

FIRE PUMP REMOTE MONITOR PANEL

Type **RMU/DE**



APPROVED



SPEC. 1/9803 Release 1.0

Metron
Eledyne

FEATURES

- ! The **Metron Eledyne Monitrol Type RMU** range of Fire Pump Remote Monitor/Alarm Unit is designed to provide supervision and alarm of remotely sited fire pumps at a constantly attended location such as a gatehouse, reception area etc.
- ! Components are contained in a **sheet steel, dust and drip proof enclosure** with lock-up front access door, suitable for wall mounting. Enclosure is finished in RAL 7032 'Eurogrey'.
- ! The system annunciates a continuous **audible and flashing visual alarm** in the event of an abnormal condition, initiated by volt-free (open to alarm) contacts within the Fire Pump Controller(s).
- ! Non-failsafe (close to alarm) contact arrangement can also be accommodated although this is restricted to only one way on each four way alarm card.

CONTROL SYSTEM

- ! Requiring only a power connection from a **110-250 volts, single phase, AC mains supply, 50/60 Hz** the system operates internally on 24 volts DC derived from an internal power supply system and includes a **maintenance-free sealed lead acid battery pack** to maintain alarm system **operation for 72 hours in the event of AC mains failure**.
- ! Each alarm channel has a **pushbutton test facility** to simulate fault contact operation.
- ! Alarm ways are available in multiples of four, with the standard unit accommodating 4-16 alarm ways. For requirements in excess of 16 alarm ways, a larger unit with an expansion board is available permitting up to 32 alarm ways.
- ! System design uses the **latest electronic technology with plug-in/modular design** combining **high reliability with low maintenance**.
- ! **Alarm accept facility** is provided permitting audible alarm to be silenced with subsequent reactivation in the event of further alarm condition occurring.
- ! **Lamp Test facility** is included to permit illumination of visual indicators without activation of alarms.

- ! Facia mounted items include:
 - Status LED Indicators
 - Battery Voltage Level LED Indicators
 - Alarm Way LED Indicators (4 per alarm card)
 - Alarm Accept Pushbutton
 - Lamp Test Pushbutton
 - Lockable AC Isolator
 - Audible Warning Buzzer
 - Alarm Way Legends and Nameplate (in engraved laminated plastic material)
 - Lexan Viewing Window

- ! Internal wiring terminates at clearly marked terminations with external connections being made via enclosure top/bottom fitted undrilled cable gland plates.

Approximate Dimensions/Weights (4-16 way unit only):

Height	Width	Depth	Weight
360 mm	480 mm	150 mm	20 Kg

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OPERATING INSTRUCTIONS FOR: REMOTE MONITOR UNIT TYPE: RMU/DE SERIES

PREFACE

MODEL NUMBER BREAKDOWN

The model variants can be identified by their model number as shown:

RMU/DE8/24A or 24B

RMU identifies that the enclosure houses a Remote Monitor Unit.

24A identifies it as having an AC rectified power supply, operating from 24 volts D.C. (option A).

24B identifies it as having 24 volt D.C. battery backup (option B).

DE refers to the unit as monitoring one diesel (D), and one electric (E) controller. The 8 refers to the unit as having a maximum number of eight channels at the time of manufacture.

The number of channels housed in the unit can vary from 4 to 16, and also can the type of monitoring required, i.e. diesel or electric.

Typical models available are:

RMU/D4/24B

Monitoring one diesel engine with a total of four channels, and having battery backup.

RMU/DE8/24B

Monitoring one diesel engine and one electric motor with a total of eight channels, and having battery backup.

RMU/DE16/240V

Monitoring one diesel engine and one electric motor with a total of 16 channels, and having AC supply only.

RMU/2DE12/24A

Monitoring two diesel engines and one electric motor with a total of twelve channels, and having AC supply only.

RMU/2ED12/24A

Monitoring two electric motors and one diesel engine with a total of twelve channels, and having AC supply only.

All of the above Remote Monitrol Units can be expanded to give a maximum of sixteen channels.

Refer to the panel rating label to identify the model supplied.

1 GENERAL

The Eledyne Monitrol alarm panel is designed to monitor 4 to 16 input channels. The system provides visual, and audible alarm/status indication. The components which form the control system are contained within a NEMA 2 single door enclosure. The control system comprises of the following:-

1 to 4 four channel lamp boards with open to fault/status inputs. Each channel is fitted with a test pushbutton, which allows the operator to simulate a fault/status condition.

