# RDU Mk2

# REMOTE DISPLAY UNIT

# INSTALLATION & PROGRAMMING MANUAL

RDU PRODUCT MANUAL

Document Number: LT0499

**Issue .....** 1.02; ..... 8 April 2015

| - APPROVALS - |
| --- |
| **AUSTRALIAN STANDARD AS1603.4 1987 (Incl. Amdt 1 & 2):**<br>**AUSTRALIAN STANDARD AS4428.1 1998 (Incl. Amdt 1 & 2):**<br>**AUSTRALIAN STANDARD AS4050 1992 (Int)**<br>**AUSTRALIAN/NZ STANDARD AS/NZS3548 1995 Class A**<br>**NEW ZEALAND STANDARD NZS4512** |

The RDU is a product of

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**NOTICE**

# TYCO FIRE PROTECTION PRODUCTS
# END USER LIABILITY DISCLAIMER

The RDU has a configuration programming facility which may be accessed from the keypad by using a password.

This programming facility allows the user to define detail of the operation of the RDU. It is possible for the user to program operational features that prevent the installed RDU from meeting statutory requirements.

Tyco Fire Protection Products does not accept responsibility for the suitability of the functions programmed by the user.

### CISPR 22/AS3548 NOTICE

**WARNING:** This 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.

## AMENDMENTS

| ISSUE | DATE | COMMENTS | ECO |
|---|---|---|---|
| 1 | 16/01/09 | Original. Derived from LT0148 & LT0256 | 3995 |
| 1.01 | 01/07/10 | Added limitations on use on MX1 in Section 7.9. | 1463 |
| 1.02 | 08/04/15 | Added IP Ratings & max dc current to specs. | 4731 |
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# CHAPTER 1
# INTRODUCTION

# 1.1 SCOPE

This manual describes the installation and programming of the RDU Mk2 (Remote Display Unit) for systems compliant with one of the following standards.

AS4428.1 Australian Standard
AS1603.4 Australian Standard (legacy systems)
NZS4512 : 2003 New Zealand Standard

The RDU Mk1 is the original RDU and uses software versions 1.00 to version 2.12 and requires an AS1603.4 keypad. The operator manual for RDU Mk1 is LT0133 and the installation and programming manual is LT0148.

The RDU Mk2 requires software version 5.xx and is available in two series – AS1603.4 and AS4428.1 – to match the keyboard layout and operation. The part numbers and manuals associated with RDU Mk2 are shown in the following table.

Table 1.1
RDU Mk2 Part Numbers

| | AS1603.4 | AS4428.1 |
|---|---|---|
| 15U Cabinet MAF/PSU 3A | FP0558 | FP0785 |
| 8U Cabinet MAF/PSU 3A | FP0585 | FP0786 |
| Slimline Wall Mount | FP0559 | FP0787 |
| Slimline Flush Mount | FP0772 | FP0788 |
| 4U 19” Rack Module | FP0577 | FP0789 |
| Operator Manual | LT0494 | LT0252 |
| Installation & Programming Manual | LT0499 | |

The RDU can be used in both New Zealand and Australia and this manual describes the operation for both. There are some differences in operation between the two countries and these are listed in section 2.4. The country mode is selected with a programmable parameter.

The manual is divided into the following chapters:

**Chapter 1** **Introduction:** Information on this manual.

**Chapter 2** **System Description:** A description of the RDU and how it interacts with the FIP.

**Chapter 3** **System Specifications:** A detailed specification for the RDU.

**Chapter 4** **Ordering Information:** Part numbers for the various system components.

**Chapter 5** **Configuring an RDU:** General information and detail on fitting of the various links and components when configuring a system.

**Chapter 6** **Programming Part 1:** Details for programming "global data".

**Chapter 7** **Programming Part 2:** Details for programming "system configuration".

**Chapter 8** **Installation & Wiring:** Detail of installation and field wiring.

**Chapter 9** **Alignment, Adjustment & Placing Into Operation:** Detail on how to adjust an RDU in the field and place it into operation.

**Appendix A** **RDU Configuration Forms:** A set of master forms for recording programming information for an RDU.

# 1.2 ASSOCIATED DOCUMENTATION

### 1.2.1 PRODUCT RELATED

The following manuals for the RDU Mk2 are available:

| | |
|---|---|
| RDU Mk2 Installation & Programming Manual | This Manual, Part No. LT0499. |
| RDU Mk2 AS4428.1 Operator's Manual | Part number LT0252. |
| RDU Mk2 AS1603.4 Operator's Manual | Part number LT0494. |

### 1.2.2 STANDARDS

This manual makes reference to the following Australian Standards:

| | |
|---|---|
| AS4428.1 | Fire Detection, Warning, Control and Intercom Systems - Control and Indicating Equipment<br>Part 1 : Fire |
| AS1603.4 | Automatic Fire Detection and Alarm Systems<br>Part 4 - Control and Indicating Equipment. |
| AS4050 (int) | (AS1603.4 systems) Fire Detection and Fire Alarm Systems - Fire Fighter's Control and Indicating Facilities. |
| AS1670.1 | Automatic Fire Detection and Alarm Systems - System Design, Installation and Commissioning. |

and the New Zealand standard:

| | |
|---|---|
| NZS4512 : 2003 | Automatic Fire Alarm Systems in Buildings |

# 1.3 PRODUCT HISTORY LOG

### 1.3.1 HARDWARE

PA0871 AS4428 CONTROLLER/DISPLAY, RDU
PA0909 AS4428 CONTROLLER/DISPLAY, NO SOFTWARE. (Customer spare)

PA0798 AS1603.4 CONTROLLER/DISPLAY, RDU
PA0804 AS1603.4 CONTROLLER/DISPLAY, NO SOFTWARE. (Customer spare)

PA0491 MAF/PSU AS1603.4

PA0873 MAF/PSU AS4428.1

PA0703 REMOTE TERMINATION BOARD

### 1.3.2 SOFTWARE

SF0424 SOFTWARE RDU Mk2 AS4428 / AS1603 REMOTE DISPLAY V5.00

# 1.4 GLOSSARY OF ABBREVIATIONS

The following abbreviations are used throughout this manual:

| | | |
|---|---|---|
| A/C | : | Air Conditioning |
| ac | : | Alternating Current |
| AEOL | : | Active End of Line |
| AHr | : | Ampere Hour |
| ANC 1 | : | Ancillary Relay 1 |
| AZC | : | Alarm Zone Circuit, or Detection Zone |
| AZF | : | Alarm Zone Facility, or Group |
| AVF | : | Alarm Verification Facility, or Check Alarm |
| Bd | : | Board |
| CIE | : | Control & Indicating Equipment |
| Char | : | Character |
| CCT | : | Circuit |
| COM | : | COMMON relay contact |
| dc | : | Direct current |
| EEPROM | : | Electrically Erasable Programmable Read Only Memory |
| ELV | : | Extra Low Voltage |
| EOL | : | End Of Line (device) |
| EOLR | : | End of Line Resistor |
| Expn | : | Expansion |
| E2 | : | Electrically Erasable Programmable Read Only Memory |
| FFCIF | : | Fire Fighter's Control & Indicating Facility |
| FIP | : | Fire Indicator Panel |
| FRC | : | Flat Ribbon Cable |
| I/O | : | Input/Output |
| LCD | : | Liquid Crystal Display |
| LED | : | Light Emitting Diode |
| MAF | : | Master Alarm Facility |
| Max | : | Maximum |

| | | |
|---|---|---|
| Min | : | Minimum |
| MCP | : | Manual Call Point (Break Glass Switch) |
| MOV | : | Metal Oxide Varistor (Used for Surge Protection) |
| msec | : | Millisecond |
| NC | : | Normally Closed |
| NO | : | Normally Open |
| No | : | Number |
| Nom | : | Nominal |
| PC | : | Personal Computer (small computer) |
| PCB | : | Printed Circuit Board |
| PSU | : | Power Supply Unit |
| PTC | : | Positive Temperature Co-efficient (Thermistor) |
| RMS | : | Root Mean Square |
| Reqd | : | Required |
| RTC | : | Real Time Clock |
| RDU | : | Remote Display Unit |
| sq mm | : | square millimetre |
| Tmnl | : | Terminal |
| VA | : | Volts Amperes |
| VB | : | Battery Backed Voltage |
| VNB | : | Non Battery Backed Voltage |
| +VBF | : | Fused Battery-Backed Voltage |
| +VNBF | : | Fused Non-Battery-Backed Voltage |
| Z1 | : | Zone Number 1 (program abbreviation) |
| Zn1 | : | Zone Number 1 (text abbreviation) |

## 1.5 GLOSSARY OF TERMINOLOGY

The following terminology is used throughout this manual:

| | | |
|---|---|---|
| Ancillary Equipment | : | Equipment external to Fire Alarm system |
| Ancillary Relay | : | Relay in RDU which operates Ancillary equipment |
| Auto-Reset | : | Mode for one person testing of detectors |
| Auxiliary Output | : | Output for driving additional LEDs/relays |
| Baud | : | Bits per second |
| Control Output | : | Output from RDU to other equipment |
| Default | : | Pre-programming option or logic equation i.e. one that exists without the user programming it. |
| Detector | : | Alarm Detection Device (electrical transducer) |
| Fire Control Station | : | Fire Brigade Authority, or any other authority which receives the FIP alarm signals. |
| Mapping | : | Programmable causal relationship between inputs and outputs |
| Zone | : | Fire searchable area of building represented by a unique number and name in the RDU, and associated with the FIP AZC of the same number. |
| Display extender board | : | Used with New Zealand operation only. It has common normal, fire and defect LEDs. |

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# CHAPTER 2
# SYSTEM DESCRIPTION

# 2.1 OVERVIEW

### 2.1.1 GENERAL

The RDU is an intelligent Remote Display Unit (RDU) which performs the functions of a Fire Fighter's Facility (FF) as specified by the Australian Standard AS4428.1 for Australian use and NZS4512 for New Zealand use. It can connect to any of MX1, F3200, F4000 or MX4428, FP1600 Mk3 and Sigma 5 FIPs to provide remote indication of zone status and optionally control the FIP. Up to 8 RDUs (in "reply" mode) can be multi-drop connected to the FIP, with additional devices connected in "listen only/mimic mode" if necessary.

The operator menus and programming of RDU Mk2 V5.00 software are quite different to the RDU Mk1 software V1.00 to V2.12. RDU Mk2 operator and programming menus are now similar to the NDU and includes new features such as temporary password access, non-volatile history, downloadable firmware and Tandem LCD access.

RDU configuration programming can be used to select which zones the RDU displays and allows control of. This means that in multiple RDU systems, each RDU can be assigned the zones corresponding to its own particular area. An RDU can be programmed to simply mimic the FIP zone status and alarms, or it can be programmed to allow control as well, where zones can be acknowledged, reset or isolated from the RDU.

The RDU can have its own independent set of zone names (which may be different from those at the FIP) or it can use the zone names sent by the FIP. The RDU can have up to 33 sixteen-zone LED display/relay boards fitted.

The RDU is supplied in several different physical arrangements, including cabinet (with MAF board), slimline wall mount, and slimline flush, as shown in Figures 2.1.1, 2.1.2 and 2.1.3.

It is available in 8U and 15U cabinets complete with a MAF/PSU module and Manual Call Point MCP. There is space for mounting from four to ten 16 Zone LED Display Boards as an optional extra.

The slimline RDU is a much smaller, minimally configured RDU. It is a wall mounting, low profile 4U, 177H, 450W, 50mmD unit which is line powered from the FIP. It does not have a MAF/PSU module and there is no provision for internal mounting of 16 Zone LED Display boards or a Manual Call Point MCP. 16 Zone LED Display boards and a MCP can be connected externally, if required, providing suitable provision can be made for physical mounting, e.g., extender cabinet plus the extra power required to drive the LEDs. A flush mounting version is also available.

The RDU may be used in either Australian mode or New Zealand mode and this manual describes the configuration for both modes. The differences between Australian and New Zealand configuration are described throughout this manual and are listed in section 2.4. The country mode is selected with a programmable parameter.

### 2.1.2 DISPLAYS

The primary display of the RDU is a 2 line by 40 character LCD on which status messages and prompts are shown. The LCD has backlight illumination which is turned on when there is an alarm or operator interaction.

Common conditions ALARM, FAULT and ISOLATE, and various system states are displayed on LEDs adjacent to the LCD.

The AS1603.4 series display panel composed of the LCD, LEDs and operator keypad meets the requirements of AS4050 (int) for a Fire Fighter's Facility (FF).

The AS4428.1 series have a keyboard layout and operation complying with AS4428.1.

As an optional extra, individual zone status (ALARM, ISOLATE and FAULT) can be displayed on LEDs by fitting the appropriate number of 16 Zone LED Display boards. The 3 column 16 Zone LED Display boards include as standard, an open collector transistor output for each zone which can be used to drive an internal or remote mimic display.

For New Zealand mode, an optional Display Extender Board may be fitted and is connected at the end of the 16 zone LED display board chain and provides 3 common status LEDs and some supplementary inputs and outputs.

### 2.1.3 SERIAL COMMUNICATIONS PORT

An RZDU port is included in the RDU to provide the 3 wire or 4 wire link required for connection to the FIP.

### 2.1.4 PRINTER/PROGRAMMER PORT

The RDU also has an RS232 serial port to drive a logging printer, which records all events, time and date stamped as they occur. This port can also be used to save or load the programmed database (refer to section 6.3.5).

### 2.1.5 FP0558/FP0585 (785/786) : MAF-CONFIGURED RDU ONLY

#### 2.1.5.1 MAF OUTPUTS

A MAF-configured RDU provides 7 relays as standard on the MAF/PSU module. These can be used to switch alarm bells and ancillary equipment such as door holders, air-conditioning shutdown, etc. The MAF standby, alarm, fault and isolate relays should not be used for signalling to the brigade, the brigade connection should be made to the FIP.

Each zone can be programmed to operate these relays when the appropriate condition is present, e.g., Alarm, Fault, Isolate, etc.

#### 2.1.5.2 POWER SUPPLY

The MAF configured RDU has a 3 Amp battery charger/power supply as standard. There is adequate room for large batteries.

An optional 6 Amp battery charger/power supply is available.

Fuse protected battery backed and non-battery backed supplies are available to power external loads such as bells, illuminated signs, interposing relays, gas release solenoids, door holders, etc.

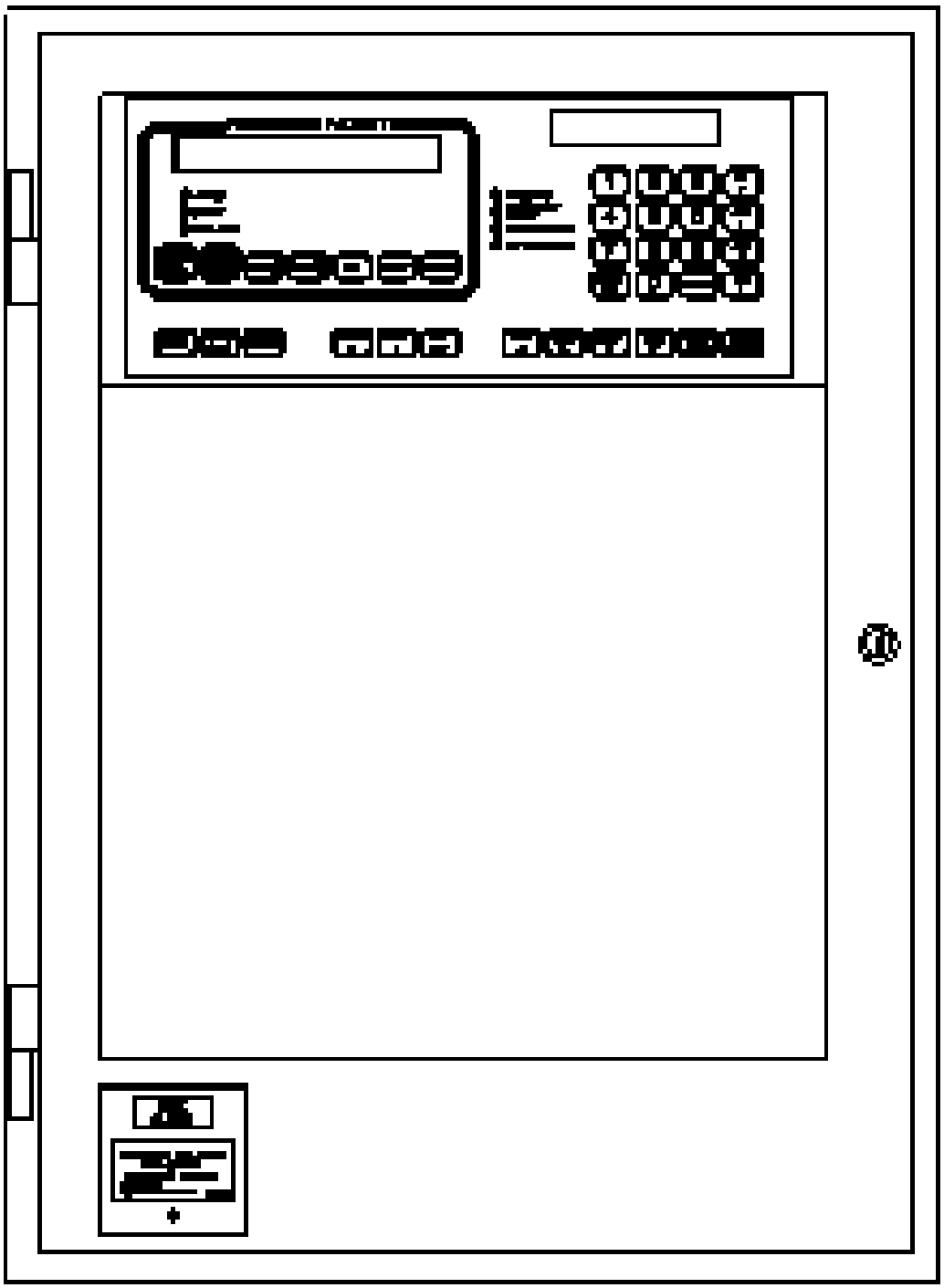


FIG 2.1.1
MAF Configured RDU (AS4428.1 keypad)

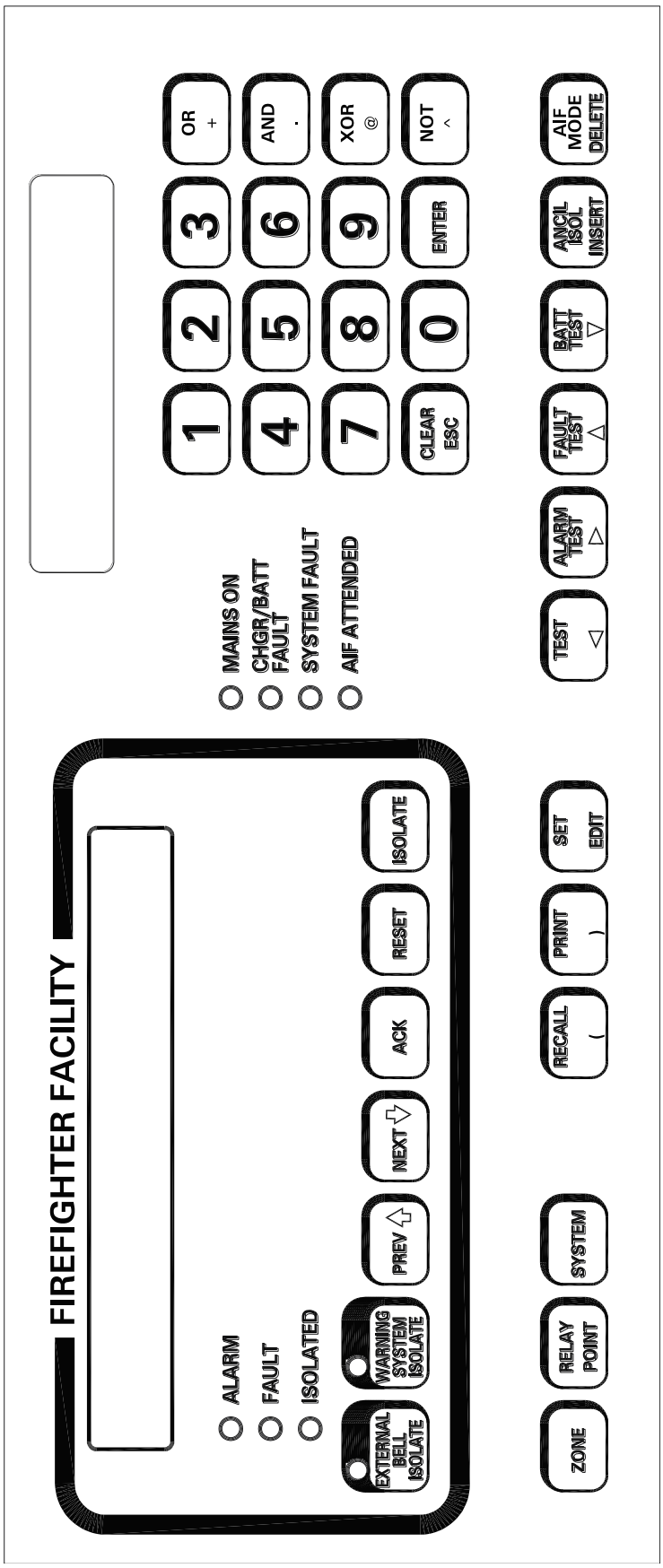



FIG 2.1.2
Non-MAF Configured RDU (AS4428.1 keypad)

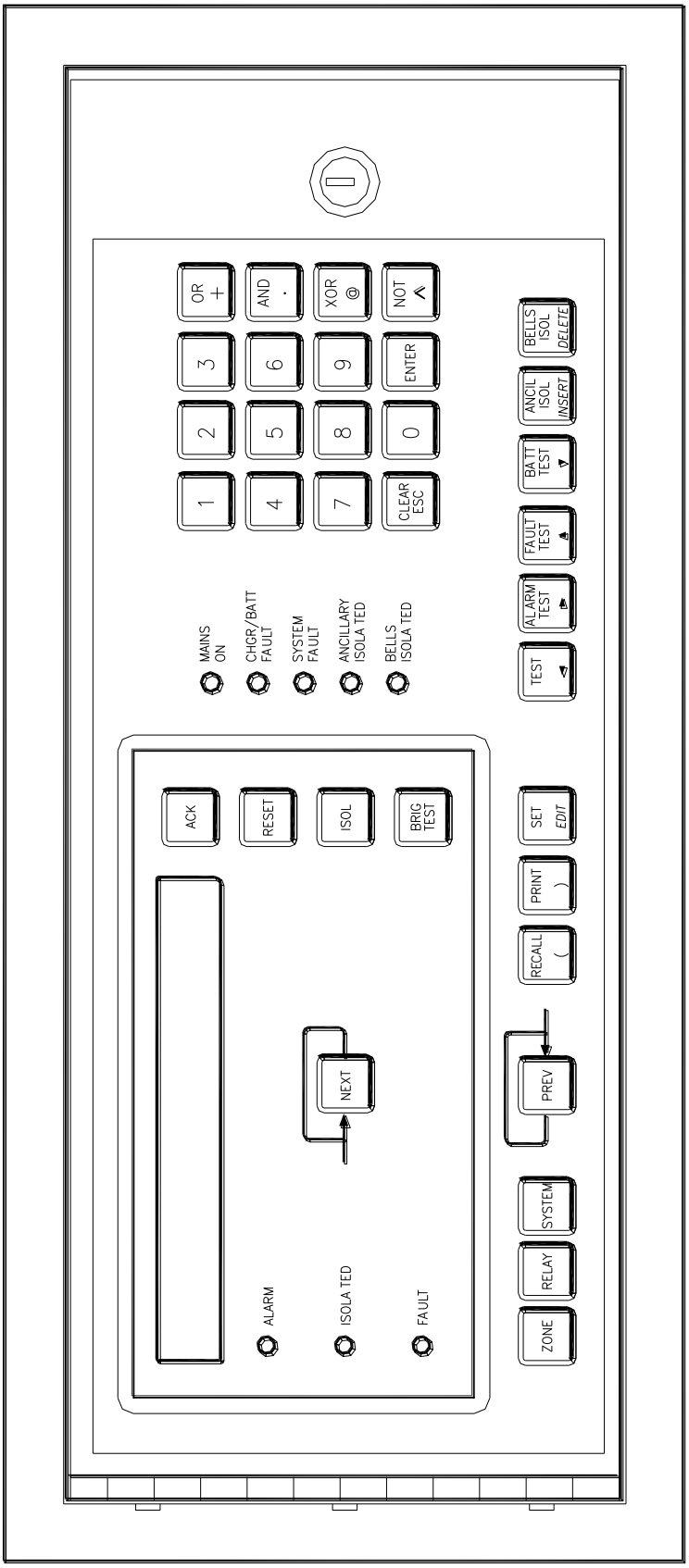



FIG 2.1.3
Non-MAF Configured RDU (Flush Mounting) (AS1603.4 keypad)

# 2.2 PHYSICAL STRUCTURE

### 2.2.1 FP0558/FP0585 (AS1603.4) & FP0785/FP0786 (AS4428.1) MAF CONFIGURED RDU

The MAF RDU has a rugged, lockable painted steel cabinet, which houses 19 inch rack-mount equipment of up to 8U or 15U height (667mm). It comes complete with a MAF/PSU module mounted in the cabinet and room for batteries below. Refer to Figure 2.2.1.

8U cabinet versions are available as FP0585 (FP0786).

The Operator Display has a screened, polyester overlay mounted on a hinged inner door fitted to the top 4U position. The Controller/Display PCB mounts directly to the rear of this door.

The remaining space is covered by a blanking plate, but there is provision for mounting other equipment below the Operator Display. E.g., a 7U hinged inner door for a mimic, or to mount the 16 Zone LED Display boards, may be fitted directly below the Operator Display.

There is provision for mounting equipment in the bottom 4U (e.g. an AS1668 control rack) but this could encroach on battery space.

The outer door has an MCP (Australian panels only - not NZ) on the outside and a large acrylic window to allow viewing of the equipment inside.

For New Zealand operation the display extender board, unprotected termination board and optional brigade key-switches could be mounted in the 15U cabinet or a suitable external cabinet. Refer to section 8.4.

### 2.2.2 FP0559 (AS1603.4) / FP0787 (AS4428.1) SLIMLINE RDU

The Slimline RDU (refer to Figure 2.1.2) is a wall mounting, low profile, 177H, 450W, 50mmD unit. It is powered from the FIP via the +24 and 0 volt wires of the 4 wire cable that is terminated onto the 1931-27 Remote Interface board inside the RDU. It is intended as a small stand-alone unit that allows remote indication and operation – but no MAF facility.

For New Zealand operation an external cabinet could be provided to house a Display Extender Board and any 16 Zone LED Display boards.

### 2.2.3 FP0772 (AS1603.4) / FP0788 (AS4428.1) FLUSH SLIMLINE RDU

The Flush Slimline RDU (refer to Figure 2.1.3) is a flush mounted "slimline" RDU and has outer dimensions of 219mm (H), 502mm (W), 75mm (D). It is otherwise the same as the Slimline RDU.

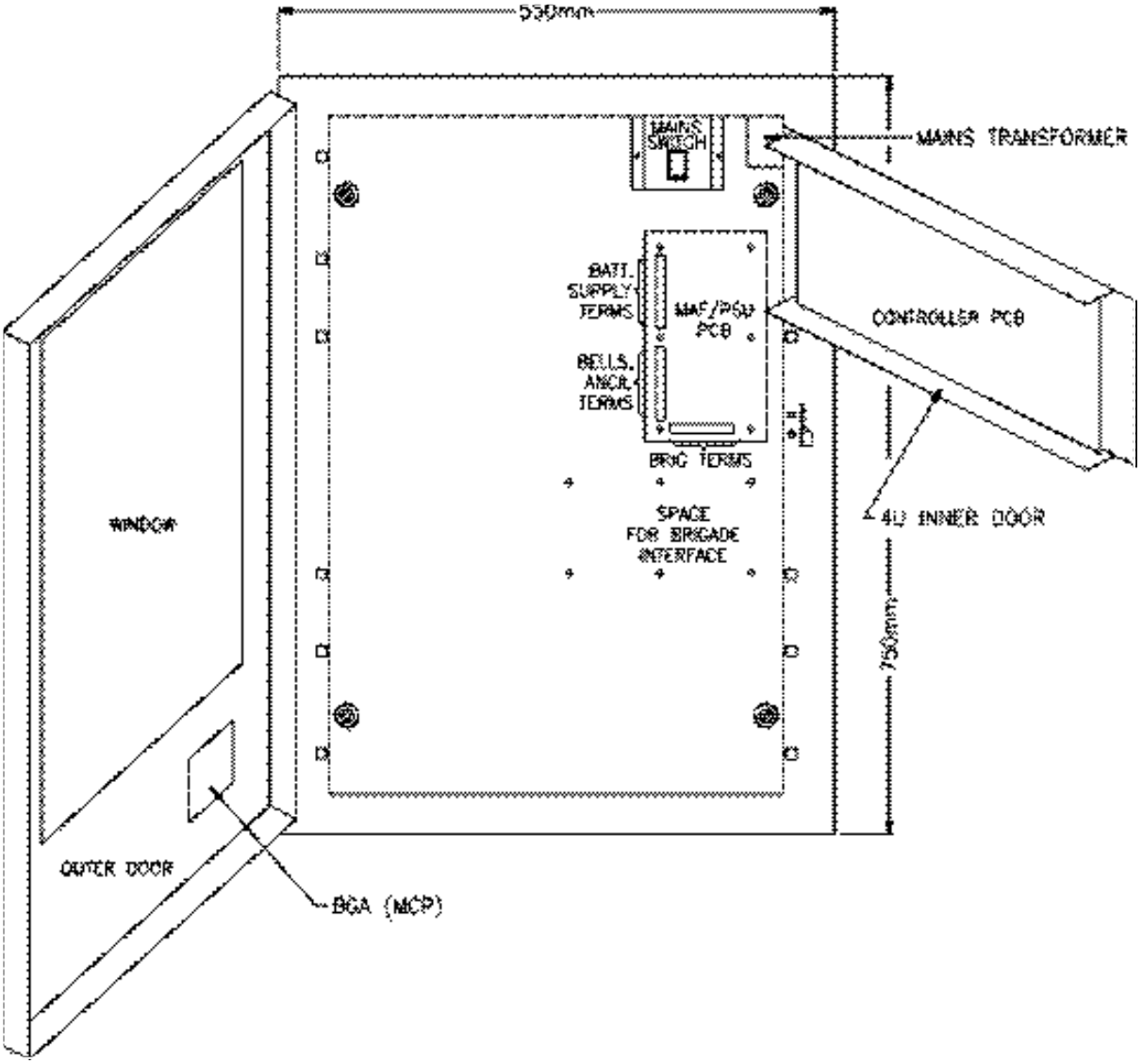



FIG 2.2.1
FP0558/FP0785 MAF RDU - INTERNAL LAYOUT

# 2.3 SYSTEM STRUCTURE

### 2.3.1 PCB MODULES: MAF-CONFIGURED RDU

The printed circuit boards which can be used in the MAF RDU are:

**Controller PA0798 (AS1603.4) / PA0871 (AS4428.1)**

Mounts on 4U inner door.
Includes: LCD, status LEDs, buzzer & keypad connection
5Vdc supply, voltage monitors for battery charger
microprocessor & memory
serial I/O bus control of other modules
reference voltage generation for I/O modules
UARTs, serial port electronics, real time clock calendar
FRC connection to other modules.

**MAF/PSU PA0491 (AS1603.4) / PA0873 (AS4428.1)**

Mounts on cabinet rear wall.
Includes: Battery charger/PSU
Brigade & Ancillary relays and supervision circuitry
MCP & door switch inputs
Screw terminals (mostly demountable) for field wiring
FRC connection to other modules.

**16 Zone LED Display (PA0454) Optional Extra (3 LEDs)**

Mounts on 7U inner door (ME0060).

Includes: 16 sets of 3 LEDs and electronics to control the LEDs (serial bus) and open collector outputs to drive mimic display or a 16 way relay board.

**16 Zone LED Display (FP1002) Optional Extra (2 LEDs)**

Mounts on 4U 80 Zone Display (ME0457).
Includes: 16 sets of red and amber LEDs.

**16 Relay Board (PA0470) Optional Extra**

Mounts internally in cabinet.
Includes: 16 sets of voltage free change-over contacts driven by the open collector outputs on the mimic connector on the 16 Zone LED Display board.

**NZ mode Display Extender Board (PA0499 or PA0742)**
**Termination Board (PA0483)**

Used for New Zealand operation only. Refer to section 8.4
The PA0499 Display Extender Board can mount on the 7U inner door and the PA0742 in a "pictureframe" cabinet.

Includes: 3 LEDs, 5 inputs, index lamp output, 5 outputs

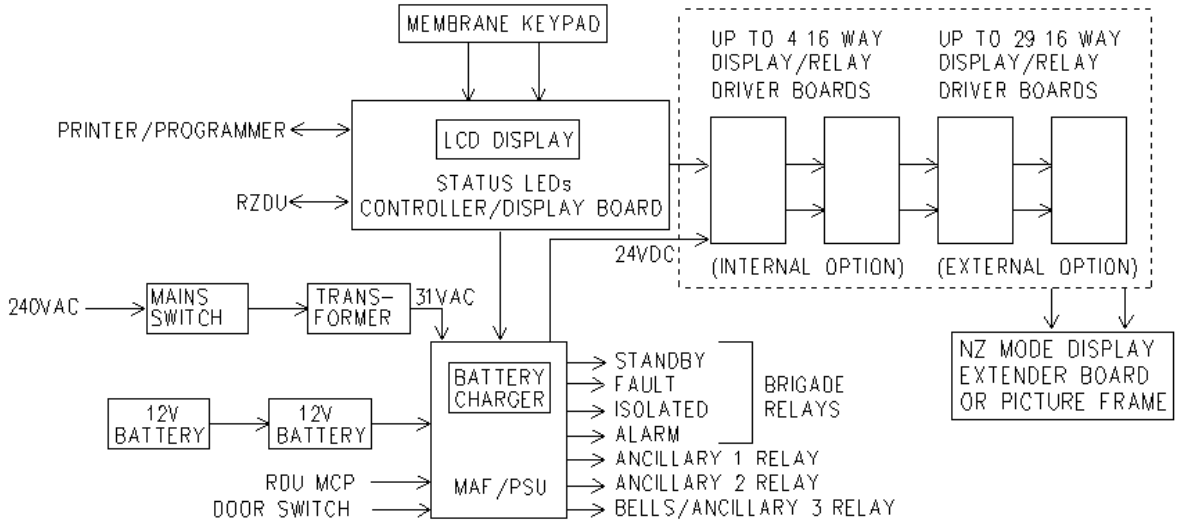



FIG 2.3.1
SYSTEM STRUCTURE: MAF CONFIGURED RDU

### 2.3.2 INTER-CONNECTION & STRUCTURE – MAF CONFIGURED RDU

**A basic MAF Configured RDU system** has one Controller/Display and one MAF/PSU, interconnected by Flat Ribbon Cable (FRC), as shown in Fig 2.3.1. For New Zealand operation, a Display Extender Board is normally also used.

#### 2.3.2.1 16 Zone LED Display Boards

**16 Zone LED Display boards** are driven from the "LED DISPLAY" serial bus on the Controller/Display PCB. They receive power from the MAF/PSU via two power leads. Where more than one is required they are connected in series from right to left (as viewed from the front) on the RDU. The 34 way FRC from J13 of the Controller goes to J1 ("From Previous") of the right hand Display Bd. Zone 1 (default) corresponds to the top LEDs on the left hand Display Bd.

There are two types of 16 zone display boards. One type has two columns of LEDs, the other type has three columns. For the three column type, the last board requires the "end of bus" mini-jump connector, (link LK1), to be fitted. Up to four 3 column boards or ten 2 column boards can mount internally. Additional Display boards can be mounted externally, up to 33 in total, to provide individual zone status indication for all 528 zones. The additional loading due to extra Display boards will need to be carefully considered when planning the system battery/PSU configuration. Refer to section 5.3.

LED Display boards may also annunciate FIP Relay status, i.e., Alarm = relay activated, Isolated = relay isolated, Fault = relay wiring fault (i.e., supervision fault). The default is that status information as received from the FIP is treated as zone status information at the RDU. If relay status information is to be processed correctly then the RDU must be specifically programmed as to which zones are relay type (refer section 7.1). Relay type zones do not generate FF type alarm events at the RDU and alarm LEDs corresponding to relay type zones do not flash.

The default zone to LED mapping maps zone 1 to the top row of 3 LEDs on the left most display. Zone 2 to the row below it, etc, (top to bottom, left to right). Zone to LED mapping is described in section 7.7.

#### 2.3.2.2 16 Way Relay Boards

The 1901-64 16 Way Relay board (PA0470) can be connected to the 1901-25-1 16 Zone LED Display board (PA0454) to provide 16 clean contact relay outputs for the alarm or relay operated conditions. The possible configurations are shown in Figure 2.3.2(b).

Note that the RDU must be programmed for board N Type = Relay, if 16 Zone LED Display boards are to be used to drive 16 Way Relay boards (refer section 7.1). This prevents pulsing of the open collector outputs. 16 Zone LED Display boards programmed as type relay will not flash their zone alarm LED on receipt of an unacknowledged alarm from the FIP and are not turned on and off by a display test or by LED "current-limiting" phasing.

#### 2.3.2.3 New Zealand mode Display Extender Board.

The Display Extender Board is used for New Zealand operation only. Two versions are available: PA0499 has the same format as standard 16 Zone LED Display boards for internal mounting; PA0742 is suitable for installation in an external custom-built brigade index cabinet.

The Display Extender Board provides common Normal, Fire, and Defect LED indicators. Inputs for brigade key-switches (Silence Alarms, Evacuation, Building Services Restore), and termination for some other miscellaneous signals are available by connection of an Unprotected Termination Board (PA0483) via a 26 way FRC. (Lamp Test, External Defect input, Ancillary Fire and Defect outputs, Index Lamp output). It connects either to the end of the 16 zone LED display board chain or if there are no other 16 zone LED / relay boards then it connects directly into J13 connector of the controller. The "end of bus" link, LK1, on the last 16 zone display (if 3 column type) should be removed when a Display Extender Board is connected.

The common normal LED (green) is on steady when both the FIP and RDU are completely normal. The common alarm LED flashes at 2 Hz when the FIP indicates there is an alarm in the system. The common defect LED flashes at 2 Hz when there is a defect present at the FIP or RDU. Refer to section 8.4 for more specific details of NZ mode display configuration.

### 2.3.3 INTER-CONNECTION & STRUCTURE: NON-MAF SLIMLINE RDU

The slimline (non-MAF) RDU has a Controller and a Remote Termination board. Refer Figure 2.3.3.

The front panel keyswitch connects to the Remote Termination board such that the keypad is enabled when the keyswitch is operated hard counter-clockwise or centre position, i.e., key cannot be removed.

The Remote Termination board is also used to terminate the 4 core cable from the FIP for the power and communications input required. The Non-MAF RDU is line powered from the FIP, hence the +24 and 0v feeds from the FIP are connected to the same terminals on the Remote Termination board. Similarly Tx from the FIP is terminated into Rx terminal on the RDU Termination board and Rx from the FIP is terminated into the Tx terminal.

An MCP (refer section 8.3), 16 Zone LED Display boards (maximum 33) and optionally 16 way Relay Modules (refer Section 2.3.2), and a Display Extender Board (NZ operation), can be connected externally to the RDU Controller/Display board. Suitable provision must be made for physical mounting (e.g., extender cabinet) plus the extra power required to drive the boards.

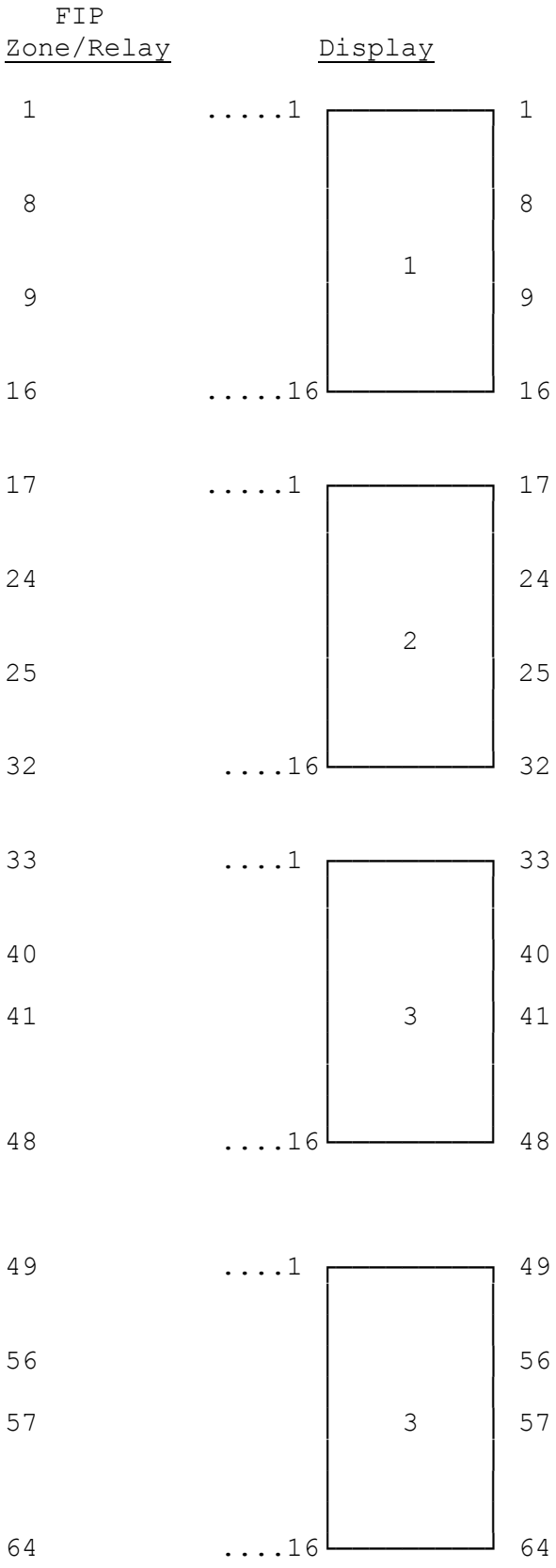
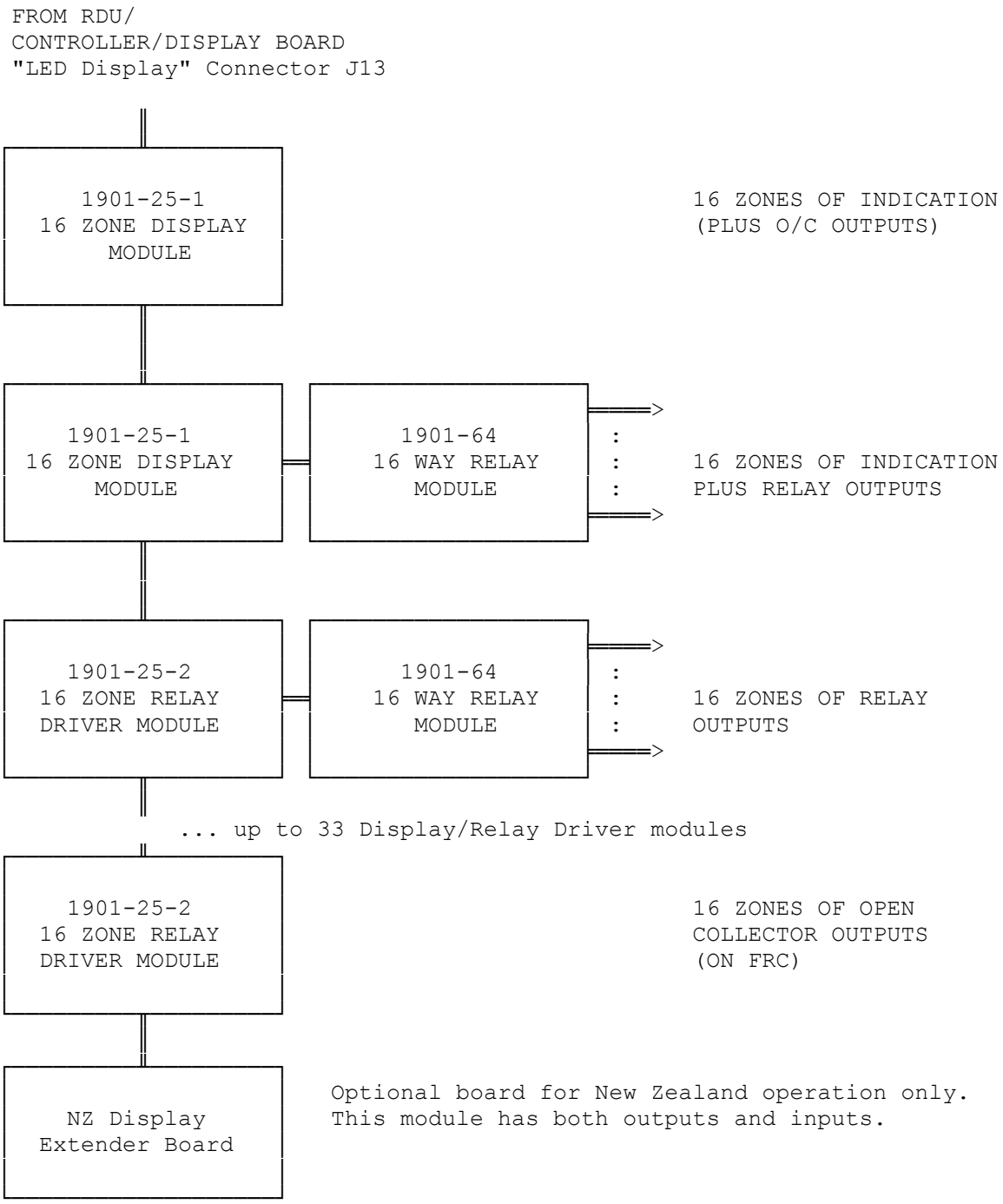



FIG 2.3.2(a)
DISPLAY STRUCTURE
(DEFAULT ZONE->LED MAPPING FOR 4 DISPLAY BOARDS CONNECTED)




Note: Relay Outputs are clean contact, 1 pole change-over, rating 1 AMP DC resistive @ 30 VDC.

