT 28/1 FAIL SELF TEST 3 1

(Self test failed on this circuit. The error code suffix has the following meaning.
First digit:
3 = the failure was on an alarm test and the circuit did not respond correctly
2 = the failure was on a fault test and the circuit did not respond correctly
1 = A test was about to begin & the circuit was not normal before test was applied.
Second digit
0 = Failure resulted from the state of another circuit
1 = Failure resulted from the state or response of this circuit.)

03/05/01 08:53 CCT 28/1 UNEXPECTED ALARM

(During self test there was an unexpected alarm detected on this circuit).

03/05/01 08:53 CCT 28/1 UNEXPECTED FAULT

(During self test there was an unexpected fault detected on this circuit).

C.3 ZONE EVENTS

03/05/01 08.53 ZONE 256 PREALARM ZONE TEXT 30 CHARACTERS
03/05/01 08:53 ZONE 256 ALARM ZONE TEXT 30 CHARACTERS
03/05/01 08:53 ZONE 256 AUTO-RESET ABORTED ZONE TEXT 30 CHARACTERS
03/05/01 08:53 ZONE 256 AUTO-RESET FAIL ZONE TEXT 30 CHARACTERS
(No circuits mapping to the zone went into alarm during the test period).
03/05/01 08:53 ZONE 256 AUTO-RESET PASS ZONE TEXT 30 CHARACTERS
03/05/01 08:53 ZONE 256 AUTO-RESET START ZONE TEXT 30 CHARACTERS
03/05/01 08:53 ZONE 256 DE-ISOLATE ZONE TEXT 30 CHARACTERS
03/05/01 08:53 ZONE 256 FAULT ZONE TEXT 30 CHARACTERS
03/05/01 08:53 ZONE 256 ISOLATE ZONE TEXT 30 CHARACTERS
03/05/01 08:53 ZONE 256 NORMAL ZONE TEXT 30 CHARACTERS
03/05/01 08:53 ZONE 256 RESET ZONE TEXT 30 CHARACTERS
03/05/01 08:53 ZONE 256 ZONE TEST ABORTED ZONE TEXT 30 CHARACTERS
03/05/01 08:53 ZONE 256 ZONE TEST FAILED ZONE TEXT 30 CHARACTERS
03/05/01 08:53 ZONE 256 ZONE TEST PASSED ZONE TEXT 30 CHARACTERS
03/05/01 08:53 ZONE 256 ZONE TEST STARTED ZONE TEXT 30 CHARACTERS

C.4 RELAY EVENT

03/05/01 08:53 RLY 24/1 FAULT
(Fault on responder 24 relay 1).
03/05/01 08:53 RLY 24/1 NORMAL
(Fault on responder 24 relay 1).

C.5 ANCILLARY CONTROL ZONE EVENTS

03/05/01 08:53 ACZ 0 ACTIVATED Master Ancillary Zone 0
03/05/01 08:53 ACZ 0 DE-ACTIVATED Master Ancillary Zone 0
03/05/01 08:53 ACZ 0 DE-ISOLATE Master Ancillary Zone 0
03/05/01 08:53 ACZ 0 FAULT Master Ancillary Zone 0
03/05/01 08:53 ACZ 0 ISOLATE Master Ancillary Zone 0
03/05/01 08:53 ACZ 0 NORMAL Master Ancillary Zone 0
03/05/01 08:53 ACZ 0 RESET Master Ancillary Zone 0
03/05/01 08:53 ACZ 0 TEST ACTIVATION Master Ancillary Zone 0
03/05/01 08:53 ACZ 48 ACTIVATED ZONE TEXT 30 CHARACTERS
03/05/01 08:53 ACZ 48 DE-ACTIVATED ZONE TEXT 30 CHARACTERS
03/05/01 08:53 ACZ 48 DE-ISOLATE ZONE TEXT 30 CHARACTERS
03/05/01 08:53 ACZ 48 FAULT ZONE TEXT 30 CHARACTERS
03/05/01 08:53 ACZ 48 ISOLATE ZONE TEXT 30 CHARACTERS

03/05/01 08:53	ACZ	48	NORMAL	ZONE TEXT 30 CHARACTERS
03/05/01 08:53	ACZ	48	RESET	ZONE TEXT 30 CHARACTERS
03/05/01 08:53	ACZ	48	TEST ACTIVATION	ZONE TEXT 30 CHARACTERS

C.6 POINT EVENTS

03/05/01 08:53 PNT 127/100 ALARM
(Alarm on Point 127/100)

03/05/01 08:53 PNT 127/100 ALARM CLR
(Alarm on Point 127/100 has cleared)

03/05/01 08:53 PNT 127/100 ALARM TEST FAIL
(Point failed to go into alarm on test).