Mother board which incorporates battery voltage sensing, 'Annunciator Sequence' and input supply distribution. i.e. A/C, D/C. The mother board also provides the supply for the lamp board L.E.Ds.

Full bridge rectified 240V AC to 27.5V D.C. power supply with on board current limiting (OPTION A).

Optional fully-automatic 24 volt battery charging system, for the two 12 volt 6 ampere hour 'sealed for life', lead acid backup batteries, connected in series to produce 24 volts (OPTION B).

AC failure reminder circuit. In the event of AC failure, an audible warning is given at regular 4 minute intervals, to remind the user that a supply fault has occurred (OPTION C).

NEMA 2 SPECIFICATIONS

Enclosures, which are designed to comply with the requirements of NEMA 2 specifications, provide protection against solid objects over 2.5 mm (tools and small objects), and vertically falling drops of water (eg condensation).

2 **ESTABLISHING THE AC POWER SUPPLY**

(OPTION A)

Connect a 220V 50Hz AC mains supply to the 'Live' and 'Neutral' (N) Terminals. Ensure the system is earthed (terminal E). Turn the AC Isolator key to the 'On' position.

The motherboard automatically distributes the power supply to the whole system which then becomes operational. Assuming no fault is present, all green indicator L.E.D's illuminate non-flashing to show the system is healthy.

The motherboard is fitted with a voltage monitoring facility, which in the event of a low voltage supply to the motherboard of approximately 20 volts D.C. or below, the circuit inhibits the supply to the system to avoid false triggering of any channel.

3 **ESTABLISHING THE DC AND AC SUPPLIES**

(OPTION B)

From a safety aspect, during transit, the internal batteries have been dis-connected and fitted with a re-connection note. Follow the re-connection instructions to restore the D.C. supply from the back up batteries to the control system via the positive (+) and negative (-) terminals.

When the D.C. supply has been successfully restored, connect a 240 50Hz AC mains supply to the 'Live' (L) and 'Neutral' (N) terminals. Ensure the system is earthed (terminal E). Turn the 'AC Isolator' key switch to the 'On' position.

If the internal battery voltage is at the set point or above i.e. Healthy, the motherboard automatically distributes the supply to the whole system, which then becomes operational. Assuming no fault is present, all green indicator L.E.D's illuminate non-flashing to show the system is healthy.

4 **BATTERY CHARGER SYSTEM**

(OPTION B)

The battery charger is a fully-automatic unit, which regulates the charge rate depending on the state of the batteries. The battery charger is set to give a maximum charge rate of approximately 800mA when the state of the batteries is low, and a decreasing charge rate as the batteries reach a fully charged state. The battery charger is preset at the factory for a float charge voltage of 27.5 volts.

If the battery voltage is low when the supplies are connected, the battery charger immediately detects this condition and responds by charging the batteries at a maximum current of up to 800mA. 'Battery Voltage' is indicated by the 4 'Battery Voltage Level' indicator L.E.Ds,

which illuminate in turn from the 'Low' to the 'Normal' position as the battery voltage is restored.

The last 'Battery Voltage Level' L.E.D. in the 'High' position will not illuminate under normal conditions, however, if the float voltage level exceeds 27.5 volts, the L.E.D illuminates to indicate a battery charger over voltage fault. If this condition occurs the battery voltage must be checked immediately, and adjusted to the float voltage level, by means of the adjustment potentiometer located on the battery charger board. If this action fails to resolve the problem, disconnect the AC supply to avoid damage occurring to the batteries and contact Eledyne.

The battery charger board is fitted with a self monitoring facility, which provides visual indication if the battery charger output drops to approximately 19 volts or below. If such a condition occurs, the 'Red' 'Battery Charger' fault indicator L.E.D illuminates flashing and the 'Green' 'Charger Healthy' L.E.D extinguishes.

5 **LOW BATTERY VOLTAGE**

The mother board monitors the condition of the batteries. If at any time the battery voltage (D.C.) drops to approximately 20 volts or below, the circuit inhibits the supply to the lamp board, and disconnects itself to avoid completely discharging the batteries.

6 **AC FAILURE REMINDER (OPTION C)**

Option C provides a facility for monitoring the AC supply to the monitor unit. With the AC isolator in the 'ON' position, and a healthy AC supply connected, the on-board 'Lead-Acid' battery receives a 1.1mA constant charge. In the event of mains failure, the circuit detects a loss of supply and sounds the alarm approx. every 4 minutes. The alarm sounds for 0.5 of a second, and acts as a constant reminder to the user that a supply fault has occurred.

