



P4Z

Four Zone Supervised Telemetry Transmitter



User Manual

P4Z Four Zone Supervised Telemetry TX

PREFACE

Important Installation Information

It is the purchasers' responsibility to determine the suitability of this equipment and its derivatives for any given application, Scope cannot give specific advice in this manual, as each use will require independent evaluation.

Scope has, wherever possible, employed extra safeguards to monitor the system's performance. Certain system installations, operational requirements or budgets may, however, limit the effectiveness of these safeguards. Again, the suitability of the system for any given application must therefore be decided by the installer and their customer, relative to the application and risk.

Good working practice dictates that a suitable system installation log must be generated, together with a record of the dates when the system has been manually checked, (with the aid of signal strength meters etc.) enabling the system performance to be compared with the original installation data.

Scope has no control of the use and application of the frequencies issued by OFCOM. Some equipment that is licensed may have greater protection than other equipment which is operated on a WT Act License Exempt basis.

The supply of this equipment is governed by our standard terms and conditions of sale, which can be found on the reverse of all order acknowledgements*, proforma invoices*, delivery notes, price lists and invoices. Alternatively, these can be provided on request.

* Faxed proforma invoices and quotations refer to "conditions available upon request".

Important Safety Information

Scope products are designed to operate safely when installed and used according to general safety practices. The following requirements should be observed at all times.

Do NOT subject this equipment to:

- Mechanical shock
- Excessive humidity or moisture
- Extremes of temperature
- Corrosive liquids

This equipment is designed for indoor use, unless expressly stated otherwise, and must not be used in classified Hazardous Areas, including areas containing explosive or flammable vapours, unless express authorisation has been given in writing by the manufacturer. If in doubt, consult your local product dealer for further information.

Do not obstruct any slots or openings in the product. These are provided for ventilation to ensure reliable operation of the product and to protect it from overheating.

Only use a damp cloth for cleaning (not liquid or aerosol based cleaners), and ensure that any power is removed from the unit prior to beginning the cleaning operation.

P4Z Four Zone Supervised Telemetry TX

Preface

Important Safety Information

Removal of covers from the equipment must only be undertaken by authorised service personnel, who must ensure that power is isolated prior to removal.

Installation

Installation must only be undertaken by an Approved contractor, who shall ensure that all work is carried out in compliance with IEE Wiring Regulations. For mains powered equipment, a readily accessible isolating fuse or switched socket must be located within 1 metre of the equipment.

No User Serviceable Parts

Alteration or modification to any part of this equipment, without the prior written consent of the manufacturer, will invalidate all Approvals and Warranties attaching to the equipment. Further liability for the operation of the equipment, under the applicable law, will pass to the user, who will absolve the manufacturer of any further responsibility for it's correct operation and use.

This product complies with the essential requirements of the R&TTE Directive 1999/5/EC. Copies of the Declaration of Conformity covering this product can be obtained from Scope at: Quantum House, Steamer Quay, Totnes TQ9 5AL United Kingdom.

Do not discard. At end of life this equipment must be sent to an authorised waste treatment centre. Contact Scope at the above address for further details.



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P4Z Four Zone Supervised Telemetry TX

System Overview

The P4Z is a four zone (dry contact input) supervised transmitter with tamper and Reset zones. The transmitter features digital signal format calling, error checking, test calls and random repeat signalling, all of which provide a high degree of system integrity, with the added advantage of a standby current as low as 250uA. The P4ZPE is a mains powered unit with optional battery backup. The maximum current drawn under transmit conditions will be in the region of 250mA and the transmitter will send a "battery low" signal when the battery voltage falls below 11 volts. The P4ZSL is designed to run on (12V dc) dry cell battery packs and should afford a battery life of around two years assuming an average duty cycle. Again, the unit will automatically transmit a "low battery" message in the event that the battery falls below its prescribed minimum.

All transmissions sent include 6 messages, end to end, with random repeats. The messages all carry a check sum to ensure the highest degree of integrity and freedom from corruption. The random repeats ensure a high degree of reliability even when two or more transmitters are operated at the same time.

