



ZoneSafe™ Compact System

User Manual

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ZoneSafe™ System User Manual

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1 Introduction

ZoneSafe™ Compact is an audible/visual proximity warning system that detects personnel wearing safety transponders within a configurable 360° zone around any compact machine or fork lift truck.

ZoneSafe™ systems are supplied as audible and/or visual warning systems, which provide an aid to safety only. ZoneSafe™ should not be used to replace proper job site organisation, safeguards, operator training and the application of relevant vision standards that addresses safety and the safety of people on job sites.

2 How the System Works

ZoneSafe Compact™ is based on proven radio frequency technology. The system produces a user configurable detection zone around any compact machine or fork lift truck between 3m* to 8m* which interacts with safety transponders worn by personnel. When a safety transponder is within the proximity of, or enters the detection zone of a ZoneSafe™ enabled machine, a visual and/or audible indication is provided to the machine operator. The machine operator is required to use a driver transponder that is placed in a holder on the control unit. Without the transponder placed in the holder the system will continue to operate however a constant tone will be emitted from the audio / visual alarm until the transponder is placed into the holder.

The ZoneSafe™ system comprises a Control unit and antenna. Each installed system has its own unique identification code, as do each of the transponders used with the system.

The system's main control unit has a real time clock and built in memory for storing an audit trail of up to 7000 proximity detection events and system configuration settings. Event logs and system settings can be viewed for each control unit using the ZoneSafe™ software or ZoneSafe Android APP

ZoneSafe™ Manager software provides an easy to use interface for downloading, viewing, analyzing and exporting event data.

NOTE: The ZoneSafe™ proximity warning system is supplied as an audible and/or visual alert system only. It is not a protective device, it does not initiate or perform safety related functions and it does not provide control to reduce risk but and audible/visual alert to the operator of the risk.

NOTE: *Minimum and Maximum ranges may be affected by mounting locations and power supply ratings. Distances are taken from the centre of the antenna

3 System Components

The ZoneSafe™ Compact system comprises the following standard components and accessories:

Standard Components

- 1) ZoneSafe™ Compact Control Unit
- 2) ZoneSafe™ Compact Antenna
- 3) ZoneSafe™ Driver Transponders
- 4) ZoneSafe™ Transponders

Recommended Accessories

- 5) ZoneSafe™ Transponder Test Unit
- 6) ZoneSafe™ LED Test Transponder
- 7) Zonesafe Android APP
- 8) Zonesafe PC software

3.1 Control Unit

The ZoneSafe™ Compact Control Unit contains the main electronics of the system and requires a 12-24Vnom DC supply (9-36v). All of the other system devices are connected to and are controlled by the control unit. A N/O or N/C relay contacts is available for the addition of external sounders or beacons for alerting personnel in the detection zone. One digital input is provided which can be used for additional functionality – contact Avonwood Developments Ltd for details. The control unit retains time and date information, stores event data, and provides wireless communication via Bluetooth to an external device.

The ZoneSafe™ Compact Control Unit provides visual and audible warnings to the operator for both transponder detection and system operational integrity.

Warning indicators and unit features include:

- Alarm Buzzer/Light
 - Pulsing - Transponder in Zone
 - Constant - No Driver Transponder, No ignition or system fault
- Mute Button
 - Alarm mute for one transponder when pressed
- Power LED
- System Status LED (Flashes On/Off = fault, Continuous = OK)
- Alarm Buzzer/Light
- Mute button



3.2 Antenna

The ZoneSafe™ Compact Antenna generates the detection zone around the machine. The antenna is fitted at an appropriate location to provide the optimum detection zone required (see installation guide). The size of the generated detection zone is adjustable from approximately 3m* to 8m*.

NOTE: *Minimum and Maximum ranges may be affected by mounting locations and power supply ratings. Distances are taken from the centre of the antenna



3.3 Transponders

The standard ZoneSafe™ Compact system uses two main types of safety transponder, yellow for drivers and grey for all other personnel*. ZoneSafe™ safety transponders must be worn by all personnel. When a safety transponder enters a detection zone a visual and audible indication is provided to warn the machine operator. Each safety transponder is factory configured with a unique identification number and can be used on any ZoneSafe™ enabled job site**. Safety transponders within the proximity of a detection zone will be logged by the control unit. The data logged from the transponder includes its unique number, date/time and any low battery warnings.