FIG 2.3.2(b)
POSSIBLE INDICATION/RELAY OUTPUT COMBINATIONS

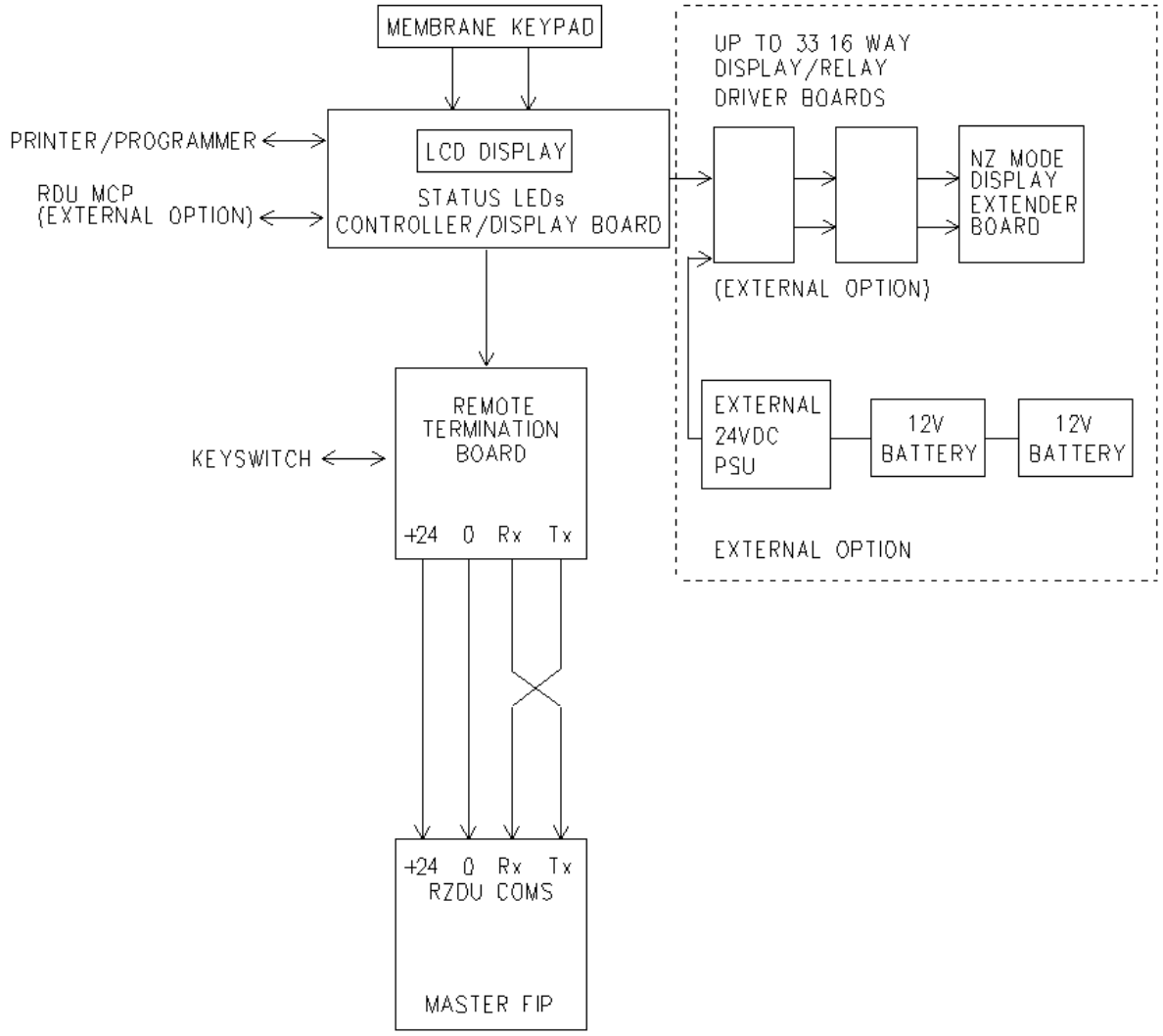



FIG 2.3.3
SYSTEM STRUCTURE: NON-MAF CONFIGURED RDU

# 2.4 NEW ZEALAND MODE OPERATION

The RDU operates in either Australian or New Zealand mode, selected with a programmable parameter (refer section 6.4.4.13). The differences between Australian and New Zealand operation are listed below.

**1. Display Extender Board.**

This is an optional board (PA0499 or PA0742) which may be used in NZ mode and in conjugate with a termination board provides additional outputs and inputs as follows. Refer to section 8.4.4 for options and wiring. If a Display Extender Board is connected then it must be enabled with a programmable parameter (system config level 2). **NOTE -** for an RDU in AS4428 mode (refer section 6.4.1.1), Trial Evac and Silence Alarms are always associated with the Warning System and not the External Bell.

| | | |
|---|---|---|
| Outputs | - | common normal, alarm and defect LEDs |
| | - | ancillary fire and defect outputs |
| | - | index lamp output |
| Inputs | - | silence alarms, trial evac, building services restore, lamp test, external defect. |

**External Defect Input.**
When this input is asserted, a fault condition is generated at the RDU. The buzzer turns on (if the buzzer is enabled for system faults), an event is logged, and a fault condition is signalled to the FIP. The FIP will annunciate a fault and signal Brigade Fault.

**Lamp Test.**
When this input is asserted a lamp test will be initiated which tests the front panel LEDs of the RDU, the three common LEDs and the index lamp, plus all the 16 zone LED Display Board LEDs.

**Ancillary Fire output.**
This output is under control of the FIP and is turned on when a fire condition is present. The output can be isolated - refer to section 6.4.4.3.6 ancillary isolate/building services restore operation.

**Ancillary Defect output.**
This output is under control of the FIP and is turned on when a defect condition is present or when a communications failure occurs. The output can be isolated - refer to section 6.4.4.3.6 ancillary isolate functions/building services restore operation.

**Index Lamp Output.**
This output is turned on whenever the FIP index lamp is turned on or whenever the RDU bells relay (if any) is energised.

**Trial Evac Input.**
The trial evac input on the Display Extender Board can be used to energise the Warning System/Bells at the FIP or RDU and has its own set of programmable options of pass-on, follow and local. Refer to section 6.4.4.3.7.

**Building Services Restore Input.**
The BSR input on the Display Extender Board can be used as an ancillary isolate function and has its own set of programmable options of pass-on, follow and local. Refer to section 6.4.4.3.6.

**Silence Alarms.**
Depending on programming (refer section 6.4.4.3.1 and 6.4.4.3.4) this input can be used to turn the Warning System/Bells off.

**2. MAF board usage.**
The MAF board used for Australian operation may also be used for New Zealand operation as a convenient way of powering the RDU and also provides some relay outputs. For example, the ancillary 1 relay can be programmed to energise when one or more selected zones are in alarm. For both Australian and New Zealand mode, the brigade alarm relay is normally de-energised and energises for alarm. The "MCP" (manual call point) input on the MAF board cannot be used when in New Zealand mode and is ignored.

**3. Bells isolate and Silence Alarms operation.**
The Silence Alarms input on the Display Extender Board is normally connected to a keyswitch which can be used to silence the bells, i.e., de-energise the bells relay at either or both the RDU and the FIP. In NZ mode the programmable options of "pass-on", "follow" and "local" which may be programmed for the operation of bells isolate are also applied to the Silence Alarms input on the Display Extender Board (if any). Refer to chapter 6.

Note: An alternative to connecting a display extender board to an RDU is to connect an LED-RZDU (PA1048) to the RZDU bus. An LED-RZDU provides the three common LEDs plus the three brigade switches (trial evac, silence alarms, services restore) and an external ACK input. The RDU provides the LCD display and keyboard.

# CHAPTER 3
# SYSTEM SPECIFICATIONS

# 3.1 GENERAL

### 3.1.1 FP0558 (AS1603.4), FP0785 (AS4428.1) 15U MAF RDU DESCRIPTION

Includes: 15U cabinet complete with MCP mounted externally
Controller/Display with FFCIF LCD & Keypad
MAF/PSU includes 7 relays, 3A PSU
Blanking plate covering 9U of 15U rack space.

The system can be expanded to include up to 64 zones of LED indicators using the 7U door and 3 column LED display boards, or 160 zones using two 4U doors and 2 column LED display boards. Refer to section 3.7 "Optional Additional Display" for detail on the extra items required for this option. For New Zealand operation this does not include a Display Extender Board.

Where more Display boards are required, they must be mounted externally via a suitable mounting arrangement, e.g., extender cabinet. Any extra PSU loading due to additional Display boards must be carefully considered when planning a system. Refer to section 5.3 for PSU loading and battery size calculations.

### 3.1.2 FP0585 (AS1603.4), FP0786 (AS4428.1) 8U MAF RDU

Includes: 8U cabinet complete with MCP mounted externally
Controller/Display with FFCIF LCD & Keypad
MAF/PSU includes 7 relays, 3A PSU
Blanking plate covering 4U of 8U rack space.

This RDU can accommodate up to 80 zones of LED indication using the ME0457 4U door and up to 5 x FP1002 16 zone LED Display Boards. An NZ Display Extender Board cannot be fitted.

### 3.1.3 FP0559 (AS1603.4) & FP0787 (AS4428.1) WALL-MOUNT SLIMLINE RDU

Includes: Wall mount low profile cabinet
Controller/Display with FFCIF LCD & Keypad

**Note**
16 Zone LED Display boards can be added externally with an optional Display Extender Board (NZ), if a suitable mounting arrangement, e.g., extender cabinet is provided. The non-MAF slim-line RDU is line powered from the FIP, thus any extra PSU loading due to additional Display boards must be carefully considered when planning a system.

### 3.1.4 FP0772 (AS1603.4) & FP0788 (AS4428.1) FLUSH-MOUNT SLIMLINE RDU

Includes: Flush-mounted cabinet
Controller/Display with FFCIF LCD and keypad

**Note**
16 Zone LED Display boards can be added externally, with an optional Display Extender Board (NZ), if a suitable mounting arrangement, e.g., extender cabinet is provided. The non-MAF RDU is line powered from the FIP, thus any extra PSU loading due to additional Display boards must be carefully considered when planning a system.

### 3.1.5 ENVIRONMENTAL: MAF & NON-MAF CONFIGURED RDU

| | | |
|---|---|---|
| Operating Temperature | : | -5°C to 45°C (Ambient) |
| Relative Humidity | : | 95% maximum @ 40°C (non-condensing) |

## 3.2 MECHANICAL SPECIFICATIONS

### 3.2.1 FP0558 (AS1603.4) / FP0785 (AS4428.1) 15U MAF RDU

| | | |
|---|---|---|
| Style | : | Wall mounting<br>Hinged outer door with large window (hinges to left)<br>Accepts 19" rack mounting equipment<br>4U Display on hinged inner door (hinges to right) |
| Construction | : | Welded steel |
| Material | : | 1.2mm and 1.6mm zinc coated mild steel |
| Size | : | 750mm (H) x 550mm (W) x 210mm (D)<br>* MCP is an additional 20mm. |
| Finish | : | Powdercoat BFF-998-CW Cream Wrinkle<br>(Iron Phosphate pre-treat) |
| Weight | : | 20kg (Unpackaged); 22kg (Packaged) |
| IP Rating | : | IP51 |

### 3.2.2 FP0585 (AS1603.4) / FP0786 (AS4428.1) 8U MAF RDU

| | | |
|---|---|---|
| Style | : | Wall mounting<br>Hinged outer door with large window (hinges to left)<br>Accepts 19" rack mounting equipment<br>4U Display on hinged inner door (hinges to right) |
| Construction | : | Welded steel |
| Material | : | 1.2mm and 1.6mm zinc coated mild steel |
| Size | : | 440mm (H) x 550mm (W) x 210mm (D)<br>* MCP is an additional 20mm. |
| Finish | : | Powdercoat BFF-998-CW Cream Wrinkle<br>(Iron Phosphate pre-treat) |
| Weight | : | 17kg (Unpackaged); 18kg (Packaged) |
| IP Rating | : | IP51 |

### 3.2.3 FP0559 (AS1603.4) / FP0787 (AS4428.1) WALL MOUNT NON-MAF RDU

| | | |
|---|---|---|
| Style | : | Wall mounting low profile<br>4U Display mounted on hinged door<br>Door hinges left 003 key lock. |
| Construction | : | Welded steel |
| Material | : | 1.2mm zinc coated mild steel |
| Size | : | 177mm (H) x 450mm (W) x 50mm (D) |
| Finish | : | Powdercoat PR12/816C Grey<br>(Iron Phosphate pre-treat) |
| Weight | : | 2.8kg (Unpackaged); 3kg (Packaged) |
| IP Rating | : | IP30 |

### 3.2.4 FP0772 (AS1603.4) / FP0788 (AS4428.1) FLUSH MOUNT NON-MAF RDU

| | | |
|---|---|---|
| Style | : | Flush mounting<br>4U Display mounted on hinged door<br>Door hinges left 003 key lock |
| Construction | : | Welded steel |
| Material | : | 1.2mm zinc coated mild steel |
| Size | : | 219mm (H) x 502mm (W) x 75mm (D) |
| Finish | : | Powdercoat PR12/816C Grey<br>(Iron Phosphate pre-treat) |
| Weight | : | 4.6kg (Unpackaged); 4.8kg (Packaged) |
| IP Rating | : | IP30 |

## 3.3 ELECTRICAL SPECIFICATIONS

### 3.3.1 MAF-CONFIGURED RDUS

#### 3.3.1.1 MAINS SUPPLY

| | | |
|---|---|---|
| Voltage | : | 240Vac +6% -10% |
| Current | : | 0.5A |
| Frequency | : | 50Hz |
| Termination | : | For up to 2.5sq mm TPS<br>3 Way block with wire protectors |

#### 3.3.1.2 BATTERY CHARGER & PSU

| | | |
|---|---|---|
| Input Voltage | : | 31Vac rms (Transformer sec) |
| Charger Voltage | : | 27.3Vdc (nominal at 20°C) |
| Temperature Compensation | : | -36mV per °C nominal |
| Non-Battery Backed Voltage | : | 28.0 nominal |
| Max Total Current | : | 3Adc (Charger, Quiescent & Alarm) |
| Max Bell Current | : | 2Adc |
| Max. Ancillary Current on VBF1 | : | 2Adc |
| Max. Ancillary Current on VBF2 | : | 2Adc (allows 3A max LED Display) |
| Max. Ancillary Current on VNBF | : | 2Adc (e.g. for door holders) |

(VBF <-> battery backed, fused. VNBF <-> non-battery backed, fused)

Current Limit :

Battery to
MAF/PSU : PTC, 6A nom, 4.8A min

PSU/Charger : 3.5A nom, 3.1A min

The following table lists the monitoring voltages which are the same for both Australian mode and New Zealand mode. A single pot adjusts all three monitoring voltages - charger, battery low and battery very low (standby off).

TABLE 3.3.1.2
BATTERY AND CHARGER MONITORING VOLTAGE SPECIFICATIONS

| STATE | MIN | NOM | MAX | COMMENTS |
|---|---|---|---|---|
| Charger High | 28.10 | 28.125 | 28.15 | Adjust with pot |
| Charger Low | 26.47 | 26.57 | 26.67 | |
| Battery Low | 24.26 | 24.33 | 24.40 | |
| Standby Off | 21.5 | 22.0 | 22.5 | For voltage falling |
| Standby On | 22.0 | 22.5 | 23.0 | For voltage rising |

Notes:
1. All voltages stated in VDC at temperature of 20°C
2. Apply temperature compensation of -36 mV/°C for temperature deviation from 20°C.
3. This applies also to charger voltage 27.3 VDC
4. There are thermal delays, therefore if checking or adjusting in field ensure unit has been running for some hours.
5. Standby Relay is normally energised (on), and turns off for Battery fail.

### 3.3.1.3 BATTERY

Battery Voltage : 24Vdc nominal (2 x 12Vdc)

Compatible Makes : Sonnenschein A200 series
Sonnenschein A300 series
Powersonic PS12 series
Yuasa NP series

Capacity : 6 to 50 Ahr (dependent on configuration)

Space : Up to 220H x 520W x 175D
(i.e. 2 of 220 x 260 x 175)

#### 3.3.1.4 FUSES

Location : MAF/PSU PCB

| Number | Name | Size | Rating | Type |
|---|---|---|---|---|
| F1 | +VBF1 | 5 x 20mm | 2A | Glass Cartridge, Std |
| F2 | +VBF2 | 5 x 20mm | 6A | Glass Cartridge, Std |
| F3 | +VNBF | 5 x 20mm | 2A | Glass Cartridge, Std |
| F4 | +VE | 5 x 20mm | 2A | Glass Cartridge, Std |
| F5 | Mains In | 5 x 20mm | 6A | Glass Cartridge, Std |
| F7 | +VBELLS | 5 x 20mm | 2A | Glass Cartridge, Std |

#### 3.3.1.5 QUIESCENT & ALARM CURRENTS

At 24Vdc battery supply, nominal currents:

| | Quiescent | Alarm |
|---|---|---|
| BASE RDU (Notes 1-2)<br>(includes 16mA for energised standby relay) | 53mA | 180mA |
| MAF/PSU | | |
| - all relays off | 9mA | |
| Current per Ancillary Relay (includes bells) | 11mA | 11mA |
| Current per Brigade Relay | 16mA | 16mA |
| Controller/Display | | |
| - LCD backlight off, status LEDs off | 29mA | |
| - LCD backlight on, status LEDs off | 85mA | |
| Current per status LED on | 3mA | |
| 16 Zone LED Display | 0mA | 5.5mA/LED (steady) |
| 16 Way Relay Bd (optional) | 0mA | 11.5mA/relay |
| NZ Display Extender | 16mA | 16mA |

Notes
1. Base RDU current includes Controller/Display and MAF/PSU but no 16 Zone LED Display or Relay Driver boards.
2. Quiescent and alarm currents do not include external loads, e.g., door holders, bells, etc.

### 3.3.2 FP0559, FP0772, FP0787, FP0788 (NON MAF RDU)

#### 3.3.2.1 DC SUPPLY

Voltage : 24Vdc (18-28V). Operation at 12V also possible.
Termination : For up to 2.5sq mm TPS
3 Way block with wire protectors

#### 3.3.2.2 FUSES

Location : Remote Termination PCB

| Number | Size | Rating | Type |
|---|---|---|---|
| F1 | 5 x 20mm | 2A | Glass Cartridge, Std |

#### 3.3.2.3 QUIESCENT & ALARM CURRENTS

At 24Vdc battery supply, nominal currents:

| | Quiescent | Alarm |
|---|---|---|
| RDU (excludes any Zone LEDs) | 29mA | 85mA |
| At 18Vdc Supply: | | 120mA max. |

# 3.4 INPUT SPECIFICATIONS

### 3.4.1 FP0558 / FP0585 / FP0785 / FP0786 MAF RDU INPUTS

#### 3.4.1.1 MAF/PSU INPUTS

| | |
|---|---|
| Battery Termination | One pair screw terminals (4sq mm max cable). |
| AC Input | 31V rms<br>3.6A rms<br>2.8mm tab terminals |
| Door Switch | 5V, 0.5mA<br>Unsupervised<br>4 Way .1" PCB header, J6 |
| MCP (not NZ mode) | 5V, 1mA Supervised<br>2k7 EOLR 4 Way .1" PCB header, J6 |
| Relay Supervision | |
| Anc 1 Sup/Anc 2 Sup | One screw terminal each |
| Modes of Operation | 1 Door holder<br>2 Load |

| | | Relay Off | Relay On |
|---|---|---|---|
| 1. | Door Holder Mode expects | Voltage Present | No Voltage Present |
| 2. | Load mode expects | Resistive to 0V | Open Circuit or Voltage Present |
| | Default Modes<br>Anc 1<br>Anc 2 | <br>Door Holder, Disabled<br>Load, Disabled | |
| | Voltage Threshold (Door Holder Mode) | 3.65V Nom | |
| | Supervision Current | 0mA @ +5V<br>1mA @ 0V | |

| | |
|---|---|
| Load Resistance (Load Mode) | 400 Ohm - 10k Ohm<br>less than 400 Ohm with series diode at load.<br>14 Ohm absolute minimum |

Ancillary 3 Supervision

| | |
|---|---|
| Input Termination | Output terminals BELLS +, - |
| Form | Reverse polarity<br>Requires series diode at each device<br>Resistor EOL<br>1, 2 or 3 circuits |

End of Line

| No. of Circuits | Type |
|---|---|
| 1 | 3k3, 5%, 250mW resistor |
| 2 | 6k8, 5%, 250mW resistor |
| 3 | 10k, 5%, 250mW resistor |

| | |
|---|---|
| Supervision Current | 0mA @ +5V<br>1.5mA @ 0V<br>+ve to BELLS- terminal |
| Circuit Resistance | 100 Ohm max. |

### 3.4.1.2 CONTROLLER/DISPLAY INPUTS

| | |
|---|---|
| Spare DC Input/Output | 24Vdc nom<br>4 Way demountable screw terminal, J5 |
| Spare Input | 22V, 10k Ohm pull up resistor<br>Provision for supervision (up to 5 band) |
| Serial I/O<br>RDU Comms & Power | Termination to TX, RX, 0V, +24V demountable screw terminal connector J11. |

### 3.4.1.3 NZ MODE DISPLAY EXTENDER BOARD INPUTS

The Display Extender Board is used with New Zealand operation only. The inputs it provides are : Silence Alarms, Trial Evac, Building Services Restore, Lamp Test and External Defect. All inputs have closure to zero volts to assert the input. An input may be left open or unconnected if not used. Refer to section 8.4 for wiring.

| | |
|---|---|
| All Inputs | Closure below 1.5V @ 0.35mA required to activate.<br>Open voltage = 5V |

### 3.4.2 FP0559, FP0772, FP0787, FP0788 NON-MAF RDU INPUTS

### 3.4.2.1 REMOTE TERMINATION BOARD INPUTS

| | | |
|---|---|---|
| Key switch Input | - | Termination via 4 Way .156" male molex (J7) Routes via J6 FRC header to 5V, 15K Ohm pull up. |
| RDU Comms | - | Termination to TX, RX, 0V, +24V screw terminals 6 Way connector (J1). |

#### 3.4.2.2 CONTROLLER/DISPLAY INPUTS

| | |
|---|---|
| Spare DC Input/Output | 24Vdc nom<br>4 Way demountable screw terminal, J5 |
| Spare Input | RDU MCP 10k EOL |

# 3.5 OUTPUT SPECIFICATIONS

### 3.5.1 MAF & NON-MAF RDU

**Controller/Display Outputs**

**Serial I/O**

**Printer/Programmer Port**

| | |
|---|---|
| Form | Pseudo RS232, Rx, Tx, 0V signals only |
| Transient Protection | Allows external wiring |
| Transmission Rate | 9600 Baud |
| Protocol | ASCII Xon, Xoff |
| Termination | 4 Way .156" male molex (J1), DB9 Male DTE (J27)<br>Use LM0041 (J1) or LM0076 (J27) to connect to PC 9 pin serial port. |
| **Serial Port 0** | 10 Way FRC header, J2<br><br>UART signals<br>RXD, TXD, RTS-, CTS-, DCD-<br>5V levels<br>0V, +5V, (+12V) |

**16 LED Display Bd**

**16 Zone LED Mimic Outputs**

The most common use for the open collector outputs will be to switch LEDs on "mimic" displays. The mimic outputs can also be used to drive the 16 way Relay Bd PA0470.

| | | |
|---|---|---|
| Output Type | : | 16 * Open Collector driven off alarm LED |
| Output Rating | : | 200mA max current sink capability @ 30V |

16 Zone Mimic Outputs are as follows:

| | |
|---|---|
| J3-1: | Zone 6 Alarm |
| J3-2: | Zone 5 Alarm |
| J3-3: | Zone 7 Alarm |
| J3-4: | Zone 4 Alarm |
| J3-5: | Zone 8 Alarm |
| J3-6: | Zone 3 Alarm |
| J3-7: | 0V |
| J3-8: | Zone 2 Alarm |
| J3-9: | 0V |
| J3-10: | Zone 1 Alarm |
| J3-11: | 0V |
| J3-12: | 0V |
| J3-13: | 0V |
| J3-14: | 0V |
| J3-15: | +V EXT |
| J3-16: | +V EXT |
| J3-17: | +V EXT |
| J3-18: | +V EXT |
| J3-19: | Zone 9 Alarm |
| J3-20: | Zone 16 Alarm |
| J3-21: | Zone 10 Alarm |
| J3-22: | Zone 15 Alarm |
| J3-23: | Zone 11 Alarm |
| J3-24: | Zone 14 Alarm |
| J3-25: | Zone 12 Alarm |
| J3-26: | Zone 13 Alarm |

**16 Way Relay Module PA0470**

Relay Output Rating : 1A @ 30VDC resistive

Relay Isolation : 500Vdc

Option : Snip LK1 when supplying relay coil +24V externally. This stops voltage being fed back into the Controller through the display cables.

16 Way Relay Bd Outputs are as follows:

(a) J1:RLY01

J1-1 RELAY 1-C
J1-2 RELAY 1-NC
J1-3 RELAY 1-NO

(b) J2-J16:RLY02-RLY16 CONNECTOR

JX-1 RELAY X-C where X = relay number
JX-2 RELAY X-NC )
JX-3 RELAY X-NO )

**NZ Mode Display Extender Board Outputs**

This is used in New Zealand mode only. Refer to section 8.4 for wiring of the outputs on the unprotected termination board. The Display Extender Board already has common Normal, Defect and Fire status LEDs fitted to it, but these may be replicated externally if necessary. There are also ancillary defect and fire outputs which are active low open collector, and an output to drive an index lamp.

| | |
|---|---|
| All Outputs (except LAMP) | Open collector pulldown to 0V<br>Off voltage = 30Vmax<br>On voltage = 1.1V @ 100mA (max)<br>On Current = 100mA max |
| LAMP + | Open collector pull up to VBATT<br>Off voltage = 0V<br>On voltage = VBATT-1V<br>On current = 400mA max |
| LAMP - | Connected to Battery – |

### 3.5.2 MAF RDU OUTPUTS

**MAF/PSU Outputs**

**Brigade Relays**

| | |
|---|---|
| Number | 4 |
| Standby | Normally energised<br>De-energises on battery fail or panel fail<br>Fault, Isolated, Alarm Normally de-energised<br>Energise on active state |
| Form | 1 Pole changeover contacts<br>Voltage-free |
| Termination | Demountable screw terminals<br>1.5sq mm max cable |
| Rating | ELV only<br>30V, 5Adc resistive<br>30V, 3Adc inductive |
| Isolation | 1500V rms contact to coil |

**Ancillary & Bells**

| | |
|---|---|
| Number | 3 |
| **Anc 1, Anc 2** | 1 Pole changeover contacts<br>Voltage-free |
| Termination | Demountable screw terminals<br>1.5sq mm max cable |
| Rating | ELV only<br>30V, 2Adc resistive<br>30V, 1Adc inductive |

(Note: The relays are 2 pole, with second pole terminated on PCB pads).

| | |
|---|---|
| Operation | Programmable |
| Default | Active on any un-isolated Zone Alarm. |
| Supervision | Separate terminal (ref 3.4.2) |
| Anc 3/Bells | 2 pole relay<br>Link selectable function |
| Standard Format | Bells<br>Switched 24Vdc output<br>2 terminals, Bells +, -<br>Demountable screw terminals<br>1.5sq mm max cable |
| Option | 1 Pole changeover contacts<br>Voltage-free<br>Snip Links Lk2, 3, 4. |
| Rating | ELV only<br>30V, 2Adc resistive<br>30V, 1Adc inductive<br>24V, 1.5Adc inductive bells |
| Operation | Programmable |
| Default | Active on any un-isolated zone alarm |
| Supervision | On Bells +, - only (ref 3.4.2) |

**RZDU Comms**

| | |
|---|---|
| Tx, Rx, 0V | 3 Wire (+VBF2 also available) |
| Transmission Rate | 1200 Baud |
| Protocol | Vigilant RZDU: non-LCD, LCD-A, LCD-B |

### 3.5.3 FP0559, FP0772 (AS1603.4) & FP0787, FP0788 (AS4428.1) OUTPUT SPECS

**RZDU Comms & Power**

| | |
|---|---|
| Tx, Rx, 0V, +24V | 3 Wire Tx, Rx, & 0v comms connection to J2 plus +24V input connection to J1 for power i.e. 4 wire connection to FIP. |
| Transmission Rate | 1200 Baud |
| Protocol | Vigilant RZDU: non-LCD, LCD-A, LCD-B |

## 3.6 CONTROLS

**KEYPAD**

| | | |
|---|---|---|
| Type | : | Polyester Membrane |
| Keypress | : | Buzzer gives short "beep" for valid keypress |
| Number of Keys | : | 34 (plus 5 concealed with no function) |
| FFCIF Keys | : | ACK; RESET; ISOL; BRIG TEST |
| Other Keys | : | Refer RDU Operator's Manual for description |

**INTERNAL CONTROLS**

| | | |
|---|---|---|
| Mains On | : | Switch in cabinet MAF configured RDU only |

**Database Write Protect**

| | | |
|---|---|---|
| Function | : | Enables/disables writing to EEPROM |
| Form | : | 2 position mini-jump shunt, Lk7 on Controller/Display PCB |

**E2 INIT**

| | | |
|---|---|---|
| Function | : | Initiates self-programming of system configuration on system power up (i.e. number of modules, etc)<br><br>Requires DATABASE WRITE PROTECT to be in WRITE position. |
| Form | : | 2 Way .1" male pins on Controller/Display PCB<br>Short circuit pins during power up to initiate. |

**BUZZER**

Mounted on Controller/Display PCB

| | | |
|---|---|---|
| Type | : | Piezo |
| Frequency | : | 2800Hz nominal |
| Sound Level | : | 70dB min at 1m (outer door closed). |

**DISPLAY EXTENDER BOARD KEYSWITCH INPUTS** (NZ mode only)

Keyswitch inputs which may be used are : Silence Alarms, Trial Evacuation, and Building Services Restore.

# 3.7 DISPLAYS

Standard Display

| | | |
|---|---|---|
| Includes | : | LCD; FFCIF LEDs; System Status LEDs |
| Panel Size | : | 19", 4U |
| FFCIF Type | : | 3 (common indicators & common controls) |
| Standard | : | Complies with AS4050 (int) - 1992 (for AS1603 systems) |
| LCD Size | : | 2 Lines of 40 characters<br>5.5mm (H) x 3.2mm (W) per character |
| Site Name | : | 40 Characters max. |
| Zone Name | : | 30 Characters max. |
| Relay Name | : | 30 Characters max. |
| FFCIF LEDs | : | ALARM (red); ISOLATED (yellow); FAULT (yellow) |
| System Status LEDs | : | MAINS ON (green); CHGR/BATT FAULT (yellow); SYSTEM FAULT (yellow); ANCILLARY ISOLATED (yellow); BELLS ISOLATED (yellow) |
| Internal Status LEDs | : | Mains On (green), Fuse Blown (yellow) on MAF/PSU PCB. |

Optional Additional Display 3 Column 16 Zone LED Display Board

Requires 1 x ME0060 plus: 1 x FZ3031 for the left hand position
1-3 x FP0475 for the remaining positions as required

ME0060 MECH ASSY, 1901-79, 19" RAC, EXT INNER DOOR
(19", 7U, mounts up to 4 of 16 Zone LED Display Bd)

FZ3031 16 ZONE LED DISPLAY, LHS POSITION, F3200

FP0475 16 ZONE LED DISPLAY EXTENDER KIT, 1901-26

| | | |
|---|---|---|
| Includes | : | 1 x 16 Zone LED Display Bd; FRC; Power leads; zone name label (FP0475 has 0.5m FRC, FZ3031 has 1.2m FRC). |
| Format | : | 7U Parallel LED display mounts directly below the standard 4U LCD.<br><br>The LCD and common LEDs operate as per standard. Zone status is additionally shown on the zone LEDs. |
| FFCIF Type | : | 2 (individual zone indicators and common controls) |
| Zone LEDs | : | ALARM (red); FAULT (yellow); ISOLATED (yellow) |
| Name Space | : | 10mm x 60mm per zone on paper label. |

Optional Additional Display 2 Column 16 Zone LED Display Board

Requires : 1 x LM0092 Controller to First Display
1 x ME0457 Mech Assy 1982-40 MX1 4U 5 x 16 LED Display Door
1-5x FP1002 FP MX1 16 Zone LED Display Extender
(includes circuit board and 200mm FRC for connecting to next board)
LM0295 FRC 26W 700mm
(connect from one 4U door to the next)

Format : 4U Parallel LED Display

Zone LEDs : ALARM (red); FAULT/ISOLATE (amber)

Name Space : 9mm by 44mm per zone on paper labkel
(use LT0369 from web site)

NZ mode Display Extender Board

Used in New Zealand mode only and provides three common LEDs - Normal (green - steady = normal), Defect (yellow, 2 Hz flash = defect) and Fire (red, 2 Hz flash = fire).

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# CHAPTER 4
# ORDERING INFORMATION

# 4.1 ORDERING INFORMATION

The following lists the part numbers for the range of products associated with the RDU Mk2. It includes a brief description where needed.

**AS4428.1 RDUs**

FP0785 FP RDU AS4428 15U CABINET MAF/PSU 3A
Controller/Display and MAF/PSU housed in 15U cabinet, C/W door, window, lock and MCP mounted on outer door.

FP0786 FP RDU AS4428 8U CABINET MAF/PSU 3A

FP0787 FP RDU AS4428 SLIMLINE WALL MOUNT

FP0788 FP RDU AS4428 SLIMLINE FLUSH

FP0789 FP RDU AS4428 4U 19' RAC MODULE
Controller/display 4U module for mounting in a 19" rack cabinet.

**AS1603.4 RDUs**

FP0558 FP,REMOTE LCD DISPLAY UNIT,FULL CABINET & MAF/PSU
Controller/Display and MAF/PSU housed in 15U cabinet, C/W door, window, lock and MCP mounted on outer door.

FP0559 FP,REMOTE LCD DISPLAY UNIT,SLIMLINE,WALL MOUNT
(Small, low profile RDU C/W Controller/Display).

FP0577 FP,REMOTE LCD DISPLAY UNIT,4U 19",RACK MOUNT
(Controller/Display 4U module for mounting in a 19" rack cabinet).

FP0772 FP, REMOTE LCD DISPLAY (RDU), SLIMLINE, FLUSH MOUNT
(Small, low profile RDU in flush mounting cabinet).

FP0585 FP,REMOTE LCD DISPLAY,SMALL CABINET C/W MAF/PSU
(Controller/Display and MAF/PSU housed in an 8U cabinet).

**OTHER PARTS**

FP0475 FP,16 ZONE LED DISPLAY EXTENDER KIT,1901-26
(LED Display Bd, 0.5m FRC, power leads and label master).

FP0486 FP,DISPLAY/RELAY DRIVER, KIT 1901-26
(Relay Driver Bd, 0.5m FRC and power leads).

FP0556 FP,F3200 EMPTY CAB,C/W WINDOW

FP0557 FP,F3200 EMPTY CAB,C/W BLANK DOOR

FP1002 FP, MX1 16 ZONE LED DISPLAY EXTENDER

FZ3031 FP,KIT,F3200 DISPLAY EXTENSION KIT,
(Same as FP0475, but with special 1.2m FRC, allows mtg of Display Bd in furthest left position and connection to RDU Controller).

KT0510 KIT, RDU AS1603 V2.XX TO V5.XX SOFTWARE UPGRADE INSTRUCTIONS
This kit contains the parts to upgrade an AS1603.4 RDU with V2.xx software to V5.xx software.

LM0041 LOOM,1888-58,PROG PORT TO 9 PIN SERIAL
(cable to connect computer to Controller).

LM0044 LOOM,1901-81-1,DISPLAY EXTENDER FRC,2M

LM0045 LOOM,1901-81-2,DISPLAY EXTENDER FRC,5M

LM0046 LOOM,1901-81-3,DISPLAY EXTENDER FRC,0.5M

LM0056 LOOM 1901-81-5,DISPLAY EXTENDER FRC,1.2M
(connects Display Bd to Controller, allows mounting of Display Bd in furthest left position).

LM0092 LOOM, 1931-88, F3200 CONTROLLER TO 1ST DISPLAY, 1.2M

LM0295 LOOM, FRC 26W STYLE B 700MM

ME0060 MECH ASSY,1901-79,RAC CABINET,EXT INNER DOOR
(hinged 7U inner door for mounting Display Bds on, includes screws, cage nuts and PCB standoffs and 64 zone window).

ME0258 MECH ASSY,1919-21-2,RAC CABINET,1U SHELF,135 DEEP
(includes screws and cage nuts for mounting in FP0558 RDU)

ME0457 MECH ASSY, 1982-40 MX1 4U 5 X 16 LED DISPLAY DOOR
(hinged 4U inner door for mounting up to 5 x FP1002 LED displays)

PA0470 PCB ASSY,1901-64-1,16 WAY RELAY BD, 24V

SF0424 SOFTWARE, RDU MK2 V5.XX

SF0425 SOFTWARE, RDU DATABASE CONVERSION

**NEW ZEALAND OPERATION ONLY**

A variety of display options are available to satisfy varying NZ requirements. These are covered in detail in section 8.4. Ordering codes are included for the various components for each option. Major items are as follows:

PA0499 PCB ASSY, NZ DISPLAY EXTENDER BOARD
NZ Display Extender Board in standard 16 Zone LED board format.

PA0742 PCB ASSY, PFD NZ DISPLAY EXTENDER BOARD, 24V
NZ Display Extender Board in format suitable for Custom Brigade Index cabinet.

PA0741 PCB ASSY, PFD 16 ALARM LED DISPLAY, 24V
"Custom Brigade Index" format 16 Zone display board (clear high-bright alarm LEDs only).

PA0754 PCB ASSY, PFD 16 ZONE FULL STATUS, 24V
"Custom Brigade Index" format 16 Zone display board (all LEDs fitted clear high-bright).

PA0753 PCB ASSY, PICTURE FRAME DISPLAY, 16 LED MIMIC, 24V
"Custom Brigade Index" cabinet format board for mimicking 16 Fire LEDs from Display board.

PA0760 PCB ASSY, NZ DISPLAY EXTENDER, PFD MIMIC
"Custom Brigade Index" cabinet format board for mimicking 3 LEDs from Display Extender Board.

PA0483 PCB, UNPROTECTED TERMINATION BOARD
With a 26 way FRC gives access Display Extender Board inputs and outputs.

PA0772 PCB ASSEMBLY, PFD TERMINATION BOARD
Breaks 26-way display FRC out to multicore cable (12 way).

PA0769 PCB, UNPROTECTED TERMINATION BOARD, C/W RESISTORS
Versions of PA0483 with 3k3 resistor per output for LED current limit.

# CHAPTER 5
# CONFIGURING AN RDU

# 5.1 GENERAL

An RDU is configured to suit a particular customer's requirements by:

- fitting and connecting any LED Display bds;
- adjusting or removing links on the PCBs;
- programming the RDU.

The manual call points (MCPs), display boards, warning devices and ancillary equipment that are connected to the RDU must match the RDU configuration.

The RDU configuration data, which is entered during programming, is stored in the non-volatile memory database. The database may be saved to a computer for back-up storage, or reloaded from a computer.

All programmable options have a default setting for the most likely usage. That is, for many applications, no programming other than entry of site and zone names will be necessary.

Programming is described in detail in Chapters 6 and 7. The rest of this chapter describes configuration of the hardware.

# 5.2 MODULE CONFIGURATION

The RDU performs some self-tests at start up and checks what modules are physically connected. It then displays the results on the LCD as to whether a MAF/PSU module is installed and how many 16 Zone LED Display boards are present. If the modules connected do not match the programmed database then the RDU indicates a fault.

E2 Initialisation (database re-initialise) assigns a default database according to what modules are found. Refer to section 6.3.1. "Display" is the Default board type stored in the database following E2 Initialisation. If the open collector mimic outputs are to be used to drive relays then they must be specifically programmed as type "Relay". Refer to section 7.1.

If it is necessary to change the installed configuration of an existing system, modules can be fitted or removed as required and the database re-programmed through the keyboard.

If a Display Extender Board (PA0499 or PA0742) is found to be connected at E2 Initialisation time, then the database will be set up for New Zealand operation, otherwise, Australian operation is selected.

# 5.3 BATTERY & POWER SUPPLY

### 5.3.1 GENERAL

The MAF RDU has a DC power supply, which also serves as a battery charger and requires a 24V sealed lead acid battery (i.e., 2 x 12V batteries in series) to be fitted. Battery leads with 4.8mm Quick Connect receptacles (for connecting to the battery tabs) are included. The figures and calculations given in this section are for Australian operation. The same calculations can be done for New Zealand operation but noting that the charger must fully recharge the batteries within 24 hours under non-alarm conditions.

The non-MAF RDU is DC line powered from the FIP. Section 5.3.3 contains a sample calculation detailing the extra loading on the FIP dc power supply and battery due to connection of one or more RDUs.

**Charger Rating**

The standard MAF configured RDU has a 3A power supply. A 6A upgrade is available but is not currently approved. This requires a second mains transformer, a 3A rectifier PCB and a larger heatsink to be fitted. When a 6A power supply is fitted, additional battery protection is also required (see Section 5.3.6).

To comply with AS1670.1 the power supply rating must be sufficient to charge the batteries while powering the panel with 2 zones in alarm including any connected ancillary loads plus all remaining quiescent loads. (This is not required in NZ).

The definition of charging the batteries is supplying enough current to charge them within 24 hours to provide a capacity that will support 5 hours of RDU quiescent load, i.e., non-alarm with mains off followed by 0.5 hour of alarm load.

The recommended order of performing calculations is listed in Sec 5.3.2.

**Battery Rating** (Refer to AS1670.1).

The battery capacity must be sufficient to support 24 hours of quiescent load (i.e., non-alarm with mains off), followed by 0.5 hour of alarm for two worst case zones.

Notes

1. The quiescent load includes the RDU electronics (in normal state) plus any external normally energised loads that operate from the battery backed supply. Hence **door holders** are normally supplied from a **non-battery backed** supply.

2. Alarm load includes RDU electronics (in alarm state) plus any external loads such as bells, air conditioning shutdown relays, etc., plus the two fire suppression zones.

### 5.3.2 BATTERY/CHARGER CALCULATIONS

The recommended order of calculations is as follows:

1. Calculate the RDU quiescent load (Iq) from the figures given in Sections 3.3.1 for a MAF configured RDU or 3.3.2 for a Non-MAF configured RDU. Calculate In separately, where In is the external non-alarm, non-battery backed load on the RDU PSU (e.g. door holders).

2. Calculate the RDU alarm load (Ia) for 2 zones in alarm from section 3.3.1 or 3.3.2 as appropriate. (Include all external loads e.g. bells, relays).

3. Calculate the 5 hour/0.5 hour battery capacity for the charger requirement as follows:

   Cap (5 hr) = (5 x Iq) + (0.5 Ia x 2) Ahr
   = 5Iq + Ia where
   Iq = quiescent current
   Ia = alarm current

4. Find the greater of Iq + In, or Ia. Calculate the power supply/charger requirement (Ic) as follows and check that it is less than 3A. (If greater a 6A charger is required).

   Ic = I + Cap (5 hr)/(24 x .8) where I is the greater of Iq + In, or Ia.

5. Calculate the battery capacity as follows:
   Cap (24 hr) = (24 x Iq + Ia)

   Select a battery which has a rated capacity (i.e. 20 hr rating) at least 25% higher than this).

### 5.3.3 EXAMPLE BATTERY/CHARGER CALCULATIONS

**MAF RDU BATTERY/CHARGER CALCULATION EXAMPLE**

An example MAF RDU has the following configuration:

MAF/PSU module, no 16 Zone Display boards
350mA of door holders off +VNBF
Ancillary relay 1 (on the MAF) switching a 24V, 100mA load
A Bell circuit with 0.75A of 24V bell load.

Calculate the required battery capacity and check the power supply load.

Steps

1. The quiescent load (Iq) for the mains fail situation is:
   53mA (MAF configured RDU, standby relay held)

   Use Iq ~= 0.055A.
   The quiescent load for mains on is Iq plus the door holders (In = 0.35A), i.e., 0.40A.

2. Say, one or a number of zones go into alarm at the FIP, and that collectively those zones map to the MAF, ANC1, ANC2 and Bells relay at this RDU.

   The alarm load at the RDU is therefore:

   180mA (RDU inc. MAF alarm, ANC1, ANC2, Bells relays held)
   \+ 100mA (Ancillary 1 relay load)
   \+ 750mA (Bells load)
   1030mA

   Say Ia = 1050mA (the door holders are switched off in alarm).

3. Cap (5 hr) = 5 x 0.055 + 1.05 Ahr = 1.33 Ahr

4. Battery charger current required is:

   Ia (1.05A) is greater than Iq + In, (0.40A), therefore:

   Ic = 1.05A + (1.33/(24 x .8)) = 1.12A
   i.e. 3A is sufficient.

5. Battery capacity:

   Cap (24 hr) = [(24 x 0.055) + 1.05] x 1.25 = 2.96 Ahr

   Suggest two 12V, 6 or 6.5 Ahr sealed batteries are used because these are a standard stock item.

**NON-MAF RDU BATTERY/CHARGER CALCULATION EXAMPLE**

An example system comprises a FIP and 8 Non-MAF configured RDUs, DC line powered from the FIP. There are no 16 Zone Display bds connected at any RDU. Calculate the extra FIP battery and power supply capacity required.

Steps

1. The quiescent load (Iq) is:

   29mA (Controller/Display, LCD backlight off

   Use Iq = 0.03A.

   The quiescent load used is thus Iq + In = 0.03A. In its standard configuration an FP0559 is line powered from the FIP hence In = 0A.

2. If one or a number of zones go into alarm at the FIP, and one or more of those zones is mapped to this RDU, then the alarm load at the RDU is:

   85mA Controller/Display, LCD backlight on, Com Alarm LED on

   Use Ia ~= 0.085A.

3. Use these figures in the battery and charger calculation for the FIP.

### 5.3.4 BATTERY SIZE

The maximum battery size given in the specification, Section 3.3.1.3, of 220mm x 520mm x 175mm, is comprised of two 220H * 260W * 175D batteries. The maximum sizes which fit within this restriction are:

| | | |
|---|---|---|
| Sonnenschein | A212/50A | 50 Ahr |
| Powersonic | PS-12600 | 60 Ahr |
| Yuasa | NP38-12 | 38 Ahr |

Fitting and removing batteries of this maximum size is difficult, and may require the removal of any modules or brackets fitted in the bottom of the cabinet.