Both the P4ZSL and P4ZPE are designed to be used with the Scope PRX series of 8 Zone Receiver systems. Contact the Scope technical sales team on 01803 860710 for further details.

The Transmitter Identity

The transmitter identity is set using a bank of 8 switches located on the encoder board (see Diagram 3), allowing up to 255 transmitters each with four zones, reset, low battery and Tamper/24 hr zone signals to be employed on the same system. A further bank of 2 switches can be located next to the bank of 8 which allow for up to 4 adjacent site codes to be employed. Switch codes follow a normal binary format (SEE CODE TABLE).

4 Zone Input Transmitters

These are normally closed (NC), voltage free circuits. Application of voltages to these circuits will cause severe damage. Please contact the technical help line in this respect. The inputs all operate in the same way. Providing power is connected to the transmitter, breaking the circuit will cause the transmitter to send out its identity together with the identity of the open circuit zone. Once instructed to transmit, the transmitter will send a sequence of 4 sets of signals which are randomly repeated to the receiver. Triggers can be reset either from the transmitter or from the receiver, depending upon the application. It is sometimes useful to be able to enforce a reset at the transmitter to ensure attendance at the actual transmitter location. Note! All unused zones must be linked closed.

Reset/Inhibit

This is a normally open (N/O) input and serves two functions. (1). When closed the unit will send a Reset signal to the 8 Zone Receiver. This will clear all triggers (except Tamper/24 hr zone) at the 8 Zone Receiver. This will automatically be repeated once randomly, after the initial call. If any of the zones 1-4 remain open after this reset they will automatically re-trigger. (2). If this circuit remains closed it will inhibit the other triggers with the exception of the Tamper/24 hr zone circuit. This effectively provides an ON/OFF switch to the transmitter.

Tamper/24hr Zone

P4Z Four Zone Supervised Telemetry TX

This input represents a 24 hour N/C circuit. When broken it will send the same random sequence of transmissions as Zone 1, 2, or 3. As soon as it returns to its N/C state it will re-arm. Note you cannot reset a Tamper/24 hr zone on an 8 zone receiver from the transmitter reset zone. On fixed receivers a reset must be enforced by using the keyswitch located on the base of the panel.

Test Calls

The standard test call period is set at 1 hour; other time periods may be set at the factory for special applications. If test calls are not received from any transmitter, the 8 Zone Receiver will report this. Test calls are only reported if they are missed, or if the transmitter notes a low battery condition.

Test Transmissions

A continuous test transmission can be invoked by linking the twin pin header at the top of the board marked TX. Do not transmit without an aerial connected or for extended periods of time. This facility is to enable the signal strength to be checked in relation to the background noise level. Note: ensure that the link is removed after testing!

Entry / Exit Delay Software

This optional feature is available where it would be useful to inhibit the transmitter from sending an immediate signal upon the activation of ZONE 1. All other zones and Tamper/24 hr zone work in the normal way. The sequence is as follows:-

1. Opening the Reset zone starts a 30 second delay, confirmed by either a flashing LED or sounder every 2.5 seconds, until the expiration of the delay.
2. When Zone 1 is triggered, a reverse count down sequence is started. If the Reset zone is closed during this period the trigger is cancelled. If the zone remains open after the end of the 30 second delay, the zone will be sent in the normal way. When the transmitter Reset zone is closed after a trigger, a Reset message will be sent.

A remote reset will not clear its channel if a Tamper/24 hr zone is present on that transmitter.

Section 1: Installation

P4Z Four Zone Supervised Telemetry TX

The information contained in this Section is intended for use by authorised system installation engineers only. Unqualified personnel should not undertake installation of this equipment under any circumstances whatsoever.

Siting of the hardware

Before locating the hardware in any given location, it is important to take into account the range of operation that you require to obtain from your system. The standard transmitter can quite easily provide ranges of up to a mile or more and will provide excellent propagation on most industrial sites, covering a considerable area with just a quarter wave antenna (BNC terminated) connected directly to the unit.