3.4 Driver Transponder

A ZoneSafe™ Driver Transponder is required for the driver of the vehicle. The Transponder is placed into the Control Unit and allows for correct system operation. When the vehicle is in operation and a Driver Transponder is not present the alarm will emit a constant tone. With correct installation the system will emit a constant tone if the transponder is left in the Control Unit when the ignition is switched off.



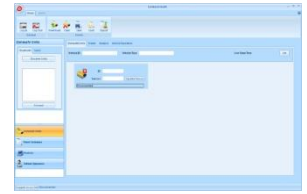
*All safety transponder enclosures for use in food safe environments use approved food safe material and are coloured blue.

** providing job site has not altered configuration from factory defaults

NOTE: It is essential that all personnel on the job site wear a safety transponder.

3.5 ZoneSafe™ Software

The ZoneSafe™ Software is an easy to use administration tool for configuring ZoneSafe™ devices and viewing event data. For full details of how to use the software please refer to the software manual, which covers the following topics:



- Installing the software
- Visual overview & key features of the interface
- Using the software

3.6 Transponder Test Unit

The ZoneSafe™ Transponder Test Unit provides an easy way to test the status of each ZoneSafe™ transponder worn by all personnel before entering the job site. The unit reads a transponder and displays the status of the battery, using indicator LEDs. Daily use of the transponder test unit ensures transponder batteries are always in a serviceable condition.



Indicator LED's include:

- Blue - Transponder Detected
- Green - Battery Good (OK to proceed)
- Red - Low Battery Warning (Contact Supervisor)

3.7 LED Test Transponder

The ZoneSafe™ LED Test Transponder is an easy to use tool for visually checking the detection zone. The test transponder uses an illuminated LED to indicate the detection zone, helping with initial set up, system checking and maintenance.

4 System Operation

4.1.1 Start up Sequence

- 1) (With constant power connected) Slide driver Transponder into tag holder.
 - 2) Ignition on (event logged).
 - 3) Automatic self test and detection zone energised.
 - 4) LED's illuminated:
 - **Power Red Solid** (flashing if no driver tag present).
 - **Status Green Solid** (flashing if fault).
 - 5) System is now operational.
-
- Personnel safety transponders in the proximity of the detection zone will trigger the alarm.
 - The audible alarm will sound and mute button LED will illuminate **Red** for as long as a transponder remains within the detection zone.
 - The alarm will continue to sound 3 seconds* after the transponder has left the zone
 - The mute button can mute the alarm when only ONE transponder is in zone. A second transponder in the zone will re-activate the alarm.
 - Alarm pulsing will speed up with increasing number of transponders in the zone

* time can be configured using ZoneSafe™ software

4.1.2 LED & Alarm Status

LED/Alarm	Status	System status
Power LED	Flashing Red	Power on but no driver transponder detected in holder or Ignition not on
Power LED	Solid RED	Power on and driver transponder detected in holder
Status LED	Flashing Green	System fault
Status LED	Solid Green	System operational
Alarm	Pulsing	Safety transponder in detection zone
Alarm	Continuous	No driver transponder detected, Transponder left in holder system error
Mute Button	Solid Red	Safety transponder in detection zone

- With the ignition ON and no driver transponder detected in the holder, the alarm will emit a constant tone, which cannot be muted. If a personnel safety transponder is detected during this time the audible alarm will change to a pulsing tone until transponder leaves the zone
- With the ignition OFF and a driver transponder detected in the holder, the audible visual alarm will emit a constant tone. This will remind the driver to remove the transponder from the holder.

5 Hardware Installation

Before installation please refer to the Installation and Operating manual, which covers the following topics:

- Minimum Requirements
- Installation Considerations
- Optimum Transponder Position
- Control Unit
- Safety Transponders

NOTE: It is recommended that the installation of ZoneSafe™ Compact is carried out by a fully authorised ZoneSafe™ installation engineer.

