

Installation And Operation Manual



KLM LEAK MONITOR

MODEL NUMBER: KLM

Contents

Information	Page Number
System first Power up.	1
LCD & Keypad functions.	2
Setting the time and date.	3
Setting up the Outstations and reading the sensor values.	4
View alarms and view system historic logs.	5
Adjusting sensitivity settings trip points.	6
Changing sensor and Outstation names.	7
Managing security pin numbers.	8
Legal information.	9
Commissioning information.	10
Technical specifications.	11
Key features.	12
4 zone Outstations.	13
Outstation address lookup table.	14
Outstation PCB layout.	15
Power supply PCB layout.	16
General Information.	17
BMS relay expansion PCB.	18

For more information on this product and Knight Alarms range of sensors please visit.

www.knightalarms.com

Or email us at:

sales@knightalarms.com

Technology is constantly updating, Information given via this manual was current on the given date.



Warranty is available on our

Important Instructions

The purpose of this manual is intended as a guide for the installation and commissioning of the addressable Leak Detection Control panel. Content within this guide is for general application and does not specify the Addressable Alarm System design and the guide assumes the reader already has attained competency with this type of system.

The installation of this system can only be carried out by a competent person with relevant current training and experience, with access to requisite tools, equipment and information (as stipulated by BS5839). The design has been carried out in accordance with a quality management system, which incorporates a set of rules for the design of all elements of the addressable Leak Detection system. The components of the addressable Leak Detection system have been designed selected for the intended purpose, and are expected to operate within their specification when the environmental conditions outside the cabinet of the addressable Leak Detection system comply with class 3k5 of EN 60721-3-3:1995.

Powering Up the System

On first power up, the system will briefly display the manufacturer LOGO plus software version whilst it initiates. Once the system has initialised you are taken by default to the home screen. The home screen shows the current time and date plus the current system status.

SOFTWARE VERSION 1.4
KNIGHT ALARMS LTD



16:47:09 11/11/24
All Areas Healthy
No Alarms or Faults

Press the "menu" button to reveal the following:

16:47:09 11/11/18
Enter Code:****



MAIN MENU 1/3
1 SET TIME
2 SET DATE
3 SET OUT-STATION

Enter the four digit default code number 1111

The LCD Display

The LCD has 4 lines capable of displaying 20 character each. It has an LED backlight that will automatically turn on when there is an event or key press.. It switches off again after a timed out period.

Descriptions may have to be abbreviated if more than 20 characters (including spaces) long,.

For example:

[FLR 5 RM 21 Tea Point] [B FLR W/C Overflow] [GRND FLR AHU 2] [MEZ FLR Cleaners tap]



The KEYPAD

The 16 button keypad is used to set up the control panel during installation.

From top to left to the bottom right, the button function are as follows:

BUTTON 7—Numerical 7 and letters PQRS

BUTTON 8—Numerical 8 and letters TUV

BUTTON 9—Numerical 9 and letters WXYZ

MENU BUTTON access system functions

BUTTON 4—Numerical 4 and letters GHI

BUTTON 5—Numerical 5 and letters JKL

BUTTON 6—Numerical 6 and letters MNO

ARROW UP BUTTON Navigation tool

BUTTON 1—Numerical 1 and letters @ \ /

BUTTON 2—Numerical 2 and letters ABC

BUTTON 3—Numerical 3 and letters DEF

ARROW DOWN BUTTON—Navigation tool

CLEARBUTTON —delete characters

ZERO BUTTON —SPACE BAR for characters

ENTER BUTTON—loads characters into memory

MUTE—Silence horn & clear the new alarm relay

Setting the Time and Date

PAGE 3



Setting The Time and Date

Press the MENU button

Using the "UP" and "DOWN" arrow buttons navigate to the following options.

1 SET TIME
2 SET DATE
3 SET OUT-STATION

MAIN MENU 2/3

4 VIEW SENSORS
5 VIEW ALARMS
6 VIEW LOGS

MAIN MENU 3/3

7 SET SET-POINTS
8 SET SENSORS NAME
9 SET PIN

MAIN MENU 1 of 3

MAIN MENU 2 of 3

MAIN MENU 2 of 3

To set the clock, press the "1" button. This will take you to a new screen for time adjustment. Follow the onscreen flashing cursor to input the correct time HH-MM-SS then press "enter".

Please note: the clock is 24 hour format.

SET TIME
TIME: 11:47:54|

Press the "2" button to adjust the date. Follow the on-screen flashing cursor to adjust the date DD-MM-YY then press "enter"

SET DATE
DATE 11:11:18

Setting The Outstation Numbers

MAIN MENU 1/3

1 SET TIME

2 SET DATE

3 SET OUT-STATION

Select option 3 in the menu. Select the amount of outstations Installed.

SET OUT-STATION

Connected: 002

Set the amount of Outstations installed then press "ENTER". You have now saved the amount of installed outstations into memory. This can be changed at any time by repeating this procedure

View Sensors

MAIN MENU 1/3

1 SET TIME

2 SET DATE

3 SET OUT-STATIONS



Press the down Arrow button to access the next menu page (menu 2 of 3) Now press key "4" to view a snap-shot of the current sensor conditions.

MAIN MENU 2/3

4 VIEW SENSORS

5 VIEW ALARMS

6 VIEW LOGS



VIEW SENSORS

OUT STATION: 01/02

1-0482

2-0480

3-0481

4-0481

The view sensor menu can be very useful for looking at the condition of each sensor. If access to particular sensors is difficult this can gauge the condition & reliability. The above sensor status example shows a very healthy reading of 0480

000 is a complete short circuit so lots of water (anything below 0400 is interpreted as a leak)