For coverage of very large sites, or where exceptionally difficult operating conditions exist, it may be advantageous to install an external antenna. Installing the transmitter on the second or third floor of a building will more often than not boost overall range. However, horizontal range is not always required as much as propagation through a multi-storey building. Here it may be more useful to use a small external antenna mounted outside the building at half the building height. Sometimes range is required more in one direction than in the other: moving the aerial to one side of the building can provide a bias in the required direction, which may overcome the range difficulties. (See section: **Other Antennas**).

Important: coaxial feeds which are longer than 5 metres must employ low loss 50 ohm coax. We normally do not recommend feeds of more than 15 metres for standard applications. However, we suggest you contact our technical department where other considerations may prove this to be impractical.

A further consideration that must be taken into account is the length and location of the dry contact cables. To avoid interference and possible false triggering, cable runs should be kept to a minimum (ideally less than 10 metres) and should be isolated from other cabling (e.g. mains, telecoms. PC networks, etc).

Some major points to consider when installing equipment:

- 1 Never install antennas near or adjacent to telephone, public address or data communication lines or overhead power cables.
- 2 Avoid, where ever possible, running antenna coax alongside other cables.
- 3 Avoid mounting the transmitter in the immediate vicinity of telephone exchanges or computer equipment.
- 4 Always use **50 ohm** coaxial cable between the antenna and the transmitter. If cable runs exceed 5 metres, always use low loss 50 ohm cable such as RG213 or UR67.

Coaxial cable intended for TV, Satellite or CCTV installations is normally 75 OHM and therefore totally unsuitable for any transmitter installation manufactured by Scope.

- 5 Also remember that the performance of the system will be affected by the type of material the unit is mounted on and its surroundings.

The following is a list of materials that this transmitter will be adversely affected by if mounted on or if mounted in close proximity to:

- a) Foil back plasterboard
- b) Metal mesh or wire reinforced glass
- c) Metal sheeting, large mirrors or suspended ceilings
- d) Lift shafts

All of the above can reflect radio waves and thereby reduce the capability of the transmitter to perform its desired functions.

P4Z Four Zone Supervised Telemetry TX

- 6 The circuit boards within this equipment may be harmed by Electrostatic Discharge (ESD). Installers should ensure that both themselves and the system's chassis are grounded before beginning any installation, and should ensure that adequate anti-static procedures are adhered to at all times.
- 7 **Warning!** Never transmit without an aerial attached to the transmitter
- 8 **Warning!** Carefully check the **Installation** section in this manual covering terminal connections prior to installation. Damage caused by incorrect connection is the responsibility of the installer!

The following procedure must be adhered to when installing the P4Z system. Ensure you have taken into consideration all of the above information before selecting the location for your transmitter. If in doubt, please feel free to telephone the technical helpline on 01803 860710.

- 1 Remove the cover from the P4ZPE transmitter unit by slackening the four Pozi head screws located at the top and bottom of the unit (see Diagram 1). For the P4ZSL, there are just two screws on the front of the cover (see Diagram 2).
- 2 Carefully lift off the cover and set aside.
- 3 The transmitter should be fixed to an even wall surface using suitable screws fitted through the three holes provided in the chassis plate. Hold the chassis up to the chosen location and with the aid of a pencil mark the position of the mounting holes.

<p>Warning: Do not use the chassis plate as a template for drilling the holes into the wall. Hammer drills vibrating through the chassis may irreparably damage the quartz crystals on the printed circuit boards.</p>