6 Connections

For full details please refer to the Installation and Operating manual, which covers the following topics:

- Control Unit Connections
- Range Adjustment
- Hardware Setup & Test

7 System Specification

7.1 Control Alarm Unit

ZoneSafe™ Control Unit		
Electrical	Power	12 to 24V DC Input (9-36v nom)
	Current Consumption	800mA
	Memory	7000 Events
Mechanical	Dimensions (inc glands)	235mm x 90mm x 73.5mm
	Connectors	IP68 ABS Glands
	Optional Relay (for additional sounder/beacon)	1 x DPCO Rated Current 2A
	Optional digital input	1 Digital Input
Communications	Wireless	Bluetooth
Environment	Ingress Protection	IP65
	Temperature	- 10°C to + 55°C



7.2 Wakeup Antenna

ZoneSafe™ Wakeup Antenna Unit		
Mechanical	Dimensions (inc glands)	280mm x 100mm x 77.5mm
	Material	Anodised Aluminium Base. Polystyrene Weather Resistant HIPS Cover
	Weight	0.8kG
	Connectors	IP68 ABS Gland
	Mounting	Integrated M6 Blind Nuts Optional Mounting Kit



7.3 Transponders

ZoneSafe™ Transponder		
Electrical	Power	Lithium Coin Cell
	Operating Voltage	3V
	Life	2m Reads or 2 Years*
Mechanical	Dimension	85mm x 54mm x 7mm
	Material	ABS (Grey/Yellow)
	Weight	22.5 grams
Environment	Ingress Protection	IP67
	Temperature	- 10°C to + 55°C



* Lengthy exposure to extremely low temperatures may reduce overall life time

7.4 Transponder Test Unit

ZoneSafe™ Transponder Test Unit		
Electrical	Voltage	24V DC nom (18-30V)
	Current Consumption	500mA max
Mechanical	Dimensions (inc. glands)	285mm x 150mm x 102 mm
	Material	Anodised Aluminium Base. Polystyrene Weather Resistant HIPS Cover
	Weight	965 grams
	Connectors	IP68 ABS Glands
	LEDs	Blue - Transponder Detected Green - Battery Good Red - Low Battery Warning
	Relays	2 x Guided Contacts DPDT Rated Current 8A
	Mounting	Integrated M8 Blind Nuts Optional Mounting Kit
Communications	Data	TCP/IP
Environment	Ingress Protection	IP67
	Temperature	- 10°C to + 55°C



8 FAQ

Description	Diagnosis	Solution
Power LED Flashing Red	Power is present but no driver transponder is detected in holder	Place driver transponder in holder
Status LED Flashing Green	System fault	Contact a qualified installation engineer
How can I check my detection zone		Use an LED test transponder
Does the event log take into account day light saving?	Time on each control unit is GMT	Zonesafe software downloads data and converts to daylight saving time
How many events can be stored?	7000	Once 7000 is reached the data is overwritten from the first event onwards
How do I down load data log?		Use Zonesafe software to down load events (save and export)
I would like to alter the length of time the alarm is on	Change system configuration	Use Zonesafe software to alter configuration

9 Troubleshooting

Description	Diagnosis	Solution
Alarm does not mute	More than one Transponder in detection zone	Check detection zone for all Transponders
With driver Transponder and Ignition on there is a constant tone	Wiring fault on ignition	Check ignition and power is connected correctly
With no Transponder in the zone the alarm still pulses	Driver Transponder is being detected	Contact a qualified installation engineer, check Driver search time and masking field
Alarm goes off in certain locations	Transponder detection	Is there a Transponder behind a wall, on the second floor or behind an obstacle?
All vehicles in the area alarm at the same time	Vehicle ID (wakeup address) is the same	Using Zonesafe software change wakeup address
Why is the alarm a constant tone when leaving the vehicle	Driver Transponder left in holder	Remove Driver Transponder

- If a fault cannot be identified in the above table, or the solution does not resolve your fault please contact your Zonesafe qualified installation engineer.
- It is the responsibility of the end user to keep a record of unique vehicle wake up ID if altered from the manufacture supplied ID.

10 WEEE Directive

The Waste Electrical and Electronic Equipment Directive (WEEE Directive) was introduced into UK law in January 2007 by the Waste Electronic and Electrical Equipment Regulations 2006.

This product shall not be treated as household waste. It must be treated in accordance with the Waste Electronic and Electrical Equipment Regulations 2006.

Avonwood Developments Limited is a WEEE registered producer WEE/EFO483SX.



Fig 1: WEEE Symbol

11 Disclaimer

The ZoneSafe™ proximity warning systems manufactured by Avonwood Developments Limited are supplied as an audible and/or visual alert system only. The ZoneSafe™ proximity warning system is not a protective device, it does not initiate or perform safety related functions and it does not provide control to reduce risk but and audible/visual alert to the operator of the risk.

ZoneSafe™ should not be used to replace proper job site organisation, safeguards, operator training and the application of relevant vision standards that addresses safety and the safety of people on job sites.