03/05/01 08:53 PNT 127/100 CONTROL CB FAIL
(A device at Point 127/100 has been sent a control signal, but the expected signal to verify that the control has taken place has not been received.)

03/05/01 08:53 PNT 127/100 CONTROL CB NML
(The signal to verify that a control has taken place was initially not received, but has since been received on re-try).

03/05/01 08:53 PNT 127/100 DEVICE FAULT
(Fault on output point. Can be internal or in external wiring.)

03/05/01 08:53 PNT 127/100 DUPLICATE DEVICE
(Two devices found on the same analogue loop at the same address.)

03/05/01 08:53 PNT 127/100 EWD DATA ERROR
(Analogue Loop data line in the incorrect voltage state. Can be caused by the 24 Volt line being shorted to the Data Line.)

03/05/01 08:53 PNT 127/100 FAULT
(Tracked value on smoke detector too low. Supervision fault on ADU002 or ADU006.)

03/05/01 08:53 PNT 127/100 FAULT CLR
(Tracked value from smoke detector or supervision fault on ADU002 and ADU006 now normal.)

03/05/01 08:53 PNT 127/100 FAULT TEST FAIL
(Fault Test on ADU006 device failed.)

03/05/01 08:53 PNT 127/100 FOREIGN DEVICE
(Device replying at an address that has not been configured in the database.)

03/05/01 08:53 PNT 127/100 LOAD SUPPLY FAIL
(*Failure of 24 volt load supply.)*

03/05/01 08:53 PNT 127/100 DIRTY ALERT
(Analogue detector at this point has reached its sensitivity compensation limit. Detector requires cleaning/service.)

03/05/01 08:53 PNT 127/100 DIRTY ALERT CLR
(Analogue detector at this point has been in dirty alert and is now normal.)

03/05/01 08:53 PNT 127/100 NODE FAIL
(Communication with this point has been lost on both lines. This event may be accompanied by "Scan Fail 1" and "Scan Fail 2" messages also indicating loss of communication on both lines.)

03/05/01 08:53 PNT 127/100 NODE FAIL CLR
(Communication with this point has now been restored on at least 1 line. This message will normally be accompanied by a Scan Fail Clr event indicating the lines affected by the event.)

03/05/01 08:53 PNT 127/100 NORMAL OFF
(ADU003A or ADU004 output turned off, with correct external confirmation.)

03/05/01 08:53 PNT 127/100 NORMAL ON
(ADU003A or ADU004 output turned on, with correct external confirmation.)

03/05/01 08:53 PNT 127/100 PARAMETER ERROR
(Analogue parameters stored at the master have been programmed wrongly for this point.)

03/05/01 08:53 PNT 127/100 POINT TYPE MISMATCH
(The type of device installed at this address does not match the type programmed in the database.)

03/05/01 08:53 PNT 127/100 POINT TYPE OK
(The type of device installed at this address now matches the type programmed in the database.)

03/05/01 08:53 PNT 127/100 PRE-ALARM
(Smoke detector at this point is returning a pre-alarm value.)

03/05/01 08:53 PNT 127/100 SCAN FAIL 1
(Communication with this point has been lost on Line 1)

03/05/01 08:53 PNT 127/100 SCAN FAIL 2
(Communication with this point has been lost on Line 2)

03/05/01 08:53 PNT 127/100 SCAN FAIL CLR 1
(Communication with this point has been restored on Line 1)

03/05/01 08:53 PNT 127/100 SCAN FAIL CLR 1 AND 2
(Communication with this point has been restored on both Lines)

03/05/01 08:53 PNT 127/100 SCAN FAIL CLR 2
(Communication with this point has been restored on Line 2)

03/05/01 08:53 PNT 127/100 SELF TEST - COMMS ERROR
(Communications error with this point during self-test causing a self test fail. Self-test causes the usual command re-try sequence to be shortened in order to reduce the time taken to test all devices. A trade-off of this is that communications errors may cause a self test fail.)