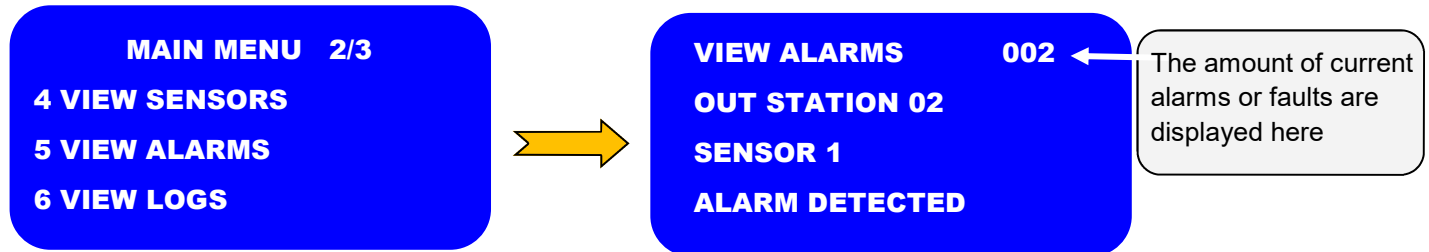
480 shows a perfect healthy reading (480 shows a 47K end of line resistor reading)

861 shows an open circuit (The sensor is disconnected, broken, removed)

Alarm Menu

PAGE 5

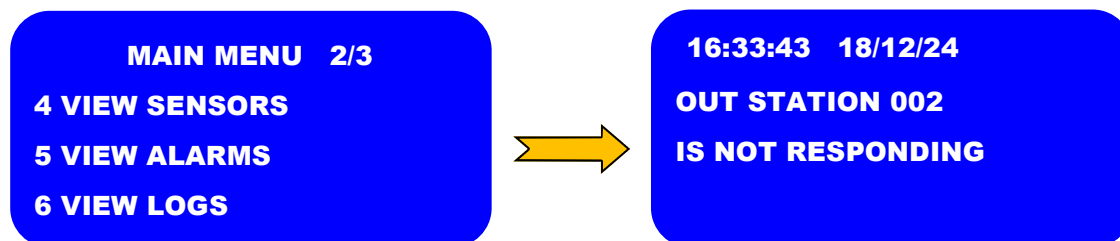
View Alarms menu



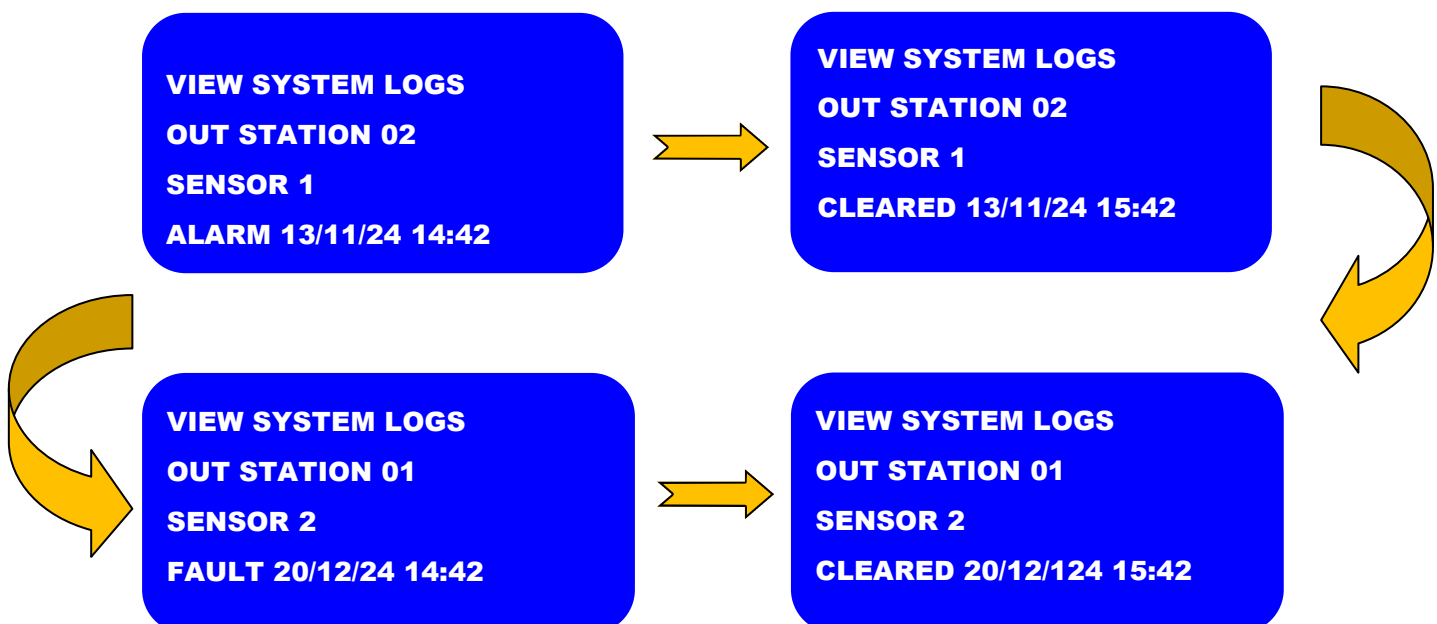
Select option 5 in the menu to View current alarms and faults. Use the arrow buttons to motor through all of the current alarms or faults that are present on the system

6 View System Logs

Press the "MENU" button to access the settings menu. You should see the screen below. Using the down arrow go to **MAIN MENU 2/3**. Select option 6 "VIEW LOG". The Time and Date of current events will be displayed.

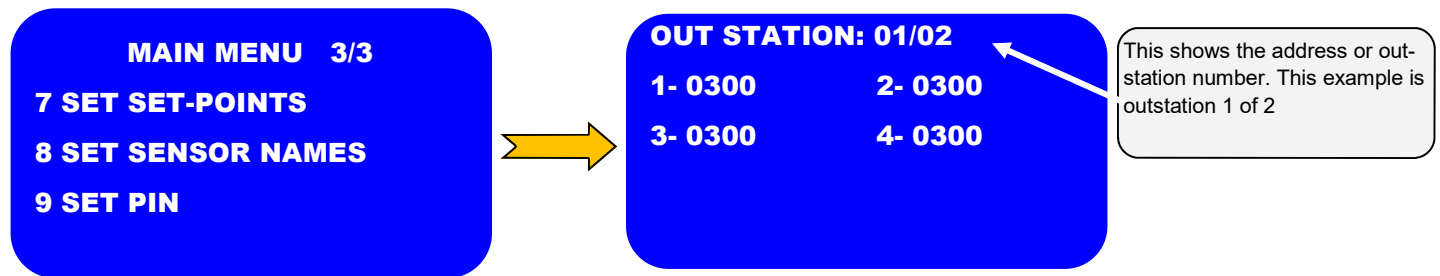


To view logged Alarms and Faults, use the arrow buttons to navigate up or down the 255 stored log files. Files are stored chronologically. Older log files automatically delete to make room for new events.