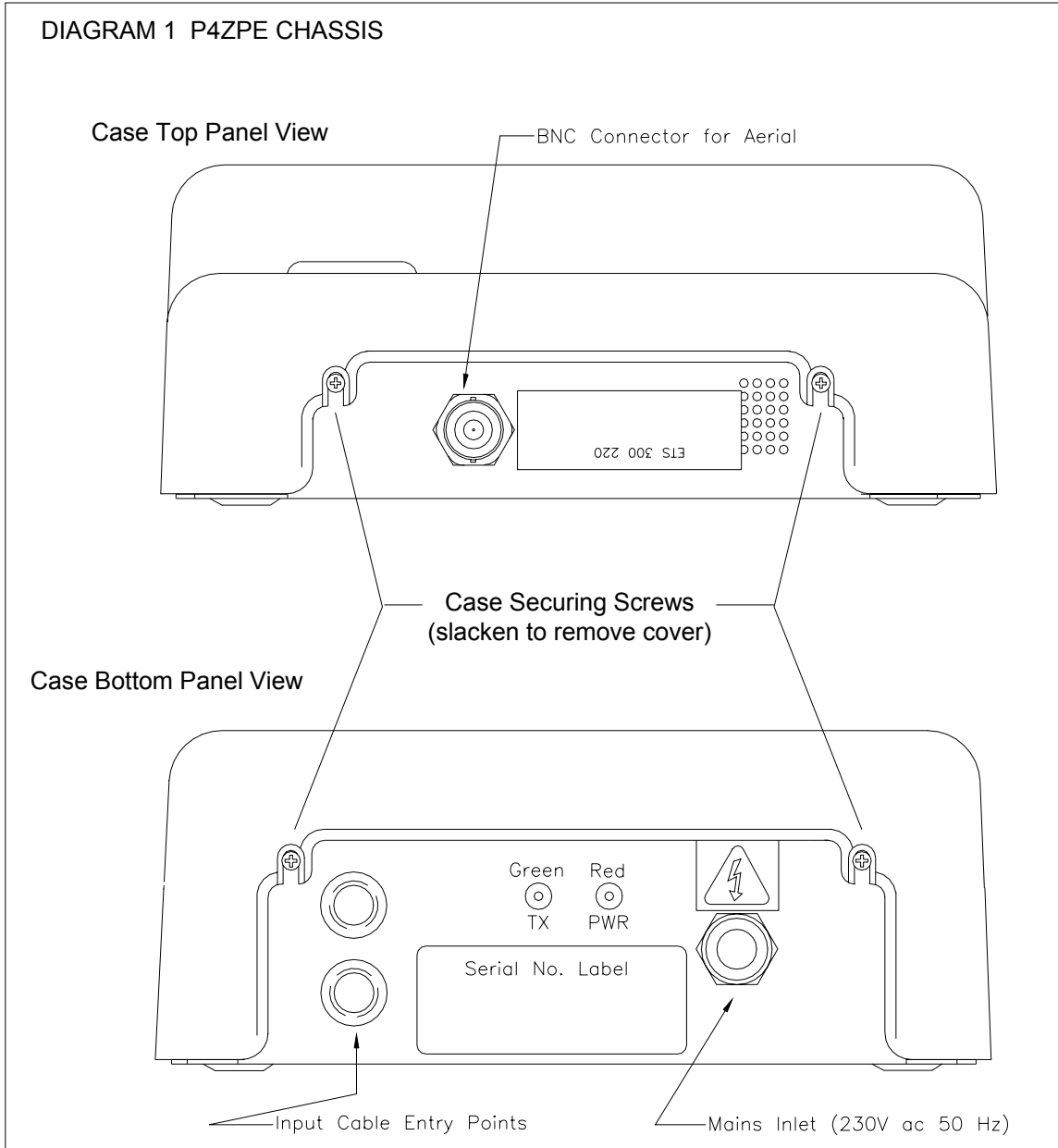
- 4 Place the transmitter over the mounting holes and secure the unit with suitable screws. Check that the chassis plate does not bend and that the screws do not snag or pinch any of the internal cables.
- 5 Connect the antenna to the unit via the BNC connector located at the top of the housing. If the antenna is an external antenna, or an antenna which is separate from the transmitter unit itself, ensure that the previous criteria covered under the section headed **Siting of the Hardware**, have been strictly adhered to (also see section headed **Other Antennas**).
- 6 Connect the input cables to the zone terminals. NOTE: these should be simple "dry" (no voltage) contacts only (i.e. isolated switch or relay contacts).
If in doubt, check with Scope before proceeding; incorrect connection may cause permanent damage.
- 7 If the unit is supplied with a sealed lead acid battery, insert the fuse and plug together the two fuse connector halves on the battery lead. The battery will now be in circuit and the unit will power up.
- 8 Replace the cover and refit the retaining screws.
- 9 Finally, after checking all connections, for the P4ZPE, connect the mains cable supplied to a suitable isolated, fused spur or switched wall outlet. For the P4ZSL, connect the 12V dc input terminals. With power correctly applied, the red LED on the base of the unit will light.