03/05/01 08:53 PNT 127/100 SIMULATED TEST FAIL
(Applies to smoke detectors and ADU002 Input Devices. A direct alarm test is available on these devices, but a direct fault test is not possible and is therefore simulated by the responder. This event indicates the failure of a simulated fault test for a device.)

03/05/01 08:53 PNT 127/100 SUPERVISION FAULT
(Fault in external supervised circuit wiring of output point.)

03/05/01 08:53 PNT 127/100 TEST - CONTROL CB FAIL
(A test command has been sent to a device, but the check back indicates that the Test has not been actioned.)

03/05/01 08:53 PNT 127/100 TEST START NOT NORMAL
(During a System Test or Autotest, a test was attempted on an input device that was not normal or in fault or in alarm at the beginning of the test (e.g. flowswitch input part-way through input time delay). The test should fail as a result of this event. Note that for a Zone Test this event does not occur and any input part-way through a time delay when a Zone Test is initiated will complete the time delay and operate.)

03/05/01 08:53 PNT 127/100 UNSTABLE INPUT
(Applies to relay devices. Relay supervision hardware is not returning a consistent analogue value. Could be a fault in the device or a loose connection in the external wiring.)

C.7 SYSTEM EVENTS

03/05/01 08:53 MX4428 ANCILLARY RELAY FAULT

03/05/01 08:53 MX4428 ANCILLARY RELAY NORMAL

03/05/01 08:53 MX4428 AUTO TEST FAILED
(The MX4428 Automatic Test has failed. This event should be accompanied by other circuit and/or point test fail event(s) or responder test fail event(s) giving the location of the failure more specifically. The "System Fault" indication on the FIP that is caused by this event, can be reset only by the system completing a successful Self Test (i.e. System Test) or Auto Test.)

03/05/01 08:53 MX4428 AUTO TEST PASSED
(The MX4428 Automatic Test has been successfully completed. This event is normally printed every 24 hrs if Auto Test has not been disabled.)

03/05/01 08:53 MX4428 BAD EVENT OUTPUT
(Internal error- the circuit or zone event given was invalid. Contact service company.)

03/05/01 08:53 MX4428 BAD RAM ERROR <error code>
(During testing a RAM fault was found at the MX4428 Master. Service required. For a description of the error codes refer Section C.11.)

03/05/01 08:53 MX4428 BAT FAIL FAULT
(Battery Failed at Master)

03/05/01 08:53 MX4428 BAT FAIL FAULT DISCONNECT
(Battery Disconnected at Master)

03/05/01 08:53 MX4428 BAT FAIL NORMAL
(Battery not failed at Master)

03/05/01 08:53 MX4428 BAT FAIL NORMAL RECONNECT
(Battery Reconnected at Master)

03/05/01 08:53 MX4428 BAT LOW FAULT
(Battery Low at Master)

03/05/01 08:53 MX4428 BAT LOW NORMAL
(Battery Normal at Master)

03/05/01 08:53 MX4428 BAT TEST ABORTED

03/05/01 08:53 MX4428 BAT TEST FAILED

03/05/01 08:53 MX4428 BAT TEST PASSED

03/05/01 08:53 MX4428 BAT TEST STARTED

03/05/01 08:53 MX4428 BELL RELAY FAULT

03/05/01 08:53 MX4428 BELL RELAY NORMAL

03/05/01 08:53 MX4428 BRIGADE TEST KEY PRESSED
(The Brigade Test function on an MX4428 was activated.)

03/05/01 08:53 MX4428 CHARGER FAULT
(Charger voltage out of required range at Master)

03/05/01 08:53 MX4428 CHARGER NORMAL
(Charger voltage restored to required range at Master)

03/05/01 08:53 MX4428 CHARGER MAINS FAULT

03/05/01 08:53 MX4428 CHARGER MAINS NORMAL

03/05/01 08:53 MX4428 COMMS BREAK 1
(Responder Loop Communications lost at the MX4428 Master on Channel1)

03/05/01 08:53 MX4428 COMMS BREAK 2
(Responder Loop Communications lost at the MX4428 Master on Channel2)

03/05/01 08:53 MX4428 COMMS RESTART 1
(*(Responder Loop Communications re-started at the MX4428 Master on Channel1)*

03/05/01 08:53 MX4428 COMMS RESTART 2
(*(Responder Loop Communications re-started at the MX4428 Master on Channel2)*

03/05/01 08:53 MX4428 EXTERNAL BELL DE-ISOLATE

03/05/01 08:53 MX4428 EXTERNAL BELL ISOLATE

03/05/01 08:53 MX4428 EXTERNAL BELL TEST

03/05/01 08:53 MX4428 EXTERNAL DEFECT
(An MX4428 system configured in NZ mode, has the external Defect input asserted.)