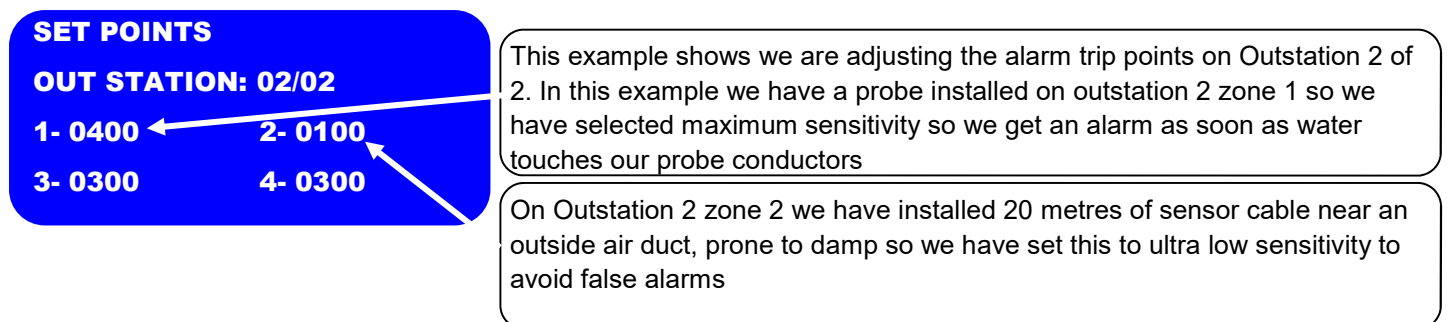
ADJUSTING THE SENSITIVITY SET-POINTS

Press the "MENU" button to access the settings menu (see the screen below). Using the down arrow button, press twice to get to MAIN MENU 3/3. Select option 7 in MAIN MENU 3/3 to View Leak Alarm trip point settings.



0300 is the default factory trip point setting.

To adjust the alarm trip points of Zones select the zone number and adjust using the keyboard Then press "ENTER". The lower the number, the less sensitive that zone becomes. alternatively the higher the set number the more sensitive that zone become.



The alarm set points can be changes at any time and allow full control to optimise and tune your install to its unique environment.

Factory default setting are always 0300 which is a medium setting selected for a standard environments.

Understanding the sensor readings.

0470 to 0500 is a healthy sensor reading. The further the distance to the sensor the nearer to 0500 it will be.

0850 to 0864 is a faulty sensor. The end of line 47K ohm resistor can not be read.

0000 to under the set trip point (0300 default) is an alarm leak condition.



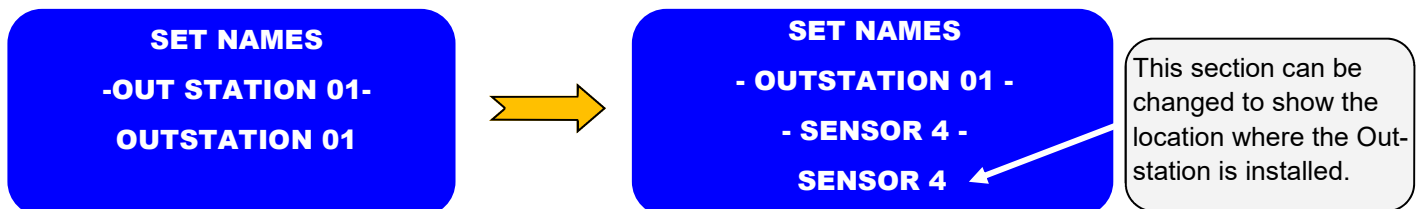
CHANGING SENSOR AND OUTSTATION NAMES

Press the "MENU" button to access the settings menu. You should see the screen below. Using the down arrow button, press twice to get to MAIN MENU 3/3. Select option 8 in MAIN MENU 3/3 to View SET SENSOR NAMES.



To make equipment locations more understandable, a representing name can be assigned. For instance if Outstation 1 is installed in the 1st floor kitchen press the "ENTER" key. The cursor will flash at the beginning of the word. Use the arrow keys to navigate up and down the word and use the lettered buttons to select the letter required. Press enter to save your changes. Using the arrow keys move on to the next character.

Please Note Zero is a space and "CLR" will delete the last letter.

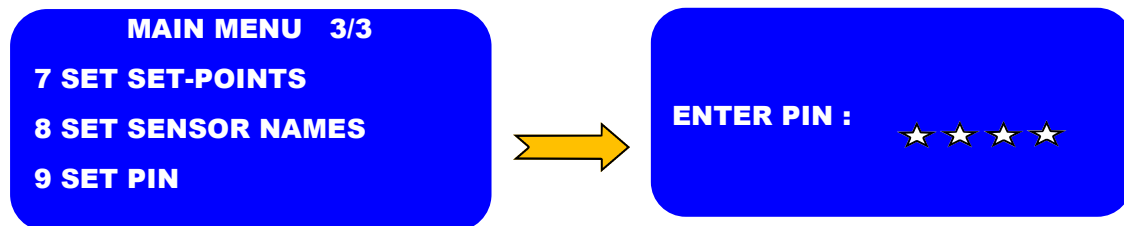


To make the Zones more understandable a name can be assigned to each one. For instance if Outstation 1 is installed in the 1st floor kitchen And Zone 1 sensor is installed under the kitchen sink, follow the same procedure as above. First press the "ENTER" key and the cursor will flash at the beginning of the word. Use the arrow keys to navigate up and down the word and use the lettered buttons to select the letter. Press enter to keep the changed letter and move on to the next with the arrow keys. Zero is a space and "CLR" will delete the last letter.