### 5.3.5 BATTERY TEST RESISTORS (R52, R53)

The battery test resistors on the MAF module (R52, R53) if fitted, MUST be removed before installation of the RDU to allow the daily 40 minute battery test to be done without flattening the batteries or burning out the resistors.

### 5.3.6 BATTERY OVERCURRENT PROTECTION

The MAF/PSU has two parallel PTCs, rated to carry 3A, for battery overcurrent protection.

Where the Alarm load from the battery to RDU is greater than 3A (i.e. with mains failed) or where a 6A power supply is used an external, self-resetting, overcurrent device of suitable rating (greater than 6A, less than 12A, e.g., 10A) must be wired between the battery terminals on the MAF/PSU and the battery (see Fig 5.3.2). For this option the PTCs must be shorted by soldering a suitable copper wire between the two adjacent test points +VB and BATT+ (TP11 and TP16 on the MAF/PSU).

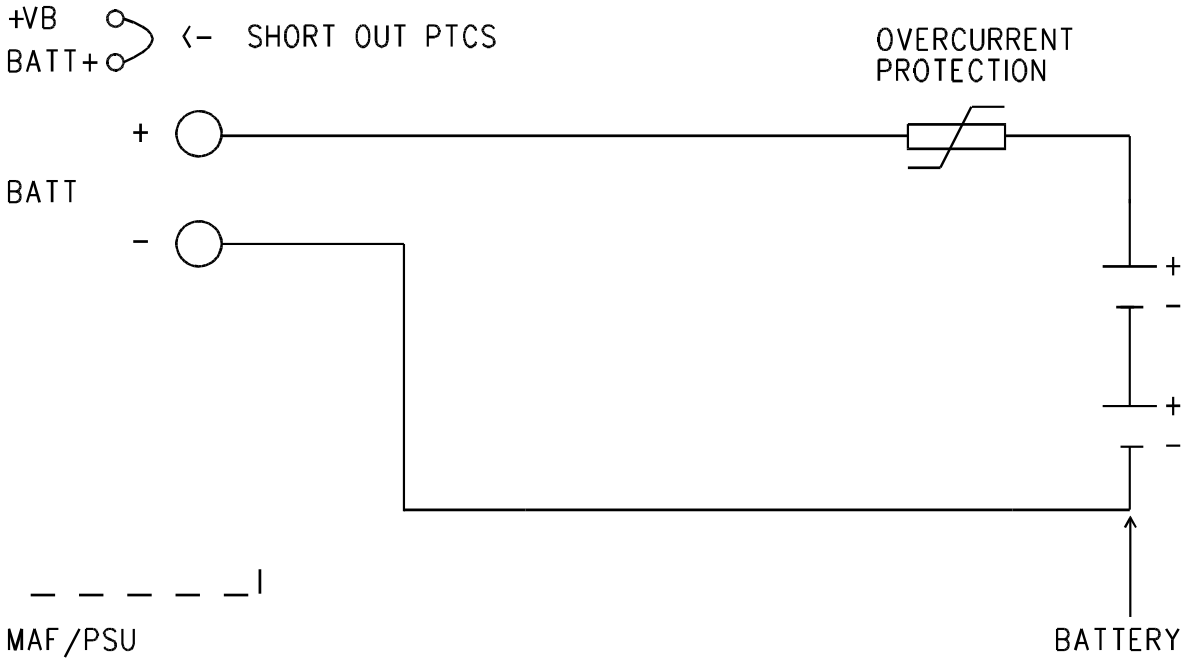


FIG 5.3.2
BATTERY OVERCURRENT PROTECTION FOR LOADS GREATER THAN 3A

# 5.4 LINKS ON PCB MODULES

### 5.4.1 CONTROLLER/DISPLAY

Apart from E2INIT (SW1) and DATABASE WRITE PROTECT/ENABLE (Lk7) all links on the Controller Display are factory set. These configure the PCB for memory chips used, other functions, and type, e.g., as a RDU Controller or FIP Controller.

SW1 and Lk7 are described in section 6.3.1.

### 5.4.2 16 ZONE LED DISPLAY BOARD

The last LED Display Bd in the chain (i.e. the one furthest from the Controller on the FRC) requires the mini-jump provided to be fitted to Lk1. However, if a Display Extender Board is fitted then the mini-jump must NOT be fitted to Lk1. If two column LED display boards are fitted, there is no need to fit a link to the last board (link LK1 does not exist on the two column board).

### 5.4.3 MAF/PSU LINKS

Of the 4 links on the MAF/PSU, 3 are for field adjustment as follows:

| | | | |
|---|---|---|---|
| Lk2-Lk4 | Bells/ANC 3 | - | Fitted in factory to provide switched 24V output. (Bells+, Bells-). For AS4428 systems, this drives the Warning System. |
| | | - | Snip all 3 for clean changeover contacts (NO, COM, NC). |

Note that Lk2-Lk4 must remain fitted if Bells supervision is required (No links are required for Ancillary Relay 1, 2 supervision).

LK1 is for factory configuration as follows:

| | | | |
|---|---|---|---|
| Lk1 | Master/RDU | - | Fitted for Master. |
| | | - | Snipped for RDU (3-wire isolated connection to RDU). |

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# CHAPTER 6
# PROGRAMMING PART 1

# 6.1 INTRODUCTION

### 6.1.1 GENERAL

This manual describes the use of program mode to configure the RDU. All configuration parameters can be set using the display/ keypad without the use of a laptop/PC. It is recommended that the database be saved to a disk file when programming is complete using a laptop/PC. The database can be loaded/restored from a previously saved disk file.

This manual applies to RDU version 5.00 software or later (RDU Mk2). The programming menus in version 5.00 RDU software are quite different to earlier RDU software, and are now similar to F3200/NDU programming menus. Version 5.00 software also supports "tandem LCD mode" which means that PanelX (a PC utility) can be used to connect with and operate/ program the RDU.

Figures 6.1.1, 6.1.2, 6.1.3, 6.1.4 and 7.2.1 (zone configuration) illustrate the programming menus in the RDU and Table 6.5.1 shows all the programmable parameters.

The RDU has two levels of access for display/keypad operation. These are "operator mode access" and "program mode access". Operator mode allows commands such as zone isolate/ de-isolate and history recall to be initiated and does not require a password. Program mode allows modification of the configuration database and requires a password plus the adjustment of the database write protect link (LK7) on the controller board. When the RDU is in program mode, the standby relay is de-energised and the RDU stops processing alarms/ zone status received from the FIP, but continues replying to the FIP on the RZDU bus. There is no off normal indication at the FIP when the RDU is in program mode.

It is recommended that configuration forms specifying all text and programmable parameters be filled out before programming commences. Blank master forms are included in Appendix A. A set of completed forms should be kept in the contract file.

**NOTE**

1. When filling out configuration forms, only non-default parameter settings need to be recorded.

### 6.1.2 MENU STRUCTURE & PARAMETER ENTRY

Program mode provides access to a set of menus. Some menus appear as a list of numbered options where the numeric keypad is used to select an option. Some menus appear as a list of fields where a flashing cursor indicates the active field and the left and right arrow keys are used to cycle through the available fields. The left and right arrow keys are also sometimes used to step backwards and forwards through different menus. When circuit, zone or relay information is being programmed, the NEXT and PREV keys are used to step to the next or previous circuit/zone/relay. The CLEAR/ESC key generally returns to a previous/higher menu level.

To exit program mode, press the CLEAR/ESC key repeatedly until a prompt appears asking if you wish to exit program mode. Changes that have been made to the database can then be saved to non-volatile memory or can be discarded at this point.

With some menus, a setting can sometimes be changed by using the up arrow/ down arrow keys and sometimes by selecting from a list of options using the numeric keypad. Some menus require the ACK key to be used to save the changes associated with that particular menu into the database. If the menu is exited without saving changes, a prompt is given, asking whether the changes should be saved.

### 6.1.3 PROGRAMMING KEYS

The front panel keypad includes numeric keys and a number of function and command keys. Some keys have a dual operation. These are the nine keys (RECALL to AIF MODE) on the lower right hand side of the front panel. In general, the "lower" function of the dual operation keys applies when in program mode. For example, the BATT TEST/ DOWN ARROW key is used as a down arrow key when in program mode and as battery test when not in program mode.

The logic functions (OR, AND, XOR, NOT) in the right hand column of the 4 x 4 "numeric" keypad are used for entering output logic equations. During text entry, the "NOT" key is used to enter a space character.

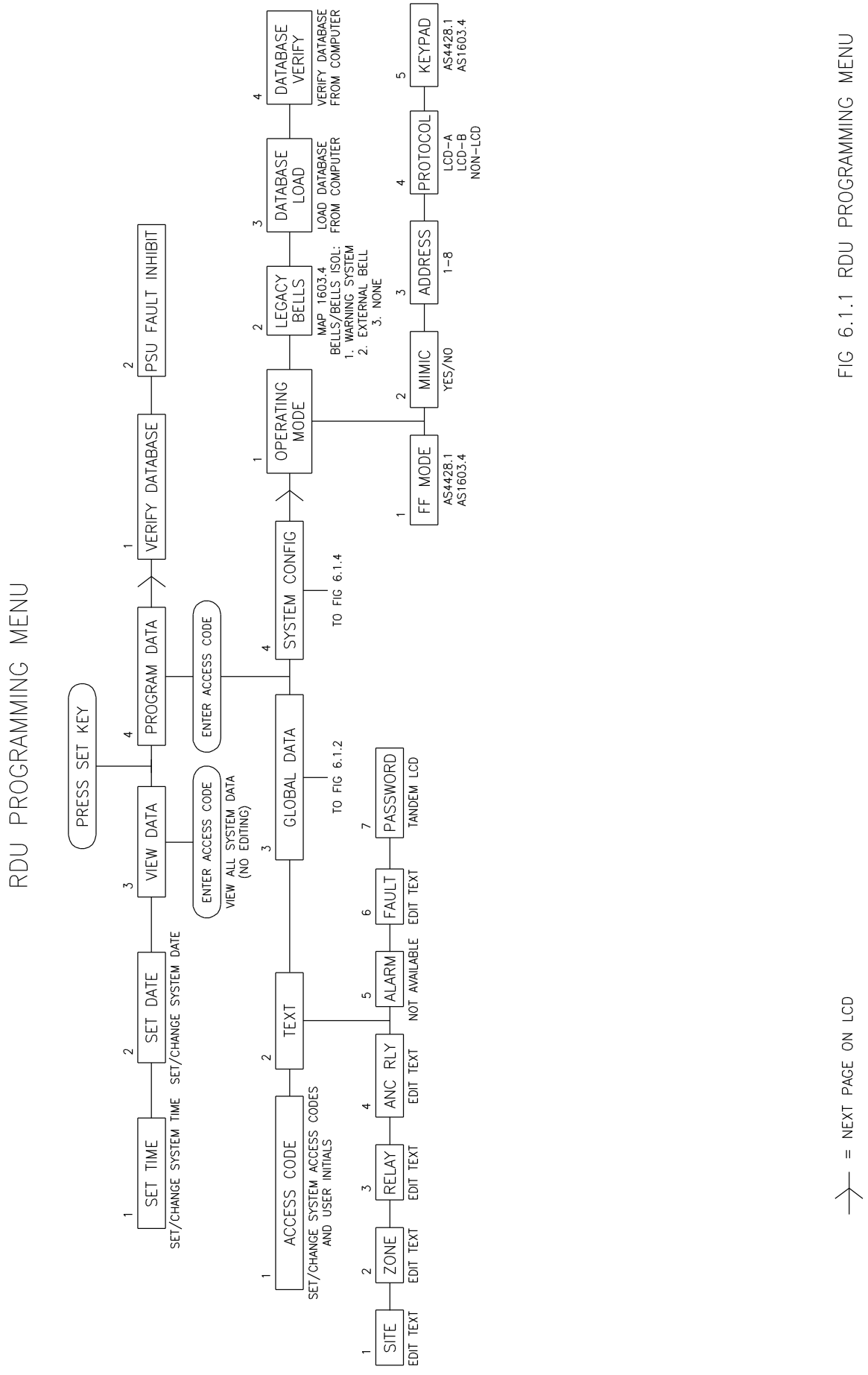



FIG 6.1.1 RDU PROGRAMMING MENU

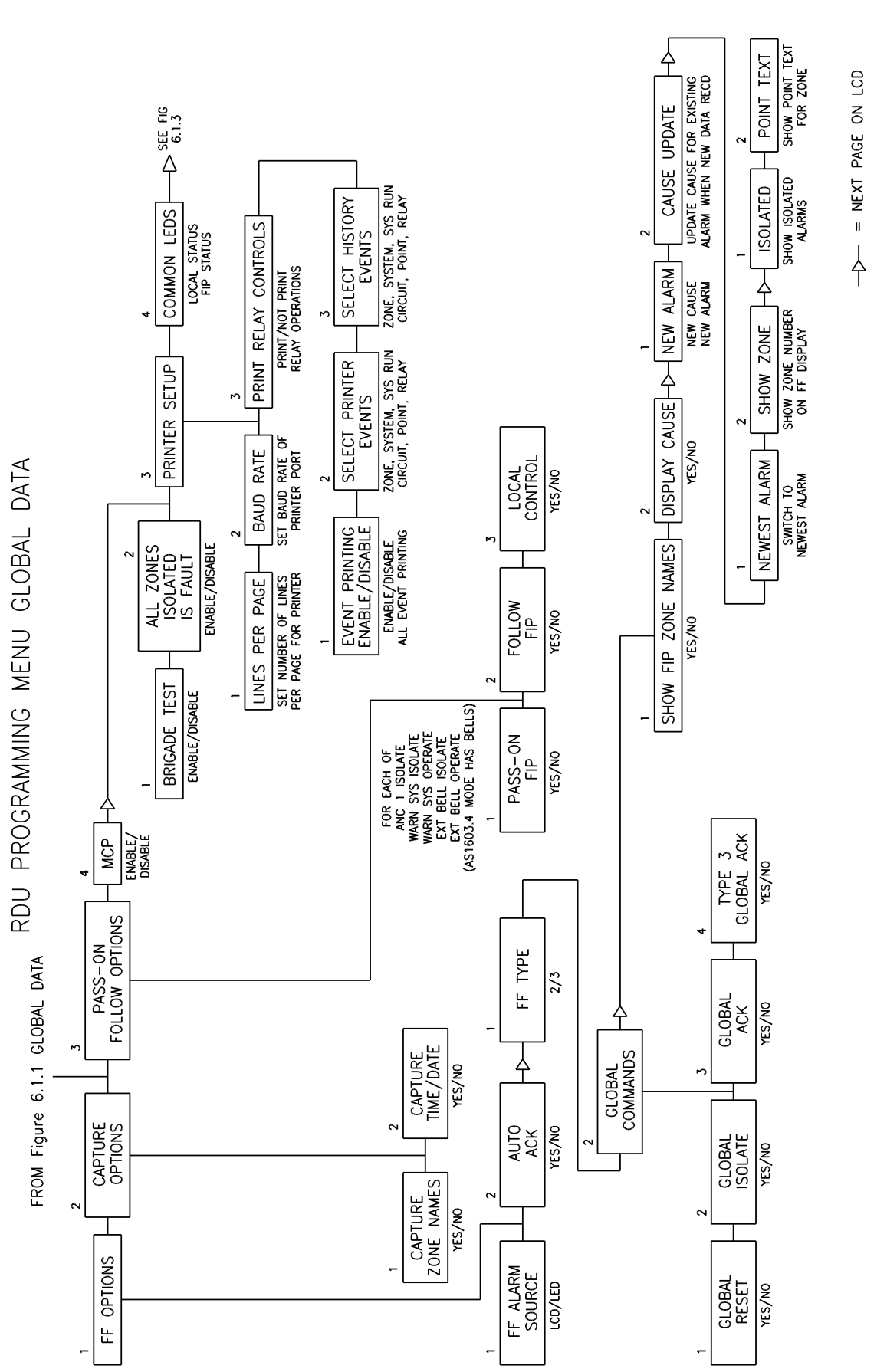



Figure 6.1.2 RDU PROGRAMMING MENU GLOBAL DATA

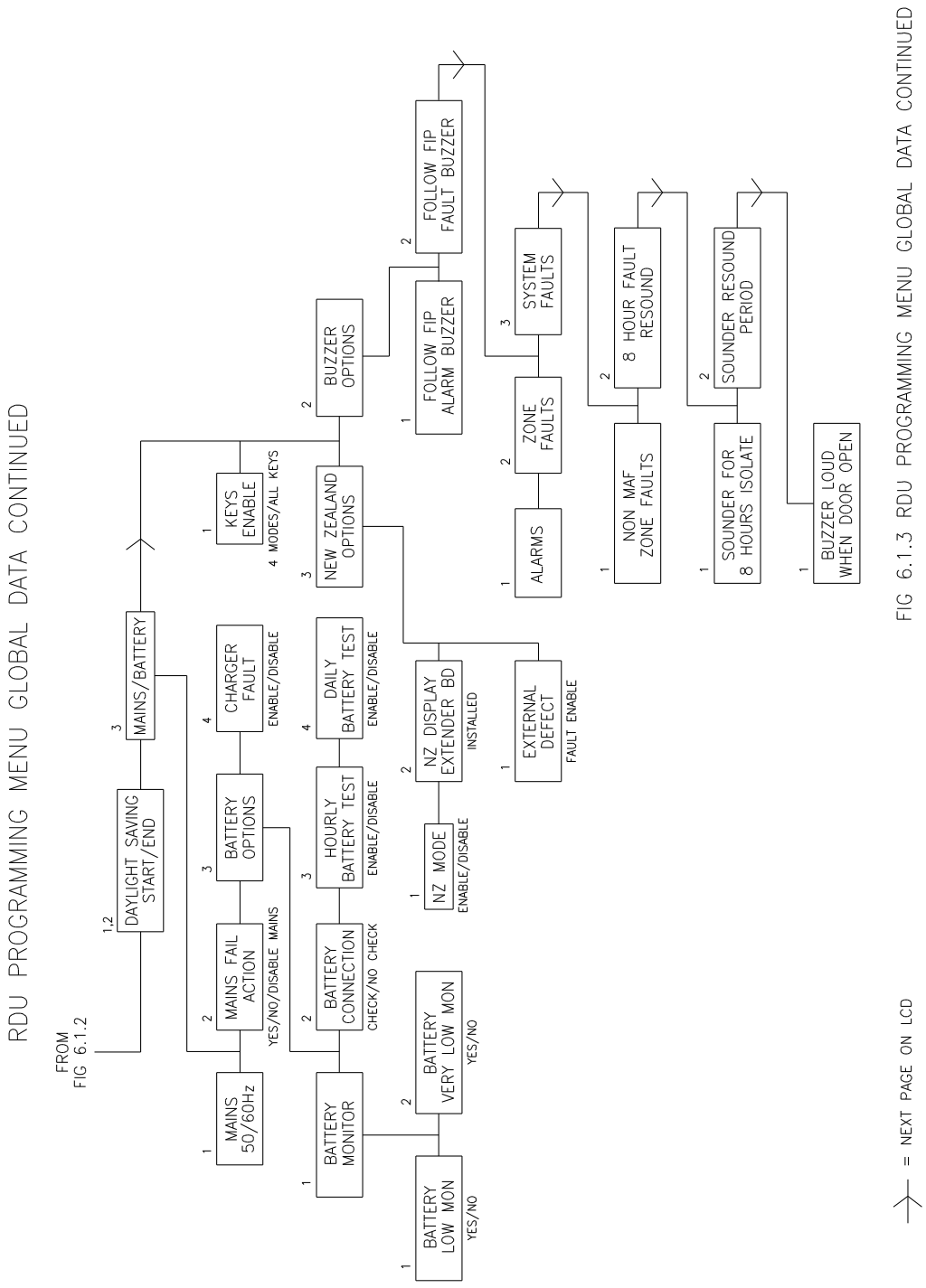



FIG 6.1.3 RDU PROGRAMMING MENU GLOBAL DATA CONTINUED

**6.1.4**

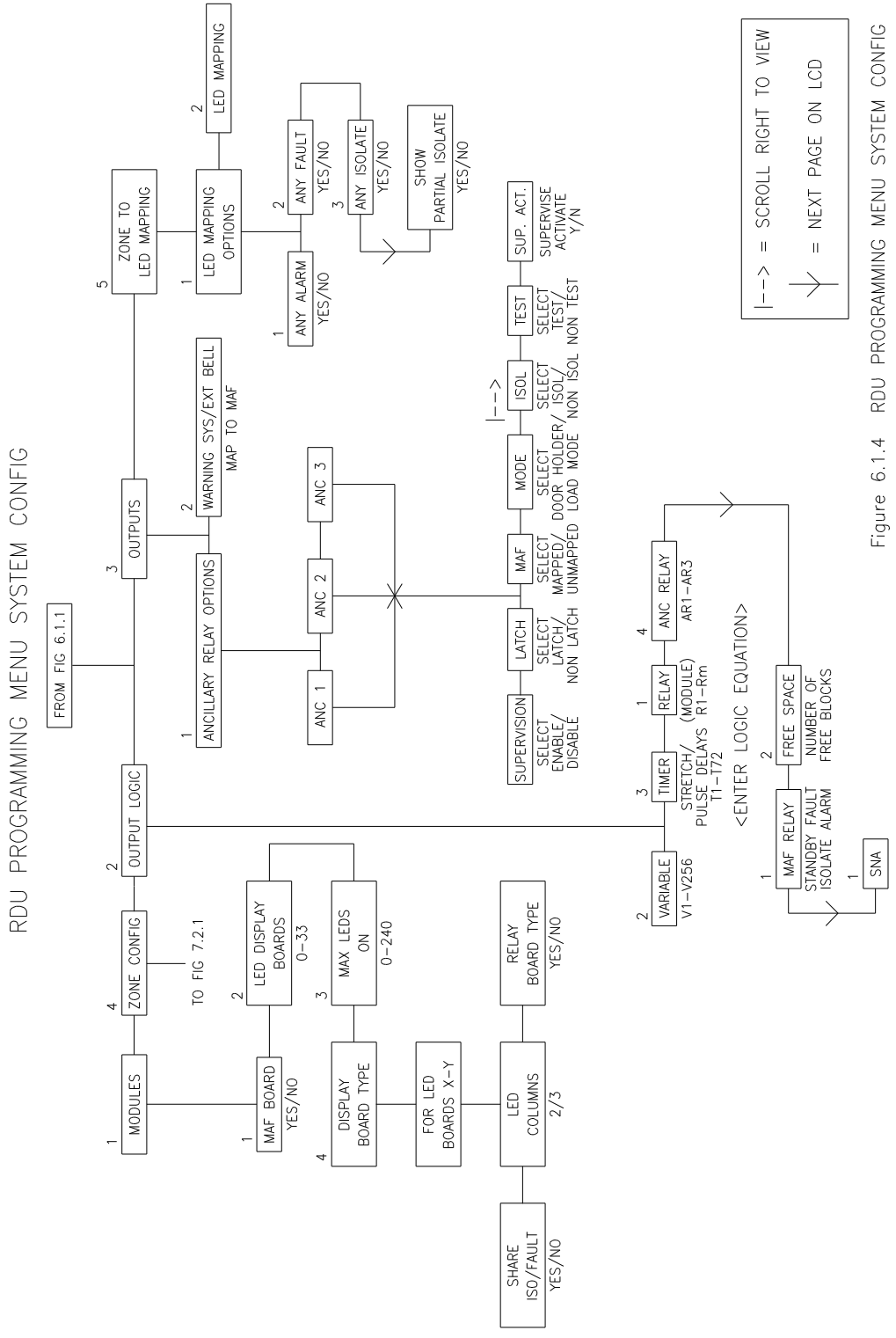



Figure 6.1.4 RDU PROGRAMMING MENU SYSTEM CONFIG

### 6.1.5 RECOMMENDED PROCEDURE FOR PROGRAMMING

The following steps should be carried out in the order given.

**1. System Design**
Determine all system requirements; decide number of zones, zone LED Display boards (if any); MAF module. Calculate the battery and PSU requirements as per section 5.3. Decide on the battery capacity. Check that the physical size of the battery fits in with the proposed mechanical arrangement. Fill out the configuration forms provided in Appendix A with all of the programming details.

**2. E2 Init / Database re-initialise**
With mains power off and the battery disconnected, fit any relay supervision links required.

Fit links Lk7 and SW1 and turn mains power on to perform a database re-initialise as per section 6.3.1. Set the time and date.

**3. Assign Access Codes**
Enter programming mode using the default password. Assign access codes as per section 6.4.2 Note that access code zero is the master code, and should be known by the System Designer or Service Supervisor as appropriate.

**4. Assign RDU address and operating mode**
The operating mode is set to AS4428.1 by default. If AS1603.4 operation is needed, then the operating mode should be changed before any other programming. Refer to section 6.4.1.

**5. Enter Text**
Program text names for each item listed in section 6.4.3. There are several ways that zone names can be created in the RDU. Refer to section 6.4.3.2.

**6. Enter Global Parameters**
Assign values to all of the "global data" parameters that need to change from the default settings. The menus and options which appear in the global data parameter list are described in section 6.4.4.

**7. Enter System Configuration**
Under the system config menu option, program the zone configuration, the number of LED display boards and the mapping of zones to LEDs. These menus are described in section 7.1.

**8. Checking**
When all parameters have been programmed, exit program mode and either:
1. Print the database (see section 6.3.5) and compare the printout against the configuration forms (check each parameter for each item and tick off), or
2. If a printer is not available, use "View Parameter" mode (see section 6.2.2) and check each parameter against the configuration forms.

**10. Testing**
Carefully test the RDU to verify that the programming is as required. This should include generating an alarm for each point/zone for which the RDU displays alarms to check that the RDU displays the alarm with the correct point/zone text.

**11. Save Database**
When programming is complete and correct, save the database to a disk file if a laptop/PC is available. See section 6.3.5.

# 6.2 PROGRAMMING OR VIEWING THE DATABASE

### 6.2.1 GENERAL

To program or view the database, from the base display, press the "SET" key and the following menu appears.

1 Set Time 2 Set Date 3 View database 4 Program database >

The arrow (>) at the right hand end indicates that a second menu can be accessed using the right arrow key. Options 1, 2 in the above menu are operator accessible and do not require a password.

Options 3:View database and 4:Program database, require an access code to be entered. View database operation is described in the Section 6.2.2. A description of program mode operation begins in Section 6.4. Fig 6.1.2 shows the structure of the menus available in program mode.

Pressing the right arrow key from the above menu produces a second menu as follows.

1:Verify database 2:PSU fault inhibit

Option 1: Verify database allows the database to be compared to one held on the disk of a PC/laptop. Refer to Section 6.3.6.

Option 2: PSU fault inhibit is an operator function described in the Operator's manual LT0494 (AS1603.4) and LT0495 (AS4428.1).

### 6.2.2 VIEW DATABASE

To view the configuration database without changing it, from the base display, press the SET key and select option 3 View database. A password must then be entered. When in view database mode, the same menus used in program mode to modify the database, are used to view the database. The database write protect link LK7 should be left in the "protect" position when viewing the database. Processing of alarms continues while in view database mode.

# 6.3 DATABASE OPERATIONS, INITIALISING, ACCESSING, SAVING

### 6.3.1 INITIALISING THE DATABASE

The database can be reinitialised by powering up with the E2INIT link fitted as described below. A default database is assigned and all previous programmed data is lost.

Steps

1. Fit the Mini-jump on the database write protect link, (Lk7 - top right of controller board) in the PROTECT position, (i.e., not write enabled).

2. With the batteries disconnected, turn the FIP mains power off.

3. Fit a mini-jump (i.e., short the two pins) to the E2INIT link (SW1 - top centre of controller), then turn the power on.

4. When the start up sequence is complete, a message will appear on the display, prompting for the database to be write enabled. Move the database write protect link Lk7 to the write enable position.

5. When prompted, remove the E2INIT mini-jump and leave it fitted to one pin only. Wait two to three seconds, then press ACK to reinitialise the database or press CLEAR to exit.

### 6.3.2 ACCESSING THE DATABASE

When programming the database, the database write protect link (LK7) should be in the write enable position. **At all other times it must be in the WRITE PROTECT position.**

To enter program mode, write enable the database, then press the SET key from the base display and select “Program database”. Enter the password/ user code (default 000000). The main programming menu then appears. If the password is unknown, the Temporary Password Access mechanism can be used to access program mode. Refer to Section 6.3.7.

Any change to the access codes/ password should be recorded in the FIP contract file.

**WARNINGS**

1. When program mode is entered, the Standby relay is de-energised (i.e. signals Standby) and alarm processing stops.
2. On an RDU that is Brigade connected , the Brigade connection should be isolated before entering program mode.

### 6.3.3

### 6.3.4 DE-ACCESSING THE DATABASE

It is important to make an orderly exit from program mode by pressing the CLEAR/ESC key repeatedly and following the prompts which appear. If power is lost or the panel restarts before program mode is exited, any changes made will be lost. The zone configuration menus (section 7.2) and zone to LED mapping menus (section 7.7) allow saving the database to flash memory without exiting program mode.

When exiting program mode, a choice is given asking whether the database should be saved or not. If the database has been changed, the following appears on the display.

Database has been changed. 1:Save 2:Discard changes and exit without saving.

Option 1 saves any database changes to flash memory and calculates a new checksum for the database. Option 2 reloads the database from flash memory and discards any changes that were made while in program mode.

If the database has not been changed while in program mode, the following appears on the display when program mode is exited.

Database has not been changed. CRC is ok. 1:Exit/no save 2:Save to flash anyway

Option 1 exits without re-writing the database to flash memory. Option 2 re-saves the database to flash memory, even though it hasn't been changed. The "last saved time/date" stored in the database is not updated when this is done so the CRC of the database should be unchanged from what it was on entry to program mode, however, the database in flash memory is completely re-written.

**NOTES**

1. The database write protect link must be fitted to the Write Protect position after exiting program mode.
2. If any zones were isolated before programming commenced, they should be checked for off normal conditions before being de-isolated.

### 6.3.5 SAVING THE DATABASE TO DISK

After making changes to the database, the database should always be saved to disk. The database can be output in both readable text format and in an encoded “binary” format (Motorola S2/S8). Both of these formats (text and binary), should be saved to disk as separate files. The file containing the database in binary format can be used to reload the database at a later time – e.g., if the controller board is replaced.

The procedure is the same for both a binary format save and a text format save, except that a different menu option is selected. For the binary format, at the completion of the save the operator is prompted to perform a verify operation to check that the database was saved correctly.

To initiate a database save (text or binary format), the procedure is as follows. Refer to section 6.3.9 for information on connecting the RDU to a computer.

1. Prepare the computer to capture the output of the RDU. This usually involves using an “upload/download” command or “capture” command in the terminal emulator and entering an appropriate filename. In PanelX, the "Capture to file" option in the File menu is used. For the binary form of the database, the file extension used is normally .S28. For the text form, the extension is normally .TXT.

2. Initiate the operation on the RDU using the PRINT key from the base display

   Print 1:history 2:system status 3:database 4:op logic 5:save database

   Select either option 3: “database” (text format) or option 5: “save database” (binary format). Enter a password when prompted and press the ENTER key on the RDU when the computer is ready to receive the data.

3. While the database save is in progress, the controller display will show - "Print in Progress. Press RESET to Cancel" (This message does not appear when PanelX/ Tandem LCD mode is being used). The RESET key on the keypad can be used to abort the operation. When the save is complete, the controller display will show “Do you wish to verify the saved database” (if a binary format save was done). At this point, the capture operation on the computer should be terminated so that the capture file is closed.

4. To perform the verify operation, select the “yes verify” option on the controller, then press the ACK key when prompted. The database file that has just been saved, should be transmitted back to the RDU using an upload/download command or send command in the terminal emulator. In PanelX, this is the "Send file" command in the File menu.

**NOTE :** The RDU uses XON (Ctrl Q)/XOFF (Ctrl S) handshaking during a database save or load. Very occasionally this can result in a lockup situation if an XON character is lost. If this happens, try typing Ctrl Q (XON) on the PC to send an XON character to the controller.

### 6.3.6 RESTORING THE DATABASE FROM A COMPUTER

A binary format database file that has been saved to disk may be loaded into the RDU as follows.

1. Connect the computer to the controller as described in section 6.3.9.

2. Enter program mode as described in section 6.3.2, then from the main program mode menu press the right arrow key and select option 3:Database load. The message "Press ACK, then start sending the new database" should appear.

3. Press the "ACK" key on the controller keypad, then initiate the transmission of the database file from the computer. With a terminal emulator, this usually involves using an upload/download command or send command in the terminal emulator. The controller display will show an incrementing count as the database is received, plus the message "Loading. Press RESET to abort". When the database has been completely received, the controller will verify its checksum and display the success or failure of the operation. If the load is successful, the database is written to flash memory automatically. When program mode is subsequently exited, if no further changes have been made, the display should indicate that the database has not been changed. In this case, it isn't necessary to save the database when exiting program mode because it was saved automatically after the database load.

The controller must receive a complete database with the correct number of records or it will display an error message.

The controller will transmit XON, XOFF characters for handshaking if it needs to slow down the rate of data being sent to it. If XON/XOFF handshaking is not available on the computer, or if errors occur, then a slower rate (e.g., 2400) should be used. The baud rate used by the controller is programmable (see section 6.4.4.7) but if the database that has been loaded contains a baud rate setting different to the prior database, the actual baud rate used by the controller hardware will not be changed until the CLEAR key is pressed to initiate an exit from program mode.

**Database Conversion**
If the loaded database was created with a version of software earlier to V5.00, then an error will occur and the database cannot be used. An older database must first be converted to V5.xx using a PC utility and then loaded into the RDU.

### 6.3.7 VERIFYING A SAVED DATABASE

A binary format database file that has been saved to disk can be verified at any time without entering program mode as follows.

1. Connect the computer to the controller as described in section 6.3.9.

2. Press the SET key from the base display, then press the right arrow key to select the second menu 1:Verify database 2:PSU fault inhibit
   Select option 1 verify database. Enter an access code when prompted. The following message should appear. Press ACK, then send the database to be verified.

3. Press the "ACK" key on the controller keypad, then initiate the transmission of the database file from the computer. With a terminal emulator, this usually involves using an upload/download command or send command in the terminal emulator. The controller display will show an incrementing count as the database is received, and the following message will appear. Verifying. Press RESET to abort

The success or failure of the verify will be indicated on the controller display. The RESET key can be pressed to terminate the verify operation at any time.

### 6.3.8 TEMPORARY PASSWORD ACCESS

If the password for accessing program mode has been lost, the Temporary Password Access (TAP) mechanism can be used. When an invalid password is entered, either on the LCD or programming terminal, the RDU generates an error code (Recovery Code). The Recovery Code can be forwarded to a Tyco staff member authorised to provide a TAP. The temporary password can be used to access program mode on the panel. The Recovery Code and TAP are valid until either the panel is restarted or the TAP is used to access the panel. The mechanism for generating the Recovery Code and using the TAP is slightly different depending on whether the RDU LCD/keypad is being used or the programming terminal is being used as described below. A TAP consists of 16 hex digits.

TAP Operation Using the RDU LCD/Keypad
When an invalid access code is entered on the LCD, the RDU displays the following message on the LCD.
Invalid code. Press any key

If the SET key is now pressed, the RDU will display the Code. For example
Error Code: 03DF6B17

Send the Error Code to be converted to a TAP. After a TAP has been generated from the Error Code, the TAP can be entered on the LCD as follows.

1. From the base display, press the SET key and select option 4 Program database. The message "Enter access code" should appear.

2. Press the SET key once.
3. Enter the 16 hex digits using the RDU keypad. The numeric keypad is used to enter digits in the range 0 to 9. To enter hex digits 'A' to 'F' the row of six keys below the numeric keypad are used where the leftmost key (TEST) corresponds to 'A' and the rightmost key (AIF MODE or BELLS ISOL) corresponds to 'F'. Hence "ALARM TEST" is 'B', "FAULT TEST" is 'C', "BATTTEST" is 'D' and "ANCIL ISOL" is 'E'.

TAP Operation Using the RDU Programming Terminal
A "terminal emulator" running on a PC is needed. Refer to section 6.3.9 for information on connecting the RDU to a computer.

To generate a Recovery Code, press the ENTER key on the programming terminal. A prompt "ENTER PASSWORD>" will appear. Enter an invalid password and press the ENTER key. An error code (Recovery Code) will be output, for example :
Error Code: 03DF6B17

After a TAP has been generated from the Recovery Code, the TAP can be entered using the LCD/keypad as described above.

### 6.3.9 CONNECTING THE RDU TO A COMPUTER

A "terminal emulator" running on a PC is needed. The PC must be connected to the printer/programmer port (J1 or J27) on the controller using a suitable serial cable (e.g., standard loom LM0041 (DB9) for connection to J1 (3 wire) or LM0076 for connection to the DB9 J27 connector) and the PC baud rate must be set to match the baud rate programmed for the controller (default 9600 baud). The controller serial port uses 8 data bits, no parity, 1 stop bit, XON/XOFF flow control.

# 6.4 PROGRAM BASE MENU, TEXT & GLOBAL PARAMETERS

### 6.4.1 GENERAL

The following menu appears when program mode is entered.
1:Access code 2:Text 3:Global data 4:System config >

Option 1 Access codes are discussed in section 6.4.2. Option 2 Text programming is described in section 6.4.3. Option 3 Global data is described in section 6.4.4. Option 4:System config is described in section 7.1. Pressing the right arrow key from the above display shows a second menu as follows.
1:Operating mode 2:Legacy bells 3:Database load 4:Database verify <>

Database load and database verify have been described in a previous section. Operating mode and legacy bells options are described in the following sections 6.4.1.1 through 6.4.1.6.

Option 1 Operating mode produces the following menu.
1:FF mode 2:Mimic 3:Address 4:Protocol 5:Keypad

These options are described below.

#### 6.4.1.1 FF Mode

The FF mode can be set to either AS4428.1 or AS1603.4. AS4428.1 is the default and is used with all new systems. AS1603.4 is used with some older systems. The two main differences between AS4428.1 mode and AS1603.4 mode are as follows.

1. AS4428.1 systems have a Warning System and External Bell; AS1603.4 systems have Bells.

2. Reset and isolate commands in the FF alarm list behave differently. In AS4428.1 mode, reset and isolate commands reset/isolate only the alarm/zone being displayed on the LCD. In AS1603.4 mode, a reset command resets all acknowledged alarms/zones and an isolate command isolates all acknowledged alarms/zones.

In general, the RDU FF Mode parameter should be set the same as the RDU keypad type. If the FF Mode and keypad type are not the same, then the Legacy Bells parameter can be used to map Bells isolate, as described in Section 6.4.1.6.

**NOTE 1.**
If the RDU FF mode and keypad type are AS1603.4 but the FIP type is AS4428.1, the AS4428 FIP also has a programmable "legacy bells" setting which determines the mapping of Bells/Bells isolate to one of: Warning System/ External Bell/ Neither.

**NOTE 2.**
When the FF mode is changed, some other parameters are changed automatically, to match the FF mode. For example, when AS4428.1 mode is selected, the "FF show isolated alarms" parameter is enabled and the global ack, reset and isolate parameters are set false (refer section 6.4.4.1). The text names for the ancillary relays corresponding to the Warning System and External Bell are also changed appropriately. When AS1603.4 mode is selected, the reverse changes happen - "FF show isolated alarms" is set false, the global ack, reset and isolate parameters are set true and the ancillary relay text names are changed.

#### 6.4.1.2 Mimic

When mimic mode is enabled, the RDU never transmits on the RZDU bus and the RZDU address assigned to it is "don't care". This might be useful if there are more than eight devices connected to the RZDU bus. When mimic mode is enabled, the RDU cannot send zone commands to the FIP, nor does it send fault indications to the FIP and the FIP does not monitor the RDU. If an RDU with mimic mode enabled is powered off or communication with the FIP is not working, there is no fault indication at the FIP. If the RDU loses communication with the FIP, the RDU still indicates a system fault and turns its buzzer on (if programmed to).

When mimic mode is disabled, the RDU must be assigned a unique address which it uses to send commands and status to the FIP. The FIP monitors responses from each programmed RDU and if an RDU stops responding, a fault is signalled.

#### 6.4.1.3 Address

The RDU address can be set to a value from 1 to 8. The address must match the values assigned at the FIP for the devices that are present on the RZDU bus. Each device on the RZDU bus must be assigned a unique address, other than devices which don't reply, such as an RDU in mimic mode. With some older FIPs, RZDU addresses must start at address one and be assigned consecutively with no gaps.

#### 6.4.1.4 Protocol

The RDU can be programmed with the protocol type to be used in communicating with the FIP. There are three protocol types which can be selected - non-LCD, LCD-A, LCD-B. The default is LCD-A, and the RDU can also operate with the "old style" LED only protocol (non-LCD). With Non-LCD protocol the RDU has less capability than with LCD-A or LCD-B - it does not receive "FFCIF alarm list" LCD type events from the FIP, and zone reset, isolate and test commands cannot be done at the RDU. LCD-B protocol is a slight improvement from LCD-A protocol and allows some more specific fault information to be sent to the FIP, and for New Zealand operation it allows the state of the Building Services Restore input to be sent to the FIP. It is currently not supported by any panels.

Not all types and versions of FIP and RDU currently in use allow all three types of protocol. The selection of which protocol type to use depends on what choice of protocol is available at the FIP and ALL of the RDUs connected to it since they must all use the same protocol type, unless the FIP has the capability of programming the protocol type specifically per each RDU connected. For some FIPs, the choice of protocol type is given as Non-LCD or LCD (e.g., F4000 and F3200) - for these FIPs, "LCD" is the same as LCD-A protocol at the RDU.

F4000 V2.00 onwards allow LCD or Non-LCD protocol. F4000 versions before V2.00 allow only non-LCD protocol. F3200 V2.00 onwards allow non-LCD, LCD-A or LCD-B. F3200 versions before V2.00 allow non-LCD or LCD (LCD-A).

When the protocol type is Non-LCD, the RDU will still generate LCD FFCIF alarm list type events when a zone goes into alarm, t the event description on the LCD will not have quite the same information as the event at the FIP.

**WARNING**

If the RDU protocol is set different to the FIP protocol, this can be detected since an incorrect RDU reply format will cause the FIP to generate scan fail for the RDU. A problem arises when the RDU is programmed as mimic only. In this case the FIP is not expecting a reply from the RDU so will not generate scan fail even though the RDU protocol is incorrect. Similarly the RDU rejects all messages received from the master FIP because it cannot interpret them, but does not show FIP Comms Failure as the messages are valid (just the wrong protocol).

In this situation the RDU will not show the true zone status present at the FIP. Every zone at the RDU will show normal regardless of the FIP zone status.

#### 6.4.1.5 Keypad Type

The keypad parameter allows the keypad type to be selected as AS4428.1 or AS1603.4 to match the physical keypad. On initialisation, the keypad type will be set as 4428.1. The 4428.1 keypad has Warning System Isolate, External Bell Isolate and AIF mode keys that the 1603.4 keypad does not. The 1603.4 keypad has Bells Isol and Brigade Test keys that the 4428.1 keypad does not.

#### 6.4.1.6 Legacy Bells

The Legacy Bells option can be set to one of:

1:Warning System 2:External Bell 3:None

The Legacy Bells parameter is provided to allow AS4428.1 operation to be mixed with AS1603.4 operation, when this is necessary. AS4428.1 systems have a Warning System and an External Bell. AS1603.4 systems have only Bells. The Legacy Bells setting determines whether Warning System isolate, External Bell isolate or neither, map to Bells isolate. If set to "none", then neither the Warning System nor the External Bell map to Bells isolate.

The RDU has an FF Mode parameter (refer section 6.4.1.1) that can be set to either AS4428.1 mode or AS1603.4 mode. The RDU also has a "keypad type" parameter (refer section 6.4.1.5) that is set according to whether the RDU keypad type is AS4428.1 or AS1603.4. If the RDU FF Mode doesn't match the RDU keypad type or doesn't match the type of FIP, the Legacy Bells parameter can be used to map Bells isolate. In general, the RDU FF Mode should be set the same as the RDU keypad type but any combination is allowed as listed below. For the purposes of the Legacy Bells setting at the RDU, an MX1 FIP behaves like an AS1603.4 FIP and effectively sends and receives "Bells isolate" states to the RDU. MX1 maps "Bells isolate" to its "Alarm Devices" disable state.

1. **RDU FF Mode is AS4428.1, RDU keypad is AS4428.1**
   If the FIP type is also AS4428.1, the Legacy Bells parameter should be set to "none". If the FIP type is AS1603.4 or is an MX1 panel, the Legacy Bells parameter can be used to map FIP Bells isolate ("Alarm Devices disable" on MX1) to either Warning System isolate or External Bell isolate at the RDU.

   For example, if Legacy Bells is set to "Warning System" then the Warning System isolate LED at the RDU indicates the state of FIP Bells Isolate, and the Warning System isolate key at the RDU can be used to isolate and de-isolate the FIP Bells. Whether the RDU is allowed to send isolate/de-isolate commands to the FIP is determined by the "pass-on/follow" parameters associated with the Warning System (if Legacy Bells is set to Warning System) - refer to section 6.4.4.3.1.

2. **RDU FF Mode is AS1603.4, RDU keypad is AS1603.4**
   The Legacy Bells parameter should be set to "none" for this configuration. If the FIP type is actually AS4428.1, then the FIP will provide a Legacy Bells setting that allows it to map Bells isolate from the RDU.

3. **RDU FF Mode is AS4428.1, RDU keypad is AS1603.4**
   The Legacy Bells setting at the RDU determines whether the RDU Bells isolate key and LED map to the Warning System, the External Bell or neither. If the FIP type is AS4428.1 then the Legacy Bells setting at the FIP should be set the same as at the RDU.

4. **RDU FF Mode is AS1603.4, RDU keypad is AS4428.1**
   This combination could be used when the FIP type is AS1603.4 (**or is an MX1 FIP**). The Legacy Bells setting determines which of the RDU Warning System isolate key/LED or External Bell isolate key/LED maps to Bells isolate (or "Alarm Devices" on MX1).

### 6.4.2 ACCESS CODES

Ten 6 digit access codes are available (numbered 0-9), and each one has provision for the users' initials (3 characters). The initials of the last user to change the database are stored in the database. When program mode is entered, an event is logged indicating the number and initials of the user who accessed the database.