P4Z Four Zone Supervised Telemetry TX

Installation

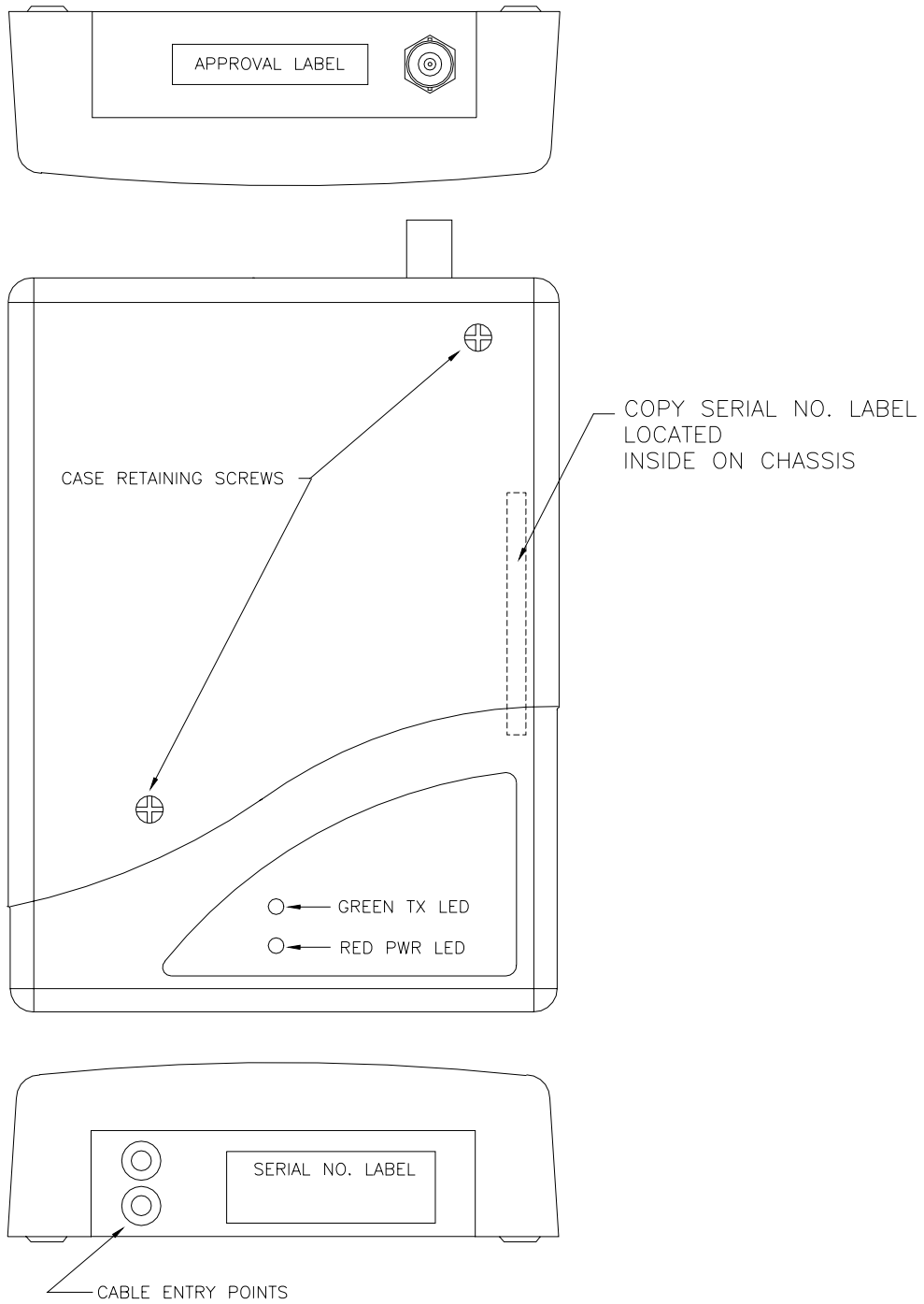
WARNING! P4ZPE: isolate mains supply before removing cover.