SET PIN NUMBER

Press the "MENU" button to access the settings menu. You should see the screen below. Using the down arrow button, press twice to get to "MAIN MENU 3/3". Select option 9 in "MAIN MENU" 3/3 to View SET PINS.



To set the a unique pin number follow the onscreen instruction using 0000 as your default pin and then press ENT. You have now security locked the Engineer/ setup menu options.

Make a note of the PIN in this manual here _____

The Below Menus Are Security PIN Locked

- 1 SET TIME
- 2 SET DATE
- 3 SET OUT-STATIONS
- 7 SET SET-POINTS
- 8 SET SENSORS NAME
- 9 SET PIN

The Below Menus Are **NOT** Security PIN Locked

- 4 VIEW SENSORS
- 5 VIEW ALARMS
- 6 VIEW LOGS

If the security PIN number has been forgotten please email sales@knightalarms.com and we will be happy to issue you with a temporary password.

Alternatively please visit www.knightalarms.com and contact us there.

Legal information

Product Information

Full information about other Leak Detection products available, visit our Website at:

www.knightalarms.com

Contact Information

Customer Support

sales@knightalarms.com

Disclaimer

About Your Water Leak Detection System:

Your equipment has been designed to provide you with the greatest possible flexibility and convenience. Read this manual carefully and have your installer instruct you on your system's operation and on which features have been implemented in your system. All users of this system should be equally instructed in its use. Fill out the "System Information" page with all of your zone information and sensor locations and store this manual in a safe place for future reference.

Water Leak Detection:

This equipment is capable of monitoring for water leaks before they become floods. Good leak detection depends on having adequate sensors placed in appropriate locations.

NOTE: Your installer must commission this equipment fully, testing to insure that your system continues to work as intended. You must test your system annually or have a maintenance plan in place. Please refer to "Testing Your System" on page 00 of this manual. If your system does not work properly, call your installing company for service. This system Monitoring is capable of sending alarms, Faults and shutting off of valves ETC. Before you inadvertently initiate an alarm, make the responsible personnel in charge of the equipment aware. Anti-Static Handling

The Main Control panel and Outstations all contain components vulnerable to static. There are no user serviceable parts within the main enclosure of the alarm unit or in the Outstations. However, if the PCB are extracted, please observe anti-static precautions. This includes storing the boards in

Battery

The main control panel normally contains a float charged, Lead Acid battery. Do not short circuit the battery or place on a metal surface where the battery terminals could become shorted. During shipment the battery is separately packed for risk of fire and must be connected before using the unit, please refer to the installation manual for details. Do not incinerate, crush or otherwise damage the battery.



At the end of the products useful life the electronic circuitry should be recycled as follows:

- Remove lid and disconnect battery. Recycle battery at licensed facility.
- Remove circuit boards and recycle at licensed facility.
- Recycle plastic enclosure as ABS.

WARNING

This manual contains information on limitations regarding product use and function and information on the limitations as to liability of the manufacturer. The entire manual should be carefully read.

System Information Page

Zone Information

Installer Details _____ Telephone _____

There are _____ active Outstations on the system. DATED _____

There are _____ active Outstations on the system. DATED _____

Each Outstation has 4 sensor inputs capable of Protecting 4 Areas/ Zones

Outstations are Installed in areas as follows

1 _____	21 _____	41 _____	61 _____
2 _____	22 _____	42 _____	62 _____
3 _____	23 _____	43 _____	63 _____
4 _____	24 _____	44 _____	64 _____
5 _____	25 _____	45 _____	65 _____
6 _____	26 _____	46 _____	66 _____
7 _____	27 _____	47 _____	67 _____
8 _____	28 _____	48 _____	68 _____
9 _____	29 _____	49 _____	69 _____
10 _____	30 _____	50 _____	70 _____
11 _____	31 _____	51 _____	71 _____
12 _____	32 _____	52 _____	72 _____
13 _____	33 _____	53 _____	73 _____
14 _____	34 _____	54 _____	74 _____
15 _____	35 _____	55 _____	75 _____
16 _____	36 _____	56 _____	76 _____
17 _____	37 _____	57 _____	77 _____
18 _____	38 _____	58 _____	78 _____
19 _____	39 _____	59 _____	79 _____

Electromagnetic Compatibility (EMC) and other EC Standards

The Alarm Unit is classified as a component with regard to the European Community EMC regulations and it is the user's responsibility to ensure that complete systems using the unit are compliant with the appropriate EMC and other standards.

Technical Support

sales@knightalarms.com

IMPORTANT NOTICE

A security system cannot prevent emergencies. It is only intended to alert you and if included your monitoring station BMS of an emergency situation. Security systems are generally very reliable but they may not work under all conditions and they are not a substitute for prudent security practices or life and property insurance. Your security system should be installed and serviced by qualified security professionals who should instruct you on the level of protection that has been provided and on system operations.

Technical Specifications	Leak monitor LMK
Sensor or Outstation Fault Relay	230Vac 2 amp change-over contacts DPDT
Alarm Detected Relay	230Vac 2 amp change-over contacts DPDT
New Alarm Detected Relay	230Vac 2 amp change-over contacts DPDT
Power Fault Relay	230Vac 2 amp change-over contacts DPDT
Sounder level	80db @ 10 cm oscillating tone
System operating Voltage	90 –230V AC 50 Hz
Mains Fuse	2 amp 20mm anti surge
Battery Fuse	2 amp 20mm anti surge
12 V supply Output	80mA MAX
Optional Main Battery Backup	12V 1.2Ah lead acid sealed
System memory Battery	3.3V DC coin cell
LCD	20 x 4 backlit
Alarm LED	Red displays on alarm
Fault LED	Yellow displays on alarm
Power Fault LED	Red displays on loss of mains voltage
Power LED	Green. Displays on mains voltage.
End Of Line	47K ohm

The Addressable Alarm Panel is a microprocessor controlled fully adjustable Alarm System suitable for zonal monitoring of Sensor Cable or distance monitoring depending on Outstation types

The Addressable Alarm Panel can monitor most sensors ranging from Toilet Overflow Sensor Probes, Linear Sensor Cable which senses water along its entire length, but it can also monitor Pad and Probe Detectors, Gas sensors, temperature sensors oil sensors and heat sensors and smoke sensors

The Addressable Alarm Panel interrogates addressable outstations at appropriate areas and reports back the exact location of the Alarm

Being microprocessor controlled, The Addressable Alarm Panel can monitor simultaneously all alarms and faults and log them chronologically in memory, nothing gets missed.