03/05/01 08:53 MX4428 EXTERNAL EVAC DEFECT
(An MX4428 system configured in NZ mode, has a supervised evacuation circuit fault.)

03/05/01 08:53 MX4428 EXTERNAL SILENCE
(An MX4428 system configured in NZ mode has the external Silence Alarms Switch input asserted.)

03/05/01 08:53 MX4428 F4KNZ BAD EVENT
(An MX4428 system configured in NZ mode has reported an invalid event. Contact the Service Company.)

03/05/01 08:53 MX4428 GLOBAL ISOLATE
(Global Isolate command was issued. Global Isolate causes all un-isolated zones in alarm to become isolated.)

03/05/01 08:53 MX4428 GLOBAL RESET
(Global Reset command was issued.)

03/05/01 08:53 MX4428 GLOBAL SILENCE
(The "ACK" key on the MX4428 FFCIF was operated to silence a steady (fault) sounder.)

03/05/01 08:53 MX4428 HISTORY LOG FULL
(No more events will be stored in the history log until the next system reset.)

03/05/01 08:53 MX4428 ITEMS LOST: 88
(The print queue has restarted, 88 items were lost. If the number of items lost is greater than or equal to 255 then ">=255" will be printed.)

03/05/01 08:53 MX4428 LOOP POWER FAULT
(The 24 volt responder loop supply wiring is faulty somewhere around the loop. This event may be accompanied by additional responder events that indicate the position of the fault around the loop. If this event only is logged it indicates that the fault is likely to be a single wire open circuit somewhere around the 24 volt loop supply. To find the location of the fault place a short circuit on the loop power wiring and note the point on the loop up to which the responders fail because of the short.)

03/05/01 08:53 MX4428 MCP ALARM
(MCP on Master in Alarm.)

03/05/01 08:53 MX4428 MCP FAULT
(MCP on Master in Fault.)

03/05/01 08:53 MX4428 PRINT QUEUE FULL
(The print queue is full. Further events may be lost.)

03/05/01 08:53 MX4428 PROCESSING STARTED
(System processing was re-started)

03/05/01 08:53 MX4428 PROCESSING STOPPED
(System processing was suspended)

03/05/01 08:53 MX4428 ROM/EEPROM CRC ERROR <error code>
(During memory testing the Database or ROM at the MX4428 Master did not match the calculated CRC. This fault occurring during Auto Test, System Test, or Power Up indicates a memory chip failure or similar, but if it should occur after loading a database from disk it may be the result of a downloading error. For a description of the error codes refer Section C.11.)

03/05/01 08:53 MX4428 SELF TEST ABORTED
(System test stopped before completion by pressing "ACK".)

03/05/01 08:53 MX4428 SELF TEST FAIL
(The MX4428 Master did not complete self test.)

03/05/01 08:53 MX4428 SELF TEST PASSED
(System Test successfully completed.)

03/05/01 08:53 MX4428 127 SOFTWARE FAULT 5
(Software Fault indicates a fault in the MX4428 database or an internal problem. Possible fault numbers are from 0 to 7:
0: Output Logic Address error
1: ACR not found
2: Relay not found
3: Circuit to Zone Mapping error
4: Analogue Database Fault
5: Analogue Database Transfer Fault
6: Non normal status from disabled Circuit
7: Message received has been changed internally

03/05/01 08:53 MX4428 SYSTEM FAULT RESET
(System fault reset command issued from MX4428.)

03/05/01 08:53 MX4428 SYSTEM POWER UP
(System was restarted from power-up)

03/05/01 08:53 MX4428 SYSTEM RE-INITIALISATION
(The MX4428 has re-initialised the system EEPROM.)

03/05/01 08:53 MX4428 SYSTEM RUNNING
(Event printed every 24 hours to verify that the system is still operating, if Auto Test is disabled. Printing of this event can be inhibited using DC/CS/PE.)

03/05/01 08:53 MX4428 SYSTEM SETUP COMPLETED
(Intialisation of the system has been completed.)

03/05/01 08:53 MX4428 SYSTEM SETUP ERROR
(The system setup procedure timed out because of invalid configuration or bad data.)