Due to the nature of radio frequency, wireless communications and possible interference, data can never be guaranteed. Data can be corrupted, have errors or be totally lost. Avonwood Developments Limited ZoneSafe™ systems should not be used in situations where failure to transmit or receive data could result in damage of any kind to the user or any other party, including but not limited to personal injury, death or loss of property. Avonwood Developments Limited accepts no responsibility for damages of any kind resulting from errors in data transmitted or received using Avonwood's ZoneSafe™ systems, or for the failure of the Avonwood's ZoneSafe™ systems to transmit or receive such data.

Avonwood Developments Limited accepts no liability for any and all direct, indirect, special, general, incidental, consequential, punitive or exemplary damages including, but not limited to, loss of profits or revenue or anticipated profits or revenue arising out of the use or inability to use any Avonwood Developments Limited products.

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12 Declaration of Conformity and FCC Compliance

12.1 Declaration of Conformity

DECLARATION OF CONFORMITY



Manufacturer:

Avonwood Developments Ltd
Knoll Technology Centre
Stapehill Road
Wimborne
Dorset
BH21 7ND

Product:

ZoneSafe System

Year of issue:

2011

Standards to which conformity is declared:

EN 301 489-3 v1.2.1 (2000-8)
EN 301 489-3 v1.4.1 (2002-8)
EN 300 330-1 v1.3.1 (2001-6)
Machinery Directive 2006/42/EC

The present document declares that the specified product conforms to the reported standards and satisfies the essential requirements of:

ETSI EN 301 489-3 v1.2.1 (2000-8)

ETSI EN 301 489-3 v1.4.1 (2002-8)

Electromagnetic Compatibility and Radio spectrum Matters (ERM);
ElectroMagnetic compatibility (EMC) standard for radio equipment and services;

ETSI EN 300 330-1 v1.3.1 (2001-6) (NUA)

Electromagnetic compatibility and Radio spectrum Matters (ERM);
Short Range Devices (SRD);
Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems
in the frequency range 9 kHz to 30 MHz;

Machinery Directive 2006/42/EC

Authorised Signatory	
Date:	March 2011
Signature:	
Name:	Linda Thomas Head of Quality Assurance



The safety guidelines in accompanying product documentation must be observed.