The Addressable Alarm Panel is provided, AS STANDARD, with output signalling relays to provide remote alarm or BMS indication of ALARM, FAULT, New alarm and POWER/BATTERY FAULT. The Unit is also able, if needed to float charge a Battery Backup.

The Control Cabinet is designed to be wall mounted and requires a 240V AC 2 amp power supply. provide remote alarm or BMS indication of ALARM, FAULT, New alarms and Power FAULT.

Connections are direct to the Main PCB via easy wire un-pluggable terminal connectors

Key Features

PAGE 12

The Addressable Alarm Panel provides continuous monitoring of the cabling system and provides a Fault readout if any field cabling is cut or damaged. It also provides an Outstation Fault readout in the event of data communication problems.

The Addressable Alarm Control Unit is provided, as standard, with audio and mute button, a four-line LCD Display and an alarm LED, Fault LED mains fail and power healthy lights.

The Addressable Alarm Panel works on RS485 Protocol therefore teeing off of data cables may cause reflective data problems. The data cable must be continuous Linear wiring and must not exceed 3000 metres.

The Addressable Alarm Panel Control Unit, being a fully electronic system with limited moving parts, will not require any specific regular maintenance. The same applies to the Intelligent Outstations. The Sensing

Cable, however, is subject to site conditions and housekeeping, possibly leading to cable contamination and false alarms, and should be regularly inspected and investigated.

Key Features

The alarm unit will monitor up to 100 remote outstations connected via a twisted pair combined communications and low power cable. Each outstation can have up to four water sensors connected. The unit will sound an alarm if:

- ◆ Any sensor becomes faulty (either disconnected broken)
- ◆ Any sensor detects a leak (alarm threshold is adjustable)
- ◆ Any outstation fails to communicate
- ◆ Power to the alarm system fails.

In addition the unit will operate one of three relays to provide signals to other equipment. All alarm events are displayed on the Alarm Screen and all alarms and events are saved to memory.

When an alarm or fault is detected the location of the occurrence is reported via the LCD. The sounder will sound if it is an alarm and the relevant fault or alarm relay will energise providing onward signalling.

A "new alarm relay" is provided as standard and will reset when the mute button is pressed to silence the sounder. This allows the new alarm relay to not be held up by nuisance alarms allowing the system not to become congested with alarms.

To clear the fault or alarm relay the problem must be rectified for example if it is a leak the sensor must be dried.

Modbus TCP/ip and RTU for onward signalling to building management systems is available but not supplied as standard.

A distance monitoring outstation will provide a location of the alarm and then tell you where along its sensor cable the leak is.

A zone outstation allows 4 areas of detection and also has 2 8 amp 230v ac relays for local switching of valves, pumps etc.

Each Outstation has its own unique address from 1 to 100 as standard, set via on board micro switches. This gives possibility of 400 zoned areas of sensor monitoring. Each sensor length must not exceed 50 metres if zonal.

All alarms are kept in the log files. The alarm log screen shows all alarms and events that have occurred. The full list can be viewed by scrolling down using the up or down arrows on the keypad.

All sensor statuses can be viewed manually in the view sensor menu. This can be a handy feature if a particular sensor is giving spurious alarms.

Sensors are fully sensitivity adjustable in the set points menu offering great flexibility to tailor adjust any sensor.

4 Zone Outstation

The 4 zone outstation has four individual channels capable of monitoring sensors with an open contact. An end of line resistor of 47K ohms should be fitted at the end of each channel. The outstation uses this resistor as a reference to the sensing circuit being complete. Shorting out of the sensing circuit raises an alarm and loosing the 47K ohm resistor raises a fault at the main control panel.

The Outstation has its own unique address selectable on the 8 way switch. Outstations must be addressed numerically, please see below on how this is done.

Sensor outputs are not polarity conscious.

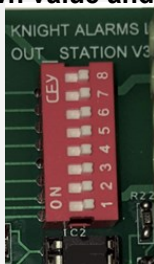
Addressing of Outstation

Each outstation has an address switch. This allows the control to communicate with the correct Outstation in the correct location.

If all the switches are set to the off position (far right) the control panel (LMK) will read this as address zero as all the switches are off.

The switches are labelled as 1 to 8. Switching them from right to left tells the LMK control panel that a value has been set. Each switch has its own value and adds its value to the next. Please see examples below.

1 = 1	5 = 16
2 = 2	6 = 32
3 = 4	7 = 64
4 = 8	8 = 128



For example, to address the outstation to number 3 switches 1 and 2 need to be on

For example, to address the outstation to number 9 switches 4 and 1 need to be on

For example, to address the outstation to number 33 switches 6 and 1 need to be on