03/05/01 08:53 MX4428 SYSTEM WARM START
(The system restarted from an internal error or a processor reset.)

03/05/01 08:53 MX4428 SYSTEM WATCHDOG
(A single Watchdog event with no other entry indicates that the system restarted with Watchdog latch/LED set. If extra text is present, it indicates that the MX4428 program has detected a problem and is deliberately restarting the system. The number displayed may be useful for diagnosis.)

- *LOCKOUT – Program not operating correctly.*
- *TRAP, TOF, ICF, SWI, NMI – Unexpected Interrupt.*
- *RAMB, EEPB, CODB – Memory Management Problem.*

03/05/01 08:53 MX4428 TIME/DATE CHANGE: NEW
(There was a time and/or date change. The time/date stamp is the new value.)

03/05/01 08:53 MX4428 TIME/DATE CHANGE: OLD
(There was a time and/or date change. The time/date stamp is the old value.)

03/05/01 08:53 MX4428 TRIAL EVAC/SPKLR
(An MX4428 system configured in NZ mode, has had the (Trial) Evacuation or Sprinkler input operated.)

03/05/01 08:53 MX4428 WARNING SYSTEM DE-ISOLATE

03/05/01 08:53 MX4428 WARNING SYSTEM ISOLATE

03/05/01 08:53 MX4428 WARNING SYSTEM TEST

03/05/01 08:53 MX4428 WRITE FAIL EEP#1 $XXXX
(A write fail error occurred in EEPROM number 1, when attempting to write near location $XXXX.)

03/05/01 08:53 MX4428 ZONE DISPLAYS FAULT
(The zone display board monitoring has been detected faulty at the master. The number of display boards may not be correct or the cable has been broken.)

C.8 REMOTE ZONE DISPLAY UNIT EVENTS

Note: Many MX4428 events described above also apply to an RZDU even though they are not repeated below. The events shown below are those that relate specifically to RZDUs and not to the MX4428 Master.

03/05/01 08:53 RZDU 1 BULK ZONE COMMAND RXD
(A command affecting a range of zones was received from RZDU 1.)

03/05/01 08:53 RZDU 1 COMMS RESTART
(Communication with RZDU 1 has been restored.)

03/05/01 08:53 RZDU 1 FOREIGN DEVICE
(RZDU 1 is replying on the RZDU communications port, but the system database is not configured to communicate with an RZDU at this address.)

03/05/01 08:53 RZDU 1 LOST COMMS
(Communication with RZDU 1 has been lost.)

03/05/01 08:53 RZDU 1 SYSTEM FAULT
(RZDU 1 has a system fault, e.g., LED displays fault, all zones isolated, etc.)

03/05/01 08:53 RZDU 1 SYSTEM FAULT NORMAL
(System Fault at RZDU 1 has been cleared.)

03/05/01 08:53 RZDU 1 ZONE COMMAND RXD
(A zone command has been received from RZDU 1.)

C.9 RESPONDER EVENTS

03/05/01 08:53 RSP 127 BAD EVENT OUTPUT
(Internal error- the event received from this responder was invalid. Contact service company.)

03/05/01 08:53 RSP 127 BAD RAM ERROR <error code>
(RAM error on this responder. A memory test is conducted on power-up, during the 24 hour autotest and during a system test. The event causes a System Fault condition which can be reset only by performing a successful memory test. The error number indicates the location of the fault within the responder and should be noted with the fault description when the device is returned for service. In the case of an MPR or AAR this could be the result of a corrupt database in RAM, in which case the responder will request a new database from the FIP and it may be possible to clear the fault by performing a system test. For a description of the error codes refer Section C.11.)

03/05/01 08:53 RSP 127 BOTH EWD AND SS DEVICES FOUND
(During initialisation, an MPR determined that it had both EWD and SS devices connected to it.)

03/05/01 08:53 RSP 127 COMMS BREAK 1
(Responder 127 is not receiving messages on responder communications channel 1.)

03/05/01 08:53 RSP 127 COMMS BREAK 2
(Responder 127 is not receiving messages on responder communications channel 2.)

03/05/01 08:53 RSP 127 COMMS RESTART
(The Master has begun to receive messages from Responder 127.)

03/05/01 08:53 RSP 127 COMMS RESTART 1
(Responder 127 has begun to receive messages on responder communications channel 1.)