The default access code (set by database re-initialise) for user 0 is 000000. There is no default code for users 1-9. User 0 can change any access codes (users 0-9), but users 1-9 can change only their own access code.

To enter or edit an access code, enter the user number (0-9) from the keypad. This gives the following options.

1:Access Code 2:Initials 3:Delete
To enter a new access code for the selected user, select Option 1. Enter the new six digits, and then re-enter them to confirm.

To change the user initials, select Option 2. The LCD will display the alphabet on the bottom line. Move the ▉ cursor through the alphabet using the ◄ ► cursor keys. Press "ENTER" when the desired letter is selected. Press "ACK" to save the entered initials. The DELETE key can be used to delete a character. The SET/EDIT key can be used to swap the cursor between the top and bottom lines of the display.

To delete an access code, select option 3 and press ACK when prompted.

Access code 000000 should not be used for any user as it will be known by all people familiar with F3200/RDU.

### 6.4.3 TEXT ENTRY

From the main programming menu, the "Text" option allows entry of the following:

1. a 40 character name for the site
2. a 30 character name for each zone
3. a 30 character name for each ancillary relay
4. a 40 character fault action text.
5. a 12 character Tandem LCD password.

Text can be programmed with the keypad or with a PC connected to the Printer/Programmer port as described in the following sections.

#### 6.4.3.1 PROGRAMMING TEXT WITH THE KEYPAD

Select the type of text to program (Site, Zone, Relay etc) then press "EDIT", "ENTER" or "►" to modify the text for that item.

The top line of the display shows the text which has been entered and the bottom line shows the characters which may be entered. The bottom line shows one of three characters sets.

There are two cursors shown on the display, one on the top line to indicate where text characters will be entered, and one on the bottom line to indicate which character is selected. The active cursor is a large block character ▉ and the inactive cursor is a small block character ■. The active cursor ▉ may be moved using the ◄ ► arrow keys to select a character to be entered, or position in the text being changed. The SET/EDIT key is used to swap the active cursor between the top and bottom lines.

Holding the ◄ ► keys down causes rapid movement of the active cursor.
The three character sets which can be shown on the bottom line of the display are

1:upper case letters, 2:lower case letters, 3:numbers and symbols.

These character sets can be cycled through using the ▲ and ▼arrow keys. Numbers can also be entered directly using the numeric keypad. The "NOT" key inserts a blank space.

| | |
|---|---|
| **"EDIT"** | swaps the cursors between the top and bottom line |
| **"INSERT"** | toggles entry between "insert" and "type-over" modes. |
| **"DELETE"** | acts as backspace for a character just entered, or deletes any character in the text selected by the cursor (active or inactive). |
| **"ACK"** | saves the text and returns the cursor to the item number. |
| **"NEXT" & "PREV"** | step through items (e.g. zones). |
| **"RECALL"** | allows copying of the text from any zone or relay to any other zone or relay. (Select zone/relay to be copied into. Press "RECALL" and select zone/relay and number of zone/relay to be copied from. "ENTER" transfers the text. This can then be edited). |

**Example of Entry of Site Name**

To entire a site name of "Penrose No 1 Store" proceed as follows.

From the Text Entry menu select option 1, Site.

The LCD has the inactive cursor in the first text position of the top line and the active cursor on A in the bottom line.

Move the cursor right with the ► key until the letter P is selected.
Press "ENTER". The letter P should appear in the top line.

Scroll the bottom line with the ▼key to the lower case alphabet.

Move the cursor with the ► key until the letter e is selected.

Press "ENTER".

Repeat for the other letters in Penrose.
To put a space after "Penrose" press the "NOT" key.

To enter the number 1 in "No 1" press the "1" key.

Mistakes can be corrected by use of the "EDIT", "DELETE", and "INSERT" keys.

When the correct name has been entered, press "ACK".

**Fault Action Text**

When a fault occurs at the RDU, the buzzer is turned on steady and if the LCD is currently showing the base display, then the text "A fault is present in the system" is shown on the top line of the LCD and a 40 character user programmed text message is shown on the bottom line of the LCD. The fault action text is cleared from the LCD when any key is pressed or when the buzzer is turned off.

The 40 character user programmed text message could be used to show the name and phone number of the local service company. When a database reinitialise is done, default fault action text of "Contact your service company" is assigned.

### 6.4.3.2 PROGRAMMING ZONE NAMES

Zone names in the RDU can be programmed using the keypad as described in the previous section, or they can be loaded from a PC as described in section 6.4.3.3.

Zone names can also be down-loaded from the FIP via the RZDU comms link, if the FIP supports this. Zone names can be sent from the FIP in two ways.

1. With an FF alarm event.
2. With a manually initiated command at the FIP. For an F3200 FIP, this command is accessed by pressing the SET key at the base display, then the right arrow key, then selecting the "RZDU zone name transmit" option. For an F4000/MX4428 FIP, the download of zone text names is initiated using the "RT" command on the programming terminal diagnostics menu (the "DG" menu).

For case 1 (FF alarm events), there is a programmable parameter in the RDU (refer section 6.4.4.2) that must be enabled to get the RDU to capture zone names from FF alarms. The database must also be write enabled (LK7).

For case 2, when the command is initiated at the FIP, the FIP will begin sending all of its zone names (up to 528) to the RDU. This can take several minutes. The RDU must have its database write enabled (Link LK7) or it won't attempt to save the zone names into its database.

For both case 1 and case 2, the RDU does not have to be in program mode. For case 1 (FF alarms) the RDU must NOT be in program mode.

The RDU stores zone names in RAM as they are received and writes them all to flash memory approximately 30 seconds after the last zone name is received. The purpose of the 30 second delay is to minimise the number of flash write operations, because, during the time the RDU is updating the flash memory, it does not respond on the RZDU bus.

**NOTE : When the RDU writes the zone names to flash memory, it stops responding on the RZDU bus for a few seconds, during which time it may miss messages sent by the FIP.**

If the zone name received from the FIP is the same as the name already in the RDU database then the RDU won't initiate a flash write operation. The RDU database write protect link LK7 should be set to the write protect position once the RDU has been updated

with all the zone names.

The RDU logs an event when it has zone names waiting to be written to flash memory and logs a second event after it finishes writing the zone names to flash.

#### 6.4.3.3 TEXT PROGRAMMING WITH A PC

Text names for zones, relays, etc, may be entered from a programming terminal/PC using the printer port. To program text from a PC, enter program mode using the keypad and LCD in the usual way and select programming of text.

When the LCD is showing the following text entry menu:

Text 1:Site 2:Zone 3:Relay 4:Anc relay 5:Alarm text 6:Fault text 7:Tandem pwd

the programming terminal/PC connected to the printer/programmer serial port can be used to enter text. The LCD must remain showing the above menu. Pressing any key on the RDU front panel keypad will terminate the entry of text from the PC.

To initiate the entry of text, the ENTER key must first be pressed on the programming terminal/PC. A prompt will then appear as follows.

Enter Znn, An, S, F, P, Q :

The type of text being entered must first be selected by entering one of the options listed, followed by the ENTER key. Either upper case or lower case z, a, s, f, p or q may be used. A text name can then be entered followed by the ENTER key.
If PanelX/ Tandem LCD mode is being used (via the local printer/programming port), the SET/EDIT key can be used (with the text entry menu showing on the display) to enable text entry mode on the programming terminal. To terminate text entry mode and return to Tandem LCD mode, type Q ENTER.

1. To enter a zone text name, type: Znnn ENTER where nnn is the zone number (1-528).
2. To enter an ancillary relay name type: An ENTER where n = 1, 2 or 3.
3. To enter the site name type: S ENTER
4. To enter Fault action text type: F ENTER
5. To enter the Tandem LCD password type: P ENTER

If a valid selection is entered, the message: "Enter Text :" will appear. The desired text can be entered, followed by ENTER. To exit from text entry mode type: Q ENTER or press the CLEAR key on the keypad.

The DELETE or BACKSPACE keys may be used to delete the last character typed, and the ESCAPE key may be used to abort the text entry for the selected item. After the ENTER key is pressed the message "Saved OK" will appear if the text has been saved correctly into memory.

To load a file of text names from the PC into the RDU, the file should be set up as shown in the following example. The names may actually be in any order, and it is not necessary to have a name for every zone or relay, etc.

Ensure that the last name in the file is followed by a carriage return before the end of the file, i.e., put a blank line at the end of the file. The characters S, Z, etc, must always be in column 1 and the text names must also start in column 1 of the following line (unless leading spaces are required, but this is unlikely).

S
40 character site name
(blank lines are allowed)
Z1
Example text name for zone 1
Z2
Name for zone 2

Z3
This name has leading spaces
Z4
This name does not have leading spaces
.
.
.
Z23
This name will be cut at 30 characters as it is too long
Z24
Name for zone 24
A1
Name for ancillary 1 relay
A2
Name for ancillary 2 relay
A3
Name for ancillary 3 relay
F
Phone TYCO FIRE SYSTEMS 7903600 (40 characters max)
<blank line>

To initiate the loading of the file into the RDU, enable remote text entry as described above. Run a terminal emulation program on the PC and press ENTER on the PC.

When the message:

Enter Znnn, An, S, F, P, Q :

appears, send the file containing the text names to the RDU using the "send file" command of the terminal emulator. If possible set the terminal emulator to use XON/XOFF flow control or else set the line transmit delay to 100 milliseconds. After loading the text names, exit program mode and do a database print to check that all names have been assigned correctly.

### 6.4.4 GLOBAL DATA

Option 3: Global data from the main program mode menu provides access to a series of menus that allow a number of different options to be set. The following set of menus shows the options that are found in these menus. The right arrow key is used to step to the next menu. The left arrow key or clear key are used to go back to a previous menu. Sections 6.4.4.1 to 6.4.4.13 describe all of the parameters that appear in the following menus.

1:FF options 2:Capture FIP options 3:Pass-on/Follow FIP options 4:MCP >

Option 1 "FF options" is described in section 6.4.4.1.
Option 2 Capture FIP options is described in section 6.4.4.2.
Option 3 Pass-on/Follow FIP options is described in section 6.4.4.3.
Option 4 MCP is described in section 6.4.4.4.

Pressing the right arrow key from the above menu produces the following menu:

1:Brigade test 2:All Zones isolated 3:Printer setup 4:Common LEDs >

Option 1 Brigade Test is decribed in Section 6.4.4.5.
Option 2 All zones isolated is described in Section 6.4.4.6.
Option 3 Printer Setup is described in Section 6.4.4.7.
Option 4 Common LEDs is described in Section 6.4.4.8.

Pressing right arrow again shows:

1:Daylight saving start 2:Daylight saving end 3:Mains/battery <>

Options 1 and 2 Daylight Start and End are described in Section 6.4.4.9.
Option 3 Mains/Battery is described in Section 6.4.4.10.

Pressing right arrow again shows:

1:Keys enable 2:Buzzer options 3:New Zealand options

Option 1 Keys enable is described in Section 6.4.4.11.
Option 2 Buzzer options is described in Section 6.4.4.12.
Option 3 New Zealand Mode options are described in Section 6.4.4.13.

### 6.4.4.1 FF Options

From the "global data" menu, option 1:FF options produces the following six "pages" of menus.

FF Pg 1 1:FF alarm source 2:FF Auto ack
FF Pg 2 1:FF type 2:Global commands
FF Pg 3 1:Show FIP zone names in FF 2:FF display cause by default
FF Pg 4 1:New cause new alarm 2:Multiple cause updates
FF Pg 5 1:Switch to newest alarm 2:Show zone number on FF display
FF Pg 6 1:Show isol alarms in FF 2:Show point text in FF for zone

1. **FF alarm source**
   This can be set to one of three values 1:LCD messages 2:LED messages 3:Both LCD & LED messages. This option is normally set to "LCD messages". For connection to a FIP which doesn't send LCD messages, this option can be set to "LED messages".

   There are two types of messages that can be sent on the RZDU bus by a fire panel - "LED messages" and "LCD messages". LED messages contain zone status (alarm, fault, isolate) for up to 528 zones. LCD messages contain "new FF alarm" information and are sent by the FIP when a zone goes into alarm. LCD messages contain zone text and point text associated with the zone/point that caused the alarm. If "LCD messages" are enabled as an FF alarm source, then when an LCD FF alarm message is received from the FIP, an entry is added to the FF alarm list. If "LED messages" are enabled as an FF alarm source, then when the zone status in an LED message received from the FIP indicates a new alarm on a zone, an entry is added to the FF alarm list for the zone. For an FF alarm generated from an "LED message", the zone text shown is taken from the zone names programmed in the RDU.

2. **FF Auto Ack**
   If enabled, alarms entered into the local FF alarm list are acknowledged automatically.

3. **FF type**
   This parameter selects either type 2 or type 3 FF operation. AS4428.1 requires type 3 FF operation. Type 2 operation might be used with legacy AS1603.4 systems.

**4. Global commands.**

When the Global commands option from FF page 2 is selected, the following menu appears. 1:Global reset 2:Global isol 3:Global ack 4:Type3 Global Ack

There are four parameters that can be enabled and disabled - global reset, global isol, global ack and "type 3 global ack". These options determine whether the RDU can send a "global command" (ack, reset or isolate) to the FIP. When the FIP receives the global command, it applies it to all zones that are in alarm and are associated with the RDU. (F4000/ MX4428 have the ability to associate specific zones with a particular RZDU device).

The term "global command" is used because the command is actioned by the FIP (rather than the RDU) and affects the entire system. "Global commands" are really a legacy facility because they are applied to "all zones in alarm" whereas AS4428.1 requires that zones be individually acknowledged, reset or isolate.

Global Reset, Global Isolate.
When the reset or isolate keys are pressed and the respective global option is enabled, the RDU will send a global command to the FIP if either "type 2" FF operation is selected at the RDU or the protocol type is non-LCD. The non-LCD protocol doesn't allow individual zone reset or zone isolate commands to be sent to a FIP.

Global Ack
When the ACK key is pressed at the RDU, a global ACK command is sent to the FIP if the global ack parameter is enabled and type 2 FF operation is selected.

Type 3 Global Ack
If the "type 3 global ack" parameter is enabled and type 3 FF operation is selected, then when the ack key is pressed at the RDU and there is at least one unacknowledged alarm, a "global ack" command is sent to the FIP. This parameter is normally disabled because with AS4428.1, zones must be acknowledged, reset and isolated individually, not as a group.

**5. FF Show FIP Zone Names**

If enabled, the RDU will show the zone name sent by the FIP with an alarm event instead of showing the zone name assigned in the RDU's database.

**6. FF Display Cause by Default**

By default, the first line of the FF Alarm display shows:
Alarm Time, Alarm Type, Acknowledge State, Number of Alarms

When the "AND" key is pressed, the first line changes to:
Cause, Number of Alarms

If the "Display Cause by Default" option is enabled, the first line is shown as:
Cause Preview, Alarm Type, Acknowledge State, Number of Alarms

and when the "AND" key is pressed, the first line changes to:
Full Cause, Alarm Time, Number of Alarms

The Cause Preview consists of the first section of the Full Cause.

**7. New cause new alarm**

When a zone goes into alarm, the alarm is initially displayed without any point information. When the specific point or points that caused the alarm become known, the alarm entry is updated with the point information (if programmed to be), and if "new cause new alarm" is enabled, the alarm entry will be made unacknowledged (even if it was previously acknowledged) and the alarm buzzer will resound (if programmed to for that zone).

**8. Multiple cause updates**
If a zone is configured with MultiAlm disabled (see FF Zone configuration, Section 7.2) then the alarm list will never have more than one entry for that zone, even if there are multiple points in alarm on that zone. If Multiple Cause Updates is enabled, then the alarm list entry for a zone configured with MultiAlm disabled, will be updated as each point in alarm becomes known, i.e., the alarm entry will show the latest point that has gone into alarm on that zone. If Multiple Cause Updates is disabled, then the alarm entry shows only the first point that goes into alarm on the zone. For zones with MultiAlm enabled, this parameter has no effect, since each point has its own entry in the alarm list.

**9. Switch to newest alarm**
If this parameter is enabled, then, whenever a new alarm is added to the FF alarm list, the display will automatically switch from wherever it currently is, to show the new alarm entry.

**10. Show zone number on FF display**
If this parameter is enabled, then the zone number will appear on the bottom line of the FF alarm list display of a zone alarm, followed by the name of the zone or point. When the RESET command is used, the zone number briefly appears on the top left of the display, regardless of this parameter.

**11. Show isol alarms in FF**
This parameter selects whether the display shows isolated alarms. If enabled, isolated alarms are displayed as part of the alarm list if there are no unacknowledged alarms. This is a requirement of AS4428.1.

**12. Show point text in FF for zone**
For a zone configured with MultiAlm disabled (see FF Zone configuration, Section 7.2), this parameter selects whether the alarm entry for the zone shows the point name(s), (when available), or just the zone name. If this parameter is enabled, point names are shown. For a zone with MultiAlm enabled, this parameter has no effect.

### 6.4.4.2 Capture FIP options

From the global data menu, capture FIP options produces the following menu

1:Capture FIP zone names from alarms 2:Capture FIP time/date

**1. Capture FIP zone names from alarms**
If this option is enabled, and the database is physically write enabled (with link LK7), when an FF zone alarm event is received from the FIP, the zone text that comes with the alarm will be saved into the RDU database. This means the RDU doesn't have to be programmed with a full set of up to date zone names. In some situations, the RDU might need its own zone names separately from the FIP.

**NOTE :** When the RDU writes the zone names to flash memory, it stops responding on the RZDU bus for a few seconds, during which time it may miss messages sent by the FIP. Refer to section 6.4.3.2.

If the zone name received from the FIP is the same as the name already in the RDU database then the RDU won't initiate a flash write operation. If the "capture FIP zone names from alarms" parameter is left permanently enabled, then either the database at the RDU should be left write protected (LK7) or the RDU zone names database should be updated after any zone name change at the FIP. This is so that the RDU doesn't go "offline" at "unscheduled times" while it writes zone names to flash memory.

**2. Capture FIP time/date**
If this option is enabled, then when a time/date update message is received from the FIP, the RDU will update its own time and date.

#### 6.4.4.3 Pass-On/Follow FIP Options

From the global data menu, the "Pass-on/follow FIP" option produces the following sequence of menus.

1:Ancil 1 Isol >

1:WarnSys Isolate 2:WarnSys Operate >

1:ExtBell Isolate 2:ExtBell Operate >

If AS1603.4 mode of operation has been selected, then instead of the Warning System and External Bell options above, the following menu appears

1:Bells Isol 2:Bells operate
If New Zealand mode of operation has been enabled then an additional menu appears as follows

1:Services Restore 2:Trial Evac

The pass-on/follow menus allow a set of "Pass-on FIP/ Follow FIP/ Local control" parameters to be programmed for each of the following. If the "pass-on" option is enabled, then the RDU can send a command (e.g., isolate or de-isolate) to the FIP. If the "follow" option is enabled then the RDU follows the state received from the FIP. If the "local control" option is enabled then the command can be applied locally for that item. If "pass-on" is enabled, then the corresponding "follow" option is enabled automatically and "local control" is disabled.

1. Ancillary 1 isolate
2. Warning System isolate
3. Warning System operate
4. External Bell isolate
5. External Bell operate
6. Bells isolate
7. Bells operate
8. Trial Evac (New Zealand mode only)
9. Services restore (New Zealand mode only)

The Warning System and External Bell options appear only in AS4428.1 mode and the Bells isolate and Bells operate options appear only in AS1603.4 mode.

For each of the above items, there are three options that can be enabled or disabled as follows. Some options are not applicable to some items.

1. Pass-on FIP
2. Follow FIP
3. Local control

#### 6.4.4.3.1 Pass-on/ Follow/ Local Options for Warning System isolate/ External Bell Isolate (AS4428.1 mode)

For each of Warning System isolate and External Bell isolate there are three parameters which may be enabled/disabled at the RDU - pass-on, follow, and local. The following description applies to both the Warning System and External Bell but they each have an independent set of pass-on/ follow/ local parameters and behaviour.

**Australian mode**

**1. Pass-on.**
If "pass-on" is enabled then the RDU can send isolate/ de-isolate commands to the FIP for the Warning System/ External Bell. "Follow FIP" is enabled automatically so the isolate LED (Warning System or External Bell) at the RDU indicates the FIP state.

**2. Follow and local.**
With pass-on disabled, any combination of "follow" and "local" may be programmed except that a non-MAF RDU may not have local enabled. The RDU receives the isolate status from the FIP and also stores its own local isolate status which it may control if it is programmed with "local" enabled.

**Follow and local both enabled.**
With both follow and local enabled the RDU outputs (e.g. relay) and LED are isolated if either the FIP is isolated or if locally isolated at the RDU. The Warning System isolate/ External Bell isolate keys affect the local isolate status and do not affect the FIP status.

**Follow enabled and local disabled.**
With follow enabled and local disabled the Warning System isolate/ External Bell isolate keys at the RDU do nothing.

**Follow disabled and local enabled.**
With follow disabled and local enabled the RDU ignores the FIP isolate status. The Warning System isolate/ External Bell isolate keys affect the local isolate status and do not affect the FIP status.

**New Zealand mode**

New Zealand operation is the same as Australian operation described above except that there is a Silence Alarms keyswitch involved. The Silence Alarms keyswitch is always associated with the Warning System and not the External Bell. The pass-on/ follow/ local parameters for the Warning System also determine how Silence Alarms is treated. If "pass-on" is true/enabled for Warning System isolate then the state of the Silence Alarms keyswitch at the RDU is sent to the FIP. If "local" is true then the Silence Alarms keyswitch at the RDU can be used to silence the Warning System at the RDU.

#### 6.4.4.3.2 Pass-on/ Follow/ Local Options for Warning System Operate (AS4428.1 Mode)

Only the "follow" parameter is meaningful - the pass-on and local parameter settings are not used for anything. If the "follow" parameter is set true then (for a MAF RDU), the Warning System at the RDU will be activated (if not isolated) when the Warning System at the FIP is activated. This requires an AS4428.1 type of FIP.

#### 6.4.4.3.3 Pass-on/ follow/ local options for External Bell Operate (AS4428.1 mode)

Only the "follow" parameter is meaningful - the pass-on and local parameter settings are not used for anything. If the "follow" parameter is set true then (for a MAF RDU), the External Bell at the RDU will be activated (if not isolated) when the External Bell at the FIP is activated. This requires an AS4428.1 type of FIP.

#### 6.4.4.3.4 Pass-on/ follow/ local options for Bells Isolate (AS1603.4 mode)

For bells isolate operation there are three parameters which may be enabled/disabled at the RDU - pass-on, follow, and local. These determine the bells isolate operation at the RDU. (This is identical to the behaviour of Warning System/ External Bell in AS4428.1 mode).

**Australian Mode Bells Isolate Operation**

1. **Pass-on.**
   If "pass-on" is enabled then the RDU can send bells isolate/ de-isolate commands to the FIP. "Follow FIP" is enabled automatically so the Bells isolate LED at the RDU indicates the FIP Bells isolate state.

   **NOTE:** not all types and versions of FIP are able to process the bells isolate command sent from an RDU. Currently FIPs which support the bells isolate command are:
   F4000 - version 2.14 onwards
   F3200 - version 2.00 onwards

2. **Follow and local.**
   With pass-on disabled, any combination of "follow" and "local" may be programmed except that a non-MAF RDU (FP0559) may not have local enabled. The RDU receives the FIP bells isolate status from the FIP and also stores its own local bells isolate status which it may control if it is programmed with "local" enabled. With follow enabled the RDU copies the FIP bells isolate status, i.e. if the FIP bells are isolated then the RDU bells are isolated.

   **Follow and local both enabled.**
   With both follow and local enabled the RDU bells relay and LED are isolated if either the FIP is isolated or if the bells are locally isolated at the RDU. The Bells Isol key at the RDU may be used to toggle the local bells isolate status.

   **Follow enabled and local disabled.**
   With follow enabled and local disabled the Bells Isol key at the RDU does nothing and can't be used to isolate the Bells.

   **Follow disabled and local enabled.**
   With follow disabled and local enabled the RDU ignores the FIP Bells isolate status. The Bells Isol key may be used to isolate/ de-isolate the bells at the RDU.

**New Zealand Mode Bells Isolate Operation**

New Zealand operation is the same as Australian operation regarding the Bells isolate key and LED, but in addition, the pass-on/ follow/ local parameters determine how the Silence alarms keyswitch at the RDU is treated. If "pass-on" is true then the state of the Silence Alarms keyswitch (if any) at the RDU is sent to the FIP. If "local" is true then the Silence Alarms keyswitch at the RDU can be used to silence the bells at the RDU.

#### 6.4.4.3.5 Pass-on/ follow/ local options for Bells Relay Operate (AS1603.4 mode)

Only the "follow" parameter is meaningful - the pass-on and local parameter settings are not used for anything. If the "follow" parameter is set true then (for a MAF RDU), the Bells relay at the RDU will be activated (if not isolated) when the Bells relay at the FIP is activated. This requires an AS1603.4 type of FIP.

#### 6.4.4.3.6 Pass-on/ follow/ local options for Ancillary Isolate (AS4428.1 & AS1603.4)

**Australian Mode**

The pass-on, follow and local parameters for ancillary isolate determine how isolation of the ancillary 1 relay at the RDU is handled and whether ancillary isolate/ de-isolate commands are sent to the FIP or not.

Pass-on

If "pass-on" is enabled, the RDU will send an ancillary isolate/de-isolate command to the FIP when an ancillary 1 isolate/ de-isolate command is initiated at the RDU. The effect of this command depends on the type of FIP. For an F4000/ MX4428 FIP, ancillary (zone zero) isolate or de-isolate occurs. For an F3200 type FIP the command is ignored by versions V1.10 or earlier. F3200 FIP software version 2.00 or later perform a Plant Isolate/De-isolate. For a non-MAF RDU with an AS1603.4 keypad and pass-on enabled, when the ANCIL ISOL key is pressed, an isolate/ de-isolate command is immediately sent to the FIP without any additional prompt on the display.

Follow

If "follow" is enabled then the ancillary 1 relay at the RDU is isolated if the "received FIP ancillary isolate state" is isolated. For an F4000/MX4428 FIP, the "received FIP ancillary isolate state" is the isolate state of ancillary zone zero. For an F3200 FIP version 1.10 or earlier, it is the state of the ancillary isolate led at the F3200 front panel. For F3200 FIP V2.00 or later it is the "Plant Isolate" status. **NOTE** - during a system test (but not daily auto test) an F4000/ MX4428 FIP sets ancillary zone zero to isolated.

Local

If "local" is enabled then the ancillary 1 relay at the RDU can be isolated or de-isolated locally at the RDU.

**AS1603.4 Ancillary Isolate LED**

An AS4428 RDU does not have an ancillary isolate LED. For an AS1603 RDU, the ancillary isolate LED indicates as follows.

| | | |
|---|---|---|
| On steady | - | if either anc 1 or anc 2 relays are locally isolated. |
| Flash at 1HZ | - | if the ancillary 1 relay is isolated because the FIP is sending an ancillary isolate state or, for NZ operation, if FIP BSR is asserted. |
| Flash at 2HZ | - | For New Zealand operation, if the local BSR input is asserted. |

**Ancillary Isolate Operation for New Zealand Mode**

The operation for New Zealand mode is slightly different to Australian mode because NZ mode may have a building services restore (BSR) key-switch at either the RDU or FIP which can be used to isolate all the ancillary outputs at the RDU if programmed to. New Zealand mode also has ancillary fire and ancillary defect outputs on the Display Extender Board which can also be isolated. For New Zealand mode, in addition to the ancillary isolate pass-on, follow, local parameters, there is a separate set of pass-on, follow, local parameters associated with the BSR keyswitch and all six parameters determine how the ancillary relays and outputs at the RDU and FIP are isolated.

For a non maf RDU, the ancillary fire and defect outputs are isolated if either the RDU BSR (with BSR "local" enabled) is asserted or the FIP BSR is asserted (with BSR "follow" enabled). For a maf RDU, the ancillary fire and defect outputs are isolated if the ancillary 1 relay is isolated or BSR is asserted.

**NOTE** - if AS4428 mode of operation is selected, the ancillary 2 relay is not affected by Services Restore because it is associated with the External Bell. If AS1603 operation is selected, then the ancillary 2 relay is inhibited by BSR.

For New Zealand operation, in addition to the ancillary isolate functions described for Australian operation, the RDU has three parameters associated with BSR - pass-on, follow and local. The ancillary relays at the RDU can be isolated with keypad operations at the FIP or RDU as described for Australian operation, and, in addition, can be isolated by asserting the BSR keyswitch (if any) at either the FIP or RDU depending on how the BSR pass-on, follow, local parameters are programmed at the RDU as described below.

1. **BSR pass-on.**
   With BSR pass-on enabled the RDU transmits the current state of its BSR keyswitch (if any) to the FIP. With pass-on disabled, the RDU BSR state is not sent to the FIP. If BSR follow is enabled, then when the BSR state received from the FIP is asserted, ancillary outputs at the RDU are isolated. **NOTE** Current F4000/MX4428 FIP software does not process the BSR state received from an RDU.

2. **BSR follow.**
   With follow enabled (with or without pass-on enabled), the RDU monitors the BSR state received from the FIP (if any), and if BSR is asserted at the FIP then the ancillary outputs at the RDU are isolated.

3. **BSR local.**
   With local enabled, asserting the BSR keyswitch at the RDU will cause the ancillary outputs at the RDU to be isolated.

If the ancillary 1 or 2 relays at the RDU are isolated due to either FIP BSR or RDU BSR being asserted, then the keypad at the RDU cannot be used to perform ancillary isolate functions for those relays.

#### 6.4.4.3.7 Pass-on/ Follow/ Local Options for Trial Evacuation (NZ Mode)

This applies to New Zealand mode only. Depending on programming, the trial evacuation keyswitch at either an RDU or at the FIP, may be used to energise the bells relay at either the FIP or any connected RDU. There are 3 parameters, pass-on, follow and local, associated with trial evac, which can be programmed at the RDU. Any combination of enable/disable for these 3 parameters may be set. e.g. all disabled or all enabled etc. Activation of the trial evac keyswitch overrides any isolation of the bells relay i.e. the bells relay will be energised even if the bells are isolated or if the silence alarms keyswitch is on.

**Pass-on**

Setting pass-on enabled means that the RDU continually transmits the current state of its trial evac keyswitch (if any) to the FIP. Setting pass-on disabled means that the RDU always transmits a "deactivated" state to the FIP. If the RDU sends an "activated" state to the FIP the FIP may then energise the FIP bells relay and may also transmit a "trial evac asserted" indication to all RDUs which will cause any connected RDU to energise its own bells relay (if programmed to - see "follow" below).

**Local**
Setting local enabled means that when the trial evac keyswitch is operated at the RDU, the bells relay (if any) at the RDU will be energised (regardless of isolation). During scan fail, the trial evac keyswitch will always work locally even if local is disabled.

**Follow**
In future, some versions of FIP may transmit a "trial evac" state to an RDU. Setting follow enabled at the RDU means that when the trial evac state received from the FIP is asserted, the RDU bells relay will be energised, regardless of isolation. There is no current version of FIP software which transmits the trial evac state to an RDU but future releases may do so. During scan fail, the last known FIP trial evac state can be overridden by bells isolate at the RDU.

For a non-maf RDU, setting follow or local true is meaningless because there is no bells relay at the RDU, but setting pass-on true allows the non-maf RDU to send the state of its trial evac input to the FIP.

#### 6.4.4.4 MCP Manual Callpoint

The MCP can be enabled or disabled. If the MCP is enabled, it will be monitored for alarm and fault which will be sent to the FIP when they occur. **NOTE** the MCP cannot be used in New Zealand mode.

#### 6.4.4.5 Brigade Test

If this option is enabled, the RDU keypad can be used to send a Brigade Test command to the FIP.

#### 6.4.4.6 All Zones Isolated

By default, the Standby relay will de-energise if all MAF mapped zones are isolated. This may be disabled if allowed by the local Fire Brigade.

#### 6.4.4.7 Printer setup

The printer setup menu options are:

1:Lines per page; 2:Baud Rate; 3:Print relay controls; >
Option 1:Lines per page, determines how often a new page/page heading is printed and
Option 2:Baud rate, allows the baud rate of the printer serial port to be set.
Option 3 allows the enabling/disabling of the logging of relay control (activate/deactivate) events.

The right arrow key gives a further menu:
1:Event printer enable/disable; 2:Select print evt; 3:Select history evt

Option 1 allows event printing to be enabled or disabled. When event printing is disabled no events at all are printed and the size of the history queue is doubled if history is stored in RAM rather than non-volatile flash memory.

Options 2 and 3 allow the selection of which types of events are to be printed and logged to history. There are six different types which can be individually enabled or disabled, and these are shown as:

1:Zone 2:System 3:Sys run 4:Cct 5:Pnt 6:Relay

Numeric keys 1 to 6 are used to enable or disable each type. A 'Y' character is shown if the type is enabled and 'N' for disabled.

1. Zone events include zone alarm, reset, isolate etc.
2. System events include "system test passed", "system power up" etc. and all events which are not one of the other 5 types.
3. Sys run (system running) applies to events associated with a system test that was initiated by a command received from the FIP.
4. Cct (circuit events) applies to FF alarms received from the FIP, where the FIP includes information on which circuit went into alarm.
5. Pnt (point events) applies to FF alarms received from the FIP, where the FIP includes information on which point went into alarm.
6. Relay events applies to events associated with the MAF relays on a MAF RDU, including isolate/ de-isolate and fault. If relay events are enabled then relay activate and deactivate events may be separately disabled (using the "Print relay controls" option as described in the previous menu).

#### 6.4.4.8 Common LEDs

When this option is selected, the following options appear:
Local status [Y/N] FIP status [Y/N]

These options affect the common alarm, fault and isolate LEDs as follows. If a zone does not map to either the MAF or totals (see zone configuration section 7.2) then it does not map to the common LEDs. "FIP status" should not be enabled if the FIP is an MX1 because an MX1 FIP does not have meaningful information to send.

Common Alarm LED
If there are any unacknowledged alarms in the FF alarm list then the common alarm LED flashes at 2 Hz. Otherwise, if "Local status" is enabled and there is at least one total-mapped or MAF-mapped zone in alarm then the alarm LED is on steady. Otherwise, if "FIP status" is enabled and the FIP alarm LED is on, then the RDU common alarm LED will be on, otherwise, the alarm LED will be off.

Common Fault LED
If the "local status" option is disabled, the common fault LED is always off, otherwise, if there is at least one total-mapped or MAF-mapped zone in fault then the common fault LED will be on, otherwise it will be off. The "FIP status" setting is irrelevant for the common fault LED because the FIP doesn't send any common fault LED status to the RDU.

Common Isolate LED
If the "local status" option is disabled, the common isolate LED is always off, otherwise, if there is at least one total-mapped isolated zone then the common isolate LED will be on, otherwise it will be off. The "FIP status" setting is irrelevant for the common isolate LED because the FIP doesn't send any common isolate LED status to the RDU.

Common System Fault LED
If the "local status" option is enabled and there are one or more local system faults then the common system fault LED will be on, otherwise, if the "FIP status" option is enabled, then the common system fault LED will be on if the FIP common system fault LED is on, otherwise it will be off.

### 6.4.4.9 Daylight Saving Start/End

For the RDU, automatic daylight savings time adjustment is disabled by default because normally the adjustment is done at the FIP and sent to the RDU. If daylight savings adjustment is enabled at the RDU then the "Capture FIP time/date" parameter should be disabled (refer section 6.4.4.2).

Daylight savings options allows the selection of a date, time, and a time difference for the start and end of daylight saving to allow the RDU to automatically set the time forward or back. The programming of the start and end is identical and is described jointly here. At the programmed start date/time the time will be put forward by the programmed start time difference and at the programmed end date/time the time will be put back by the programmed end time difference.

Daylight saving starts and ends on different dates and times, depending on the country and state the RDU is located in.

The following table indicates suitable settings:

| COUNTRY/STATE | | FORWARD | | | BACKWARD | | |
|---|---|---|---|---|---|---|---|
| | ENABLED | MONTH | SUNDAY | HOUR | MONTH | SUNDAY | HOUR |
| NSW, ACT, VIC, SA | Y | 10 | 1 | 2 | 4 | 1 | 3 |
| TAS | Y | 10 | 1 | 2 | 4 | 1 | 3 |
| NZ | Y | 9 | L | 2 | 4 | 1 | 3 |
| WA | N | 10 | L | 2 | 3 | L | 3 |
| NT, QLD (2) | N | - | - | - | - | - | - |

NOTE: (1) Tasmania may start Daylight Saving earlier at their discretion.
(2) NT and QLD do not have Daylight Saving.

There are two menus used to program daylight savings settings. To swap between the two menus the right arrow/left arrow keys are used. The first menu gives options of 1:month; 2:hour; 3:minute; 4:day.

Setting the month to zero disables the daylight saving process for either the start or end, whichever is selected, i.e., they can be disabled independently and the month must be set to zero for both the start and end to disable them both. Otherwise, set the month to a value 1-12 to select months JANUARY to DECEMBER.

Options 2:hour and 3:minute determine the time of day that the daylight saving process is to change the time. The hour is set to a value 0-23 to select midnight through to 11pm. The minute is set to 0-59.

Option 4:day gives a menu which allows the setting of which day of the month the time is to be changed. The menu gives options 1:last weekday of; 2:Nth weekday of; 3:date.

Only one of options 1,2,3 can be chosen, but the daylight saving start setting may be different to the end setting. Option 1:last weekday of, will prompt for the entry of a weekday selection, 1 to 7 (1=Sunday, 7=Saturday) so that the day selected is then the last Sunday (say) of the month. This will mean that the daylight saving change will occur on the last Sunday (say) of the month regardless of the month or year.

Option 2:Nth weekday of, will prompt firstly for a value 1-4, to select the first, second, third or fourth weekday, and then prompt for a weekday selection, 1 to 7 (1=Sunday, 7=Saturday) so

that the day selected is then, say, the third Sunday of the month - regardless of the month or year.

Option 3:date allows the entry of a specific day 1-31 to select the day of the month, i.e., 1 being the first day of the month, etc.

The second of the two daylight saving menus has options of 1:hour and 2:minute. This allows the setting of the time difference in hours (0-23) and minutes (0-59), which is the amount of time to be added or subtracted when the daylight saving change occurs. These values must be programmed for both daylight saving start and end.

#### 6.4.4.10 Mains/Battery Options

The mains/battery option from the "global data" menu produces the following menus.

1:Mains frequency 2:Mains fail action 3:Battery options 4:Charger options

Option 3:Battery options produces
1:Batt mon option 2:Batt connect test 3:Batt hourly test 4:Batt daily test

Option 1 Batt mon option produces
1:Batt low mon 2:Batt very low mon

1. **Mains Frequency**
   The mains frequency can be selected as either 50Hz or 60Hz.

2. **Mains fail = fault after 8 hours**
   The options for this are 1:Yes 2:No 3:Mains disabled.
   If this option is enabled, then fault will be signalled when mains has been failed continuously for 8 hours. This option also allows mains monitoring to be “disabled”, for example, when the RDU is externally DC powered.

3. **Battery Options**
   For a mains powered RDU, battery low monitoring and battery connection tests are required for AS4428.1.

   a. Battery monitoring.
      There are two options 1:Battery low monitoring and 2:Battery very low monitoring. If the RDU is being powered from 12V D.C. then these options should be disabled.
      If battery low monitoring is enabled, a fault is signalled when a battery low occurs.
      For a slim-line RDU with no MAF board, the battery very low threshold is used as the battery low threshold.

   b. Battery connection test.
      If enabled, the battery connection will be checked every 30 seconds by reducing the charger voltage.

   c. Hourly battery capacity test.
      If enabled, a 90 or 60 second battery test will be done automatically every hour, starting at five minutes past the hour. If the keypad type is AS4428, this test runs for 90 seconds, otherwise it runs for 60 seconds. **NOTE** - a manually initiated battery test runs for 40 minutes if the keypad is AS4428, otherwise it runs for 60 seconds.

d. Daily battery capacity test.

For Australian operation, if the daily battery capacity test is enabled, a 40 minute battery test will be done when the FIP sends a "system test" command to the RDU. This is typically at 9 a.m. each day

For New Zealand operation, if enabled, a 40 minute battery test will be done when the FIP initiates a "charger inhibit period". If the daily battery capacity test is disabled, a request from the FIP to initiate a charger inhibit period is ignored. The time of day that the test starts depends on the type of FIP but is typically at the start of the auto test period at the FIP. For New Zealand operation, if the 40 minute battery test fails, the test is terminated and a fault is signalled for the remainder of the 40 minute period, after which the fault automatically clears.

**WARNING -** older versions of RDU hardware must have the battery test resistors R52, R53 removed from the MAF board if this test is enabled.

**4. Charger fault monitor**
If enabled, a fault is signalled when the charger is high or low. A charger low condition must be present continuously for 60 seconds before a fault is signalled. Charger low is ignored for 30 minutes after a battery capacity test. If the charger fault monitoring parameter is disabled, a charger fault will still be indicated on the charger LED and in system fault recall, but no fault is signalled.

**NOTE -** when a new or flat battery is connected to the panel, a battery low fault is likely to be present until the battery charges up. An operator command is available that allows such faults to be ignored for a 24 hour period, to give the battery time to charge.

### 6.4.4.11 Keys Enable

Each key on the keypad may be enabled or disabled for each of four operating states.

A use for this feature might be to disable specific keys, such as External Bell Isol or Warning System Isol, when they are not required, or to disable RESET and ISOL keys in FF mode so that the user cannot reset or isolate the alarms. Another use is for an NDU to have selected keys enabled when the door is closed.

The four operating states and the default key enablements are:
1 - FF mode with door open - default all keys enabled
2 - FF mode with door closed - default all keys disabled
3 - Non FF mode with door open - default all keys enabled
4 - Non FF mode with door closed - default all keys disabled

"FF mode" refers to when the FF alarm list is being displayed. When FF mode is active, the principal keys used are those enclosed in the red border on the keypad - ACK, RESET, ISOL, NEXT, PREV, WARNING SYS ISOL, and EXTERNAL BELL ISOL.

Non-FF mode refers to operation when the FF alarm list is not being displayed.
When the panel is in program mode or has a database checksum error, all keys are automatically enabled. Also, if the database write protect link is in the enable position then the SET key, NUMERIC keys and CLEAR key are automatically enabled to allow entry to program mode. For a Tandem LCD connection, all "remote" keys are automatically enabled. Note that disabling a particular key does not prevent a particular function from being done another way. For example, if the ISOL key is disabled a zone can still be isolated by pressing the ZONE key from the base display and using the menu option. Enabling RECALL, NEXT, PREV, CLEAR, ACK and NUMERIC keys and disabling ZONE, ISOL, RESET, RELAY, TEST, ALARM TEST, and FAULT TEST keys allows recall of information without allowing reset, isolate, test or programming functions.

Enabling the SET key allows the time and date to be set, but also allows access to the "boards present" function which may not be desirable.

The RECALL key generally allows recall of off-normal states but can also be used to display the status of any zone or point by selecting zone or point from the menu then selecting the "status" option.

After the keys enable option has been selected from the menu, one of the four modes can then be chosen. There are 5 "pages" of options for each mode which can be stepped through using the NEXT and PREV keys. Pressing the EDIT key at this point displays the currently selected mode and allows all keys for the selected mode to be enabled or disabled with a single command.

#### 6.4.4.12 Buzzer Mode

The buzzer option from the global data menu produces the following sequence of menus.
1:Follow FIP alarm buzzer 2:Follow FIP fault buzzer >

Pressing right arrow shows more buzzer options
Buzzer enable 1:Zone alarms 2:Zone faults 3:System faults >

Pressing right arrow shows more buzzer options
1:Buzzer sound for non-maf zone faults 2:Fault sounder after 8 hours fault >

Pressing right arrow again shows
1:Fault sounder after 8 hours isolate 2:Set 8 hour period in 6 minute units

Pressing right arrow again shows
1:Buzzer operates in loud mode when door/keyswitch is open/enabled

1. **Follow FIP alarm buzzer.**
   If this option is enabled, the alarm buzzer at the RDU will be on if the FIP alarm buzzer is on. The alarm buzzer may also be on if it is programmed to activate for "local" zone alarms.

2. **Follow FIP fault buzzer**
   If this option is enabled, the fault buzzer at the RDU will be on if the FIP fault buzzer is on. The fault buzzer may also be on if it is programmed to activate for "local" zone faults or system faults.

3. **Zone alarms, zone faults, system faults**
   These options determine whether the buzzer sounds for zone alarms, zone faults or system faults. If the zone alarm buzzer option is set to disabled, the alarm buzzer will never sound for a zone alarm. If the zone alarm buzzer option is enabled, then the alarm buzzer will sound only if the zone is mapped to the FF and has the AlrmSndr option enabled. Refer to section 7.2.

4. **Buzzer sound for non-MAF zone faults**
   This selects whether a fault on a non-MAF zone should cause the fault buzzer to turn on.

5. **Fault sounder after 8 hrs fault**
   Enabling this means the buzzer will be re-activated 8 hours after it was silenced if a fault is still present. AS4428.1 requires this to be enabled.

6. **Fault sounder after 8 hrs isolate**
   If this is enabled, the fault buzzer is activated if an isolate state (zone or relay) has been present for 8 hours with no operator intervention. AS4428.1 requires this to be enabled.

7. **Set 8 hr period in 6 minute units**
   A value from 0 to 255 can be set. A default value of 80 selects a time of 8 hours for the buzzer re-activation period described above.

8. **Buzzer operates in loud mode when door/keyswitch is open/enabled**
   This option allows selection of quiet or loud mode for the buzzer when the door is open. This is particularly for slim-line RDUs where the door may be open (keypad enabled) all of the time. The default setting is quiet mode.

#### 6.4.4.13 New Zealand Mode

Selecting "New Zealand options" from the global data menu produces the following menu.

1:NZ mode enabled 2:Display bd >

Pressing the right arrow key produces

1:External defect is fault

On the first menu, option 1 allows New Zealand mode to be enabled or disabled. Option 2 allows the NZ display extender board to be enabled or disabled. On the second menu, the external defect input can be enabled or disabled.