The Transcoder PCB contains static sensitive components. Care should be taken to avoid contact wherever possible and anti-static precautions should be observed during installation.



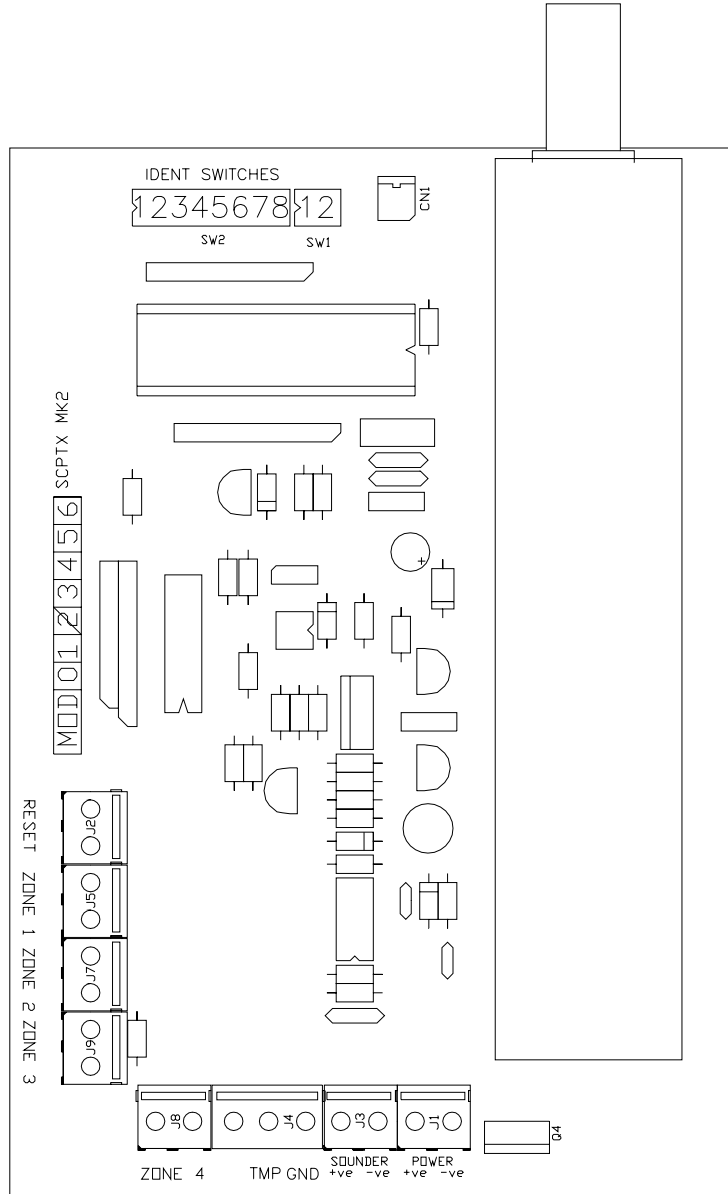
P4Z Four Zone Supervised Telemetry TX

DIAGRAM 2 P4ZSL CHASSIS



P4Z Four Zone Supervised Telemetry TX

DIAGRAM 3: P4Z SUPERVISED 4 ZONE TX MK2



P4Z Four Zone Supervised Telemetry TX

Section 2: System Operation

Confirmation of power connection is by way of the red LED on the base of the unit (P4ZPE), or on the front panel (P4ZSL).