03/05/01 08:53 RSP 127 COMMS RESTART 2
(Responder 127 has begun to receive messages on responder communications channel 2.)

03/05/01 08:53 RSP 127 DATABASE TX COMPLETE
(Transmission of database information to Responder 127 (AAR/MPR/MXP) has been completed.

03/05/01 08:53 RSP 127 DATABASE TX REQUEST
(An AAR/MPR/MXP has requested a database up-date from the Master. Such a request occurs if the CRC of the responder database is found to be incorrect or a previous database transmission was not received or if there has just been a System Re-initialisation.)

03/05/01 08:53 RSP 127 DATABASE TX START
(Transmission of database information to Responder 127 has commenced.)

03/05/01 08:53 RSP 127 EWD CLOCK FAULT
(Hardware fault on AAR)

03/05/01 08:53 RSP 127 EWD CLOCK NORMAL
(Hardware fault on AAR cleared.)

03/05/01 08:53 RSP 127 FAIL AUTOMATIC TEST
(Responder 127 did not pass its automatic test for reasons other than a circuit failure, e.g. the responder did not go into auto test fire, or there was an unexpected fault or alarm at the responder.)

03/05/01 08:53 RSP 127 FOREIGN DEVICE 2
(Responder 127 is communicating on the responder loop, but the system database is not configured for a responder with this number.)

03/05/01 08:53 RSP 127 LOOP OPEN CIRCUIT

03/05/01 08:53 RSP 127 LOOP OPEN CIRCUIT CLEARED
(Responder 127 detected an open circuit, or its restoration, on its analog loop.)

03/05/01 08:53 RSP 127 LOOP POWER FAULT
(Loss of one of the two 24 volt loop connections to this responder. This message will normally be accompanied by a Loop Power Fault message from an adjacent responder (or from the Master) in which case it indicates that there is a fault (probably a short circuit) on the 24 volt loop supply wiring between the two responders that have reported the event. Note that in the case of a short circuit several responders may initially report Loop Power Faults, but will restore to normal within a few seconds. The responders that remain in fault are the ones that indicate the position of a short.)

03/05/01 08:53 RSP 127 LOOP POWER NORMAL
(Loop power is now present on both sides of the 24 volt loop connection to this responder.)

03/05/01 08:53 RSP 127 LOOP SHORT CIRCUIT

03/05/01 08:53 RSP 127 LOOP SHORT CIRCUIT CLEARED
(Responder 127 detected a short circuit, or its restoration, on its analog loop.)

03/05/01 08:53 RSP 127 LOST COMMS
(The Master is not receiving messages from Responder 127. If not accompanied by other loop fault messages it usually means that the responder is faulty.)

03/05/01 08:53 RSP 127 POWER FAIL LINE 2
(Applies to an AAR wired in 3 wire mode and indicates an open circuit condition on the 24 volt analogue loop supply. If present on a 2 wire system indicates that the link at the AAR between +24 volts Line 1 and Line 2 is not in place.)

03/05/01 08:53 RSP 127 POWER OK LINE 2
(Fault on the Analogue loop 24 volt supply has returned to normal.)

03/05/01 08:53 RSP 127 RELAY BD FAULT
(The RRM on an ARR or an output or input board of an IOR is faulty or has been removed.)

03/05/01 08:53 RSP 127 RELAY BD NORMAL
(The fault on an RRM on an IOR or an output or input board of an IOR has now returned to normal.)

03/05/01 08:53 RSP 127 ROM/EEPROM CRC ERROR <error code>
(ROM or EEPROM memory error on this responder. A memory test is conducted on power-up, during the 24 hour autotest and during a system test. The event causes a System Fault condition which can be reset only by performing a successful memory test. The error will normally indicate a faulty responder. The error number indicates the location of the fault within the responder and should be noted with the fault description when a responder is returned for service. For a description of the error codes refer Section C.11.)

03/05/01 08:53 RSP 127 SELF TEST FAIL
(Responder 127 did not complete self test.)

03/05/01 08:53 RSP 127 SOFTWARE FAULT 5
(Software Fault indicates a fault in the MX4428 database or an internal problem. Possible fault numbers are from 0 to 7:
0: Output Logic Address error
1: ACR not found
2: Relay not found
3: Circuit to Zone Mapping error
4: Analogue Database Fault
5: Analogue Database Transfer Fault
6: Non normal status from disabled Circuit
7: Message received has been changed internally

03/05/01 08:53 RSP 127 TOP BOARD FAULT
(A fault has been detected in the top PCB of AAR 127, or the top PCB of the AAR may be missing.)