When New Zealand mode is enabled or disabled, a number of other parameters are changed automatically as shown in the table below.

| PARAMETER | AUSTRALIAN DEFAULT | NEW ZEALAND DEFAULT |
|---|---|---|
| New Zealand mode enabled | N | Y |
| External defect is fault | N | Y |
| Zone alarm buzzer enabled | Y | Y |
| Zone fault buzzer enabled | Y | N |
| System fault buzzer enabled | Y | N |
| Fault sounder after 8 hrs fault | Y | N |
| Fault sounder after 8 hrs isolate | Y | N |
| Mains fail is fault after 8 hours | N | N |
| Battery low is fault | Y | Y |
| Battery connection test enabled | Y if MAF bd | Y if MAF bd |
| Hourly battery test enabled | Y if MAF bd | Y if MAF bd |
| Daily 40 minute battery test enabled | Y if MAF bd | Y if MAF bd |
| Charger high/low is fault | Y if MAF bd | Y if MAF bd |
| MCP is enabled | Y | N |
| Daylight savings | Defaults (disabled) | Defaults (disabled) |

The default settings for Australian operation are required for AS4428.1 compliance.

# 6.5 RDU PROGRAMMABLE PARAMETER LIST

The following table lists all of the programmable parameters.

TABLE 6.5.1
PROGRAMMABLE PARAMETERS

| Parameter | Options | Default value | Refer Section |
|---|---|---|---|
| **GENERAL** | | | |
| FF Operating mode | AS4428.1<br>AS1603.4 | AS4428.1 | 6.4.1.1 |
| Address | 1 - 8 | 1 | 6.4.1.3 |
| Site text | 40 characters | | 6.4.3 |
| Fault action text | 40 characters | Contact your service company | 6.4.3 |
| Access codes users 0 - 9 | | User 0, access code 000000 | 6.4.2 |
| Tandem mode password | 12 characters | FIRES | 6.4.3 |
| Mimic mode | Enable/disable | Disabled | 6.4.1.2 |
| Protocol type | non-LCD, LCD-A | LCD-A | 6.4.1.4 |
| | | | |
| **HARDWARE SETTINGS** | | | |
| MAF Board | Enable/disable | According to hardware | 7.1 |
| LED Display boards | 0 - 33 | According to hardware | 7.1 |
| Max LEDs on | 1 - 240 | 240 | 7.1 |
| Keypad type | AS4428.1<br>AS1603.4 | AS4428.1 | 6.4.1.5 |
| MCP | Enable/disable | Enabled for MAF RDU | 6.4.4.4 |
| | | | |
| **USER COMMAND OPTIONS** | | | |
| Global Ack | Enable/disable | Disabled | 6.4.4.1 |
| Global Reset | Enable/disable | Disabled | 6.4.4.1 |
| Global Isolate | Enable/disable | Disabled | 6.4.4.1 |
| Type 3 Global Ack | Enable/disable | Disabled | 6.4.4.1 |
| Ancil 1 isolate | Pass-on, follow, local | MAF RDU - local control enabled. Non-MAF - pass-on & follow enabled. | 6.4.4.3.6 |
| Warning System isolate | Pass-on, follow, local | MAF RDU - local control enabled. Non-MAF - pass-on & follow enabled. | 6.4.4.3.1 |
| Warning System operate | Pass-on, follow, local | MAF RDU - local control enabled. | 6.4.4.3.2 |
| External Bell isolate | Pass-on, follow, local | MAF RDU - local control enabled. Non-MAF - pass-on & follow enabled. | 6.4.4.3.1 |
| External Bell operate | Pass-on, follow, local | MAF RDU - local control enabled. | 6.4.4.3.3 |
| Bells isolate (AS1603.4 only) | Pass-on, follow, local | MAF RDU - local control enabled. Non-MAF - pass-on & follow enabled. | 6.4.4.3.4 |
| Bells operate (AS1603.4 only) | Pass-on, follow, local | MAF RDU - local control enabled. | 6.4.4.3.5 |
| Services Restore (NZ only) | Pass-on, follow, local | If NZ mode, all enabled. | 6.4.4.3.6 |
| Trial Evac (NZ only) | Pass-on, follow, local | If NZ mode, all enabled. | 6.4.4.3.7 |
| | | | |

| Parameter | Options | Default value | Refer Section |
|---|---|---|---|
| **MISCELLANEOUS OPTIONS** | | | |
| Legacy bells | Disable<br>Warning system<br>External bell | Disable | 6.4.1.6 |
| All zones isolated operates standby | Enable/disable | Enable | 6.4.4.6 |
| Warning system maps to MAF | Yes / No | Yes | 7.4.3 |
| External bell maps to MAF | Yes / No | Yes | 7.4.3 |
| Brigade test enable | Enable/disable | Disable | 6.4.4.5 |
| Common LEDs show - local status, remote status | Enable/disable | Local status enabled<br>FIP status disabled | 6.4.4.8 |
| Capture FIP time/date | Enable/disable | Enabled | 6.4.4.2 |
| | | | |
| **LOGIC EQUATIONS** | | | |
| | | No default equations. | 7.3 |
| | | | |
| **FF OPTIONS** | | | |
| FF Auto ack | Enable/disable | Disabled | 6.4.4.1 |
| FF Type | 2/3 | 3 | 6.4.4.1 |
| FF Display cause by default | Enable/disable | Disabled | 6.4.4.1 |
| New cause new alarm | Enable/disable | Disabled | 6.4.4.1 |
| Multiple cause updates | Enable/disable | Enabled | 6.4.4.1 |
| Switch to newest alarm | Enable/disable | Disabled | 6.4.4.1 |
| Show zone number in FF | Enable/disable | Enabled | 6.4.4.1 |
| Show isolated alarms in FF | Enable/disable | Enabled | 6.4.4.1 |
| Show point text in FF for zone | Enable/disable | Disabled | 6.4.4.1 |
| Show FIP zone names in FF | Enable/disable | Enabled | 6.4.4.1 |
| Capture FIP zone name from alarms | Enable/disable | Disabled | 6.4.4.2 |
| FF alarm source | LCD, LED, Both | LCD | 6.4.4.1 |
| | | | |
| **BATTERY/ MAINS/ CHARGER OPTIONS** | | | |
| Mains frequency | 50 Hz; 60 Hz | 50 Hz | 6.4.4.10 |
| Mains fail is fault after 8 hours | Yes/ No/ Disable | No (not a fault) | 6.4.4.10 |
| Charger high/low monitoring | Enable/disable | Enabled if MAF bd present | 6.4.4.10 |
| Battery low monitoring | Enable/disable | Enabled | 6.4.4.10 |
| Battery very low monitoring | Enable/disable | Enabled | 6.4.4.10 |
| Battery connection test | Enable/disable | Enabled if MAF bd present | 6.4.4.10 |
| Hourly battery test | Enable/disable | Enabled if MAF bd present | 6.4.4.10 |
| Daily battery test | Enable/disable | Enabled if MAF bd present | 6.4.4.10 |
| | | | |
| **BUZZER OPTIONS** | | | |
| Follow FIP alarm buzzer | Enable/disable | Disabled | 6.4.4.12 |
| Follow FIP fault buzzer | Enable/disable | Disabled | 6.4.4.12 |
| Zone alarm buzzer | Enable/disable | Enabled | 6.4.4.12 |
| Zone fault buzzer | Enable/disable | Enabled if Australian mode | 6.4.4.12 |
| System fault buzzer | Enable/disable | Enabled if Australian mode | 6.4.4.12 |
| Non-maf zone fault buzzer | Enable/disable | Disabled | 6.4.4.12 |
| Fault sounder after 8 hours fault | Enable/disable | Enabled if Australian mode | 6.4.4.12 |
| Fault sounder after 8 hours isolate | Enable/disable | Enabled if Australian mode | 6.4.4.12 |
| Fault re-sound period | 0 - 255, units 6 minutes | 80 (8 hours) | 6.4.4.12 |

| Parameter | Options | Default value | Refer Section |
|---|---|---|---|
| Buzzer operates in loud mode when door open | Yes / No | No | 6.4.4.12 |
| | | | |
| **EVENT LOGGING OPTIONS** | | | |
| Event printer output | Enable/disable | Enabled | 6.4.4.7 |
| Print relay controls | Enable/disable | Enabled | 6.4.4.7 |
| Printer lines per page | 0 - 250 | 60 | 6.4.4.7 |
| Printer baud rate | 300 - 9600 | 9600 | 6.4.4.7 |
| Event types to print | Zone<br>System<br>Sys running<br>Circuit<br>Point<br>Relay | All enabled | 6.4.4.7 |
| Event types to log to history | Zone<br>System<br>Sys running<br>Circuit<br>Point<br>Relay | All enabled | 6.4.4.7 |
| | | | |
| **AUTO OPERATION OPTIONS** | | | |
| Daylight saving start options | Month, Hour, Minute, Day | Disabled | 6.4.4.9 |
| Daylight saving end options | Month, Hour, Minute, Day | Disabled | 6.4.4.9 |
| | | | |
| **KEYPAD KEY ENABLE OPTIONS** | | | |
| Door open FF mode | Enable/disable | All 40 keys enabled | 6.4.4.11 |
| Door open non FF mode | Enable/disable | All 40 keys enabled | 6.4.4.11 |
| Door closed FF mode | Enable/disable | All 40 keys disabled | 6.4.4.11 |
| Door closed non FF mode | Enable/disable | All 40 keys disabled | 6.4.4.11 |
| | | | |
| **RELAY OPTIONS (Ancillary relays 1,2,3)** | | | |
| Supervision | Enable/disable | Enabled | 7.4 |
| Latching | Enable/disable | No | 7.4 |
| Map to MAF | Enable/disable | Yes | 7.4 |
| Isolatable | Enable/disable | Anc1=Yes, Anc2,3 No | 7.4 |
| Testable | Enable/disable | Anc1=Yes, Anc2,3=No | 7.4 |
| Supervise activated state | Enable/disable | Yes | 7.4 |
| Mode Door holder/ Load (anc1 & anc2 only) | Door holder/ Load | Anc1 - door holder<br>Anc2 - load | 7.4 |
| Ancillary 1 text name | 30 characters | | 6.4.3 |
| Ancillary 2 text name | 30 characters | ANC 2 External Bell Output | 6.4.3 |
| Ancillary 3 text name | 30 characters | ANC 3 Warning System Output | 6.4.3 |
| | | | |
| **ZONE NAMES** | | | |
| Zones 1 - 528 | 30 character name | All blank | 6.4.3.2 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

| Parameter | Options | Default value | Refer Section |
|---|---|---|---|
| **FF ZONE OPTIONS** | | | |
| Global settings &<br>Individual zone or zone range settings | MapFF<br>AlrmSndr<br>MultiAlm<br>AckTX<br>AckRX<br>LocAck<br>ResetFF<br>IsolFF<br>Hide<br>Log<br>Total<br>Alarm test<br>Fault test<br>Output zone<br>MapMAF<br>MapANC1<br>MapExtBell (AS4428)<br>MapWarnSys<br>MapANC2 (AS1603)<br>MapBells | Global options are all enabled except for the following : AckRX, Hide, Output zone, MapANC1, MapANC2.<br><br>There are no individual zone settings in the default database. | 7.2 |
| | | | |
| **ZONE LED MAPPING OPTIONS** | | | |
| Zone to LED mapping | | Zones 1 to 528 map to LEDs 1 to 528 | 7.7 |
| Local LEDs show any alarm | Yes/ No | Yes | 7.7 |
| Local LEDs show any fault | Yes/ No | Yes | 7.7 |
| Local LEDs show any isolate | Yes/ No | Yes | 7.7 |
| Local LEDs show partial isolate | Yes/ No | Yes | 7.7 |
| | | | |
| | | | |
| **NEW ZEALAND MODE OPTIONS** | | | |
| NZ mode | Enable/disable | Enabled if display extender board is present. | 6.4.4.13 |
| Display extender board | Enable/disable | Enabled if installed | 6.4.4.13 |
| External defect fault | Enable/disable | Disabled | 6.4.4.13 |
| | | | |

# 6.6 ERROR MESSAGES DURING CONFIGURATION

Listed below are some error messages that can appear on the LCD during installation. Refer also to the Operator Manual for a list of error and event messages.

**Error messages that can occur on start-up**

**"Shift reg clocking fault"**
**"Invalid # shift regs.Total # regs=xxx # input regs=xxx"**
These messages indicate a hardware fault with the shift register bus that connects the Controller with MAF/PSU module. The fault could be on the Controller, the interconnecting FRCs or any of the connected boards. Try with different cables.
**"Shift reg driver fault"**
This message indicates a problem with the software driver for the shift register bus.

**"Clock crystal timebase check fail"**
**"Clock chip ram write read fail"**
**"Clock register write read fail"**
**"Clock startup fault"**
These messages indicate a hardware fault on the Controller.

**“Firmware checksum fail”**
**"Eprom CRC fail"**
These messages indicate the checksum of the software program code is incorrect. This can be caused by a damaged/corrupted memory chip or some other hardware fault on the controller.

**Error messages that can occur on entry to program mode**

1. **"Flash database version error Must reinit or reload database."**
   This message appears on entry to program mode and indicates that the database was created with a different version of software and cannot be used. This message does not appear if the database checksum is incorrect so it indicates the database is valid but incompatible with this software version.

2. **"WARNING-the database in flash is invalid. Recommend save->PC before save to flash."** This message appears on entry to program mode if the database checksum is incorrect.

**Error messages that can occur on exit from program mode**

1. **"Flash database checksum fail. Processing is disabled."**
   This indicates the database checksum is invalid and the panel is non-operational. A **"DBASE CHKSUM ERROR"** event is also logged.

2. **"History queue is being cleared"**
   This indicates that the size of the history queue has been decreased to enable the print queue. This occurs when the programmable option to enable or disable event printing is changed from disable to enable. When event printing is disabled, the history queue uses the memory normally used for event printing.

3. **“Shift reg clocking fault”**
   **“Invalid # shift regs.Total # regs=xxx # input regs=xxx”**
   **“Shift reg driver fault”**
   This indicates a hardware fault

4. **"Processing disabled."**
   If a shift register fault occurs (as listed above), then this message will also appear to indicate the panel is non-operational.

5. **"Display module mismatch."**
   This indicates the number of connected display boards does not match the database configuration parameter.

# CHAPTER 7
# PROGRAMMING PART 2

# 7.1 SYSTEM CONFIGURATION MENU

The System Configuration menu is shown in Figure 6.1.4. section 6.1.

1:Modules 2:Output Logic 3:Outputs 4:Zone config 5:Zone LED mapping

Output logic is described in section 7.3. Zone config is described in section 7.2. Zone LED mapping is described in section 7.7.1. Option 3 Outputs allows programming of options for the ancillary relays on the MAF board and is described in section 7.4.2.

**CONFIGURING MODULES**

1:MAF Board 2:LED Display bds 3:MAX LEDs on 4:Display board type

Option 1 (MAF Board) allows selecting whether a MAF board is installed.

Option 2 (LED Display bds) allows setting the number of zone LED display boards (0 - 33) that are connected.

Option 3 (MAX LEDs on) allows setting the max number of zone LEDs that can be on simultaneously. This is to limit the maximum current that is used driving LEDs. The default value is 240 and the maximum value is 240.

Option 4 (Display board type) allows configuring the type of each LED display board. LED boards are configured in ranges. Enter the first board (1-33) and the last board (1-33) in the range to be configured. Board number 1 corresponds to the board that is furthest from the controller board, i.e., is at the end of the chain of display boards. Board number 1 has LED sets 1 to 16 and board number 33 has LED sets 513 to 528. The following options can be configured for each board.

1:Share Iso/Fault 2:LED Columns 3:Relay type board

A two column board has two columns of LEDs; a red column (for alarm) and an amber column (for fault/isolate). A three column board has a red column and two amber columns. The outer-most amber column indicates an isolate state and the inner-most amber column indicates fault.

Option 1 (Share Iso/Fault) allows the selection of whether the amber isolate/fault LED should be shared between fault and isolate. On a "two column" board, the amber LED is normally shared and on a three column board it is normally not shared.

Option 2 (LED Columns) allows the selection of whether the board is a 2 column or 3 column type.

Option 3 (Relay type board) allows selection of whether the board has relays on it. For a board that is configured as "relay type", the alarm LEDs never flash and the board is not tested during an LED display test.

LED Phasing

When phasing occurs, six boards at a time show the correct state of their LEDs and the other boards are all off. Every 3 seconds, the "window" moves by one position. Hence a minimum of seven boards must be present for any phasing to occur. Any boards which are programmed as "relay type" will always show their true state.

# 7.2 CONFIGURING ZONES

### 7.2.1 ZONE CONFIGURATION OPTIONS

The following options can be programmed individually for each zone or zone range, or globally for all zones. The global options apply to all zones 1 to 528 that don't appear explicitly in the zone/ zone range list. The default settings are shown in Table 6.5.1.

1. **MapFF**
   If enabled (set to 'Y'), the zone will be entered into the FF alarm list when an alarm occurs on the zone.

2. **AlmSndr**
   If enabled, the alarm buzzer will be activated for a new alarm on the zone. The global option "zone alarm buzzer" must also be enabled. Refer section 6.4.4.12.

3. **MultiAlm**
   If enabled, multiple entries in the alarm list will be created for the specified zone, one for each point that goes into alarm. The FIP must also be configured to send the point alarm information, i.e., in F4000/MX4428 "Create multiple causes" must be enabled and an appropriate text name should be assigned to each point.

4. **AckTx**
   This parameter selects whether the RDU can send an ACK command to the FIP for the specified zones. If enabled, then when an alarm is locally acknowledged by pressing the ACK key, if there are no other unacknowledged alarms for that zone, a zone ACK command will be sent to the FIP. This may result in alarm entries in the alarms list of other panels becoming acknowledged, for that zone. If there are other locally unacknowledged alarms for the zone, then they must all be acknowledged first before a zone ACK command is sent to the FIP.

5. **AckRX**
   "Acknowledge receive". This option selects whether an acknowledgment received from the FIP for the zone should be applied to an alarm for the zone in the local alarm list. If AckRx is disabled, then an alarm for the zone must be acknowledged locally.

6. **LocAck**
   "Local Acknowledge". This option selects whether an alarm for the specified zone can be acknowledged locally. If LocAck is disabled, then the AckRX option should be enabled otherwise the alarm can never be acknowledged.

7. **ResetFF**
   If disabled, a reset command cannot be applied to the zone at the RDU. If enabled, a reset command can be initiated for the zone locally, and sent to the FIP. For a reset command in the FF alarm list, if there are other alarms in the alarm list for the same zone, then the alarm being reset is removed from the alarm list, but no reset command is sent to the FIP. If there are no other alarms in the list for the zone, then a reset command is sent to the FIP for the zone.

8. **IsoFF**
   If enabled, an isolate command can be initiated for the zone locally, and sent to the FIP. For an isolate command in the FF alarm list, an isolate command is sent to the FIP only if there are no other unacknowledged alarms in the alarm list at the RDU for the same zone. All alarms for the zone must be acknowledged before the zone can be isolated.

**9. Hide**
If enabled, the zone does not appear in zone recalls unless the MapMAF or Total options are enabled for the zone. I.e., mapMAF and Totals options override the "hide" option.

**10. Log**
If enabled, events for the zone are logged to the printer and history. If disabled, no events are logged for the zone(s).

**11. Total**
For MAF mapped zones, this setting is ignored. MAF mapped zones always map to totals, common LEDs and logic tokens (e.g. NMA, NMF). For non-MAF zones, if the "Total" option is set false, then the zone is not included in totals, common LEDs etc.

**12. Alarm test**
If enabled, an alarm test may be initiated on the zone at the RDU.

**13. Fault test**
If enabled, a fault test may be initiated on the zone at the RDU.

**14. Output zone**
If enabled, the zone is treated as a relay/ ACZ type zone rather than an alarm zone. This means that off normal conditions on the zone are treated as "activated" rather than "alarm". The status bits sent from the FIP to the RDU for a zone include alarm/activate, fault and isolate. The "Output zone" setting is needed at the RDU to determine whether the alarm/activate state is alarm or activate.

**15. MapMAF**
If enabled, the zone maps to the MAF. If the RDU has a MAF board fitted, then the MAF relays (alarm, fault and isolate) are driven from MAF mapped zones. A number of logic tokens distinguish between MAF mapped zones and non-MAF mapped zones.

**16. MapANC1**
If enabled, the zone maps to the ancillary 1 relay. This means that ancillary relay 1 will be energised for a non-isolated alarm on the zone.

**17. MapExtBell**
If enabled, the zone maps to the External Bell. This means that External Bell outputs at the RDU will be energised for a non-isolated alarm on the zone. This option is available only in AS4428.1 mode.

**18. MapWarnSys**
If enabled, the zone maps to the Warning System. This means that Warning System outputs at the RDU will be energised for a non-isolated alarm on the zone. This option appears only in AS4428.1 mode.

**19. MapANC2**
If enabled, the zone maps to the ancillary 2 relay. This means that ancillary relay 2 will be energised for a non-isolated alarm on the zone. This option appears only in AS1603.4 mode.

**20. MapBells**
If enabled, the zone maps to the Bells. This means that the Bells outputs at the RDU will be energised for a non-isolated alarm on the zone. This option appears only in AS1603.4 mode.

### 7.2.2 OPERATION OF THE ZONE CONFIGURATION PROGRAMMING MENUS

The zone configuration programming menus (refer Figure 7.2.1) allow the programming of a set of options for a zone or range of zones, and also a set of global options. A zone (or range of zones) must first be assigned to the zone configuration list before its options can be set. In “view mode”, the cursor cannot be moved between options fields – the OR key must be used to step through the option pages.

**Note** – if the PC application “PanelX” is being used, then the dedicated arrow keys on the PC keyboard can be used as left/right/up/down arrow operations and the numeric keypad plus key can be used as the “OR” key for stepping through the different menu pages (shown as Pg1, Pg2, etc.).

#### 7.2.2.1 Global Settings for Zones

The global settings are presented on the display as shown below.

```
Global zone configuration              Pg1
MapFF:Y  AlmSndr:Y  MultiAlm:Y
```

An enabled option is shown as ‘Y’, disabled as ‘N’. The left and right arrow keys move between fields and from page to page. In each field, the up and down arrow keys toggle the setting. The OR key steps directly to the next page of options, and the PRINT key displays “help” information. Press CLEAR to exit.

#### 7.2.2.2 Individual Settings for Zones

Individual settings apply to a single zone or a group of consecutively numbered zones. A single SID number (zero) is shown on the display indicating that the zones are associated with a single FIP. The NEXT and PREV keys may be used to step through the assigned entries in the zone database. These are shown in numerically ascending (NEXT), or descending (PREV), order.

#### 7.2.2.3 Entering Zone Numbers

Numeric keys can be used to enter zone numbers or the up/down arrow keys can be used to increment or decrement these numbers. When some, but not all, of the specified zones are present in the database, then the bottom line of the LCD shows an appropriate message as described in the following section.

#### 7.2.2.4 Entering a New Zone Range

If none of the zones in the range specified by the start and end zone are present in the database, then the bottom line of the display shows “Zones not present, press ACK to assign”. For example :

```
SID:0    Start zone:31    End zone:40
Zones not present, press ACK to assign
```

Pressing ACK will add the zone range to the zone database. To assign a single zone, the start zone and end zone should be equal, i.e., the group is only one zone in length.

When the zones specified by the start and end zone correspond to an existing entry in the database then the bottom line of the display shows the current settings for those zones. For example :

```
SID:1    Start zone:1    End zone:1   Pg1
MapFF:Y  AlmSndr:Y  MultiAlm:Y
```

An enabled option is shown as 'Y', disabled as 'N'. The EDIT key switches the cursor between the top and bottom lines. The left and right arrow keys step between fields. On the bottom line, the up and down arrow keys change the setting. The OR key steps directly to the next page of options. The AND key steps to the previous page.

The XOR key displays a command menu as shown in Figure 7.2.1. The DELETE key brings up a menu that allows zones ranges to be deleted from the FF zone database. The PRINT key displays "help" information from which the CLEAR is used to return to the zone range display.

**NOTE** in "view mode", the cursor cannot be moved to the bottom line of the display – the OR key must be used to step through the option pages.

If some of the specified zones are present in the zone database, but do not correspond to an exact entry in the database, then an appropriate message is shown on the bottom line of the display as described in the examples below.

For example, suppose the database contained the following entries :

Start zone 5, End zone 12

Start zone 13, End zone 20

If the start zone is now set to 5 and the end zone is set to 20, then the bottom line of the display will show "ACK:Extend range ZONE:Show existing" even though all of the zones are actually already in the database, because the settings for zones in the range 5 to 12 may be different from zones in the range 13 to 20.

Existing entries in the database can be modified (extended, split or deleted) as shown in the following examples. After making changes to the database and exiting program mode, if possible, the database should be "printed" (captured to a PC in text format) and checked to see that it contains the correct zone configuration settings.

**Example 1 - Extending an Existing Range**

SID 0 [31 ... 40] Existing zone range in database

SID 0 [25 ... 40] Entered zone range

```
SID:0    Start zone:25    End zone:40
ACK:Extend range  ZONE:Show existing
```

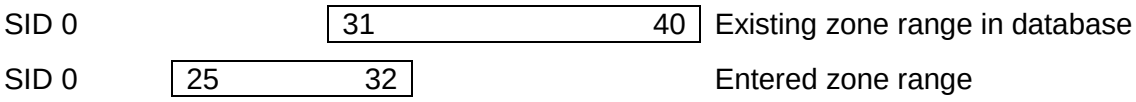
According to which key is pressed, the result is as follows.

SID 0 [31 ... 40] ZONE: Show Existing

SID 0 [25 ... 40] ACK: Extend range

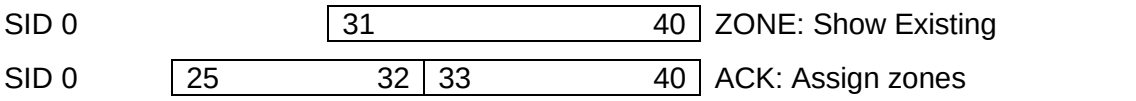
If the ACK key is pressed, the range 25 to 40 will be entered into the database, replacing the range 31 to 40 and with the same option settings. If the ZONE (or NEXT) key is pressed, the display then shows the actual range that is present in the database without changing it.

**Example 2 - Modifying an Existing Range**



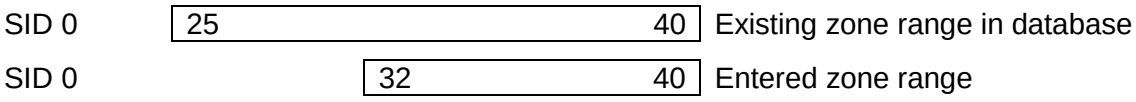

```
SID:0     Startzone:25     Endzone:32
ACK:Assign zone(s)   ZONE:Show existing
```

According to which key is pressed, the result is as follows.



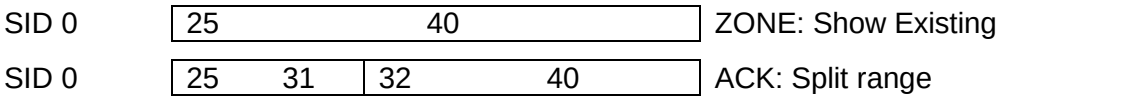

If the ACK key is pressed, the range 25 to 32 is added to the database and the existing range 31 to 40 is reduced to the range 33 to 40, i.e., the previous range 31 to 40 has been reduced to 33 to 40. If the overall intention was to remove zones 33 to 40 from the database then they must be explicitly deleted (via the DELETE key).

**Example 3 - Splitting an Existing Range - 1**



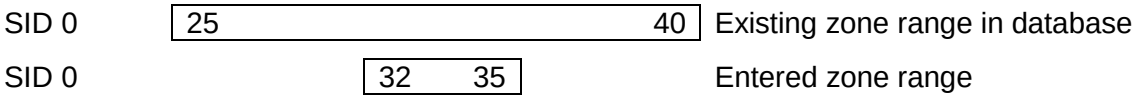

```
SID:0     Startzone:32     Endzone:40
ACK:Split range   ZONE:Show existing
```

According to which key is pressed, the result is as follows.



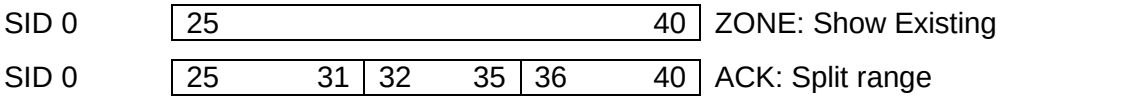

If the ACK key is pressed, the range 25 to 40 is split into two ranges. If the intention was to remove zones 25 to 31 from the database then they must be explicitly deleted.

**Example 4 - Splitting an Existing Range - 2**




```
SID:0     Start zone:32     End zone:35
ACK:Split range   ZONE:Show existing
```

According to which key is pressed, the result is as follows.



#### 7.2.2.5 Zone Command menu

At any place in the zone menus, pressing the XOR key produces the following "command" menu:

```
1:Save all to flash     2:Delete zones
3:Copy (& set defaults) 4:Paste
```

Option 1 - Allows saving the entire database to flash memory. If a lot of data is being programmed, it may be worth saving to flash memory periodically, in case of power fail. The database is held in RAM while it is being changed and changes will be lost if a power fail or restart occurs while in program mode.

Option 2 - Selects the delete menu.

Option 3 - Copy assigns the previously displayed settings as “default settings” that are used when any new zone group is entered into the database.

Option 4 - Paste assigns previously copied settings to the current zone range.

ESC/CLEAR exits the command menu.

#### 7.2.2.6 FF Zone Delete Menu

At any place in the FF zone menus, pressing the DELETE key displays the following menu showing the current values of SID, start and end zone.

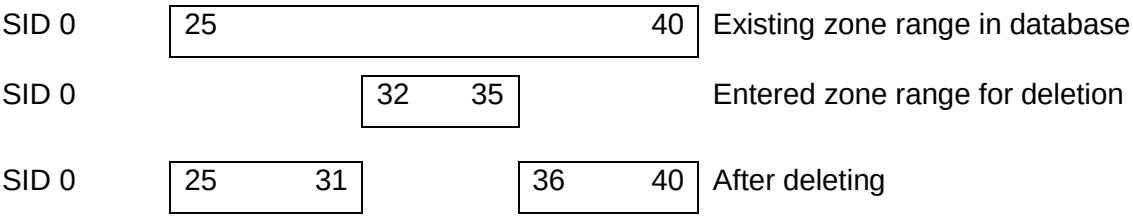
```
Delete zones 25 – 40

1:Yes  2:No  3:Enter range  4:more
```

Option 1 confirms, and option 2 cancels the deletion of this entry.
Option 3 allows the zone range to be changed:

```
SID:0    Start zone:32    End zone:35
Enter zones to delete then press DELETE
```

The zone range can be part of an existing range, as in this example:




Option 4 in the delete menu produces the following menu which allows deletion of all zones.

```
1:Delete all zones
```

The delete options should be used carefully as the information cannot be recovered once deleted.

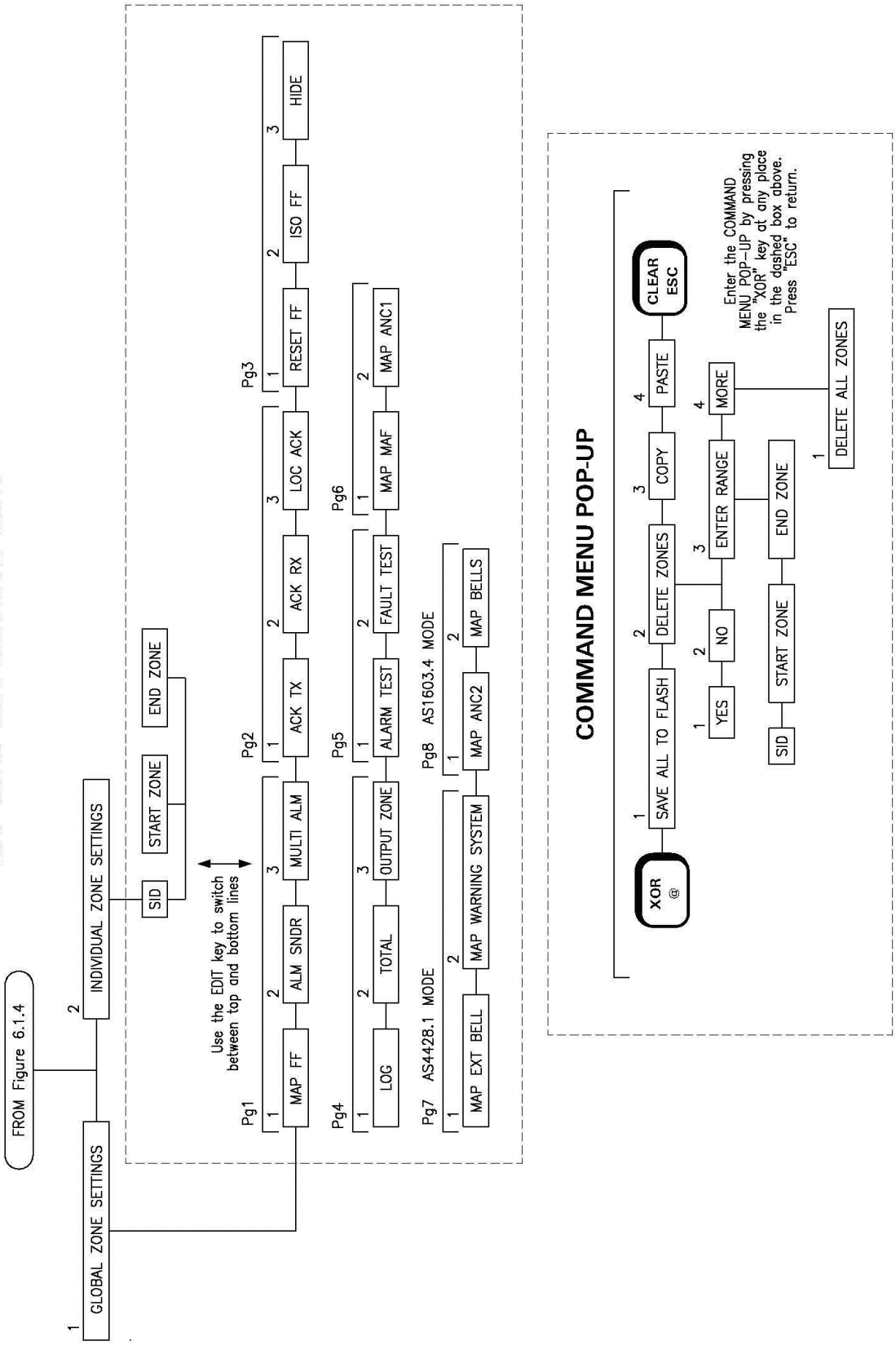



Figure 7.2.1 RDU ZONE CONFIGURATION MENU

# 7.3 OUTPUT LOGIC

### 7.3.1 GENERAL

The three ancillary relays, MAF Brigade Relays, sounder and the first 64 zone LED sets may be driven by logic equations. The LEDs/relays on zone LED display boards may be driven by a logic equation using a relay equation where the relay number is in the range 65 to 256.

**Output Logic Equation Format**
An output logic equation takes the form of:
Output = operand [operator operand] [operator operand] ...

**Output Logic Destinations**
The outputs that output logic can control are referred to as destinations, e.g., with AR1=Z1A, the destination is ancillary relay 1. The destination is specified by the left hand side of the equation. The destinations available in the RDU are:

1. Relays (for controlling zone LEDs), e.g., R65=Z4A
2. Variables, e.g. V1=T1
3. Timers, e.g., T1 (15, 20) = Z16A
4. Ancillary Relays, e.g., AR1 = Z1A
5. MAF Relays, e.g., ALM = Z1:16(1)A
6. Sounder activate (fault buzzer), e.g., SNA = Z1:16(1)F

**Logic Equations for Relays**
Unlike an F3200 panel, an RDU has no module relays, however, logic equations for relays 65 to 256 may be used to drive zone LEDs. The RDU can have up to thirty three 16 zone LED display boards connected but only the first 64 LED sets (four boards) can be controlled with logic equations. Equations for relay numbers 65 to 128 are used to control alarm LEDs 1 to 64 on the first four display boards. Equations for relay numbers 129 to 192 are used to control fault LEDs 1 to 64. Equations for relay numbers 193 to 256 are used to control isolate LEDs 1 to 64. The LEDs being controlled will be either on steady or off - they cannot be selected to flash (unless the equation generates the flashing). Relay numbers 65 to 256 cannot be used in the "right hand side" part of an equation as an operand.

If an LED is driven by both output logic and by a zone LED mapping (refer section 7.7) then output logic overrides.

Example: R65 = Z1A (drives zone 1 alarm LED)
R129 = Z1F (drives zone 1 fault LED)
R193 = Z1I (drives zone 1 isolate LED)

**Output Logic Specifications**

| | |
|---|---|
| Maximum number of equations | 512 |
| Maximum number of "()" per equation | 14 |
| Maximum equation length (note 1) | 100 bytes |
| Number of variables | 256 |
| Number of seconds timers | 64 (1-64) |
| Number of minutes timers | 8 (65-72) |
| Time range of timers | 0-250 seconds/minutes |
| Error margin of seconds timers | 0-1 sec. |
| Error margin of minutes timers | 0-1 Minute |

**NOTES**

1. The maximum size of an equation is approximately 30-40 operands plus operators. It is 100 bytes, where most operands use 2 bytes, and operators use 1 byte.

2. The RDU continually "updates" the status of the inputs to the output logic equations, processes the equations, and updates the resultant outputs. The processing time taken is dependent on the number and size of the equations.

   A timer is started by a logic equation, and then operates the output via another logic equation. There is a processing delay added to the timer delay.

   For a system with only 10-20 small to medium sized equations, the processing delay should be of the order of 100 msec, and an approximate 1 second timer can be used.

   For a system with the maximum number of equations, the processing time may stretch beyond 1 second, therefore a delay programmed as "1 second" could cause a real delay (from input event to output options) in excess of 3 seconds.

3. The amount of programming memory left can be viewed by using the "free space" option of the output logic programming menu.

### 7.3.2 THE OUTPUT LOGIC MENU

There are three base menus in the output logic programming and they can be cycled around by pressing the < or > keys.

Menu 1 has
1:relay 2:variable 3:timer 4:anc relay

Menu 2 has
1:maf relay 2:freespace

Menu 3 has
1:SNA

Menu 1: Option 1 (relay) is used to enter equations for driving LEDs/relays (relays numbers 65 to 256) on LED display boards. Option 2 is to enter equations for variables, option 3 is for timers and Option 4 (Anc relay) is for the three ancillary relays.

Menu 2: Option 1 (maf relay) is used to enter equations the four Brigade relays (standby, Fault, Isolate, Alarm) - which have default operation that may be overridden by a logic equation.

Menu 2: Option 2 (freespace) shows the output logic memory available.

Menu 3: Option 1 SNA - "Sounder Activate" allows entering an equation to drive the sounder. The RHS must change from false to true to activate the sounder (fault buzzer) on the RDU (and also the SOF token). Pressing any key will silence the sounder. SNA must go false then true again to restart the sounder.

When programming equations for relays, note the following.

1. The default operation of the **MAF Brigade relays** conforms to AS4428.1. Programming relays for operation other than default may contravene AS4428.1. The logic tokens MRA, MRF, MRI, MRS may be used to drive the alarm, fault, isolate and standby relays respectively with the same behaviour as the implicit default operation when there is no logic equation for the relay.

2. Although the **MAF Standby relay** may be programmed to operate off a logic equation, it is still de-energised (by hardware) for the Battery Very Low condition.

3. It is **not** recommended to program **normally energised relays** because they are de-energised when isolated. Also, they increase quiescent current. All relays have change-over contacts.

### 7.3.3 LOGICAL OPERATORS

The logical operators are as follows:

OR (+) logical OR
C = A + B C is active if A is true or B is true.

AND (.) logical AND
C = A . B C is active if A is true and B is true.

XOR (@) exclusive OR
C = A @ B C is active if A is true and B is false, or if A is false and B is true (i.e. if A and B are in opposite states).

NOT (^) Logical inverse
B = ^ A B is active if A is false

Associated with these operators are "logic operator keys" in the right hand column of the 4 x 4 numeric keypad on the controller.

Using "1" to represent a "true" condition or "on" (active) state and "0" to represent a "false" condition or "off" (inactive) state, the following tables show the function of the logic operators for the various combinations of inputs (operands) A and B.

| A | B | A + B | A . B | A @ B | ^ A | ^ B |
|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 0 | 1 | 1 | 0 | 1 | 1 | 0 |
| 1 | 0 | 1 | 0 | 1 | 0 | 1 |
| 1 | 1 | 1 | 1 | 0 | 0 | 0 |

**TRUTH TABLE**

**Priorities & Evaluation**
Logic operators have a precedence/ priority that determines the order they are applied. Parentheses () are used to override operator precedence. The operators in order of precedence are NOT, AND, OR, XOR; with NOT having the highest precedence and XOR having the lowest.

**Example:**
In the following equation, the AND operator is applied before the OR operator because it has higher precedence

AR1 = Z1A + Z2A . V1

which means that ancillary relay 1 is active if either
a. zone 1 is in alarm or
b. zone 2 is in alarm and variable V1 is true.

whereas with the following equation

AR1 = (Z1A + Z2A) . V1

Ancillary relay 1 is active if V1 is true and zone 1 is in alarm or zone 2 is in alarm.

The parentheses operators "(" and ")" can be entered into a logic equation using the "RECALL" and "PRINT" keys.

### 7.3.4 LOGIC OPERANDS

Logic operands return a value of true or false. Some operands are simple three letter names and others include a numeric value and condition. For example, a zone operand consists of the letter Z, a number 1 to 64, and a condition which is represented by a single letter (A, F, I, N). E.g. Z12A returns true when zone 12 is in alarm and not isolated.

The operands available are as follows:

| Abbr | Name | In Equation | Example |
|---|---|---|---|
| AR | Ancillary Relay | AR | AR2F |
| RL | Module Relay | R | R4I |
| VL | Variable | V | V7 |
| ZN | Zone | Z | Z3A |
| TM | Timer | T | T15 |
| ZR | Zone Range (n of m) | Z:() | Z1:8(2)A |
| NA | New Alarm | NA[r1..;s1..] | NA[ACK;Z1F,Z5F,Z7F] |
| VR | Variable Range (n of m) | VR:() | VR12:19(3) |

**Zone (ZN)**
The status of zones 1 to 528 as received from the FIP can be accessed with output logic.

Zxxq where xx = 1 – 528, (see note 1 below), q can be A, F, I, N as follows:

- A - Alarm . ^ (Isolated + In-Situ Test mode) (i.e. Alarm on a zone which is not isolated and not in In-Situ Test mode).
- F - Fault . ^ (Isolated + In-Situ Test mode).
- I - Isolated + In-Situ Test mode.
- N - Normal - true when none of A, F or I are true.

**NOTES:**
1. When entering numbers, leading zeros need not be entered.
2. None of the zone tokens are affected by whether a zone is programmed as a MAF type or not.

**Zone Range (ZR)**
Zone status (as received from the FIP) can also be accessed with a range operand. **NOTE** caution should be used with the zone range operand because when zones at the FIP change state, it may require more than one message to be sent to the RDU, before the RDU is fully updated.
Zxx:yy(zz)q
where xx, yy, zz = 1 – 528, yy > xx , (yy - xx) + 1 $\geq$ zz
q can be A,F,I,N as above.

The operand returns true if the number of zones in the range xx to yy in the specified condition is zz or greater. If zz is zero at least one zone must be in the specified condition for the operand to be true (i.e., 0 and 1 are the same).

Example
AR2 = Z2:6(2)A means that ancillary relay number 2 will energise when at least any two zones in the range 2 to 6 go into the alarm state simultaneously.

Note that the range includes the zones from xx to yy, so allocation of zones is important when using this operand.

Note also that a zone range with zz = 1 is simply the OR of all the zones in the range and that a range of xx..yy with zz = yy - xx + 1 is simply an AND function.

Z1:10(1)A = Z1A + Z2A + Z3A + Z4A + Z5A + Z6A + Z7A + Z8A + Z9A + Z10A
Z11:13(3)F = Z11F . Z12F . Z13F

**Ancillary Relay (AR)**
ARxq
where x is 1,2,3 for Ancillary Relay 1,2,3; q can be A, F, I or N

The relay logic tokens are not affected by whether the relay is mapped to the MAF or not. The F condition may be latching or non-latching (as programmed under relay supervision for that relay).

**New Alarm (NA)**
The New Alarm token (NA) is a set/reset latch, which incorporates two lists of tokens. One list of tokens "sets" the latch, i.e., when a token goes true the latch goes true and stays true, even if the token returns to false. The other list of tokens "resets" the latch, i.e., when a token goes true the latch returns to false and stays false until a token in the "set" list goes from false to true. On power up, NA is false. NA takes the form:

NA[r1,r2,....rn;s1,s2,....sm]
where r1-rn is the list of tokens which reset the latch and
s1-sm is the list of tokens which set the latch.

Entry of an NA token into an equation is described later in this section.

If a set and a reset token both go true at the same time, then reset overrides set, i.e.. the latch turns off.

**Variables & Variable Range**
Vxxx where xxx = 1 – 256 - single variable
VRxxx:yyy(mmm) - variable range (mmm = 1-256)

A variable holds a logical state of true or false. The VR variable range operand allows checking for a minimum number of variables being true within a specified range of variables. For example, VR12:19(2) returns true when any two or more of the variables V12 to V19 are true.
All variables are set to "false" on power up.

**Timers**

Txx[P/Sy:z] where xx = 1 - 64 for seconds timers and 65-72 for minutes timers, P or S specifies pulse or stretch operation, y is the delay to output on, and z is the output delay.

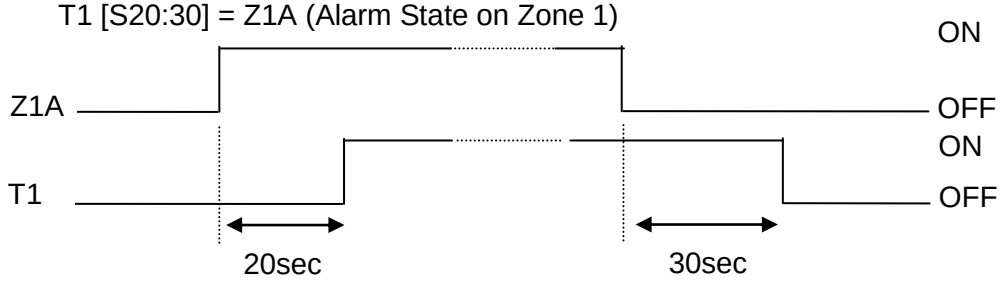
Timers allow outputs to be timed from inputs. They all have two time delays associated with them and can be "stretch" timers or "pulse" timers. The default configuration sets both delays to zero, and all timers are set to "false" on power up.