ADDRESS SWITCH POSITIONS

PAGE 14

SELECTION	S1	S2	S3	S4	S5	S6	S7	S8	SELECTION	S1	S2	S3	S4	S5	S6	S7	S8
ADDRESS 1	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ADDRESS 51	ON	ON	OFF	OFF	ON	ON	OFF	OFF
ADDRESS 2	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	ADDRESS 52	OFF	OFF	ON	OFF	ON	ON	OFF	OFF
ADDRESS 3	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	ADDRESS 53	ON	OFF	ON	OFF	ON	ON	OFF	OFF
ADDRESS 4	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	ADDRESS 54	OFF	ON	ON	OFF	ON	ON	OFF	OFF
ADDRESS 5	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	ADDRESS 55	ON	ON	ON	OFF	ON	ON	OFF	OFF
ADDRESS 6	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF	ADDRESS 56	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
ADDRESS 7	ON	ON	ON	OFF	OFF	OFF	OFF	OFF	ADDRESS 57	ON	ON	OFF	ON	ON	ON	OFF	OFF
ADDRESS 8	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	ADDRESS 58	OFF	ON	OFF	ON	ON	ON	OFF	OFF
ADDRESS 9	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	ADDRESS 59	ON	ON	OFF	ON	ON	ON	OFF	OFF
ADDRESS 10	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	ADDRESS 60	OFF	OFF	ON	ON	ON	ON	OFF	OFF
ADDRESS 11	ON	ON	OFF	ON	OFF	OFF	OFF	OFF	ADDRESS 61	ON	OFF	ON	ON	ON	ON	OFF	OFF
ADDRESS 12	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	ADDRESS 62	OFF	ON	ON	ON	ON	ON	OFF	OFF
ADDRESS 13	ON	OFF	ON	ON	OFF	OFF	OFF	OFF	ADDRESS 63	ON	OFF	ON	ON	ON	ON	OFF	OFF
ADDRESS 14	OFF	ON	ON	ON	OFF	OFF	OFF	OFF	ADDRESS 64	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
ADDRESS 15	ON	ON	ON	ON	OFF	OFF	OFF	OFF	ADDRESS 65	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF
ADDRESS 16	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	ADDRESS 66	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF
ADDRESS 17	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	ADDRESS 67	ON	ON	OFF	OFF	OFF	OFF	ON	OFF
ADDRESS 18	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	ADDRESS 68	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF
ADDRESS 19	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	ADDRESS 69	ON	OFF	ON	OFF	OFF	OFF	ON	OFF
ADDRESS 20	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	ADDRESS 70	OFF	ON	ON	OFF	OFF	OFF	ON	OFF
ADDRESS 21	ON	OFF	ON	OFF	ON	OFF	OFF	OFF	ADDRESS 71	ON	ON	ON	OFF	OFF	OFF	ON	OFF
ADDRESS 22	OFF	ON	ON	OFF	ON	OFF	OFF	OFF	ADDRESS 72	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF
ADDRESS 23	ON	ON	ON	OFF	ON	OFF	OFF	OFF	ADDRESS 73	ON	OFF	OFF	ON	OFF	OFF	ON	OFF
ADDRESS 24	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	ADDRESS 74	OFF	ON	OFF	ON	OFF	OFF	ON	OFF
ADDRESS 25	ON	OFF	OFF	ON	ON	OFF	OFF	OFF	ADDRESS 75	ON	ON	OFF	ON	OFF	OFF	ON	OFF
ADDRESS 26	OFF	ON	OFF	ON	ON	OFF	OFF	OFF	ADDRESS 76	OFF	OFF	ON	ON	OFF	OFF	ON	OFF
ADDRESS 27	ON	ON	OFF	ON	ON	OFF	OFF	OFF	ADDRESS 77	ON	OFF	OFF	ON	OFF	OFF	ON	OFF
ADDRESS 28	OFF	OFF	ON	ON	ON	OFF	OFF	OFF	ADDRESS 78	OFF	ON	OFF	ON	OFF	OFF	ON	OFF
ADDRESS 29	ON	OFF	ON	ON	ON	OFF	OFF	OFF	ADDRESS 79	ON	ON	OFF	ON	OFF	OFF	ON	OFF
ADDRESS 30	OFF	ON	ON	ON	ON	OFF	OFF	OFF	ADDRESS 80	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF
ADDRESS 31	ON	ON	ON	ON	ON	OFF	OFF	OFF	ADDRESS 81	ON	OFF	OFF	OFF	ON	OFF	ON	OFF
ADDRESS 32	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	ADDRESS 82	OFF	ON	OFF	OFF	ON	OFF	ON	OFF
ADDRESS 33	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	ADDRESS 83	ON	ON	OFF	OFF	ON	OFF	ON	OFF
ADDRESS 34	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF	ADDRESS 84	OFF	OFF	ON	OFF	ON	OFF	ON	OFF
ADDRESS 35	ON	ON	OFF	OFF	OFF	ON	OFF	OFF	ADDRESS 85	ON	OFF	ON	OFF	ON	OFF	ON	OFF
ADDRESS 36	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF	ADDRESS 86	OFF	ON	ON	OFF	ON	OFF	ON	OFF
ADDRESS 37	ON	OFF	ON	OFF	OFF	ON	OFF	OFF	ADDRESS 87	ON	ON	ON	OFF	ON	OFF	ON	OFF
ADDRESS 38	OFF	ON	ON	OFF	OFF	ON	OFF	OFF	ADDRESS 88	OFF	OFF	OFF	ON	ON	OFF	ON	OFF
ADDRESS 39	ON	ON	ON	OFF	OFF	ON	OFF	OFF	ADDRESS 89	ON	OFF	OFF	ON	ON	OFF	ON	OFF
ADDRESS 40	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	ADDRESS 90	OFF	ON	OFF	ON	ON	OFF	ON	OFF
ADDRESS 41	ON	OFF	OFF	ON	OFF	ON	OFF	OFF	ADDRESS 91	ON	ON	OFF	ON	ON	OFF	ON	OFF
ADDRESS 42	OFF	ON	OFF	ON	OFF	ON	OFF	OFF	ADDRESS 92	OFF	OFF	ON	ON	ON	OFF	ON	OFF
ADDRESS 43	ON	ON	OFF	ON	OFF	ON	OFF	OFF	ADDRESS 93	ON	OFF	ON	ON	ON	OFF	ON	OFF
ADDRESS 44	OFF	OFF	ON	ON	OFF	ON	OFF	OFF	ADDRESS 94	OFF	ON	ON	ON	ON	OFF	ON	OFF
ADDRESS 45	ON	OFF	ON	ON	OFF	ON	OFF	OFF	ADDRESS 95	ON	ON	ON	ON	ON	OFF	ON	OFF
ADDRESS 46	OFF	ON	ON	ON	OFF	ON	OFF	OFF	ADDRESS 96	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF
ADDRESS 47	ON	ON	ON	ON	OFF	ON	OFF	OFF	ADDRESS 97	ON	OFF	OFF	OFF	OFF	ON	ON	OFF
ADDRESS 48	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	ADDRESS 98	OFF	ON	OFF	OFF	OFF	ON	ON	OFF
ADDRESS 49	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	ADDRESS 99	ON	ON	OFF	OFF	OFF	ON	ON	OFF
ADDRESS 50	OFF	ON	OFF	OFF	ON	ON	OFF	OFF	ADDRESS 100	OFF	OFF	ON	OFF	OFF	ON	ON	OFF

The Leak Monitor Outstation requires 12 - 24 volts DC to operate.