03/05/01 08:53 RSP 127 TOP BOARD OK
(Fault in top board of AAR 127 now restored to normal.)

03/05/01 08:53 RSP 127 TOP BOARD WARNING
(Fault message received from the top board of AAR 127.)

03/05/01 08:53 RSP 127 TYPE MISMATCH
(Responder 127 is configured as the wrong type of Responder.)

C.10 NETWORK EVENTS

03/05/01 08:53 SID 5 NET BAD EVENT
(Internal event is corrupted/invalid.)

03/05/01 08:53 SID 5 NET COMMAND ACCEPTED
(A command was received from the specified network panel and validated. Other events may show the effect of the command.)

03/05/01 08:53 SID 5 NET MESSAGE DISCARD
(Attempts to send a message to the SID have failed. The message is discarded to allow other messages to be sent. SID 0 indicates a problem with broadcast confirmation.)

03/05/01 08:53 SID 5 NET SCAN FAULT <CHA/CHB>

03/05/01 08:53 SID 5 NET SCAN NORMAL <CHA/CHB>
(SID had a fault on (or restoration) Panel Link Channel A or Channel B.)

C.11 MEMORY TEST FAIL CODES

CODE	DESCRIPTION	FIP	RZDU	RESPONDER
0	Microprocessor RAM/ROM	✓	-	✓
1	External RAM	✓ *f	-	✓*e
2 *a	EEPROM Database Main Board U10/U9 Memory LCD Board U4/U2 (Bank 0)	✓	-	-
3	EPROM Memory LCD Board U1	✓	-	-
4	EPROM Main Board U7	✓	✓	-
5	NOT USED	-	-	-
6	External RAM/Microprocessor RAM	-	✓ *b	-
7-10	EPROM U8/Banked EPROM Emulator U1	✓	-	-
11 *g	Responder External RAM Checksum	-	-	✓
12-27	EPROM Memory LCD Board U1 (Bank 0-15)	✓	-	-
28-43 *c	EEPROM Memory LCD Board U2 (Bank 0-15)	✓	-	-
44-59 *d	RAM Memory LCD Board U3 (Bank 0-15)	✓	-	-
60-74	Undefined	-	-	-
75 *g	Responder External RAM Checksum	-	-	✓
76-254	Undefined	-	-	-
255	Internal Test Error Flag	✓	-	-

Notes:

a) Error Code 2 relates to the main MX4428 database area. This database always occupies 2 EEPROMs (Memory LCD board U4 and U2).

Possible causes for Error Code 2 include:
- faulty ICs or Memory LCD Board.
- incorrectly fitted ICs, wrong IC type, or Memory LCD Board not fitted correctly.
- incorrect Memory/LCD Board link settings.
- corrupt database download.

b) An RZDU with software V1.10 or later will also generate this error code if it has a Database CRC fault.

c) Most MX4428 LCD systems have 4 banks of EEPROM in Memory LCD board position U2. Thus error codes 28-31 are possible although error code 28 is covered by error code 2. MX4428 systems using point text have a larger EEPROM for the Memory LCD board U2 which can produce error codes 28-43 if the larger EEPROM is not fitted or the CRCs are invalid.

Possible causes of error codes 29-43 are:
- that there is a general corruption of the database due to the database being write enabled during a power-up/down.
- the EEPROM or Memory LCD Board are damaged or not connected properly.
- corrupt database download.

An additional cause of an error code of 32 is that a larger EEPROM needs to be fitted to the Memory LCD board U2 or that the point text feature has been enabled but no point text has been downloaded.

d) MX4428 has a large RAM chip (Memory LCD board U3) which can produce error codes 44-59, except for 47, 51, 55 and 59 as the corresponding RAM banks are hidden by one of the database ICs (Memory LCD board U4).

   A possible cause of RAM Error 48 is that a smaller RAM chip is fitted in Memory LCD board U3 when a larger chip is required.

   Possible causes of RAM Errors 44 through 59 are that Memory LCD board U3 or the Memory Board are damaged or not connected properly.

e) AAR/MPR/MXP Read/Write RAM Fault.

f) MX4428 External RAM is U11 of the Main Board.

g) Some older MX4428 firmware displays an error code of 75 instead of the correct error code of 11.

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