A stretch timer (S) follows the programmed input with two programmable delays, i.e., Input on to Output on, and Input off to Output off.

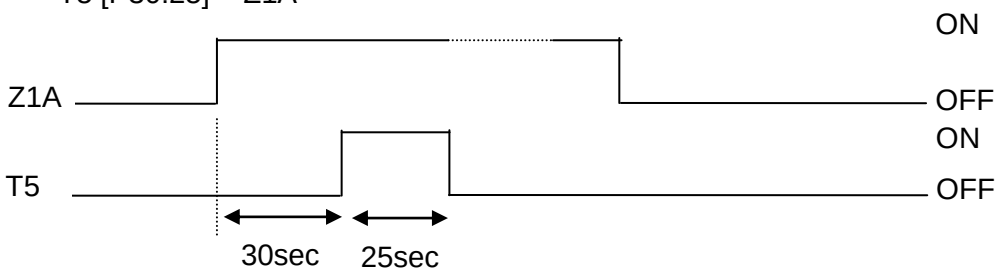
A pulse timer (P) is initiated by the input with two programmable delays, i.e., Input on to Output on, and Output "on" duration.

**Examples:** These examples show a seconds based timer 1-64, but the same logic applies to the minutes based timers.

1. T1 [S20:30] = Z1A (Alarm State on Zone 1)




2. T5 [P30:25] = Z1A




Notes

1. If the input turns off before the first delay has expired, the timer is reset. Timing will restart from zero when the input next turns on.

2. Any changes to the input while a pulse timer output is on will not affect the output.

3. For a pulse time of 0, the output may or may not momentarily turn on.

**THREE LETTER OPERANDS**

ACK When the "ACK" key is pressed with the base display selected this returns true for between 1 and 2 complete passes of all output logic equations.

ALM True if one or more MAF mapped zones are in alarm.

BFT BFT is true when there is a battery connection fault or a battery capacity fault (battery test fail). Note the battery connection tests and battery capacity tests must be enabled for them to produce faults. BFT is false if PSU faults inhibit for 24 hours is active.

BGT True if the brigade test key (or menu option) has been held down for 2 seconds and brigade test is enabled (refer section 6.4.4.5). The token remains true while the key is held down.

BLO If battery low fault monitoring is enabled, BLO is true when there is a battery low fault. BLO is false when 24 hour PSU fault inhibit is active.

BSR BSR (NZ Building Services Restore) is true if the local Services Restore keyswitch is active (and BSR local control is enabled) or if a Services Restore active state is being sent by the FIP (and BSR follow FIP is enabled - refer section 6.4.4.3.6).

BTS True if a manual, hourly, or daily battery test is in progress. This does not include a battery connection test.

CGF CGF is true when there is a charger fault present, regardless of whether a charger fault is programmed as being a system fault. CGF is false if PSU faults inhibit for 24 hours is active.

EBO True when the External Bell is activated (operated) and not isolated or silenced.

EBS True when the External Bell is isolated (silenced).

EBT True when an External Bell test is active.

FFA True when there are one or more events in the FF alarm list.

FLT True if there are one or more non-isolated MAF-mapped zones or ancillary relays in fault.

ISO True if one or more MAF-mapped zones or ancillary relays are isolated.

MFL True if the mains is failed. If it is desired to detect a condition of mains failed continuously for 8 hours then timer logic must be used in conjunction with this token.

MRA MAF Relay Alarm. True if any condition that would cause the MAF alarm relay to be operated is true.

MRF MAF Relay Fault. True if any condition that would cause the MAF fault relay to be operated is true.

MRI MAF Relay Isolate. True if any condition that would cause the MAF isolate relay to be operated is true.

MRS MAF Relay Standby. True if any condition is present that would cause the MAF standby relay to be de-energised.

MUA True if there are one or more unacknowledged alarms in the FF alarm list.

NED New Zealand mode external defect input true. NED is always false if external defect is programmed as not being a fault.

NMA True if one or more non-isolated non MAF-mapped zones are in alarm.

NMF True if one or more non MAF-mapped, non-isolated zones or ancillary relays are in fault.

NML Australian operation
The NML token is false if any of the conditions which cause either the Brigade Alarm or Brigade Fault relay to operate (if not controlled by output logic) are true. Note this does not include conditions which cause the standby relay to de-energise and do not energise Brigade Defect (e.g. fuse blown, database checksum error). The SFT token includes conditions which de-energise standby but not Brigade Fault.

New Zealand operation
The NML token is true if there are no abnormal conditions.

NSA For New Zealand mode, NSA is true if the local silence alarms keyswitch is operated.

ODR True if the outer door is currently open or if the keyswitch on a slim-line RDU is in the "open" position.

RST True when the "RESET" key is pressed with the base display selected. This returns true for between 1 and 2 complete passes of all output logic equations.

SFT True if any system fault is present. This includes all the conditions that cause the standby relay to de-energise, including hardware faults, memory checksum faults and comms fail.

SOA True when the alarm buzzer is currently sounding.

SOF True when the fault buzzer is currently sounding.

STS True if a system test or auto test is currently in progress.

TEV TEV (NZ Trial Evacuation) is true if the local Trial Evac keyswitch is active (and "trial evac local control" is enabled) or if a Trial Evac active state is being sent by the FIP (and "trial evac follow FIP" is enabled - refer section 6.4.4.3.7).

WSO True when the Warning System is activated and not isolated or silenced.

WSS True when the Warning System is isolated. For New Zealand operation, WSS is also true when the Warning System is silenced by the Silence Alarms keyswitch.

WST True when a Warning System test is active.

ZBA True when there is an alarm on a non-isolated zone mapped to the External Bell.

ZWA True when there is an alarm on a non-isolated zone mapped to the Warning System.

### 7.3.5 EXAMPLES OF LOGIC EQUATIONS

**Note** - the following examples are taken from the F3200 programming manual and are for illustration. This kind of functionality is normally implemented at the FIP rather than the RDU.

**Example 1 - Use of Variables**
Assume that two relays are required with similar logic equations, as follows (note, for the RDU, "relays" 65 to 128 correspond to alarm LEDs/relays on zone LED display boards).

R65 = (Z1A + Z2A + Z9A + Z10A) .^ Z3A
R66 = (Z1A + Z2A + Z9A + Z10A) .^ Z11A

Rather than enter both equations in full, it is easier to assign a variable to the common section of logic and enter three equations as follows:

V2 = Z1A + Z2A + Z9A + Z10A
R65 = V2.^Z3A
R66 = V2.^Z11A

**Example 2 - Use of Zone Range and Timers In a Deluge System**
A manned area in a building has a high risk of fire but some chance of false operation of a smoke detector. The area is protected by a solenoid operated deluge system. It is considered best to run three separate smoke detector circuits through the area, and have a "voting" system. Also, there is to be one circuit with heat detectors and MCPs, and a circuit of different coloured MCPs which function as "Inhibit Deluge".
The logic specified by the consultants is that any smoke, heat or MCP operation sounds an Alert warning tone in the area.

If any 2 of the 3 smoke circuits operate, an Evacuate tone is sounded, and 20 seconds later the deluge is to operate if no one has operated "Inhibit".

If an MCP or heat detector operates, the Evacuate tone and timer are to start and "Inhibit" must not prevent the deluge from operating.

Solution:

By assigning the smoke and thermal circuits consecutively, the zone range operand can be used. Inhibit is assigned a separate zone which is configured as not mapped to MAF, ANC1, External Bell and Warning System.

The "zones" could be assigned as follows:
Zones Z9, Z10, Z11 are the smoke circuits
Zone Z12 is the heat/MCP circuit
Zone Z13 is the "Inhibit" circuit
Relay R4 switches the "Zone Alert"
Relay R5 switches the "Zone Evacuate"
Relay R6 switches the "Zone Deluge" solenoid.

The appropriate names for zones and relays should be programmed. For thermal detectors with electronic bases and 15V MCPs, the AZCs should be configured with:
AZC 12 as "Heat", with B3 = Instant Alarm;
AZC 13 as "Manual" with B3 = Instant Alarm.

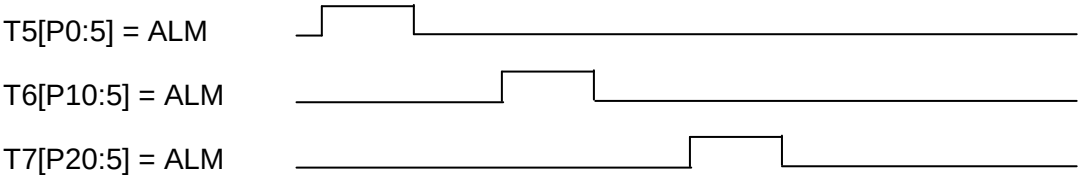
The logic may be entered using the zone range (ZR) option as follows:

R4 = Z9:12(1)A (i.e., alert on any of zones 9-12 in alarm)
V1 = (Z9:11(2)A.^Z13A)+Z12A (i.e., any two of zones 9-11 in alarm with Zone 13 not in alarm, or Zone 12 in alarm).
R5 = V1 (evacuate tone)
T1[S20:0]=V1 (stretch timer, input delay 20 sec)
R6 = T1 (deluge)

The variable, V1, is used to start the timer rather than relay R5, so that if someone operates R5, e.g., by the Test Relay function, there is no chance of it starting the time delay and initiating the deluge (R6).

**Example 3 - Use of Timers**
Timers 1 to 64 are "seconds based" with a range of 0 to 250 seconds, and timers 65 to 72 are "minutes based" with a range of 0 to 250 minutes.
A certain building has an outdoor yard with a very loud sounder. It is too loud to be left on continuously. For any alarm in the premises it is desired to give one set of three 5 second bursts on the sounder with 5 second delays between the bursts.
Solution:

A relay (say R7) is assigned to switch the sounder. Three pulse timers (say T5, T6, T7) are required.

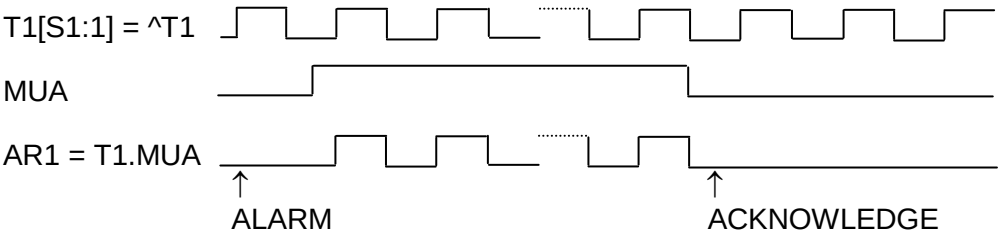



R7 = T5 + T6 + T7

**Example 4 - Use of Timer To Make Continuous Pulsing**
A building has a loud "hooter" to attract the operator to the RDU. The hooter is relay driven and must pulse 1 second on, 1 second off, on occurrence of any alarm until it is acknowledged.

Solution:

Use a timer to make a 1 second on, 1 second off oscillator. An ancillary relay output (say AR1) and a timer (say T1) are assigned. The MUA (MAF unacknowledged alarm) is used as follows:




### 7.3.6 ENTERING EQUATIONS

Entering equations from the keypad is similar to entering text names, but includes entering logical operators and parentheses with specific keys.

When an output (e.g., Relay 65) is selected, press "EDIT", "ENTER" or "►" to enable equation entry mode for that output.

There are two cursors shown on the display, one on the top line to indicate where the next item will be entered in the equation, and one on the bottom line to indicate which operand is selected. The active cursor is a large block character ▉ and the inactive cursor is a small block character ■. The active cursor ▉ may be moved using the ◄ ► arrow keys. The SET/EDIT key is used to swap the active cursor between the top and bottom lines.

Parentheses and the NOT operator may also be entered directly using the NOT, RECALL and PRINT keys. The bottom line of the display shows one of eight sets of operands. These may be scrolled through using the ▲ and ▼keys to choose the desired set. Note that numbers and operators can be entered directly from the keypad.

"EDIT" toggles the cursor between the top and bottom line.

"DELETE" If the cursor is at the end of the equation it deletes the last item in the equation, otherwise it deletes the item under the cursor.

"ACK" saves the equation.

"NEXT" & "PREV" step through outputs (e.g. relays).

**NOTES:**
1. Operators NOT AND OR XOR have an associated precedence (or priority) as described previously and are not necessarily evaluated left to right.

2. It is recommended that parentheses be used liberally to ensure the correct order of evaluation.

3. It is recommended that all equations be written on forms before they are entered, and checked against the forms after they have been entered.

**Example**
**NOTE** this example has been taken from the F3200 programming manual. The RDU does not have module relays or open collector outputs.

Enter an equation to program module relay 5 to activate if Zones 9 or 10 go into alarm, but not if Open Collector 4 is active (say open collector 4 drives a status LED and has a logic equation entered to do this).

The equation is:
R5 = (Z9A + Z10A).^OC4

From the "System Configuration" menu (4), select "Output Logic" (4) followed by "relay" (1).

Use "NEXT" to step onto Relay 5 (R5).

| Press | LCD Shows |
|---|---|
| "►" | R5 = ■<br>AR RL VL ■N TM OC ZR NA NV VR |
| "(" | R5 = ( ■<br>AR RL VL ■N TM OC ZR NA NV VR |
| "ENTER" | R5 = (Z ■ |
| "9", "ENTER" | R5 = (Z9 ■ |
| "1" | R5 = (Z9A ■ |
| "OR" | R5 = (Z9A + ■<br>AR RL VL ■N TM OC ZR NA NV VR |
| "ENTER" | R5 = (Z9A + Z ■ |
| "1" "0" "ENTER" | R5 = (Z9A + Z10 ■ |
| "1" | R5 = (Z9A + Z10A ■ |
| ")" | R5 = (Z9A + Z10A) ■ |

"AND" "NOT" R5 = (Z9A + Z10A).^ ■
AR RL VL ▌N TM OC ZR NA NV VR

"►" "►" AR RL VL ZN TM ▌C ZR NA NV VR

"ENTER" R5 = (Z9A + Z10A) .^OC ▌

"4" "ENTER" R5 = (Z9A + Z10A) .^ OC4 ▌

"ACK" R▌ = (Z9A + Z10A) .^ OC4
Equation Saved OK

The next relay can be selected. Note that (Z9A + Z10A) could have been entered as zone range ZR9:10(1)A.

**Entering an NA Operand in a logic equation**
To enter an NA operand, do the following:

1. Select NA with the ▌ in the bottom line and press "ENTER".

2. Select the first token in the "RESET" group with the cursor keys and enter it.

3. Select the next token in the "RESET" group and enter it (the comma will automatically be inserted when this token is entered).

4. When all the "RESET" tokens are entered, press one of the Operator keys ("AND", "OR", etc) then enter the "SET" tokens (on the right side of the ;).

5. Select the desired tokens with the cursor keys.

6. When all the "SET" tokens are entered, press "AND", "OR", "XOR" or "NOT" to exit from NA. If the NA is the last token in an equation and the operand just entered is not required, press "DELETE".

**NOTES:**
1. A logic equation or another NA token cannot be entered directly as an NA operand. An intermediate variable can be used to achieve the same effect.

# 7.4 OUTPUTS & ANCILLARY RELAYS

### 7.4.1 GENERAL

The Ancillary relays (Anc 1, 2, 3) on the MAF/PSU all have the option of supervision (i.e., checking the wiring from the relay to its load to see that it is not "short" or "open" circuited). The supervision also includes a "confirmation" function, i.e., it expects to "see" a different state after a relay has been activated. If an incorrect state is "seen" by the supervision, before or after relay activation, then a "fault" is signalled for that relay. Supervision in the activated state can be disabled for “load” mode if it is not required, for example when the relay switches the load to 0V.

For each relay, the supervision can be disabled if not required, mapped to the MAF, and made latching or non-latching. Anc 1 and 2 relays can be programmed for two different modes of supervision - door holder or load mode. All relays can be made individually non-isolatable (prevents an operator from isolating them) and non-testable (prevents an operator from isolating them).

"Door holder mode" refers to when the load is normally energised with the relay itself de-energised, e.g., for door holders. The normal state is for the door to be held open by energised magnets (i.e., the load is energised) and the relay itself is de-energised. To close the door the relay energises and disconnects power to the load. "Load mode" is the opposite of door holder mode, whereby the load is de-energised when the relay is de-energised.

### 7.4.2 ANCILLARY RELAY PROGRAMMING OPTIONS

To program ancillary relay options, select option 4:System config from the base programming menu, then option 3:outputs, then option 1:Ancillary relay options.

**Ancillary Relay Options**
The options which may be entered for ANC 1, 2, and 3 are:

- Supervision enabled (E) or disabled (D).
- Supervision latching (L) or non-latching (N) (applies to faults).
- Fault and isolate mapped (M) or not mapped (N) to the MAF.
- Supervision is load (L) or door holder (D) mode (not for Anc 3)
- Isolatable (yes/no)
- Testable (yes/no)
- Supervise Activated State (yes/no)

The default setup (by database re-initialise) is.
ANC 1: supervision enabled, non-latching, mapped to MAF, Door holder, isolatable, testable, supervise activated state.
ANC 2: supervision enabled, non-latching, mapped to MAF, Load mode, non-isolatable, non-testable, supervise activated state.
ANC 3: supervision enabled, non-latching, mapped to MAF, non-isolatable, non-testable, supervise activated state.

### 7.4.3 WARNING SYSTEM/ EXTERNAL BELL MAP TO MAF

The mapping of Warning System and External Bell to the MAF can be enabled or disabled. If enabled, isolate conditions signal Brigade fault and Brigade isolate respectively.

To program these options, select option 4:System config from the base programming menu, then option 3:Outputs, then option 2:Warning system/ External bell. This produces the following menu

1:Warning system maps to MAF 2:External bell maps to MAF

# 7.5 OPERATION OF WARNING SYSTEM/EXTERNAL BELL & ANCILLARY RELAYS

AS4428.1 introduced two new concepts, the Warning System and the External Bell, which the previous AS1603.4 standard did not have. AS1603.4 systems have a “Bells” output which usually corresponds to the External Bell in AS4428.1.

The purpose of the AS4428.1 Warning System is to evacuate people from the building when an alarm occurs. The purpose of the External Bell is to help the Fire Brigade locate the fire panel where an alarm has occurred. In an AS4428.1 F3200 system, the Ancillary 3 relay (Bells) is normally used for the Warning System and the Ancillary 2 relay for the External Bell. The Ancillary 3 relay has different supervision to Ancillary 1 and 2 and can supervise multiple connections, which is why it is used for the Warning System. The External Bell normally has only a single bell connected.

There is a set of "Pass-on FIP, Follow FIP, local control" configuration parameters that affect the operation of the Warning System and External Bell. Refer section 6.4.4.3.

New Zealand Operation

For New Zealand operation, Silence Alarms and Trial Evacuation Brigade switches always map to the Warning System and never to the External Bell. For New Zealand operation, the operating mode is normally set to AS4428.1 as this is compatible with NZS4512:2003.

### 7.5.1 OPERATION OF THE WARNING SYSTEM FOR AS4428.1 OPERATING MODE

Australian Operation

For an RDU with a MAF board the Warning System maps to the ancillary 3 relay implicitly, but can be overridden by a logic equation if necessary. If there is no logic equation for the ancillary 3 relay then the relay is off if the ancillary 3 relay is isolated. Otherwise, if WSO is true and WSS is false, the ancillary 3 relay is activated, otherwise the ancillary 3 relay is off.

**WSS** is true if
- The Warning System is locally isolated, or
- The FIP Warming System is isolated and the RDU is programmed to follow the FIP Warning System isolate state.

**WSO** is false if WSS is true or if there is no MAF board installed, otherwise, WSO is true for any of the following.
- Any zone mapped to the Warning System is in alarm, or
- When the FIP Warning System is activated and the RDU is programmed to follow the FIP Warning System state, or
- A Warning System test is done at the RDU.

**WST** is true when a Warning System test is initiated locally.

New Zealand Operation

For New Zealand systems, trial evacuation and silence alarms map implicitly to the Warning System. New Zealand operation is the same as Australian operation described above with the following additions.

**WSS** is true if Silence Alarms is asserted at the FIP (and the RDU is programmed to follow FIP silence alarms) or if Silence Alarms is asserted locally and local control is enabled for Silence Alarms.

**WSO** is true if FIP trial evacuation is asserted (and the RDU is programmed to follow) or if local Trial Evacuation is asserted and local control is enabled for Silence Alarms.

### 7.5.2 OPERATION OF THE EXTERNAL BELL FOR AS4428.1 OPERATING MODE

For an RDU with a MAF board, External Bell maps to the ancillary 2 relay implicitly but can be overridden by a logic equation if necessary. If there is no logic equation for the ancillary 2 relay then the relay is off if the ancillary 2 relay is isolated. Otherwise, if EBO is true and EBS is false, the ancillary 2 relay is activated, otherwise the ancillary 2 relay is off.

**EBS** is true if
- The external bell is locally isolated, or
- The FIP external bell is isolated and the RDU is programmed to follow FIP Ext Bell isolate state.

**EBO** is false if EBS is true or if there is no MAF board installed, otherwise, EBO is true for any of the following.
- Any zone mapped to the ext bell is in alarm, or
- When the FIP ext bell is activated and the RDU is programmed to follow the FIP Ext Bell, or
- An external bell test is done at the RDU.

**EBT** is true when an external bell test is initiated locally.

### 7.5.3 ANCILLARY 2 RELAY OPERATION FOR AS1603.4 OPERATING MODE

If the ancillary 2 relay is not controlled by output logic, then the relay is off if it is isolated; otherwise the relay is activated if any zone mapped to the ancillary 2 relay is in alarm or if an ancillary 2 relay test is done.

NOTE : When the operating mode is set to AS1603.4, zone configuration (section 7.2.2) allows zones to be mapped to anc1, anc2 and bells. When the operating mode is AS4428.1, zones can be mapped to anc1, External Bell and Warning System.

# 7.6 CONVERTING AN RDU Mk1 DATABASE TO RDU Mk2

### 7.6.1 USING THE DATABASE CONVERSION UTILITY

A database that was originally created by RDU Mk1 software can be used in an RDU running Mk2 software but it must first be converted to a form that can be used with RDU Mk2 software. Also, RDU Mk2 software can be installed in an RDU that was previously running RDU Mk1 software (if the hardware is not too old) and if it is desired to use the existing Mk1 database with the Mk2 software, then the database must first be saved to a computer where the database conversion utility can be used to convert it to RDU Mk2 format. The database conversion utility is available on the Tyco website as software SF0425.

The database conversion utility runs on a PC and reads a database file ("S2/S8 format") that has been captured from RDU Mk1 software and generates a database file ("S2/S8 format") that can be loaded into an RDU Mk2. The command line used to run the database converter is : RDU_DatabaseConverter.exe input_filename output_filename 4428

The 4428 parameter at the end is optional, and if it is present the output database file will have AS4428.1 operation selected, otherwise AS1603.4 operation is selected. An RDU Mk1 database is always AS1603.4 type so if the 4428 parameter is present, some translation is done by the database converter to convert the AS1603.4 database to AS4428.1 operation. The automatic translation may not always be desirable, in which case the "4428" option can be left off and AS4428 operation configured manually after the database has been loaded into the panel. The automatic conversion that occurs when the database is converted to AS4428 mode is as follows.

1. FF Mode is selected as AS4428. Refer to section 6.4.1.1.
2. The keypad type is selected as AS4428. Refer to section 6.4.1.5.
3. The mapping of zones to ANC1, ANC2, ANC3 is converted to a mapping to ANC1, Warning System and External Bell respectively. I.e., zones which were previously mapped to ANC2 become mapped to the Warning System and zones which were previously mapped to ANC3 become mapped to the External Bell.

Refer to the following section 7.6.3 for more information on the changes that need to be made when converting to AS4428.1 compliance. If the RDU is to be fully AS4428.1 compliant then it must have separate relay outputs for the Warning System and External Bell if these are provided. The ancillary 3 relay is most suitable for the Warning System because it supports wiring to multiple circuits of alerting devices.

### 7.6.2 DIFFERENCES BETWEEN RDU MK1 AND RDU MK2 PROGRAMMING OPTIONS

In addition to the changes listed in the previous section when AS4428 operation is selected, there are some other differences between RDU Mk1 and RDU Mk2 programming options. The following is a list of the 1603 RDU parameters that do not have an obvious counterpart in RDU Mk2 and how they are converted.

1. **Custom mode.**
   The 1603 RDU Mk1 had a "mode parameter" that could be set to one of [non LCD mimic, non LCD, type 2 mimic, type 2, type 3 mimic, type 3, custom]. If the "mode parameter" was set to custom, then a number of additional custom mode parameters could be programmed. RDU Mk2 does not have a mode parameter and all of the RDU Mk1 custom mode parameters can be programmed at any time, regardless of other mode settings. These include mimic/ non-mimic operation, FF type 2/3 selection, buzzer options and FF alarm input source type.

2. **Custom mode local ack, local reset, local isolate and local test.**
   RDU Mk1 had the above global parameters but RDU Mk2 does not. In RDU MK2, these items are programmed individually for each zone. Refer to section 7.2.1.

3. **Custom mode "remote ack".**
   RDU Mk2 does not have the "remote ack" parameter. Instead, individual zones are programmed for whether they can be remotely ack'd or not. Refer to the "ackrx" option described in section 7.2.1.

4. **Totals - MAF only or MAF & non MAF.**
   In RDU Mk1, this parameter determined whether both MAF and non MAF zones mapped to totals and common LEDs, or just MAF zones. RDU Mk2 does not have this parameter. Instead, RDU Mk2 allows a zone to be individually mapped to totals, to MAF, and to event logging. In RDU Mk2, if a zone maps to either totals or MAF then it also maps to the common LEDs, unless the common LEDs are mimicking the FIP. If a zone maps to totals then it is always included in zone recalls, regardless of other programming.

5. **Zone to LED mapping.**
   In RDU Mk1, zone programming included specifying the LED the zone mapped to, the type of zone and the outputs the zone mapped to. In RDU Mk2, the mapping of zones to LEDs is separated from the rest of zone programming. Refer to section 7.7.

6. **Database view password.**
   RDU Mk1 allowed the setting of a password for viewing the database. RDU MK2 does not have this option but does allow programming of multiple passwords.

7. **Key enable/disable settings.**
   RDU Mk2 allows each of the individual front panel keys on the keypad to be programmed as enabled or disabled. Refer to section 6.4.4.11.

8. **Buzzer, battery and FF options.**
   RDU Mk2 has additional buzzer options (section 6.4.4.12), battery/PSU options (section 6.4.4.10) and FF options (section 6.4.4.1) that RDU Mk1 did not have.

9. **Output logic**
   RDU Mk2 has output logic (as in F3200) and allows the relays on a MAF board to be driven by a logic equation. LEDs on 16 zone LED display boards can also be driven with logic.

### 7.6.3 DIFFERENCES BETWEEN AS4428.1 AND AS1603.4 OPERATION

When converting from AS1603,4 operation to AS4428.1 operation, some changes need to be made to the database and the system as listed below. In the following steps, the menu keystrokes to get to a particular command are identified as, for example, (Menu ► 2). This means from the base programming menu (which shows “Programming 1: Access code 2: Text 3: Global Data etc”) press the ► (Alarm Test) key followed by the 2 key.

1. An AS1603.4 keypad has a Brigade Test key. With AS4428.1 software installed, this key may still be used to do a Brigade Test. There is also another mechanism for doing a Brigade Test. Pressing the TEST key at the base display, then pressing and holding of the "6" key for 2 seconds will initiate a Brigade Test. There is a programmable option (Menu 3 ► 1) which selects whether Brigade Test should be enabled. This should be disabled if it is not needed.

2. AS4428.1 operation requires type 3 FF operation rather than type 2.

3. There are new battery tests and battery/mains/charger monitoring options that were not available in the older software. These are as follows.

   Battery connection test
   Hourly 90 second battery test
   Daily 40 minute battery test
   Battery low monitoring
   Charger high/low fault signalling
   Mains fail signalling fault after 8 hours.

   These options are accessed via Menu 3 ► ► 3, and all but the last option need to be enabled to comply with AS4428.1. If the daily 40 minute battery test is enabled then it is essential that the battery test resistors R52/R53 (if present) on the MAF module be removed.

5. The mapping of zones to ANC 1 relay, Warning System, and the External Bell needs to be carefully checked. Zones previously mapped to ANC 1, ANC 2, and ANC 3 become mapped to ANC 1, Warning System, and External Bell, respectively, when the database is converted to AS4428.1 mode by the database conversion utility. I.e. a zone which previously mapped to ANC 2 will now be mapped to the Warning System (which by default uses ANC 3) and a zone previously mapped to ANC 3 becomes mapped to the External Bell (which by default uses ANC 2). Therefore, on upgrading, it is likely that the output wiring from ANC 2 and ANC 3 will need swapping over and changes made to the wiring to allow supervision.

   If the ANC 2 relay is not going to be used for either the Warning System or the External Bell, but is still required to operate for an alarm on zones that were previously mapped to it, then those zones will need to have their mapping to the Warning System removed (unless they also need to operate the Warning System) and a logic equation should be entered to drive ANC 2 directly from the zone alarms, or from the ALM token if the ANC 2 relay should operate for any MAF alarm.

   Similarly with the ANC 3 relay, some systems may need to remove the mapping of zones to the External Bell (these are zones which previously mapped to ANC 3) and enter a logic equation for AR3. If the ANC 3 relay is actually used to drive the External Bell then the zones which previously mapped to ANC 3 will have become mapped to the External Bell and this can be left unchanged, but it will be necessary to enter an equation for the External Bell to drive AR3 e.g. AR3 = EBO + EBT

6. The Ancillary 1, 2, 3 relays can be configured as latching/non latching; mapped to maf; isolatable/non-isolatable etc and they can all be configured with a text name. For AS4428.1 compliant systems, the Warning System and External Bell outputs must be supervised.

7. Mapping of the Warning System/ External Bell to MAF.
   It is recommended that these be enabled (Menu 4 3 2 ) so that isolate conditions are signalled to a monitoring centre (refer section 7.4.3).

8. The are some new "FF options" settings that should be checked. Refer to section 6.4.4.1.

# 7.7 ZONE LED MAPPING & CONFIGURATION

This section describes how to map zones to the LEDs on 16 zone LED display boards.

**Menu access**
To access the menus for configuring and mapping zones to LEDs, from the main programming menu, select option 4: System config, then option 5:Zone LED mapping. The following menu appears.

1:LED mapping options 2:LED mapping

Option 1 LED mapping options, produces the following menu.

Local LEDs show 1:Any alarm 2:Any fault 3:Any isolate 4:more

Options 1,2 and 3 allow the selected parameter to be enabled or disabled. Option 4:more produces the following menu

1:Local LEDs show partial isolate

Option 1 allows this parameter to be enabled or disabled.
The parameters shown in the menus above are listed below, with a description of their usage. Unique LED cadences are used to indicate various conditions - isolate, partial isolate, fault & isolate, fault & partial isolate. The cadences are described later in this section.

**Local LED mapping options**

1. **Any alarm [Yes/No]**
   If this parameter is true (i.e., set to "yes"), then for local LEDs, the alarm LED is turned on for both isolated alarms and non-isolated alarms. If false, then only non-isolated alarms are indicated.

2. **Any fault [Yes/No]**
   If this parameter is true ("yes"), then for local LEDs, the fault LED is turned on for both isolated faults and non-isolated faults. If false then only non-isolated faults are indicated.

3. **Any isolate [Yes/No]**
   **Show partial isolate [Yes/No]**
   These parameters apply only to LEDs that have more than one zone mapped to them.

   LEDs with multiple zones mapped
   a. If all zones mapped to the LED are isolated, then the isolate LED is on steady, regardless of the "any isolate" and "show partial isolate" parameter settings.
   b. If some but not all mapped zones are isolated (i.e., a partial isolate condition is present), then if the "show partial isolate" parameter is true ("yes"), a partial isolate state is indicated on the LED.
   c. If some but not all mapped zones are isolated and the "show partial isolate" parameter is false, then the "any isolate" parameter determines what is indicated. If "any isolate" is true then an isolate state is indicated (steady LED) when there is at least one mapped zone isolated. If "any isolate" is false then an isolate state is indicated only when all mapped zones are isolated.

**LEDs with only one zone mapped**

With only one zone mapped to an LED, a partial isolate state never occurs. The isolate LED is on steady when the zone is isolated. With a "two column board", if the zone is not isolated then the isolate LED indicates fault if the zone is in fault and is otherwise off.

**LED Display board types and LED cadences**

There are two types of LED display boards that can be connected to an RDU. One type of board has two columns of LEDs (red and amber) and the other type has three columns of LEDs (one red column and two amber columns). On the three column board, the red column is used to display alarm states, the middle amber column displays fault states and the outer amber column displays isolate states. On a two column board, the amber column can be configured to show isolate states only, or the amber column can be shared by fault and isolate.

Three column board LED cadences

1. Unacknowledged alarm - 2 Hz flash
2. Acknowledged alarm - on steady
3. Fault - on steady
4. Isolate - on steady
5. Partial isolate - 2.5 seconds on, 0.5 seconds off
6. Auto-reset mode (in-situ) - Isolate LED flashes at 2 Hz

Two column board cadences

1. Unacknowledged alarm - 2 Hz flash
2. Acknowledged alarm - on steady
3. Fault - 2 Hz flash
4. Isolate - on steady
5. Fault and isolate - 2 Hz for 1 second then 1.5 on, 0.5 off (2 short, one long)
6. Fault and partial isolate - 2 Hz for 1 second then 1 Hz for 2 seconds (2 short, 2 long)
7. Partial isolate - 2.5 seconds on, 0.5 seconds off
8. Auto-reset mode (in-situ) - Isolate LED flashes at 2 Hz

### 7.7.1 OPERATION OF THE ZONE TO LED MAPPING MENUS

Zone to LED mapping allows programming the LED mapping for a zone or range of zones. For a zone range, all zones in the range can map to the same LED or they can map to a range of LEDs where the number of LEDs in the range is the same as the number of zones in the range. E.g., a zone range of 1 to 5 (5 zones) can map to LEDs 17 to 21 (5 LEDs) or they can all map to LED 17. The display always shows a start zone and an end zone, plus a start LED and an end LED. When a single zone is being mapped, the start zone and end zone are the same value. When a zone range is being mapped to a single LED, the start LED number is the same as the end LED number.

**NOTE 1**. If the PC application “PanelX” is being used, then the dedicated arrow keys on the PC keyboard can be used as left/right arrow operations.

**NOTE 2**. A database re-initialize operation assigns a default LED mapping which is that zones 1 to 528 map to LEDs 1 to 528. If this default mapping is not what is needed, then before entering new LED mapping data, it is probably easiest to first **delete the existing mapping using the DELETE key.** This means that when you enter a new mapping, you are not continually asked to confirm that you wish to replace the existing mapping.

#### 7.7.1.1 Entering SID and Zone Numbers

The "SID" number cannot be changed and always shows as zero on the RDU. The left and right arrow keys are used to move the cursor between the start zone and end zone fields. The SET key is used to swap the cursor between the top and bottom line of the display. The zone numbers are entered on the top line and the LED numbers are entered on the bottom line. Zone numbers must be in the range 1 to 528.

When some, but not all, of the specified zones are already present in the database, then the bottom line of the display indicates this with a "split range" (or "extend range") message as shown in the examples following. When an existing range is being split, the "non-visible" part of the existing range that is being kept, has its LED numbers adjusted to match the reduced size of the zone range. This adjustment should be checked to ensure it gives the desired mapping.

#### 7.7.1.2 Entering a New Zone Range

If none of the zones in the range specified by the start and end zone are present in the database, then the bottom line of the display shows “Zones not present, press ACK to assign”. For example :

```
SID:0   Start zone:31   End zone:40
Zones not present, press ACK to assign
```

Pressing ACK will add this zone range to the database. To assign a single zone, the start zone and end zone should be the same value.

When the zones specified by the start and end zone correspond exactly to an existing entry in the database then the bottom line of the display shows the current LED mapping for those zones. For example :

```
SID:0     Start zone:1  End zone:1
          Start LED :5  End LED :5
```

**NOTE** in “view mode”, the cursor cannot be moved to the bottom line of the display.

If some of the specified zones are present in the mapping database, but do not correspond to an exact entry in the database, then an appropriate message is shown on the bottom line of the display as shown in the examples below.

For example, if the database contained the following entries :

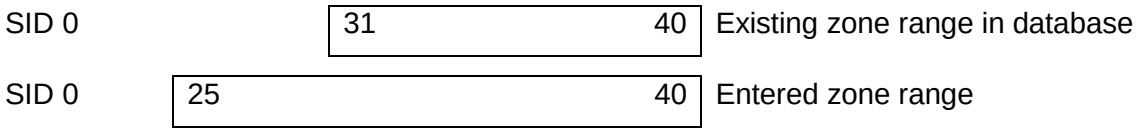
Start zone 5, End zone 12

Start zone 13, End zone 20

If the start zone is now set to 5 and the end zone is set to 20, then the bottom line of the display will show “ACK:Extend range ZONE:Show existing” even though all of the zones are actually already in the database, and the LED mapping for zones in the range 5 to 12 might be different from zones in the range 13 to 20.

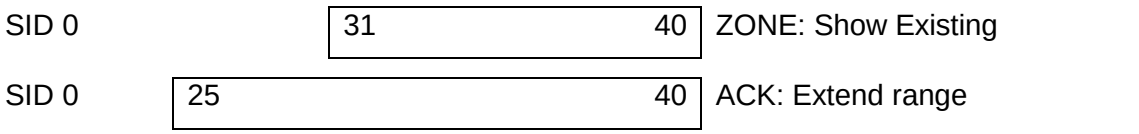
Existing entries in the database can be modified (extended, split or deleted) as shown in the following examples.

**Example 1 - extending an existing range**



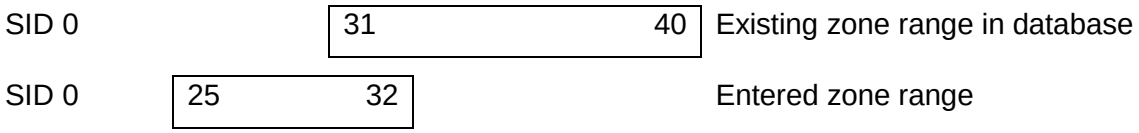

**SID:0 Start zone:25 End zone:40**
**ACK:Extend range ZONE:Show existing**

According to which key is pressed, the result is as follows.



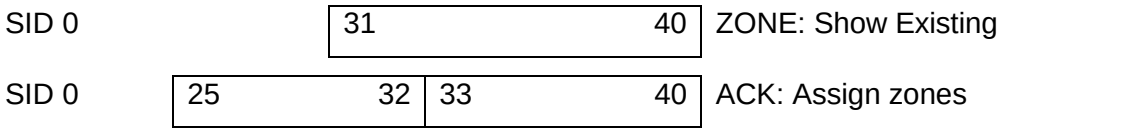

If the ACK key is pressed, the range 25 to 40 will be entered into the database, replacing the range 31 to 40. If the ZONE (or NEXT) key is pressed instead of the ACK key, the display then shows the actual range that is present in the database without changing it.

**Example 2 - modifying an existing range**



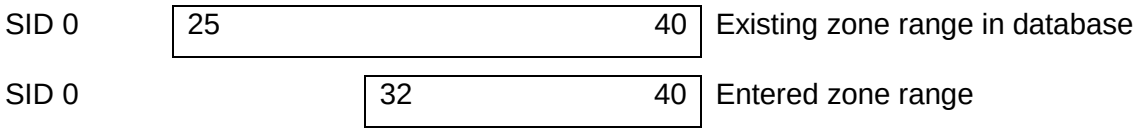

**SID:0 Start zone:25 End zone:32**
**ACK:Assign zone(s) ZONE:Show existing**

According to which key is pressed, the result is as follows.




If the ACK key is pressed, the range 25 to 32 is added to the database and the existing range 31 to 40 is reduced to the range 33 to 40, i.e., the previous range 31 to 40 has been reduced to 33 to 40. If the overall intention was to remove zones 33 to 40 from the database then they must be explicitly deleted (via the DELETE key).

**Example 3 splitting an existing range - 1**




**SID:0 Start zone:32 End zone:40**
**ACK:Split range ZONE:Show existing**

According to which key is pressed, the result is as follows.

| | | |
|---|---|---|
| SID 0 | 25 40 | ZONE: Show Existing |
| SID 0 | 25 31 \| 32 40 | ACK: Split range |

If the ACK key is pressed, the range 25 to 40 is split into two ranges. If the intention was to remove zones 25 to 31 from the database then they must be explicitly deleted.

**Example 4 splitting an existing range - 2**

| | | |
|---|---|---|
| SID 0 | 25 40 | Existing zone range in database |
| SID 0 | 32 35 | Entered zone range |

```
SID:0    Startzone:32    Endzone:35
ACK:Split range  ZONE:Show existing
```

According to which key is pressed, the result is as follows.

| | | |
|---|---|---|
| SID 0 | 25 40 | ZONE: Show Existing |
| SID 0 | 25 31 \| 32 35 \| 36 40 | ACK: Split range |

#### 7.7.1.3 Command Menu

The XOR key can be used to select a "command menu" as shown below.

```
1:Save all to flash     2:Delete zones
```

Option 1 allows saving the entire database to flash memory. If a lot of data is being programmed, it could be worth saving to flash memory periodically, in case of power failure or accidental restart. The database is held in RAM while it is being changed and changes are lost if a power fail or restart occurs while in program mode.

Option 2 selects the delete menu as described in the following section. ESC/CLEAR exits the command menu.

#### 7.7.1.4 Delete Menu

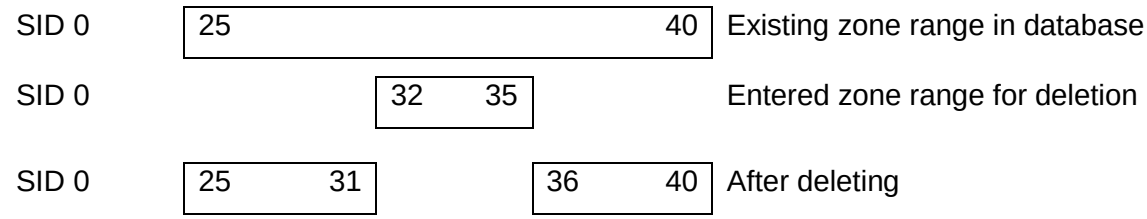
At any place in the LED mapping menus, pressing the DELETE key displays the following menu showing the current values of start zone and end zone.

```
Delete zones 25 - 40
1:Yes  2:No  3:Enter range  4:more
```

Option 1 confirms, and option 2 cancels the deletion of this entry.
Option 3 allows the zone range to be changed, for example :

```
SID:0   Start zone:32   End zone:35
Enter zones to delete then press DELETE
```

The zone range can be part of an existing range, as in this example:




Option 4 in the delete menu, allows deletion of the LED mapping for all zones.

```
1:Delete all zones
```

The delete options should be used carefully as the information cannot be recovered once deleted.

## 7.8 TANDEM LCD MODE

Tandem LCD mode allows the LCD and keypad of an RDU to be "operated" from a PC/terminal connected to the printer/programmer port. PanelX is a software program which runs on a PC and uses Tandem LCD mode to interact with the RDU, allowing the RDU keypad/LCD to be driven from the PC. PanelX presents an RDU-like keyboard on the computer screen.

Refer to section 6.3.9 for information on connecting the RDU to a computer. With a plain terminal or terminal emulator connected to the printer/programmer port of the RDU, tandem mode can be initiated by “pressing” the ENTER key and entering the Tandem LCD password. A password of up to 12 characters can be programmed using option 7 from the text programming menu.

**NOTE :** When a terminal emulator is used to run tandem mode (instead of using PanelX), the "C" (upper case C) key is used to exit tandem mode.

Tandem mode allows full programming of the RDU to be done including database load, save and verify, and "remote text entry”. “Remote text entry” refers to the entering of text names for zones and relays etc. on the programming terminal - refer to section 6.4.3.3. To initiate remote text entry mode when tandem LCD mode is active (or PanelX is being used), enter program mode and select the text programming option. The following text entry menu should appear.

```
1:Site 2:Zone 3:Relay 4:Anc relay 5:Alarm text 6:Fault text 7:Tandem pwd
```

Remote text entry mode can then be initiated by pressing the EDIT key on the keypad. The remote text entry prompt will appear as follows and text can then be entered.

```
Enter Znn, An, S, F, P, Q :
```

# 7.9 CONFIGURING AN RDU FOR AN MX1 PANEL

For Australian fire alarm systems, AS 1670.1 requires any remote fire brigade attendance point display or mimic on an AS 7240.2 approved panel (which MX1-Au is) to include a Fire Brigade Panel (FBP) compliant to AS 4428.3. As the RDU does not have an FBP, and its functionality with MX1-Au is limited, the use of the RDU on MX1-Au is not recommended (use a Remote FBP instead).

All the same, this manual does describe how to connect an RDU to the MX1 and some of the issues involved for when the MX1 and RDU are used in other markets.

The AS 4428.1-style RDU (and the AS 1603.4 RDU with V5.xx firmware) can be used on MX1 to provide remote annunciation and limited control functions to the MX1. Multiple RDUs can be connected to the MX1's RZDU connection to provide displays in different locations. Each RDU can display zone and point alarms from the MX1, allow the zones to be disabled and enabled, show zone faults and allow these to be reset. Zone test alarm and test fault commands can be issued and reset from the RDU.

Other limitations in the use of RDUs on MX1 include:

- Point enable/disable, test, reset, and analogue values are not available at the RDU.
- System functions – battery test, PSU voltages, system faults are not available at the RDU.
- If the Bell Isolate or Warning Isolate function is enabled on the RDU then there will be no resounding of alarm devices (warning system) on new alarms. These functions disable the Alarm Device output rather than only silence it (as per the Silence Alarm Devices key on the MX1). If this function is enabled on the RDU, appropriate warning signs and procedures should be employed.
- The "Ack" function on the RDU is local only and does not silence the buzzer on the MX1.
- The Silence Buzzer key on the MX1 does not "Ack" the RDU, nor silence the RDU sounder.