All terminals un-plug for ease of wiring.

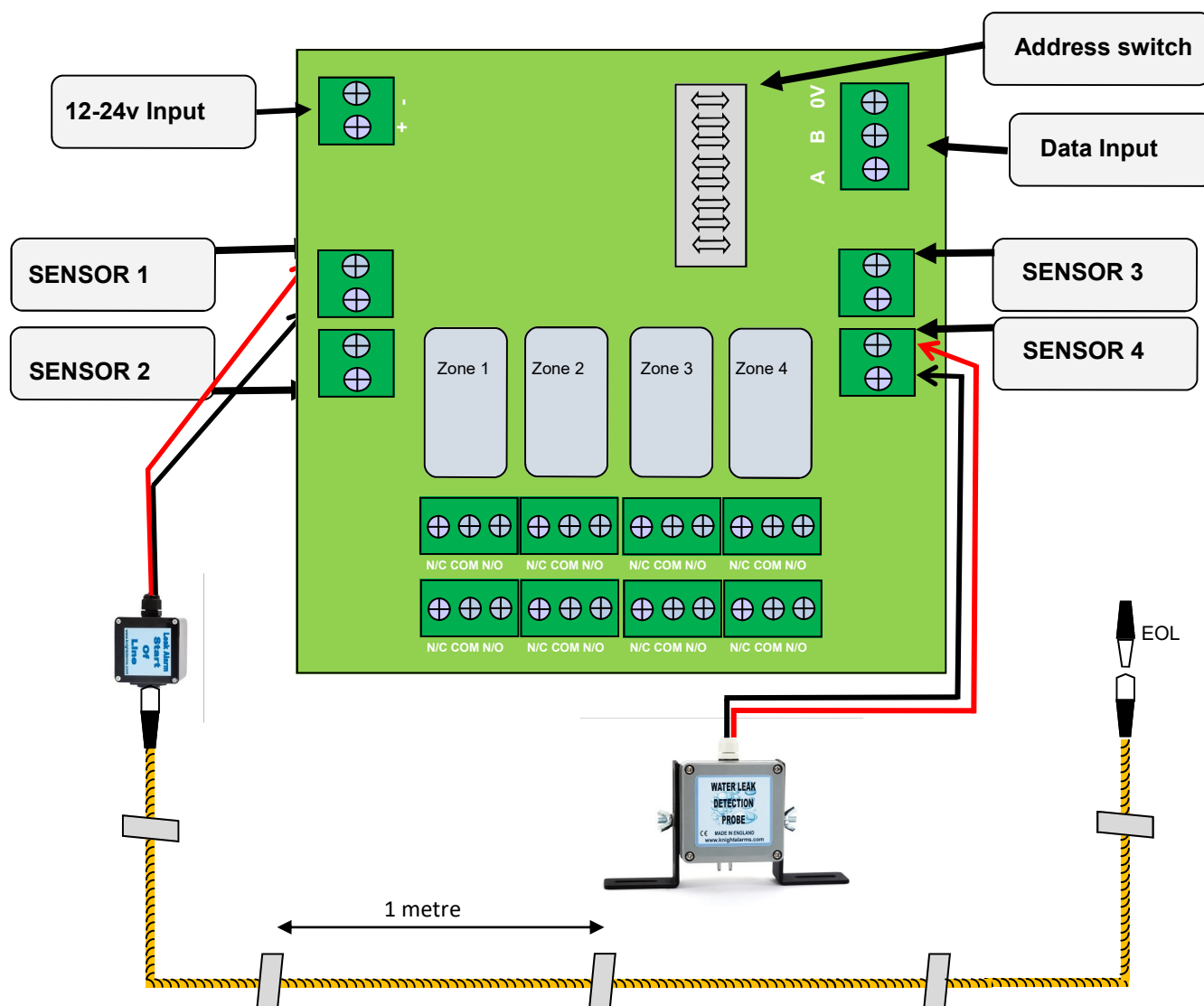
Relays 1 to 4 are rated at 230V AC 2 amps. There are two sets of change-over relay contacts per zone.

Relay 1 is assigned to zone 1.

Relay 2 is assigned to zone 2.

Relay 3 is assigned to zone 3.

TXT Relay 4 is assigned to zone 4.