Confirmation of transmit is by way of the momentary green LED on the base of the unit (P4ZPE), or on the front panel (P4ZSL).

When any zone is triggered (by breaking the circuit to that zone), the unit will send a series of four randomly repeated transmissions. This will include the transmitter identity and the zone triggered.

The sounder output is an "open collector" type switching to ground. It may be used to switch up to 24V dc @ 1A max. Note that if it is used to switch a relay, a suitable diode must be connected across the relay coil (stripe towards positive side of coil).

Problems and Fault Finding.

- 1 Check that the input cables are connected to the active zones and that all unused zones have shorting links fitted.
- 2 Check that the correct transmitter identity is set on the switches (see diagram 3)
- 3 Check that cable runs are not excessive (preferably less than 10 metres) and are not in close proximity to other mains or telecoms cabling.
- 4 Check that the pagers are at least 3 metres from the transmitter and aerial. Under certain conditions it is possible to flood the pager receivers and corrupt the data received.
- 5 Check that the pagers have the battery installed with the correct polarity and are correctly powered up.
- 6 Check that the red power LED on the transmitter unit is lit.
- 7 Check that the green LED lights for the duration of the transmission. If not, go back to the cabling and re-check the terminal connections.
- 8 Check that the aerial is correctly installed.

P4Z Four Zone Supervised Telemetry TX

Other Antennas

The range and performance of this equipment can be improved by the addition of more efficient antennas*. These can be installed either inside or outside the building and are connected to the transmitter with 50 OHM coaxial cable.

Glass mount antenna (UHFGM): for installation on the inside of a suitable window. This can boost range, especially if it is required in one direction from the building.

The centre fed half wave di-pole, measuring approximately 12 inches from tip to tip, will provide excellent all round local signalling. This can be mounted either inside or outside a building. Two versions are available:

- 1) a light duty antenna suitable for sheltered environments/internal installation (LUHFDP).
- 2) a heavy duty stainless unit with optional mounting hardware for more arduous applications (UHFDP).

Pre-terminated coaxial feeder cables are available for 5, 10 or 15 metre requirements.

Note! High frequencies can equate to high power losses. Always use quality cable. RG58 is only acceptable on cable runs of up to 5 metres. We recommend RG213, or equivalent, on greater lengths. If in doubt consult your dealer.

**subject to license conditions. Specifically, mounting height and Effective Radiated Power (ERP).*

Service Information

For all Service enquiries, call (01803) 860740.

Record your system details here for quick reference:-

Date supplied ___/___/___ Serial Number of the base console _____

Transmitter frequency ___MHz Transmitter Type approval 4213 4Z

Number of pagers supplied with the system _____

System base ID number _____ Transmitter baud rate _____

For information on individual pager types, refer to the appropriate pager manual

P4Z Four Zone Supervised Telemetry TX

System Specification

P4ZPE

Mains Input: 230V @ 50Hz

Mains Power Consumption: 6W max

P4ZPE and P4ZSL

System Operating Voltage: 12 to 14V dc

System Power Consumption: less than 250uA (microAmp) standby, 300mA transmit.

Transmitter:

Power output: 500mW

Frequency band: 458 MHz

Channel Spacing: 12.5 and 25 KHz

Adjacent Channel: better than 200nW @ 4.5 KHz deviation

TX Baud Rate: 1200

Type Approval: MPT1361, MPT1329, EN 300 220

Type Approval No. 4213 4Z

General:

Ports: 4 dry contact inputs + Tamper + Reset
Open Collector (siren) output: 1A max

Footprint (mm): P4ZPE: •328 (L) x 190 (W) x 75 (D) max
P4ZSL: •184 (L) x 138 (W) x 45 (D) max

•excluding aerial

Scope's policy is one of continuous development and specifications are subject to change without prior notice