When an RDU (AS1603.4 or AS4428.1 version) is connected to an MX1 Fire Panel, the Legacy Bells (refer section 6.4.1.6) and FF Mode (refer section 6.4.1.1) parameters may need to be changed from the defaults. As described in section 6.4.1.6, with regard to "Bells Isolate", an MX1 panel behaves like an AS1603.4 panel and can send and receive Bells isolate states/ commands to an RDU. The MX1 panel maps these to its "Alarm Devices disable" status. This means that with an AS4428 RDU, it is necessary to map one of Warning System or External Bell to Bells Isolate (using the Legacy Bells parameter) if the MX1 Alarm Devices disable status is to be displayed and controlled at the RDU.

# CHAPTER 8
# INSTALLATION & WIRING

# 8.1 INSTALLATION : MAF & NON-MAF CONFIGURED RDU

### 8.1.1 CABINET INSTALLATION

The location of the RDU is chosen by the Fire Authority and building owner (or owner's representative) in accordance with the appropriate installation standard.

The cabinet is normally fixed to a wall with four 6 mm screws or bolts. The drilling details are shown in Figure 8.1.1 for the 15U cabinet, in Figure 8.1.2 for the slim line RDU, and in Figure 8.1.3 for the flush mounting version.

The following conditions are required:

1. Dry Area.

2. Moderate ambient temperature, 45°C absolute maximum.

3. Not exposed to direct sunlight.

4. Not subject to outdoor conditions without suitable protection.

5. The LCD should be at average eye level and must not be higher than 1850 mm or lower than 750 mm above finished floor level.

6. Clear access and viewing for Fire-Fighters and operators.

7. At least 1 metre free space should be provided in front of and on sides of the RDU for installation and maintenance.

8. Must not be installed in hazardous areas as defined in AS3000.

9. If recessed into a wall:

    i. Allow for the door to open at least 145°.

    ii. Prevent water entering the cabinet - seal unused knockouts and any top cable entries. Preferably use bottom cable entry, with cables going down 100 mm below cabinet before rising.

| |
|---|
| It should not be necessary to drill within the cabinet, but if drilling or filing is required, remove the PCBs first. Clean out all swarf before replacing the PCBs. |

| |
|---|
| Use antistatic precautions when handling the PCBs. |

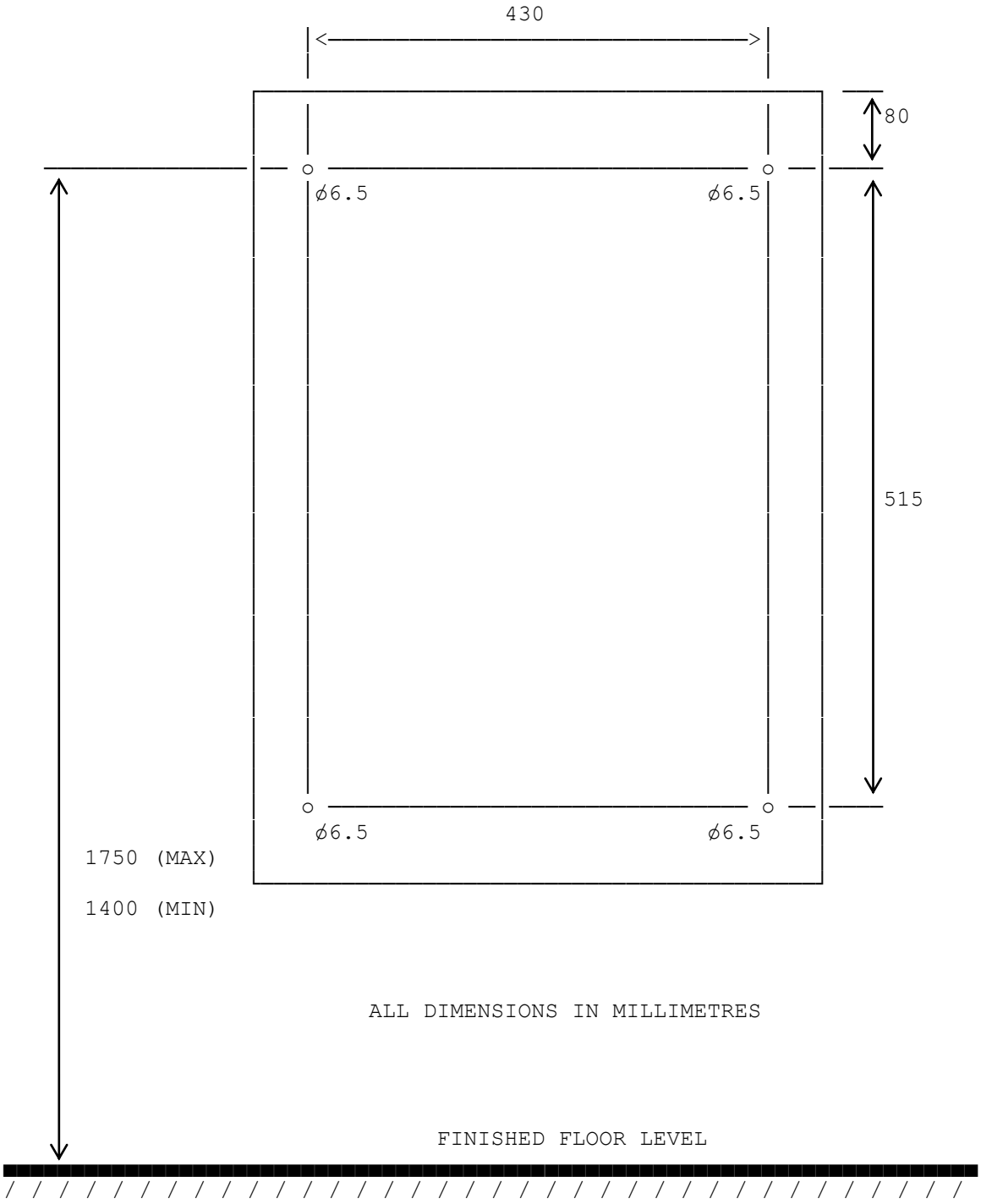



FIGURE 8.1.1
RDU CABINET MOUNTING DETAILS: 15U RDU

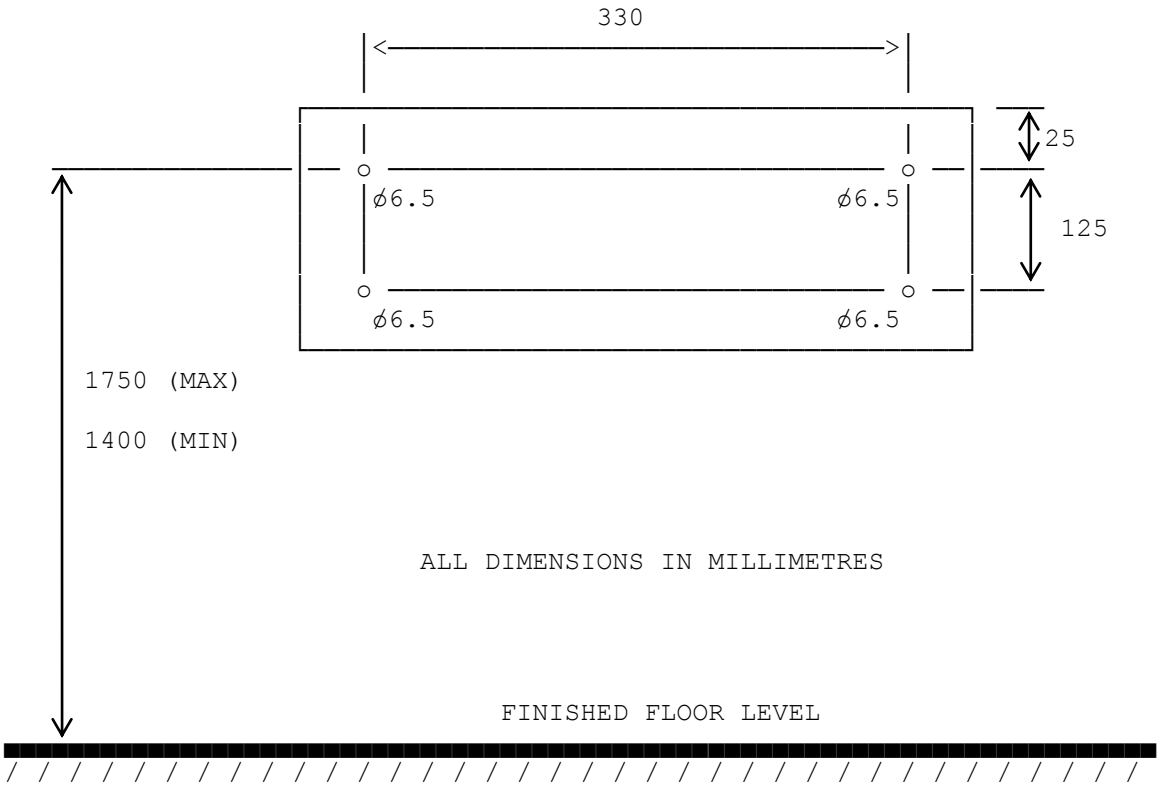



FIGURE 8.1.2
RDU CABINET MOUNTING DETAILS: SLIMLINE RDU

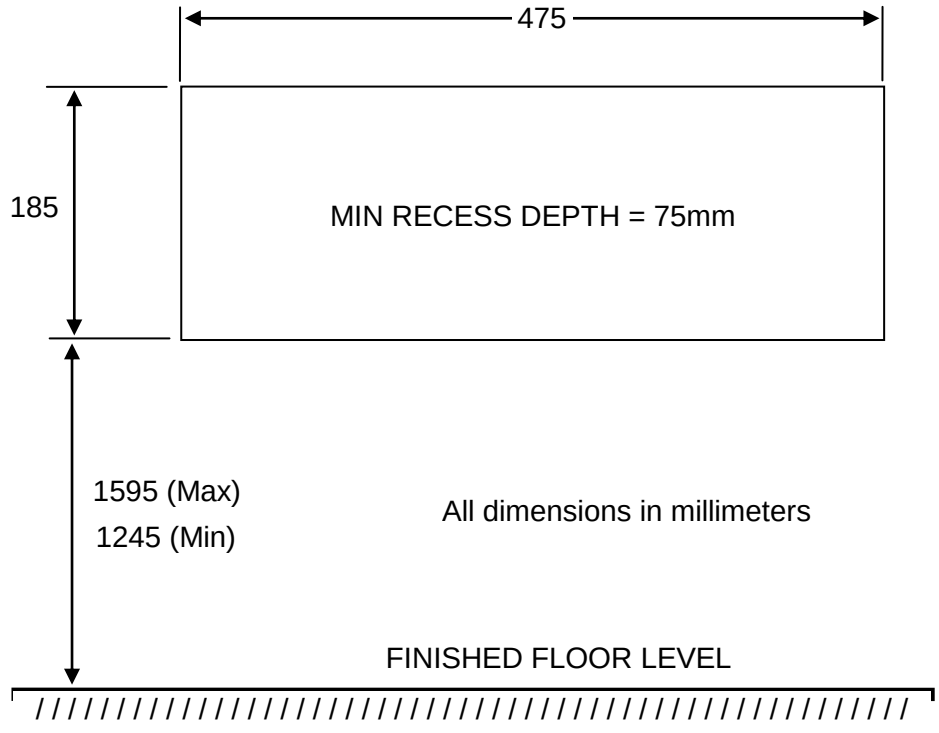



FIGURE 8.1.3
RDU CABINET MOUNTING DETAILS: FLUSH RDU

### 8.1.2 FIELD WIRING

Cabling should comply with all the points in AS1670.1. Note the requirements for segregation and identification.

The cabling should, in general, be not less than 0.75mm² cross sectional area, insulated and have red PVC sheathing. Joins should only occur in enclosed terminal boxes, and it is important that all terminations be good. I.e.

no bare wire protruding from the terminal;
no insulation inside the clamp part of the terminal;
wire not cut or "nicked" during stripping;
wire not soldered;
wire not "doubled back" in the demountable terminals with leaf type strain relief clamps;
all terminals firmly tightened;
neat service loop;
goose neck where servicing requires cable movement;
coil of spare cable in wall/ceiling to allow for mistake/alteration.

Note that it is best to carry out parts of the initial survey during installation, in particular, resistance and insulation testing.

**WARNING**

Apart from the Mains supply to the RDU, only ELV cabling should enter the cabinet.

### 8.1.3 COMMUNICATIONS WIRING

Each FIP can drive up to 8 replying RDUs. The RDUs are all connected in parallel on common Tx and Rx circuits. Note that both Star and Bus wiring connections are permitted as shown in Fig 8.1.4.

NOTE: TX from the FIP goes to RX on ALL RDUs.

RX from the FIP goes to TX on ALL RDUs - not required for mimic RDUs.

Figure 8.1.4 shows an example of interconnection between both MAF and Non-MAF configured RDU(s) and the FIP.

NOTES: To maintain electrical isolation:

(1) One end of Lk1 on the MAF/PSU Board should be cut for RDUs with their own PSU.

(2) Non-MAF configured RDUs (e.g. FP0559, FP0577 or FP0772) that are powered by a PSU other than the FIP must have Lk3 on the Remote Termination Board cut and Lk14 on the Controller in the “R” position.

**Cable Limitations**

The maximum distance to the furthest RDU is determined by the cable type used and the wiring arrangement.

(1) The MAXIMUM line resistance loop (FIP TX out, 0V return must not be greater than 150 Ω.

(2) The MAXIMUM inter-wire capacitance at the FIP RZDU terminals, MUST NOT exceed 100 nF. This should be the total of all cables used - not just the length to the furthest RDU. Typically this is 1km of TPS cabling.

(3) The +V and 0V cables must be of sufficient size to avoid excessive voltage drops to RDUs when they are drawing maximum current (e.g., lamp test).

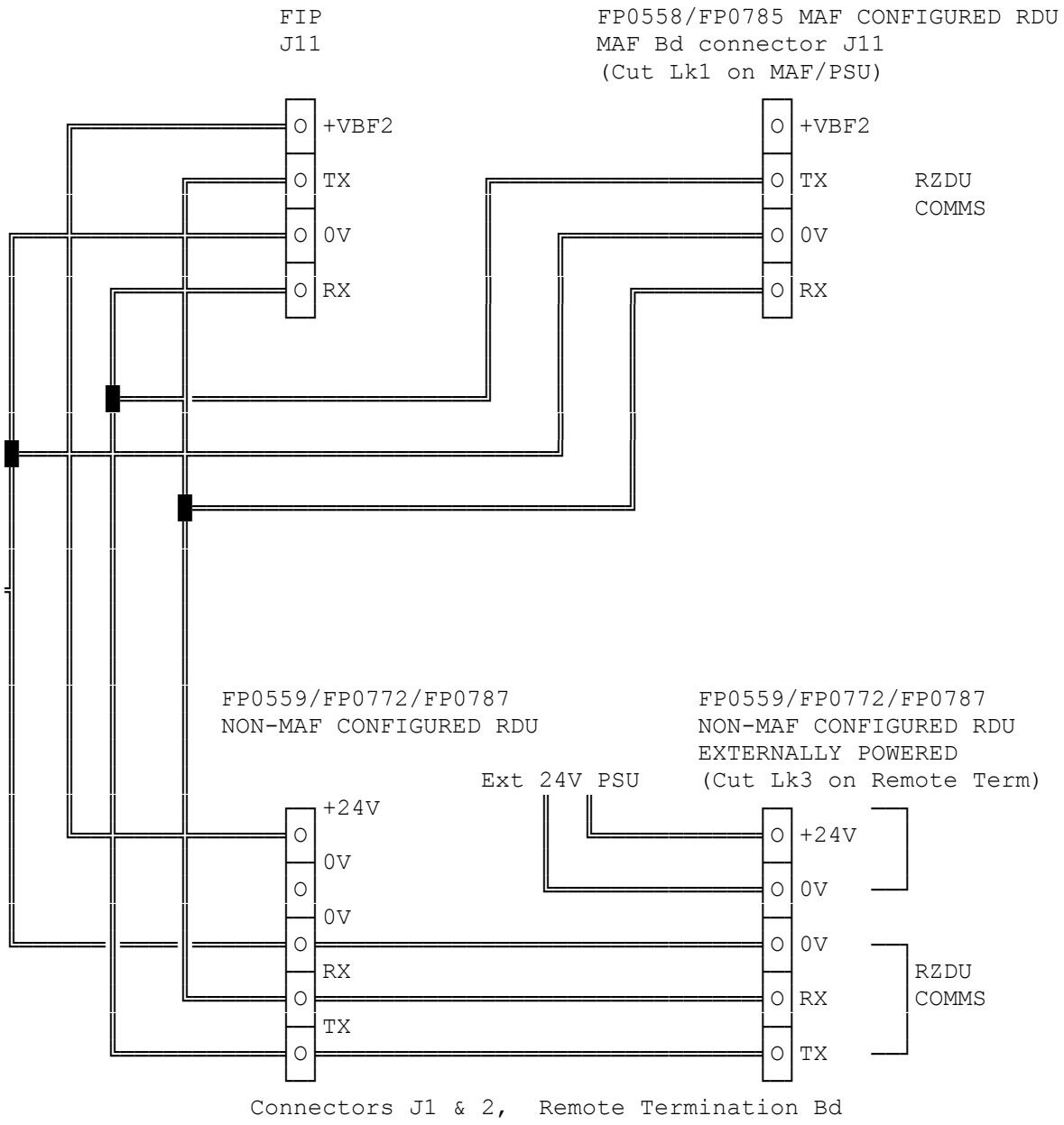



FIG 8.1.4
EXAMPLE OF RDU COMMS WIRING TO FIP

# 8.2 INSTALLATION : MAF RDU

### 8.2.1 MAF RDU MAINS WIRING

The mains (240Vac) supply must be connected by a qualified electrician in accordance with AS1670.1 and AS3000 regulations.

> Ensure the mains cables to the RDU are isolated at the Distribution board before connecting to the RDU.

The mains cable connects to the 3 way terminal block mounted on the cabinet rear behind the mains cover.

(a) Remove the mains cover with an M4 nut driver.

(b) Shape the mains cable to clear the top of the cover, cut to length and strip only 20mm of the PVC cable sheath.

(c) Connect the wires: blue (black) to N
brown (red) to A
green (green/yellow) to E

Take care when stripping not to "nick" wires.

(d) Cable tie the cable to the cabinet.

(e) Refit the mains cover with the M4 nuts and shake-proof washers (note that these earth the cover).

### 8.2.2 MAF RDU LED DISPLAY INSTALLATION

When internal LED Displays are required, the 4U x 80 zone or 7U x 64 zone inner door is fitted to the cabinet directly below the 4U Operator Display with the M6 screws, washers and cage nuts provided. The hinge is on the right hand side. Click the cage nuts in from the inside.

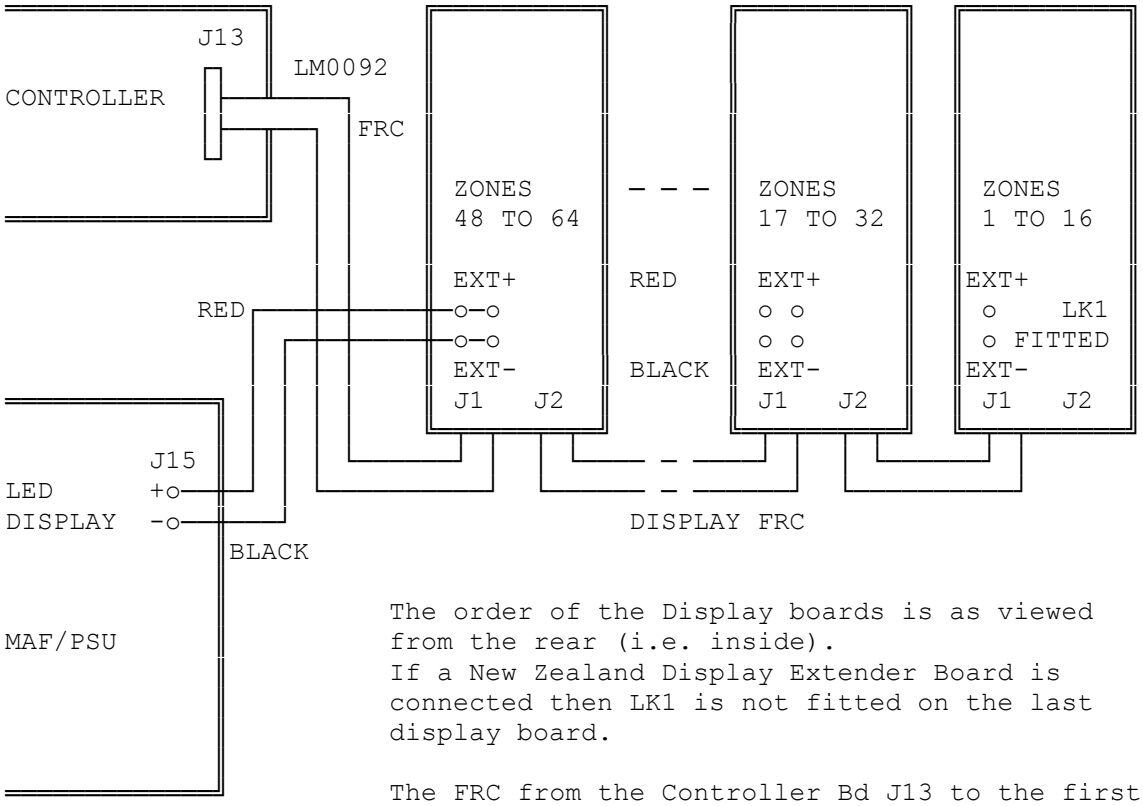
The flat M6 washers have a sharp edge and a rounded edge. Fit washers to the screws with the rounded edge facing the metalwork (to avoid damaging the paint).

The Display Bds mount to the inner door on the standoffs supplied.

Fit the FRCs and mini-jump link as shown in Fig 8.2.1.

The 2-wire LED Display power leads from the MAF/PSU should be fitted to one board in every four, e.g. 1 per 7U inner door.

For New Zealand operation, the Display Extender Board connects to the last 16 zone display board (if any) or directly to connector J13 on the controller if there are no display boards. Refer to section 8.4.




The order of the Display boards is as viewed from the rear (i.e. inside).
If a New Zealand Display Extender Board is connected then LK1 is not fitted on the last display board.

The FRC from the Controller Bd J13 to the first Display Board is a 34 way to 26 way cable, LM0092.

FIG 8.2.1
DISPLAY BOARD CONNECTION

### 8.2.3 RELAY DRIVER BOARD INSTALLATION: MAF RDU

A PA0470 Relay board can be installed where outputs are to be switched via clean contacts on a per zone basis. The PA0470 Relay board can be driven via the "mimic" output connector on either the 16 Zone 3 LED Display Bd or FP0486 Relay Driver board. Both provide open collector outputs, the difference being that the Display Bds also provide zone status indication.

Installation for the FP0486 is the same as that described in the previous section for the 16 Zone LED Display boards. The Relay Driver boards mount on the inner door and FRC is used to chain from one board to the next.

The 16 Way PA0470 Relay boards are then mounted, for example, using a PCB holder on DIN "C" rail. If just one board is to be mounted then the 5 hole pattern for the PCB may be drilled in the back of the case and the board mounted on plastic standoffs. Alternatively the boards can mount in an extender cabinet.

FRC is used to connect from the mimic header of each Relay Driver board or 16 Zone LED board to connector J17 on each 16 way Relay board. Care must be taken not to route the FRC to the Relay board next to the Display FRCs. This is to avoid noise coupling into the display cables.

A wire MUST be run from the cabinet's earth stud to the "E" terminal of connector J18 on each 16 way Relay board. This wire shall be a short as possible. The "+24V" and "0V" terminals of connector J18 are not available for use in wiring applications.

### 8.2.4 LED MIMIC DISPLAYS: MAF RDU

Open collector outputs are available via the mimic connectors of both the 16 Zone LED Display board or the FP0486 Relay Driver board. It is expected that the most common use the open collector outputs will be to switch LEDs on "mimic" displays. These outputs are approved for field connection, so may be used to "drive" remote mimics. Refer to Figures 8.2.4 and 8.2.5.1.

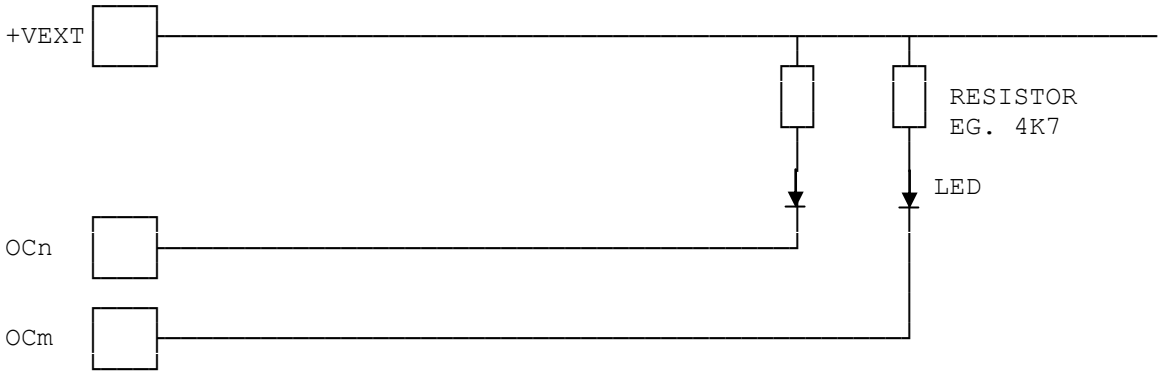



FIG 8.2.4
EXAMPLE OF LED MIMIC WIRING

### 8.2.5 INTERFACING TO OTHER EQUIPMENT: MAF RDU

Where the open collector outputs are used to switch inputs to other systems such as an Evacuation System or Plant Computer there are two main options as follows:

**1. Direct Coupling**

The open collector output switches the equipment input to less than 1V (typically 0.6V at 1mA). E.g. it may be used to switch a 5V CMOS input, or monitored 5V, 12V or 20V input. Refer to Fig 8.2.5.1.

Note that for this to work, the 0V supply of the equipment must be connected to the 0V supply of the RDU. This may not be desired, especially if the equipment has a power supply connection to earth.

Note also that the open collector output has protection diodes to the RDU positive and negative supplies and should not connect to inputs that could be "pulled" to a voltage above or below this voltage, even with mains failed and battery voltage low.

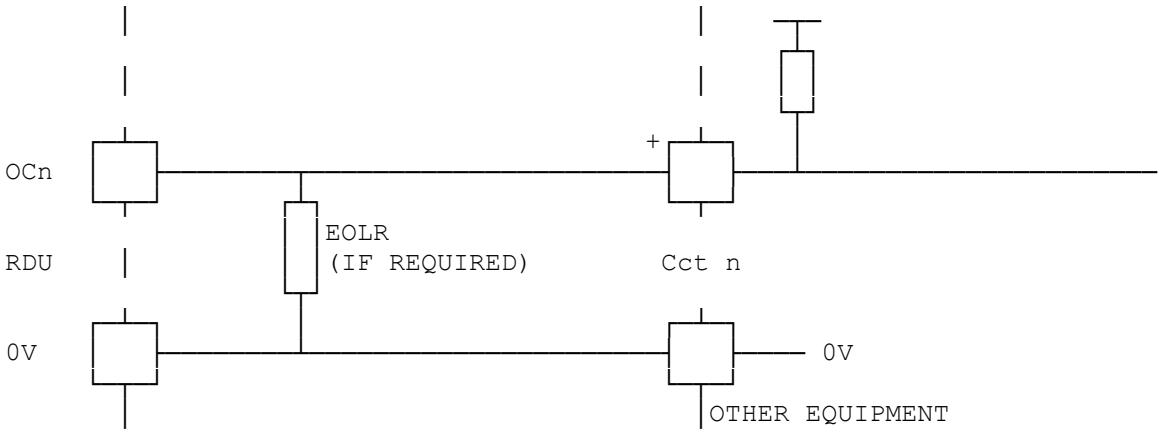



FIG 8.2.5.1
EXAMPLE OF INTERFACING TO OTHER EQUIPMENT, DIRECT COUPLING

**2. Isolated Coupling**

The open collector output can be used to switch a relay, or an opto-coupler as shown in Fig 8.2.5.2. When the open collector is "on", the opto-coupler transistor is also "on".

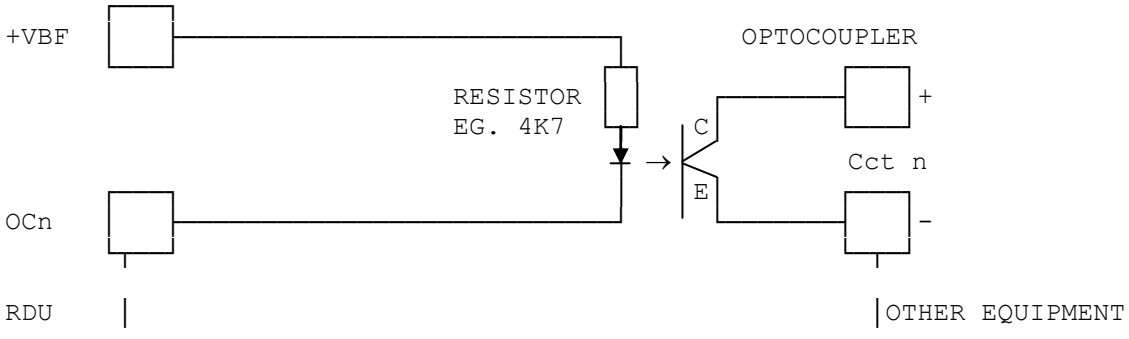



FIG 8.2.5.2
EXAMPLE OF INTERFACING TO OTHER EQUIPMENT, OPTICAL ISOLATION

### 8.2.6 MAF ANCILLARY RELAY WIRING: MAF RDU

Ancillary Relays 1 and 2 each have 1 set of voltage free contacts available for switching plant equipment such as Door Holders, Air Conditioning Shutdown, etc. Where supervision of wiring is required, the supervision (SUP) input is used as shown in the following figures.

**Door Holder Wiring**

Door holders are typically powered through normally closed contacts from the non-battery backed supply (+VNBF). As door holders are inductive, a suppression diode should be fitted between 0V and the door holder positive line.

Where door holders have individual manual release buttons, suppression should be fitted at each device.

> Observe polarity, the cathode of the suppression diode is connected to the positive line.

Where supervision is required, the recommended connection is as shown in Fig 8.2.6 (A or B) with a return from the furthest door holder. The alternative shown in Fig 8.2.6A does not supervise the 0V wire.

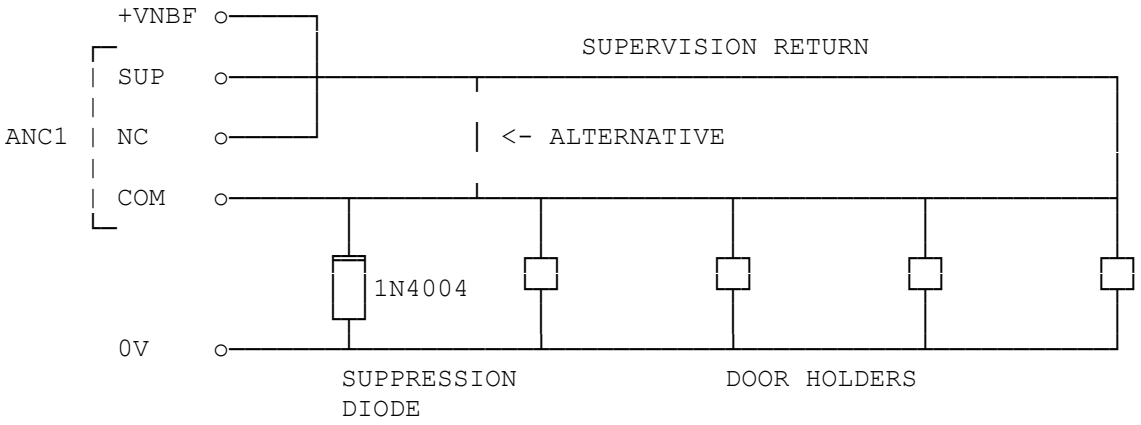
The 24V relay used at the end of the loop in Fig 8.2.6B only needs to switch low current.

"Door Holder" mode supervision "looks for" the presence of voltage when the ancillary relay is de-energised.

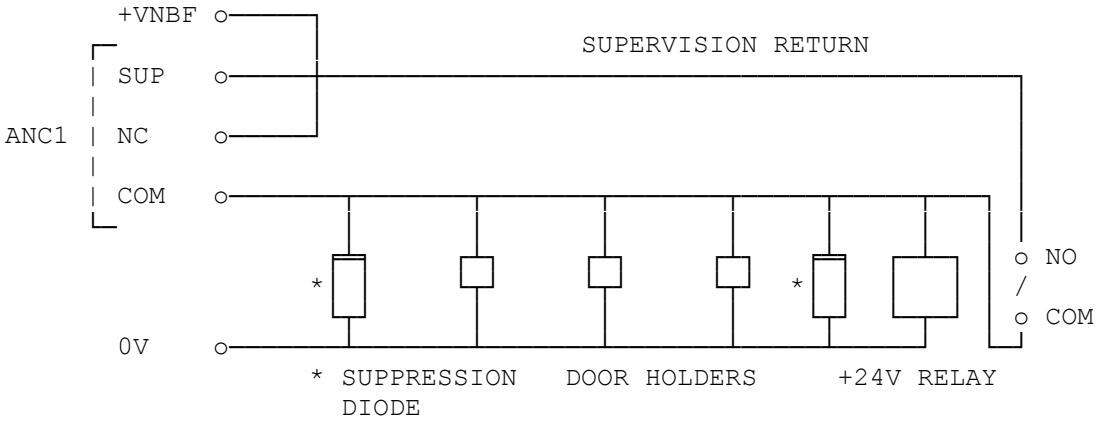
**Plant Relay/Solenoid Wiring**

Where a plant relay is to be energised on Ancillary Relay operation it would typically be powered through normally open contacts from a battery-backed supply.

If wiring supervision is required, it is connected as shown in Fig 8.2.6C. "Load" mode supervision looks for a resistance to 0V when the ancillary relay is de-energised. For a very low resistance load (refer specifications section 3.4.1.1) a series diode must be fitted as shown.

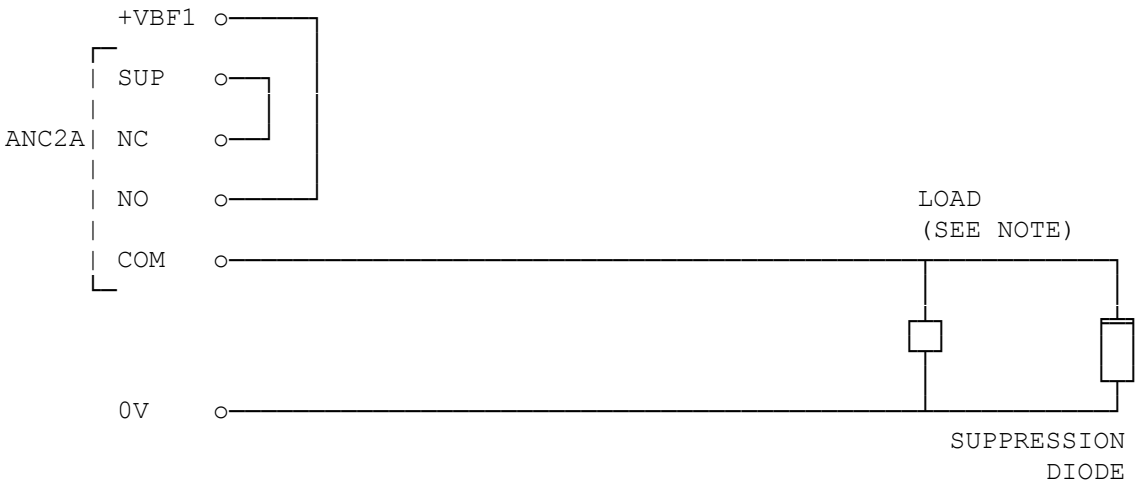



**A. WITH SUPERVISION OF LOOP POSITIVE WIRING ONLY**




**B. WITH SUPERVISION OF LOOP POSITIVE AND NEGATIVE WIRING**

FIG 8.2.6A & B
EXAMPLE OF DOOR HOLDER WIRING WITH SUPERVISION




Note: For a load of less than 400 Ohms a diode of suitable current rating must be added in series with the load at the load as shown below.

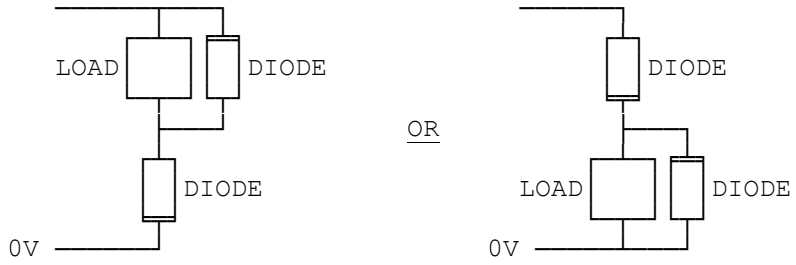



FIG 8.2.6C
EXAMPLE OF PLANT RELAY WIRING WITH SUPERVISION

**WARNING**

Apart from the mains supply to the RDU only ELV wiring may enter the cabinet. Relays must not be used to switch medium or high voltage.

### 8.2.7 WARNING SYSTEM / BELLS WIRING: MAF RDU

24V Bells/Warning System or alerting devices can be connected to the BELLS+/- terminals on J14 of the MAF/PSU. This output has its own fused supply.

As bells are inductive and produce large amounts of electrical noise, suppression is required at each bell.

For non-supervised wiring suppression diodes can be fitted as shown in Fig 8.2.7a (Observe the polarity, with the diode ‖ end to Bells +).

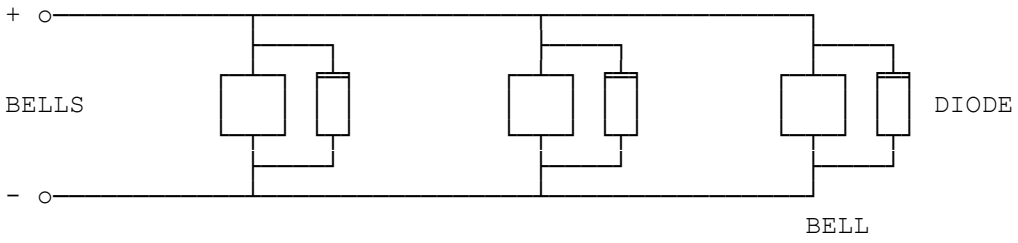



FIG 8.2.7A
EXAMPLE OF BELLS WIRING WITH NO SUPERVISION

**Supervision**

Bells Supervision allows for up to 3 branches of bells, with each requiring its own end of line resistor. The value of the end of line resistor varies with the number of branches such that the combined total is always 3K3.

| Branches | EOLR |
|---|---|
| 1 | 3k3 |
| 2 | 6k8 |
| 3 | 10k |

The EOLR must be fitted at the end of each branch.

For bells supervision, a series diode must be fitted at each bell/sounder, or else a bell/sounder with an internal series diode must be used. In this case, correct polarity of wiring must be ensured.

Where a bell with an internal series diodes is used, non-polarised suppression is required. E.g. a 36V MOV and ceramic capacitor (e.g. 10N, 100V), or a transient suppressor BZW04P31B and ceramic capacitors as shown in Figure 8.2.7b.

Where external series diodes are fitted, diode suppression can be used as shown in Fig 8.2.7 c.

The diode need only be rated to carry the current of the bell. A 1N4004 is adequate.

The Bells output can be wired to other warning system devices, e.g., Min-Gen, T-Gen 50, and the ISO Strobe Driver. Refer to the relevant wiring diagrams with the particular product used.

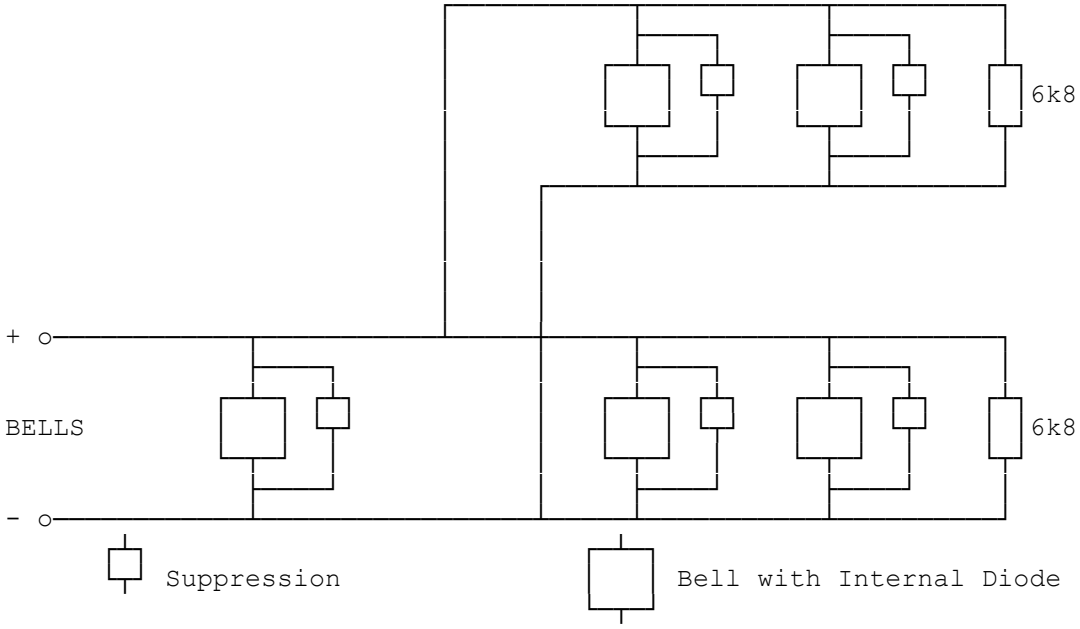



FIG 8.2.7B
EXAMPLE OF BELL WIRING WITH 2 SUPERVISED BRANCHES
FOR BELLS WITH INTERNAL SERIES DIODE

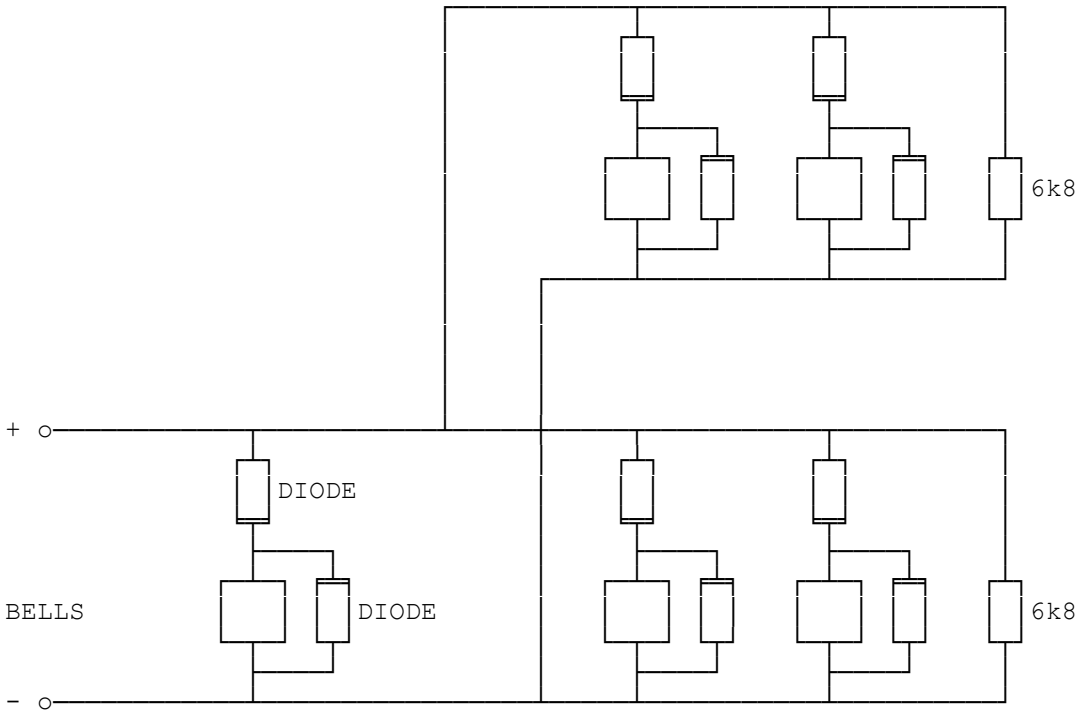



FIG 8.2.7C
EXAMPLE OF BELL WIRING WITH 2 SUPERVISED BRANCHES
FOR BELLS WITH NO INTERNAL SERIES DIODE

# 8.3 SLIMLINE RDU – MCP WIRING

**MCP Connection**

A slimline RDU has the facility for connection of an MCP input, but the MCP has to mount externally, on the wall, immediately adjacent to the RDU.

The MCP is connected to pins 3 & 4 of J5, the 4 way 0.1" "Spare Input Connector" on the RDU Controller/Display Bd, with the loom supplied. The wiring to the MCP itself is detailed in Figure 8.3.

**THE MCP INPUT CANNOT BE USED IN NEW ZEALAND MODE.**

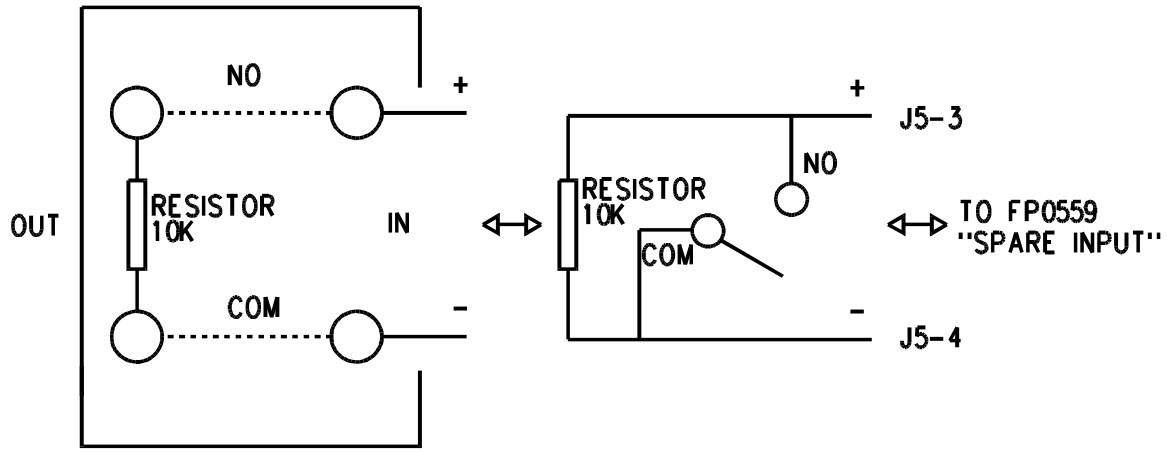



FIG 8.3
MCP CONNECTION TO SLIMLINE RDU

# 8.4 INSTALLATION : NZ DISPLAY EXTENDER BOARD & BRIGADE DISPLAYS

### 8.4.1 GENERAL

The preferred method for remote brigade mimics in New Zealand is to use the LED-RZDU – refer LT0460. The following information describes how remote NZ mimics have been arranged using the RDU.