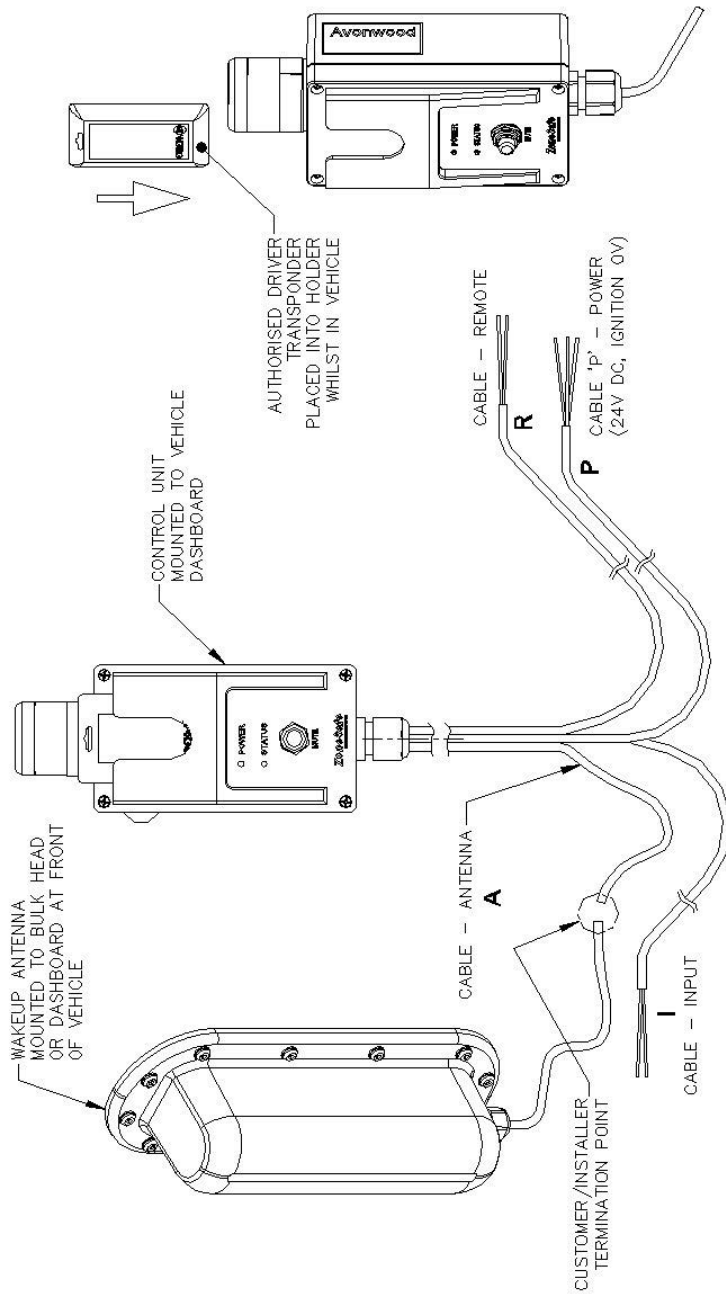
12.2 FCC Compliance Information

12.2.1 User Information

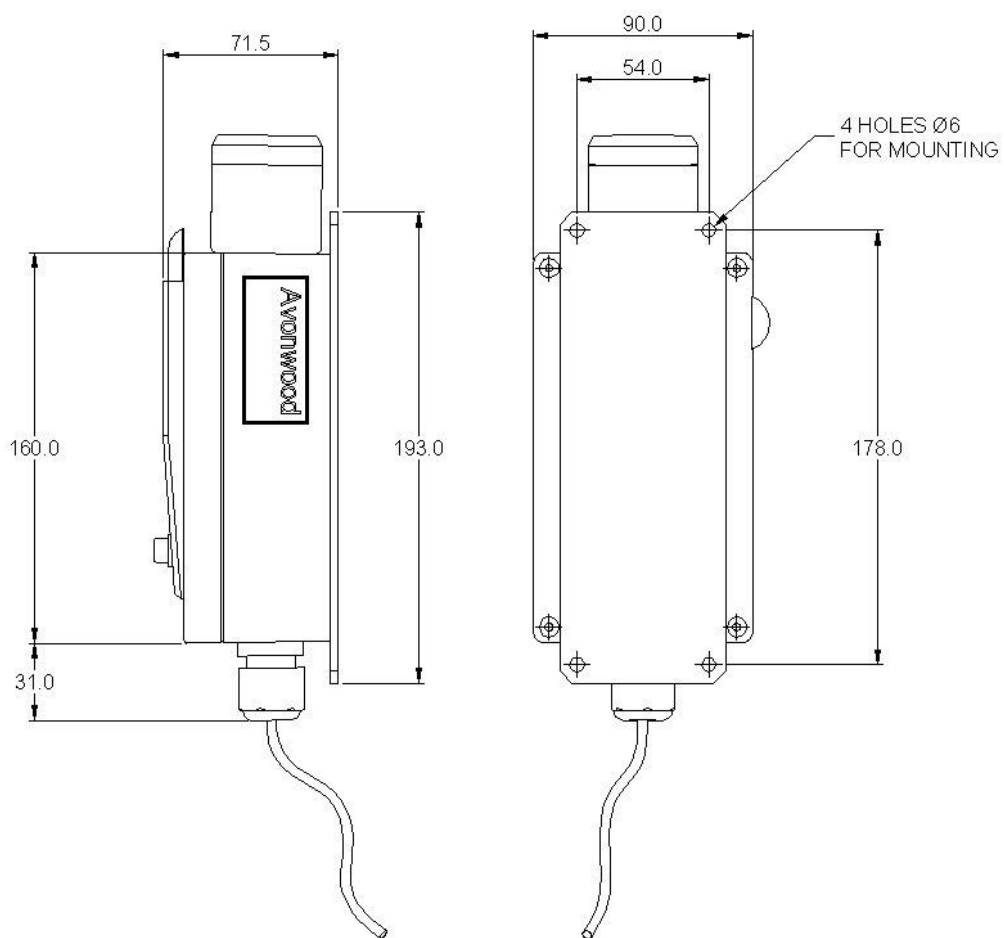
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes or modifications to ZoneSafe™ systems not expressly approved by Avonwood Developments Limited may void the user's authority to operate the equipment.