7 **CURRENT CONSUMPTION**

With four lamp boards fitted, the quiescent current consumption of the monitor unit, i.e. with no channels activated, is measured at approximately 220mA, each lamp board requiring approximately 40mA to operate. If all the channels activate simultaneously, the current consumption will rise to approximately 380mA, with each lamp board requiring approximately 75mA to operate. In the event of mains failure the system is designed to operate on fully charged batteries for a period of between 29 and 59 hours in standby mode, depending upon how many lamp boards are fitted.

8 **LAMP BOARD ALLOCATION CHART**

With reference to Dwg. No: DE1312 & CM1969 the chart below shows typical channel allocation to each lamp board, and lists the input terminals associated with

each channel.

LAMP BOARD LB1 (See circuit diagram DE1312 for channel description)

CHANNEL NUMBER	TEST P.B NUMBER	INPUT TERMINALS	CHANNEL DESCRIPTION
1	PB1	1 & 2	
2	PB2	3 & 4	
3	PB3	5 & 6	
4	PB4	7 & 8	

LAMP BOARD LB2

CHANNEL NUMBER	TEST P.B NUMBER	INPUT TERMINALS	CHANNEL DESCRIPTION
5	PB5	9 & 10	
6	PB6	11 & 12	
7	PB7	13 & 14	
8	PB8	15 & 16	

LAMP BOARD LB3

CHANNEL NUMBER	TEST P.B NUMBER	INPUT TERMINALS	CHANNEL DESCRIPTION
9	PB9	17 & 18	
10	PB10	19 & 20	
11	PB11	21 & 22	
12	PB12	23 & 24	

LAMP BOARD LB4

CHANNEL NUMBER	TEST P.B NUMBER	INPUT TERMINALS	CHANNEL DESCRIPTION
13	PB13	25 & 26	
14	PB14	27 & 28	
15	PB15	29 & 30	
16	PB16	31 & 32	

CAUTION

Ensure the connection terminals are volt free (i.e. do not inject direct voltage). If this condition is not complied with, damage WILL RESULT to the unit.

The motherboard is fitted with four sets of 4 non-latching 'Test' pushbuttons. The pushbuttons are assigned to lamp boards LB1, LB2, LB3 and LB4 as indicated by the allocation chart. The 'Test' pushbuttons allow the operator to activate each channel individually for the period the respective 'Test' pushbutton is actuated.

When the 'Test' pushbutton is released, the channel automatically resets.

9 OPERATION

If OPTION B is fitted, connect the on-board battery to the battery connector before switching the unit on. A note is attached to the battery clip as a reminder to do this.

With the AC, or the AC and D.C supplies established as previously mentioned, the monitrol unit will be in standby. If an alarm or status condition occurs, the respective field contacts open to activate the associated monitor channel, which provides visual and audible indication. The unit is factory set to respond to normally closed contacts opening to alarm or status. See the example below:-

EXAMPLE

If channel 2 activates due to the field contacts opening between terminals 3 & 4, the following will occur simultaneously:

Visual Red indicator L.E.Ds flashes.

Volt free Group fault output activates.

Audible klaxon alarm sounds and the green healthy L.E.D. extinguishes.

The audible alarm may be muted by pressing the 'Accept Alarm' push-button. If this course of action is adopted, the visual L.E.D. indicator will change state from flash to steady. Any subsequent alarms that may occur, after the 'Accept Alarm' pushbutton has been operated, will not be affected, i.e. L.E.D flashes and the audible alarm energises. The monitrol unit automatically resets to standby when the field contacts clear.

10 LAMP/AUDIBLE ALARM TEST

The visual indicator L.E.Ds and the audible alarm klaxon may be tested at any time, without affecting the status of any existing alarm, by simply pressing the 'Lamp Test Pushbutton'. After releasing the pushbutton the system will resume its previous status.

11 **CLOSE TO FAULT CHANNEL**

In the event of a lamp board being fitted, which has the facility to respond to a close to fault contact, i.e. a specially manufactured card supplied by Metron Eledyne, the operation of that channel will be as described above with the exception of the alarm status responding to a 'closed field contact'.

The 'test' pushbutton fitted to a 'close to fault' channel is rendered redundant, and cannot be used to activate that channel to show a fault condition.