For New Zealand operation a Display Extender Board (PA0499 or PA0762) can be used if a brigade mimic is needed or access to/display of any of the common signals is required.

In general, a separate display panel must be provided if there needs to be zone alarm indication to the attending Fire Brigade staff. The zone indicators inside the RDU cabinet or RZDU do not meet the requirements of NZS4512, and viewing access to the cabinet by the brigade members is generally not practical.

Any Ancillary Control Zone indicators on this external display must be coloured differently or be segregated from the zone alarm and common indicators, and be clearly labelled.

There are several methods for providing a separate display panel. Two basic approaches are detailed below.

### 8.4.2 MIMIC DISPLAY

A mimic display uses the mimic outputs from the RDU's internal 16 Zone LED Indicator Boards to drive alarm LEDs in an external display. Each group of 16 zone alarms and the common indicators are extended in a separate 26 way FRC to the external display.

The number of FRCs between the RDU and the external display limit the practical separation distance. Since the cabling is not supervised in any way, the Fire Service or approving authority may place restrictions on this distance. The cable must be well protected mechanically by conduit, trunking or equivalent.

These parts are available for constructing displays of this type:

| | |
|---|---|
| FP0475 | FP,16 ZONE LED DISPLAY EXTENDER KIT (C/W LOOM) |
| FZ3031 | 16 ZONE LED DISPLAY EXTENDER KIT, RHS POSITION |
| LM0044 | LOOM, DISPLAY EXTENDER FRC,2M,26 WAY |
| LM0045 | LOOM, DISPLAY EXTENDER FRC,5M,26 WAY<br>(Longer and 3-way looms can be made to special order) |
| LM0092 | LOOM, CONTROLLER TO FIRST DISPLAY, 1.2m |
| PA0483 | PCB ASSY, IOR UNPROTECTED TERMINATION BOARD |
| PA0499 | PCB ASSY, NZ DISPLAY EXTENDER BOARD |
| PA0769 | PCB ASSY,16 O/P MIMIC TERMINATION BOARD,C/W RESISTORS<br>(As for PA0483 but 3k3 resister per output) |
| PA0753 | PCB ASSY,PICTURE FRAME DISPLAY,16 LED MIMIC,24V |
| PA0760 | PCB ASSY,NZ DISPLAY EXTENDER,PFD MIMIC |

At the display panel there are two possibilities:

(i) Geographic Plan Mimic - the FRCs from the RDU are connected to Termination boards (PA0483). Individual LEDs with series resistors are mounted on the display panel and wired to these Termination boards. Figure 8.4.1 shows this arrangement.

Alternatively, the PA0769 Termination Board has 3k3 resistors already fitted (gives 7mA LED current which is adequate for interior use).

(ii) Column Format - where arrangement of zone alarms into columns is acceptable, LED Mimic Display boards can be used. This simplifies the wiring considerably.

The obsolete Picture Frame Display (ME0074 or ME0073 Front Service, or ME0076 Rear Service) is a suitable cabinet, and also has mounting hardware for four 16 zone Display mimic boards (PA0753), plus one Common Indicator and Index Lamp Mimic board (PA0760). Figure 8.4.2 shows this arrangement.

Note that a special 3-way FRC is required for the Display Extender board, so that the miscellaneous inputs are accessible in the RDU cabinet. This is not a standard part, and will need to be made up to suit the application.

### 8.4.3 ACTIVE DISPLAY

An active display is driven from the RDU display chain and is economical for large mimics. The Mk2 Picture Frame Display (FP0967) cabinet is suitable for housing an active display with FRC or a 12 way shielded cable linking it to the RDU (ref. Figures 8.4.3 and 8.4.4). No supervision requirements for this cable are specified in NZS 4512, but because some individual wires in the cable are not supervised (though the cable as a whole is), good fire alarm practice dictates that the distance between the panel and indicating unit should be limited for principal brigade mimics. The wiring should also be well protected by conduit, trunking or equivalent. An electrical limit of 30 metres applies to this connection.

Note the common Normal, Fire and Defect LEDs will need to be specially arranged.

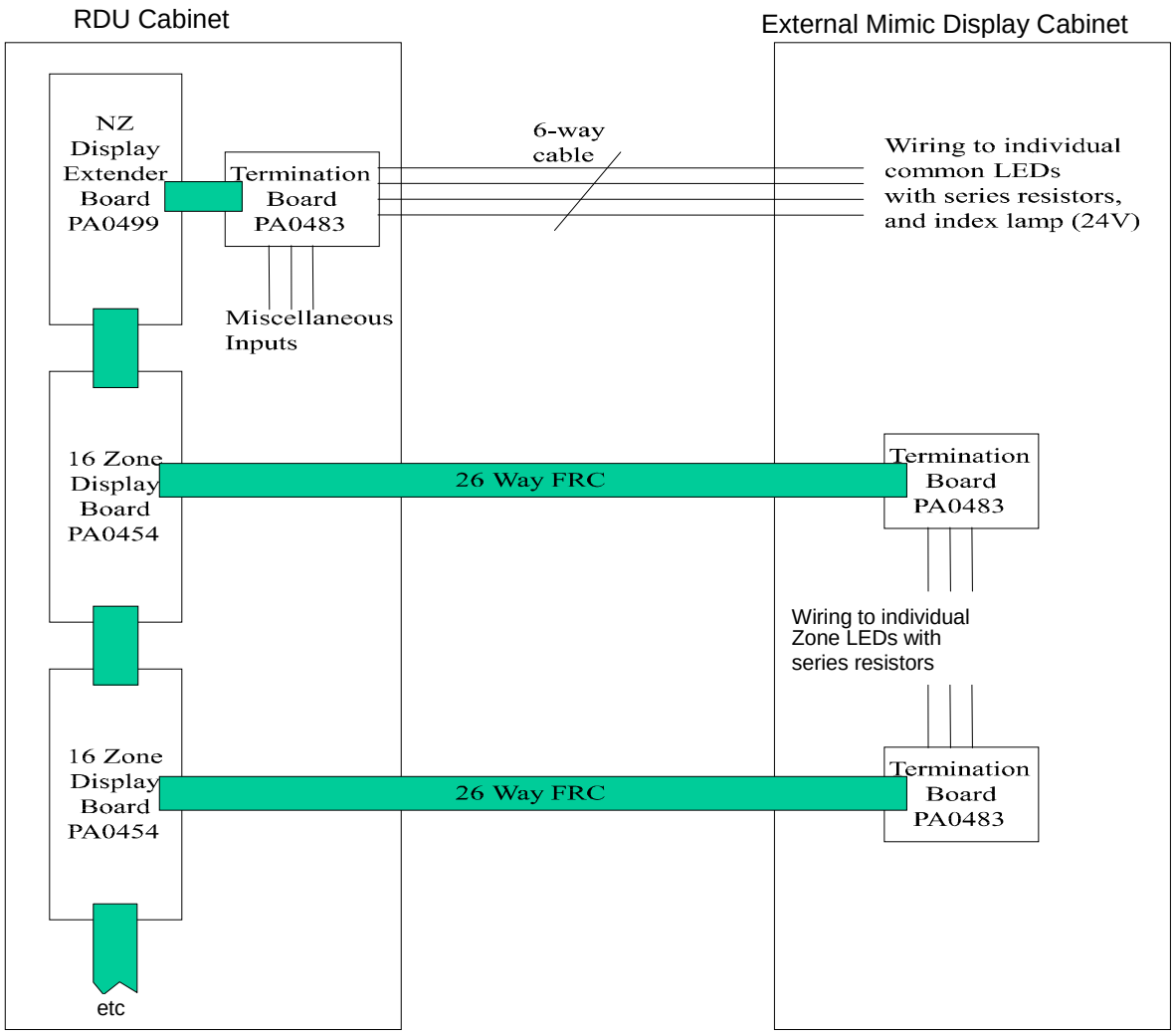
The following parts are available for constructing displays of this type:

| | |
|---|---|
| PA0742 | PFD NZ DISPLAY EXTENDER BOARD,24V<br>(requires special cabinet) |
| PA0741 | PFD DISPLAY 16 ALARM LED,24V (ALARM LEDS ONLY)<br>(requires special cabinet) |
| FP0967 | FP,1952-22,PICTURE FRAME DISPLAY,MK2 |
| FP1002 | FP MX1 16 ZONE LED DISPLAY EXTENDER |
| PA0772 | PFD TERMINATION BOARD (FRC TO MULTICORE) |
| PA0483 | UNPROTECTED TERMINATION BOARD |
| LM0056 | LOOM,DISPLAY EXTENDER FRC,1.4M,26 WAY |
| LM0046 | LOOM, DISPLAY EXTENDER FRC,0.5M,26 WAY |
| LM0092 | LOOM,CONTROLLER TO FIRST DISPLAY,1.2M |

A PA0772 PFD Termination Board is mounted in the RDU cabinet and in the PFD.

### 8.4.4 DISPLAY EXTENDER BOARD MISCELLANEOUS TERMINATION

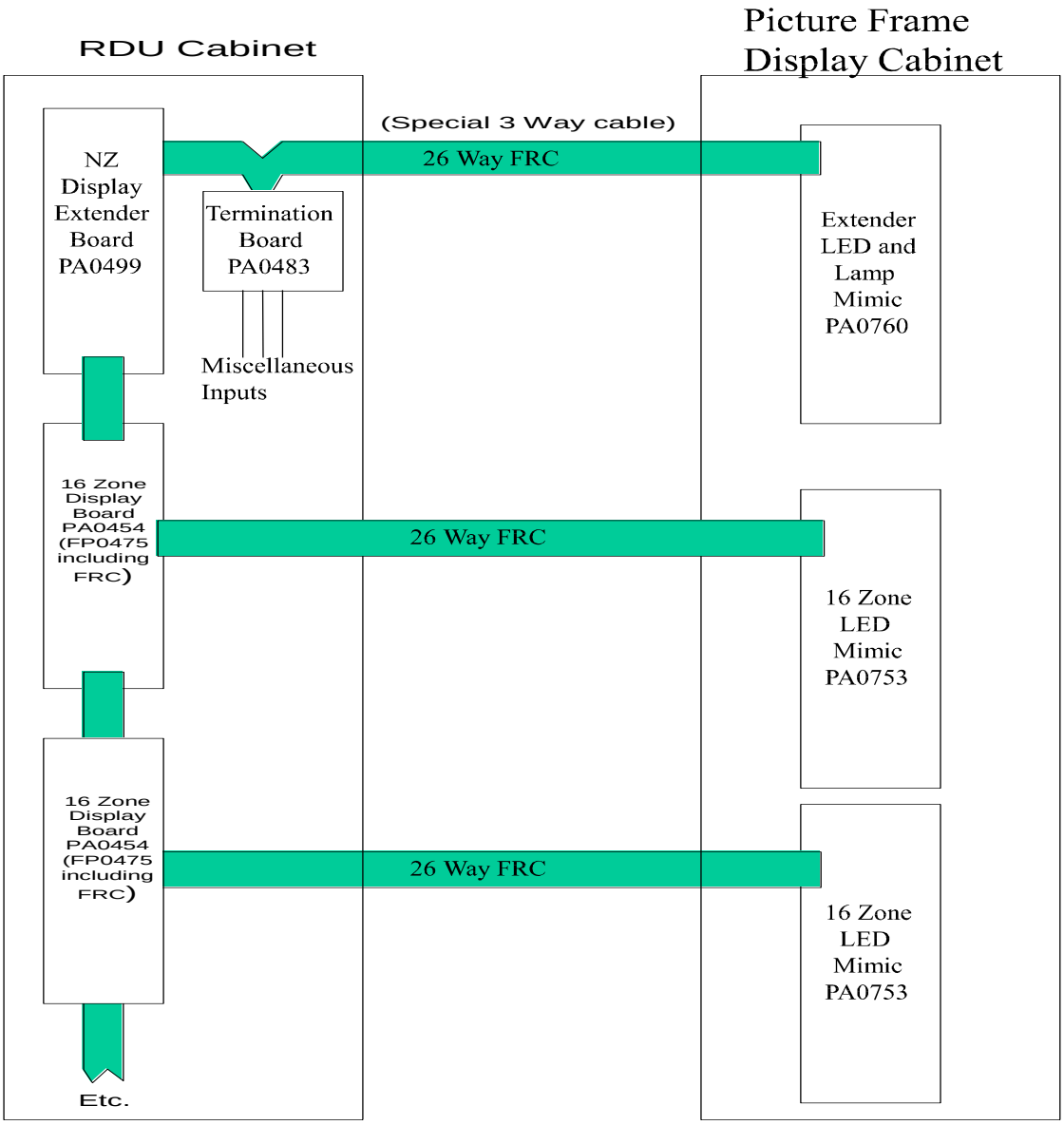
The miscellaneous signals available through a NZ Display Extender Board are accessible via a 26 way FRC and PA0483 unprotected termination board. A termination pin out diagram is given in Fig 8.4.5. Refer to Sections 3.4.1.3 and 3.5.1 for electrical specifications of these signals, and to section 2.4 for their logical functions.




Note: PA0769 Termination Board can be used instead of PA0483
PA0769 has resistors for LEDs already fitted to the PCB.

All shaded cables 26 way FRC.
The first cable from the RDU Controller must be LM0092 (FZ3031 kit)

FIG 8.4.1 - REMOTE PLAN MIMIC DISPLAY




All shaded cables 26 way FRC.
The First cable from the RDU controller must be LM0092 (FZ3031 kit).

FIG 8.4.2 - REMOTE MIMIC USING PICTURE FRAME DISPLAY CABINET

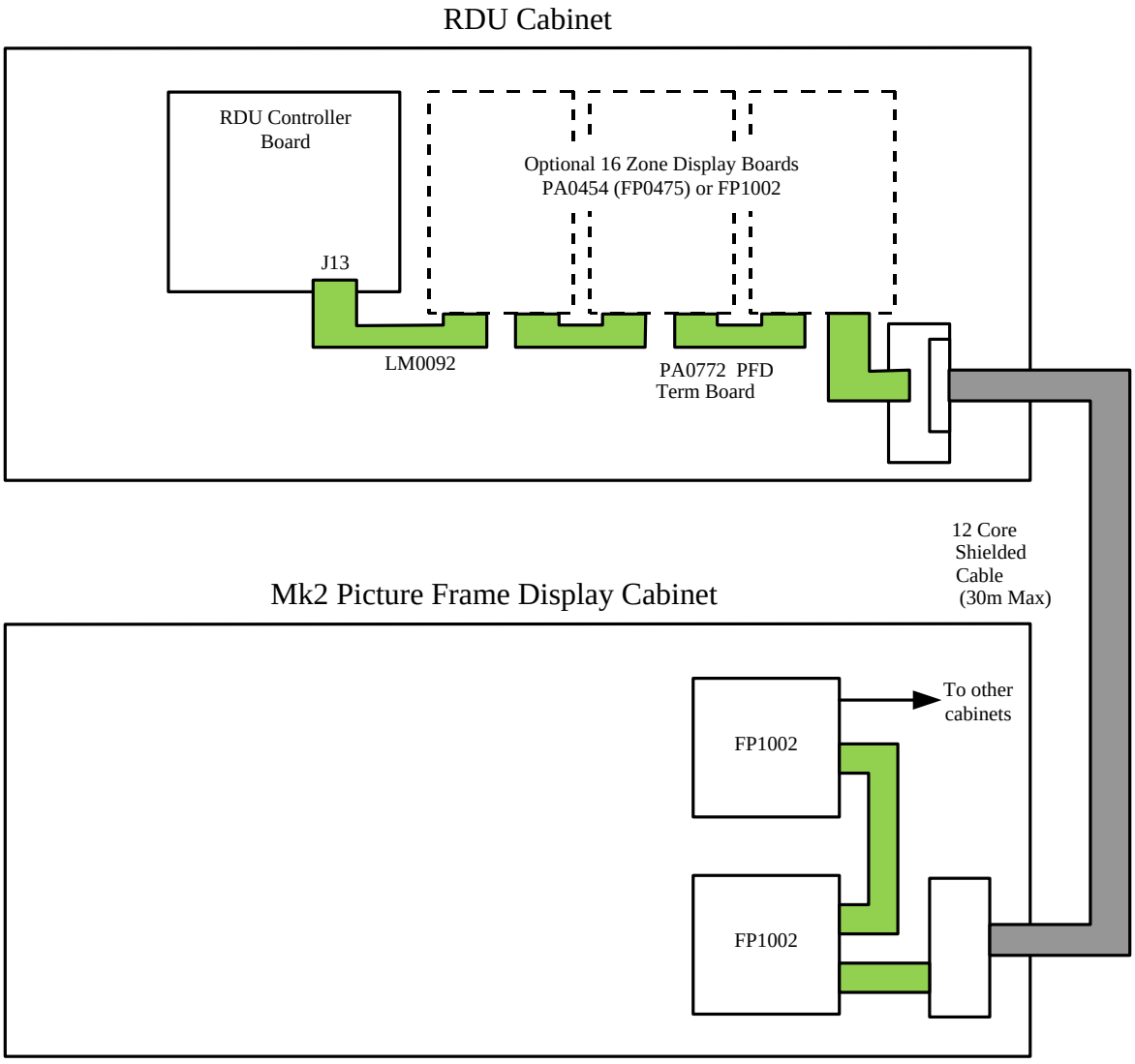



FIG 8.4.3
REMOTE DISPLAY WITH ACTIVE DISPLAY BOARDS
IN PICTURE FRAME DISPLAY CABINET

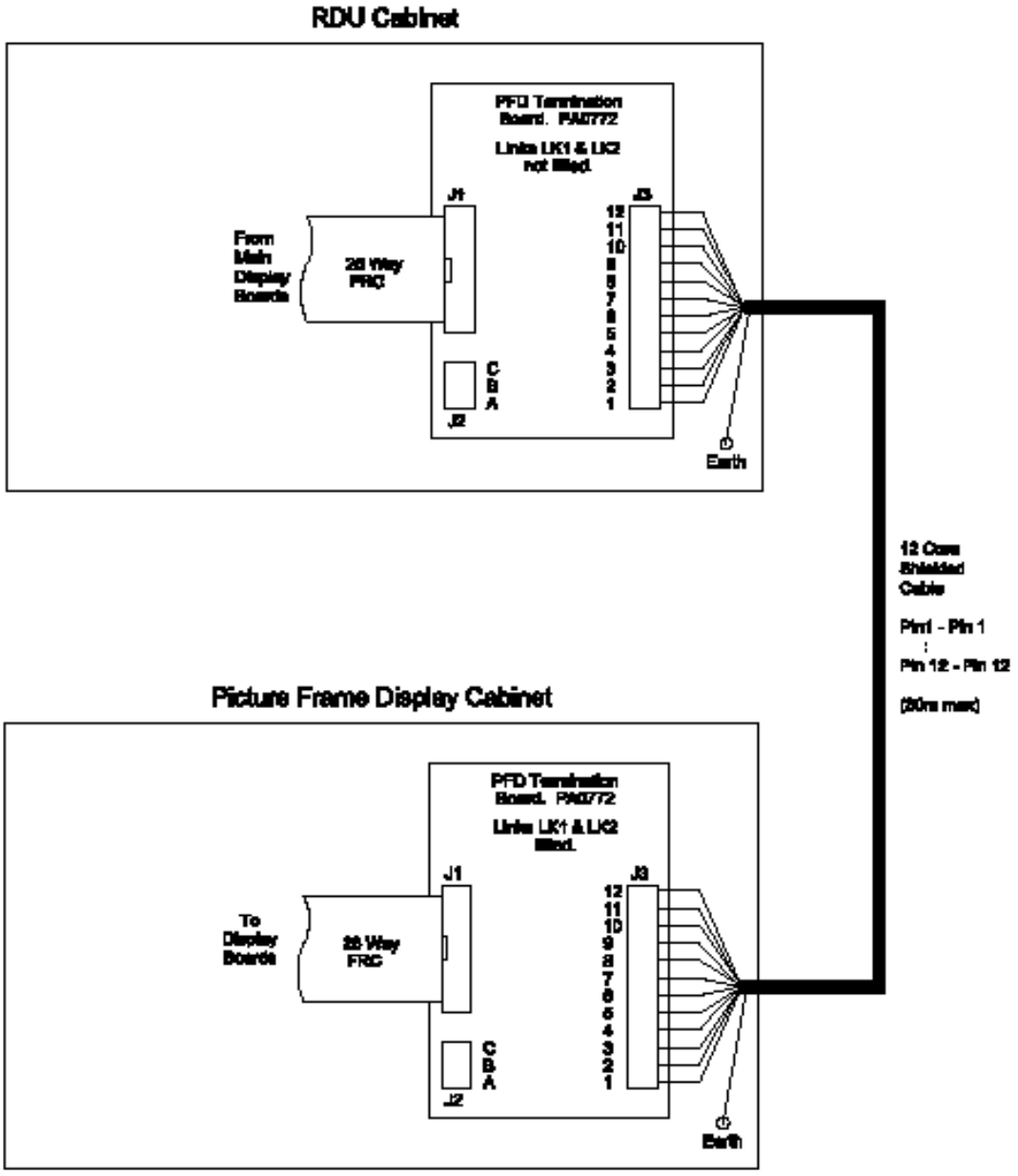



FIG 8.4.4
WIRING OF RDU TO PFD (ACTIVE DISPLAY)

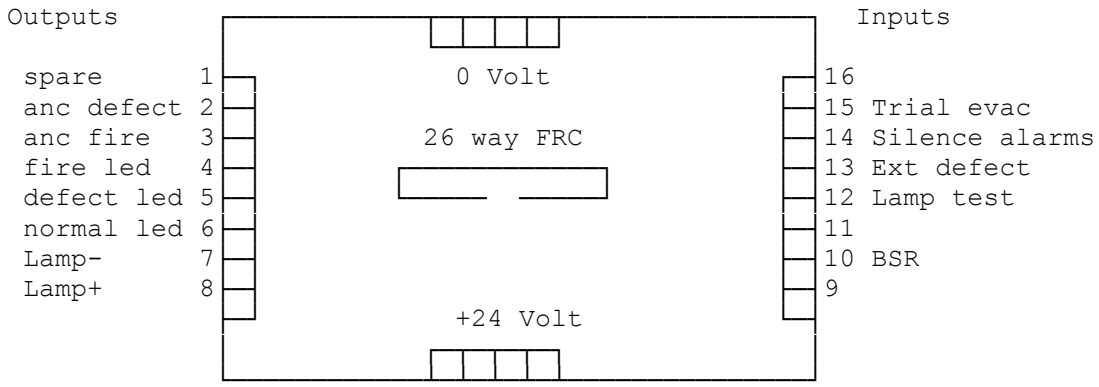



FIG 8.4.5
TERMINATIONS FROM NZ MODE DISPLAY EXTENDER BOARD ON
UNPROTECTED TERMINATION BOARD (PA0483)

# CHAPTER 9
# ALIGNMENT, ADJUSTMENT & PLACING INTO OPERATION

# 9.1 ALIGNMENT & ADJUSTMENT

All the RDU modules (PCBs) are tested and aligned in the factory before being supplied to the customer or fitted to a RDU. The only field adjustments that may be necessary are to set the LCD contrast and the battery charger voltage.

**Controller/Display**

| | | |
|---|---|---|
| VR2 | LCD Contrast | Adjust for best readability of the LCD when viewed from the front of an installed RDU. |

Factory adjustments include:

| | | |
|---|---|---|
| VR1 | Set 1.2V Ref | Adjust for Charger High voltage of 28.1V to 28.15V. |
| VR3 | Adjust 15.9V | Adjust until the 15.9V reference on TP15 is 15.90Vdc. |
| R94, R105 | Fault Threshold | Snip as required to set Fault Threshold to nominal 19.03V. |

**MAF/PSU: MAF CONFIGURED RDU**

PT1 Battery Charger Voltage

Should the battery charger voltage need adjusting, the method is as follows:

1. Run the system with the door closed for at least 30 minutes to allow components to "warm up" (the longer the better).

2. Calculate the required no-load battery charging voltage by taking 27.3V for 20°C and subtracting approximately 0.1V for every 3°C above 20°C, or adding approximately 0.1V for every 3°C below 20°C.

3. With the system not in Alarm, disconnect the batteries.

4. Measure the voltage at the battery terminals and adjust to the voltage calculated in Step 2 by turning PT1.

5. Re-connect the batteries.

PT2 +22V Supply is factory set and should not need field adjustment.

# 9.2 PLACING INTO OPERATION

### 9.2.1 GENERAL

This chapter describes the procedure to place an RDU into operation. It assumes that the mains and other field wiring has been connected, but that the battery has not. Note that all electronic modules were tested and adjusted in the factory and should need no further adjustment.

### 9.2.2 PLACING INTO OPERATION: MAF RDU

**VISUAL INSPECTION**

Before switching on power, inspect the cabinet and internals. Check as follows:

1. Check that all equipment is securely mounted, and that all cables are connected at the appropriate points. The factory checklist is included.

2. Check the 16 Zone LED Displays if present are fitted and connected correctly. (Refer Section 8.2.2).

3. Check that (if required) the additional battery test resistors, 6A power supply and overcurrent protection device are fitted as per Chapter 5 (with PTCs shorted). Note that batteries are not yet connected. NOTE : if the daily 40 minute battery test is enabled, the battery test resistors must be removed.

4. Check that links Lk2-4 on the MAF are fitted, unless Anc3 is being used as clean contacts.

5. Check that a 3 wire comms connection has been made to the FIP with Tx & Rx at the FIP routed to Rx & Tx respectively at the RDU. Also check that the FIP has been programmed correctly to send status/ receive commands to/from the RDU.

The "MAINS ISOLATE SWITCH" is located at the top right hand side of the cabinet rear, to the left of the mains transformer, behind the inner display door. This controls the mains power to the RDU, charger and power supply, and should be left on once the RDU is operational.

**NOTE: The Battery is not disconnected by the "MAINS ISOLATE SWITCH".**

**POWER UP**

To place the RDU into operation, perform the following steps:

**STEP 1** Ensure that the Mains Isolate Switch is OFF.

**STEP 2** Ensure that 240 VAC is connected to the panel from the mains distribution switchboard.

**STEP 3** If an E2INIT is required before programming, fit Lk7 on the Controller to the DATABASE WRITE ENABLE position and fit mini-jump SW1. (Refer to section 6.3.1).

Turn the Mains Isolate Switch ON.

**STEP 4** Check that the buzzer sounds and all LEDs on the Operator Display panel flash for 2 seconds (except Mains On).

**STEP 5** Check that the green "MAINS ON" LED indicator is on.
The Controller performs tests on its memory, electronics, and the LCD.

**STEP 6** If doing an E2INIT, remove mini-jump SW1 and press "ACK" to complete the sequence.

**STEP 7** Check that the LCD has good visibility. The LCD displays the RDU PCB configuration before showing the Base Display.

**STEP 8** Install and connect the batteries.
Take care not to short the battery leads or connect in reverse polarity when connecting.

**STEP 9** If required, complete programming as per Chapters 6 & 7 and then fit Lk7 on the Controller to the DATABASE PROTECT position.

Link Lk7 may be left in the write enabled position if software write protection is enabled and it is desired that the RDU accept and use zone names as received from the FIP. (Refer Section 6.4.4.2).

**STEP 10** Perform a Battery Test.
- If this fails check the battery connections, leave for 24 hours and then retest.

**STEP 11** Perform a Bells and System Test at the RDU, then a system test at the FIP (de-isolate all zones first).

**STEP 12** Check that zone status conditions at the FIP are received and annunciated correctly at the RDU and that commands issued at the RDU act correctly to acknowledge, reset and isolate zones as required.

A full commissioning test should be carried out as per AS1670.1.

### 9.2.3 PLACING INTO OPERATION: SLIMLINE RDU

**VISUAL INSPECTION**

Before switching on power (e.g., do not install RDU remote termination board Fuse F1), inspect the cabinet and internals. Check as follows:

1. Check that all equipment is securely mounted, and that all cables are connected at the appropriate points. The factory checklist is included.

2. Check that a 4 wire comms plus power connection has been made to the FIP with Tx & Rx at the FIP routed to Rx & Tx respectively at the RDU. Also check that the FIP has been programmed correctly to send status/ receive commands to/from the RDU.

3. Double check the FIP MAF/PSU and battery to ensure there is sufficient capacity to cope with the extra loading due to connection of the RDU. Refer Section 5.3.

**POWER UP**

To place the RDU into operation, perform the following steps:

**STEP 1** If an E2INIT is required before programming, fit Lk7 on the Controller to the DATABASE WRITE ENABLE position and fit mini-jump SW1. (Refer to Section 6.3.1).

Install the 2A Fuse supplied into holder F1 on the Remote Termination board.

**STEP 2** Check that the buzzer sounds and all LEDs on the Operator Display panel flash for 2 seconds (except Mains On).

**STEP 3** The Controller performs tests on its memory, electronics, and the LCD.

**STEP 4** If doing an E2INIT, remove mini-jump SW1 and press "ACK" to complete the sequence.

**STEP 5** Check that the LCD has good visibility. The LCD displays the RDU PCB configuration before showing the Base Display.

**STEP 6** If required, complete programming as per Chapters 6 and 7 and then fit Lk7 on the Controller to the DATABASE PROTECT position.

Link Lk7 may be left in the write enabled position if software write protection is enabled and it is desired that the RDU accept and use zone names as received from the FIP. (Refer Section 6.4.4.2).

**STEP 7** Perform a System Test at the RDU, then a system test at the FIP (de-isolate all zones first).

**STEP 8** Check that zone status conditions at the FIP are received and annunciated correctly at the RDU and that commands issued at the RDU act correctly to acknowledge, reset and isolate zones as required. A full commissioning test should be carried out as per AS1670.1.

### 9.2.4 COMMISSIONING CHECKLIST: MAF RDU

The following checklist should have been completed and supplied by the manufacturer. It should be placed with other System Configuration Information. Commissioning staff should check the installed RDU against it. (Note that all PCBs are electronically tested and adjusted before being fitted to the RDU).

**1. CABINET & GENERAL**

| | | |
|---|---|---|
| A) | Cabinet colour - Standard Cream Wrinkle (BFF 998 CW)<br>- Other: _____ | ☐ |
| B) | Cabinet undamaged (Paint OK) | ☐ |
| C) | Door aligned correctly | ☐ |
| D) | Window undamaged and fitted correctly | ☐ |
| E) | MCP fitted and undamaged | ☐ |
| F) | Cabinet Door locks firmly, operates microswitch | ☐ |
| G) | Lock - 003 Type & two keys supplied | ☐ |
| H) | Door seals fitted to top and sides | ☐ |
| I) | Display Keypad and 4U door fitted & aligned correctly | ☐ |
| J) | Standoffs fitted to cabinet rear (none missing) | ☐ |
| K) | Operator Manual, battery leads & MCP key included | ☐ |
| L) | VIGILANT™ RDU label completed | ☐ |

**2. PCBS & WIRING**

| | | |
|---|---|---|
| A) | MAF/PSU Fitted securely on standoffs | ☐ |
| B) | Controller/Display fitted securely | ☐ |
| C) | FRC Looms fitted correctly | ☐ |
| D) | MCP & door switch wires fitted to J6 of MAF/PSU, secured | ☐ |
| E) | Earth wire fitted to display door | ☐ |
| F) | All modules earth to cabinet metal | ☐ |

## 3. POWER SUPPLY

| | | |
|---|---|---|
| A) | Mains Wired correctly, MOV, cap fitted | ☐ |
| B) | "Mains Isolate Switch" and "NAE" label fitted | ☐ |
| C) | Mains Earth wired to stud, good contact | ☐ |
| D) | All 6 fuses fitted to MAF/PSU | ☐ |
| E) | Mains Switch neon off/on for switch off/on | ☐ |
| F) | MAF/PSU Mains On LED on, Fuse Blown LED off | ☐ |
| G) | VRECT at DC IN tab 40-42Vdc | ☐ |
| H) | Charger Voltage 27.3-27.4V warm, 27.5-27.6V cold | ☐ |

## 4. OPERATION

| | | |
|---|---|---|
| A) | LEDs bright through window, "MAINS ON" LED on | ☐ |
| B) | Correct modules are configured and found on E2INIT | ☐ |
| C) | Buzzer louder with microswitch operated (Controller Lk2 Fitted) | ☐ |
| D) | Controller Lk7 in "Protect" position | ☐ |
| E) | LCD contrast correct for front view | ☐ |
| F) | System test pass | ☐ |
| G) | Recall -> MCP shows "MCP Alarm" for MCP operation | ☐ |
| H) | Acknowledge silences buzzer, Zone Resets | ☐ |

SERIAL NUMBER ☐ TEST PASSED ☐

DATE : ……..... SIGNATURE : ……..... 

### 9.2.5 COMMISSIONING CHECKLIST: SLIMLINE RDU

The following checklist should have been completed and supplied by the manufacturer. It should be placed with other System Configuration Information. Commissioning staff should check the installed RDU against it. (Note that all PCBs are electronically tested and adjusted before being fitted to the RDU).

**1. CABINET & GENERAL**

A) Cabinet colour – Grey Gloss PR12/816C ☐
- Other: _____

B) Cabinet undamaged (Paint OK) ☐

C) Door aligned correctly ☐

D) Cabinet Door locks firmly, operates microswitch ☐

E) Lock - 003 Type & two keys supplied ☐

F) Display, Keypad and Status LEDs fitted & aligned correctly ☐

G) Operator Manual included ☐

H) VIGILANT™ RDU label completed ☐

**2. PCBS & WIRING**

A) Controller/Display fitted securely ☐

B) Remote Termination Bd fitted securely, Fuse F1 installed ☐

C) FRC Looms fitted correctly ☐

D) Door switch fitted to J7 of Remote Termination Bd ☐

## 3. OPERATION

A) LEDs bright through window ☐

B) Correct modules are configured and found on E2INIT ☐

C) Keypad disabled, Buzzer louder with keyswitch hard clk-wise ☐

D) Controller Lk7 in "Protect" position ☐

E) LCD contrast correct for front view ☐

F) Passes System Test ☐

G) Acknowledge silences buzzer, Zone Resets ☐

H) Controller Lk2 (Service Mode) fitted ☐

SERIAL NUMBER ☐ TEST PASSED ☐

DATE : ……..... SIGNATURE : …….....

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# APPENDIX A

**RDU CONFIGURATION FORMS**

The following pages are suggested as master forms for programming. It is recommended that they be photocopied, and a complete set be filled in for each RDU before programming is started.

When programming is completed, the database printout should be checked against the forms.

A copy of the database printout and completed forms should be kept in the contract file for each installation.

## RDU MK2 SYSTEM CONFIGURATION PAGE 1

REF:.....

SITE TEXT .....

FAULT ACTION TEXT ……

| SYSTEM PARAMETERS & HARDWARE | | |
|---|---|---|
| Address | 1 - 8 | |
| FF Mode | AS4428.1 / AS1603.4 | |
| MAF board present | Yes / No | |
| Keypad type | AS4428.1 / AS1603.4 | |
| MCP installed | Yes / No | |
| Legacy bells | WarnSys, ExtBell, None | |
| Mimic mode | Enable/disable | |
| Protocol type | LCD-A / Non-LCD / LCD-B | |
| Common LEDs show local status | Yes / No | |
| Common LEDs show FIP status | Yes / No | |
| Number of LED display boards | 0 - 33 | |
| Max LEDs on | 1 - 240 | |
| All zones isolated operates standby? | Yes / No | |
| Brigade test | Enable / disable | |
| Capture FIP time/date | Yes / No | |
| New Zealand mode? | Yes / No | |

| PSU / BATTERY OPTIONS | | | | | |
|---|---|---|---|---|---|
| Mains enabled | Y/N | | Mains Frequency | 50/60 | |
| 8 hours mains fail = fault | Y/N | | Battery connection test enable | Y/N | |
| Charger high/low = fault | Y/N | | Hourly Battery test enable | Y/N | |
| Battery low monitoring | Y/N | | Daily Battery test enable | Y/N | |
| Battery very low monitoring | Y/N | | | | |

| NEW ZEALAND MODE OPTIONS | | |
|---|---|---|
| Display extender board present? | Y/N | |
| External defect is enabled? | Y/N | |

**RDU MK2 SYSTEM CONFIGURATION PAGE 2** REF:.....

| ACCESS CODES 0-9 USER INITIALS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | | | | | | | | | |

| MAF RELAY LOGIC EQUATIONS | | |
|---|---|---|
| | NAME | LOGIC EQUATION |
| ANC1 | | |
| ANC2 | | |
| ANC3 | | |
| STANDBY | | |
| FAULT | | |
| ISOLATED | | |
| ALARM | | |

| ANCILLARY RELAY CONFIGURATION | | | | | | | |
|---|---|---|---|---|---|---|---|
| | ENABLE SUPVSN. Y / N | LATCH Y / N | MAF Y / N | MODE Door-holder /Load | ISOL Y / N | TEST Y / N | SUP.ACT Y / N |
| ANC1 | | | | | | | |
| ANC2 | | | | | | | |
| ANC3 | | | | | | | |

| ANCILLARY RELAY NAMES | |
|---|---|
| ANC1 | |
| ANC2 | |
| ANC3 | |

| WARNING SYSTEM / EXTERNAL BELL OPTIONS | | |
|---|---|---|
| Warning System maps to MAF | Y/N | |
| External Bell maps to MAF | Y/N | |

## RDU MK2 SYSTEM CONFIGURATION PAGE 3

REF:.....

| FF OPTIONS | | |
|---|---|---|
| FF auto ack enable/disable | Yes / No | |
| FF type | 2/3 | |
| FF display cause by default | Yes / No | |
| FF new cause new alarm | Yes / No | |
| FF multiple cause updates | Yes / No | |
| FF switch to newest alarm | Yes / No | |
| FF show zone number | Yes / No | |
| FF show isolated alarms | Yes / No | |
| FF zone alarm shows point text | Yes / No | |
| FF show FIP zone names | Yes / No | |
| Capture FIP FF alarm zone name to database | Yes / No | |
| LCD messages generate FF alarms | Yes / No | |
| LED messages generate FF alarms | Yes / No | |

| BUZZER OPTIONS | | |
|---|---|---|
| Follow FIP alarm buzzer | Y/N | |
| Follow FIP fault buzzer | Y/N | |
| Zone alarm buzzer enable | Y/N | |
| Zone fault buzzer enable | Y/N | |
| System fault buzzer enable | Y/N | |
| Non-MAF zone faults buzzer | Y/N | |
| Faults resound after 8 hours | Y/N | |
| Sounder after 8 hours isolate | Y/N | |
| Sounder “8 hour” resound period | 0-255 | |
| Buzzer operates in loud mode when door open | Y/N | |

## RDU MK2 SYSTEM CONFIGURATION PAGE 4

REF:.....

| USER COMMANDS | | |
|---|---|---|
| Global Ack | Enable/disable | |
| Global Reset | Enable/disable | |
| Global Isolate | Enable/disable | |
| Type 3 Global Ack | Enable/disable | |
| Ancil 1 isolate | Pass-on, follow, local | |
| Warning System isolate (AS4428 only) | Pass-on, follow, local | |
| Warning System operate (AS4428 only) | Pass-on, follow, local | |
| External Bell isolate (AS4428 only) | Pass-on, follow, local | |
| External Bell operate (AS4428 only) | Pass-on, follow, local | |
| Bells isolate (AS1603.4 only) | Pass-on, follow, local | |
| Bells operate (AS1603.4 only) | Pass-on, follow, local | |
| Services Restore (NZ only) | Pass-on, follow, local | |
| Trial Evac (NZ only) | Pass-on, follow, local | |

| ZONE LED MAPPING OPTIONS | | |
|---|---|---|
| LEDs show any alarm | Yes/No | |
| LEDs show any fault | Yes/No | |
| LEDs show any isolate | Yes/No | |
| LEDs show partial isolate | Yes/No | |

## RDU MK2 SYSTEM CONFIGURATION PAGE 5

REF:.....

| DAYLIGHT SAVING | | |
|---|---|---|
| | START | END |
| MONTH | | |
| HOUR | | |
| MINUTE | | |
| DAY: (one of next 1,2,3) | | |
| 1: LAST WEEKDAY OF (MON-SUN) | | |
| 2: Nth WEEKDAY OF (MON-SUN) | | |
| 3: DATE | | |
| TIME DIFFERENCE: | | |
| HOUR | | |
| MINUTE | | |

| EVENT LOGGING | | |
|---|---|---|
| Event printing enable/disable | Y/N | |
| Printer lines per page | 0 – 250 | |
| Printer baud rate | 300 – 9600 | |
| Print relay control events | Y/N | |

| EVENT TYPES LOGGED TO PRINTER AND HISTORY | | |
|---|---|---|
| | PRINTER Y/N | HISTORY Y/N |
| ZONES | | |
| SYSTEM | | |
| SYS RUN | | |
| CIRCUIT | | |
| POINT | | |
| RELAY | | |

## RDU MK2 SYSTEM CONFIGURATION PAGE 6

REF:.....

### KEY ENABLE/DISABLE SETTINGS

| Key | Non-FF Mode Door Open Key Enabled Y/N | FF Mode Door Open Key Enabled Y/N | Non-FF Mode Door Closed Key Enabled Y/N | FF Mode Door Closed Key Enabled Y/N |
|---|---|---|---|---|
| Prev | | | | |
| Next | | | | |
| Ack | | | | |
| Reset | | | | |
| Isolate | | | | |
| Relay | | | | |
| External Bell Isol | | | | |
| Warn Sys Isol | | | | |
| AIF Mode | | | | |
| Clear | | | | |
| Recall | | | | |
| Ancil Isol | | | | |
| Zone | | | | |
| System | | | | |
| Numeric | | | | |
| Enter | | | | |
| Batt Test | | | | |
| OR | | | | |
| AND | | | | |
| XOR | | | | |
| NOT | | | | |
| Print | | | | |
| Set | | | | |
| Test | | | | |
| Alarm Test | | | | |
| Fault Test | | | | |
| Brigade Test | | | | |
| Bells Isol | | | | |
| | DEFAULT IS ALL ENABLED | DEFAULT IS ALL ENABLED | DEFAULT IS ALL DISABLED | DEFAULT IS ALL DISABLED |

## RDU MK2 GLOBAL ZONE CONFIGURATION REF:.....

| | |
|---|---|
| MapFF Y/N | |
| AlmSndr Y/N | |
| MultiAlm Y/N | |
| AckTx Y/N | |
| AckRx Y/N | |
| LocAck Y/N | |
| ResetFF Y/N | |
| IsoFF Y/N | |
| Hide Y/N | |
| Log Y/N | |
| Total Y/N | |
| Alarm test Y/N | |
| Fault test Y/N | |
| Output type Y/N | |
| MapMAF Y/N | |
| MapANC1 Y/N | |
| Map ExtBell Y/N (AS4428) | |
| MapWarnSys Y/N (AS4428) | |
| MapANC2 Y/N (AS1603) | |
| MapBells Y/N (AS1603) | |

## RDU MK2 ZONE CONFIGURATION PAGE OF REF:.....

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Zone | | | | | | | | | | | |
| End Zone | | | | | | | | | | | |
| MapFF Y/N | | | | | | | | | | | |
| AlmSndr Y/N | | | | | | | | | | | |
| MultiAlm Y/N | | | | | | | | | | | |
| AckTx Y/N | | | | | | | | | | | |
| AckRx Y/N | | | | | | | | | | | |
| LocAck Y/N | | | | | | | | | | | |
| ResetFF Y/N | | | | | | | | | | | |
| IsoFF Y/N | | | | | | | | | | | |
| Hide Y/N | | | | | | | | | | | |
| Log Y/N | | | | | | | | | | | |
| Total Y/N | | | | | | | | | | | |
| Alarm test Y/N | | | | | | | | | | | |
| Fault test Y/N | | | | | | | | | | | |
| Output type Y/N | | | | | | | | | | | |
| MapMAF Y/N | | | | | | | | | | | |
| MapANC1 Y/N | | | | | | | | | | | |
| Map ExtBell Y/N (AS4428) | | | | | | | | | | | |
| MapWarnSys Y/N (AS4428) | | | | | | | | | | | |
| MapANC2 Y/N (AS1603) | | | | | | | | | | | |
| MapBells Y/N (AS1603) | | | | | | | | | | | |

**RDU MK2 LED DISPLAY BOARD CONFIGURATION** REF:……

| ZONE LED DISPLAY BOARDS | | | |
|---|---|---|---|
| BOARD NUMBER | 2 COLUMN / 3 COLUMN 2/3 | SHARE ISOLATE/ FAULT LED Y/N | RELAY/ OUTPUT TYPE Y/N |
| 1 | | | |
| 2 | | | |
| 3 | | | |
| 4 | | | |
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| 30 | | | |
| 31 | | | |
| 32 | | | |
| 33 | | | |

**RDU MK2 CONFIGURATION**
**ZONE NAMES**

REF:.....

| ZONE NUMBER | ZONE NAME (MAX 30 CHARACTERS) |
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**RDU MK2 ZONE DISPLAY** REF:.....
**BOARD LED OUTPUT LOGIC CONTROL** PAGE..... of .....

| LOGICAL RELAY NO (65-256) | LED SET (1-64) | ALARM, FAULT, ISOLATE | LOGIC EQUATION |
|---|---|---|---|
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**RDU MK2 OUTPUT LOGIC**

REF:.....
PAGE..... of .....

| TIMER/VARIABLE/ RELAY | LOGIC EQUATION |
|---|---|
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REF:.....

| **RDU MK2 ZONE TO LED MAPPING** | | | | | **PAGE /** |
|---|---|---|---|---|---|
| | START ZONE | END ZONE | START LED | END LED | COMMENTS |
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