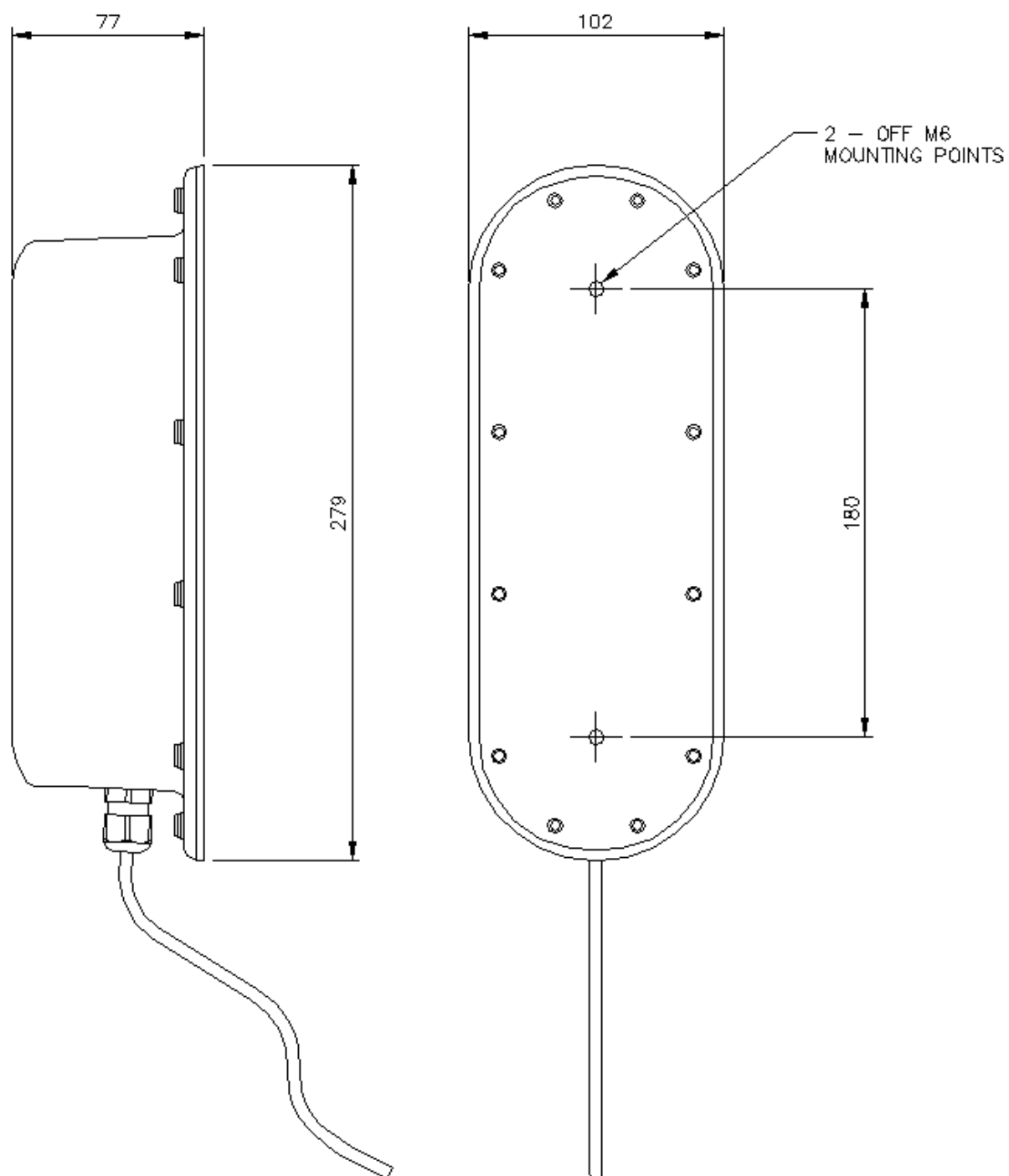
13 Appendix A1 - System Diagram



14 Appendix A2 - Controller Dimensions



15 Appendix A3 - Wakeup Dimensions



16 Appendix A4 – Transponder Test Unit Operation Guide



Test YOUR Safety Transponder Before Entering Work Site.

- 1) Hold your transponder in front of the test unit.
- 2) Wait for LED's to illuminate.
- 3) Check transponder status as indicated:
 - **Blue** - Transponder Detected
 - **Green** - Battery Good (OK to proceed)
 - **Red** - Low Battery Warning (Contact Supervisor)



OK to proceed



Do NOT Proceed



Contact supervisor

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