!! WARNING !! – MAINS ELECTRICAL SUPPLY

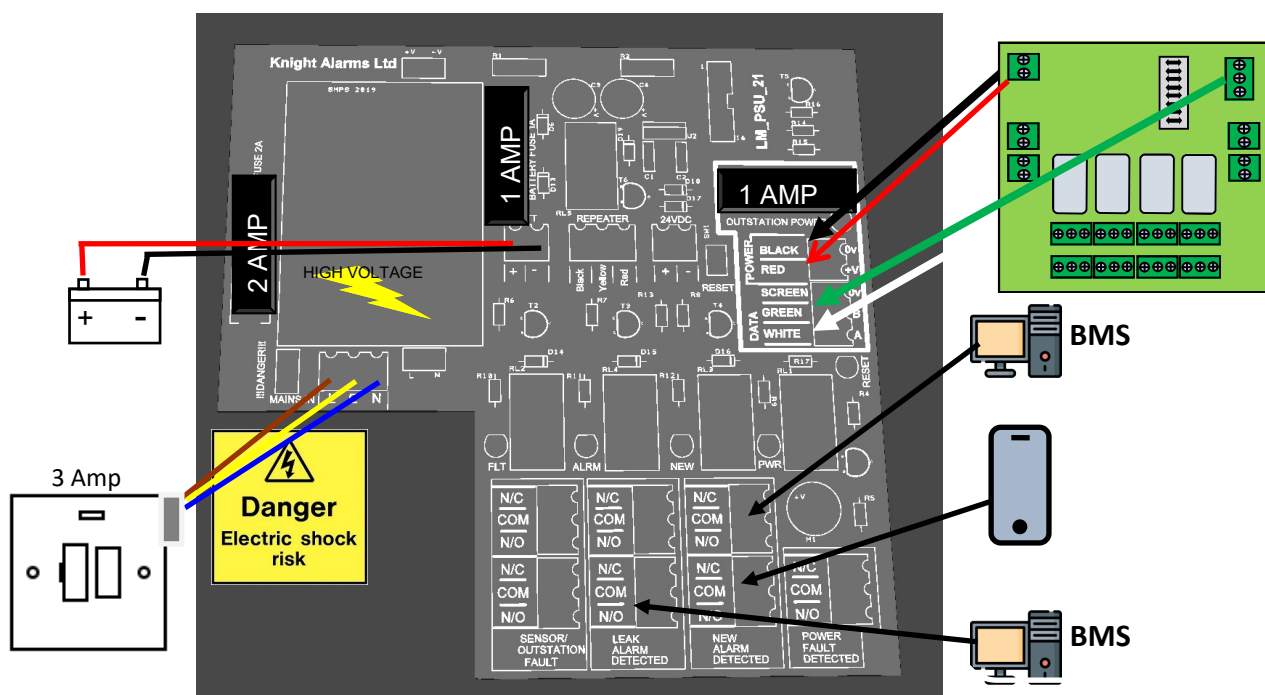
The panel must be permanently connected to the mains supply in accordance with current IEE wiring regulation. A 3 amp fused spur, installed by a qualified electrician, is strongly recommended. Any fault which could be mains related must be diagnosed and corrected by a qualified electrician to ensure continued safe operation.

!! WARNING !! – MAINS ELECTRICAL SUPPLY

ALWAYS DISCONNECT THE MAINS SUPPLY BEFORE YOU WORK ON THIS EQUIPMENT.

HIGH RISK OF ELECTRIC SHOCK.

DO NOT WORK ON THIS EQUIPMENT UNLESS YOU ARE QUALIFIED TO DO SO.



NEW ALARM DETECTED RELAY

The new alarm detected relay will energise when any new Leak alarm condition has been detected. The relay will self-reset once the mute button has been pressed. This relay is to allow the user to externally monitor up to date alarm conditions.

This relay is rated at 240 Volts AC and can switch loads up to 2 amps

This Relay has 2 sets of volt free change over contacts

LEAK ALARM DETECTED RELAY

The Fault relay will energise when a Fault condition has been monitored. The relay will self-reset once the Fault has rectified.

This relay is rated at 240 Volts AC and can switch loads up to 2 amps

This Relay has 2 sets of volt free change over contacts.

MAINS POWER FAULT RELAY

The Mains power Fault relay operates on the loss of mains power.

The contacts are rated at 240 Volts AC and can switch loads up to 2 amps

FAULT ALARM DETECTED RELAY

The FAULT alarm detected relay will energise when any Fault condition has been detected. The relay will self-reset once the Fault has been cleared

This relay is rated at 240 Volts AC and can switch loads up to 2 amps

This Relay has 2 sets of volt free change over contacts.

SYSTEM FUNCTIONS

The addressable alarm system constantly monitors its sensors for signs of leaks before they become serious. The Alarms are then displayed on the LCD display locating which sensor in which area has a potential problem. On detection of an alarm, a soft audible pulsing sounder is activated to alert personnel to its status. Internally 2 relays will energise, one is called alarm detected and the other is called new alarm. These are for onward signalling to a BMS or for shutting off valves, turning on pumps or telephone diallers etc.

WHEN AN OUTSTATION DETECTS A LEAK

When an alarm is detected on the system, the horn will sound, the alarm LED will flash red and the LCD display will report which area the alarm is in.

Internally 2 relays will energise: "New Alarm Detected" & "Leak Alarm Detected".

Pressing the mute button will silence the horn and also tell the system that someone has acknowledged the leak. Once the sensor has dried the system will automatically reset and will now be ready to detect a leak again.

If the mute button is not pressed the system will report an alarm until it has acknowledgement. pressing the mute button gives the system acknowledgement and only then will the system self-reset.

NOTE: Sensors must be kept clean and free from debris to maintain full working ability.

WHEN AN OUTSTATION REPORTS A FAULT

When a system fault is detected on the system the Faults LED will flash and the LCD display will report which area the Fault is in and the nature of the fault.

Internally the Fault Relay will energise. The fault will stay on the system until the fault is rectified then will self-reset.

Faults are usually Sensors disconnected or the system is unable to interrogate the outstation It is best to telephone the supplier who will be happy to talk to help & explain the nature of the fault.

MAINS POWER FAULT

When a Power Fault is detected The green LED will turn off and the Mains Power Fault Red LED will turn on. This is not reported in the display and does not activate the sounder.

Internally a relay will energise called power fault detected. This is used for onward signalling.

The system will self-reset when the power is restored

BATTERY BACK UP

When a Power Fault is detected The battery will automatically power the panel for up to 8 hours. The battery is float charged internally and should be replaced every 3 years.

Relay expansion PCB.

PAGE 18

Technical Specifications	Leak monitor LMK
RS485 relay module	16 x 2 amp change-over contacts SPDT.
voltage	12v DC
Current standby	13mA
1 relay energised	41mA
4 relays energised	121mA
8 relays energised	225mA
Default baud rate	9600
Relay default mode	All off normal energise on alarm.
Relay rating.	240 V AC 2 amp.
Configuration.	Plug and play

Relay Interface modules (RIM) are designed to be added locally or next to BMS Outstations.

A Power supply rated 12V DC @ 2amps per RIM will power the relays.

The RS485 data communication cable can be connected at any point to the data circuit (A) and (B) of the RIM.

Address the RIM as 0 to mimic outstations 1 to 4 zones 1-16)

Address the RIM as 1 to mimic outstations 5 to 8 zones 17-32)

