



Plus Reader / Tag Tester

User Manual

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1. Introduction

The Plus Reader is a cost effective solution for active RFID tagging applications using our Eureka RFID technology. Designed for both internal or external applications the reader is housed in a rugged weatherproof enclosure.

Applications include personnel and asset tracking, access control and asset identification.

Each reader can be connected to a network enabling tag data to be logged and the device managed via local or online services.

The unit is powered by a 24V DC supply or option for power over Ethernet (PoE) enabling easy installation where multiple readers are set up on the same network.

Two onboard relays are available to operate auxiliary systems or an alarm on detection of a tag.

2. System Components

The Plus Reader is part of a complete RFID system comprising of the following standard components and accessories:

Standard Components

1. Plus Reader(s)
2. Tags (supplied seperately)

Accessories

1. Power over Ethernet module
2. +24VDC Installation Power Supply
3. External Antenna

3. How Does The System Work?

The Plus Reader produces a user configurable detection zone between 1m to 4m (or upto 8m with external antenna) which interacts with tags worn by personnel.

1. The Plus Reader creates a detection zone (1 - 4 metres) around the unit.
2. The Plus Reader identifies any tags entering the detection zone.
3. When the tag is identified, the reader will carry out the required function:
 - Access Control - open door, barrier, gate or turnstile
 - Alarm on tag detection
 - Identify a particular asset

The example on the right illustrates a pedestrian worker walking towards a Plus Reader. When the worker who is wearing a tag enters the detection zone, the door automatically opens offering a hands free access solution. This helps traffic flow especially when people are carrying equipment or pushing trolleys.



4. Installation

Before installation please read the following guidelines to ensure that the system is correctly installed and provides optimum performance.

Minimum Requirements

- 24VDC ($\pm 5\%$) 10W supply protected by a 1A anti-surge fuse

4.1. Location Consideration

Figure 1



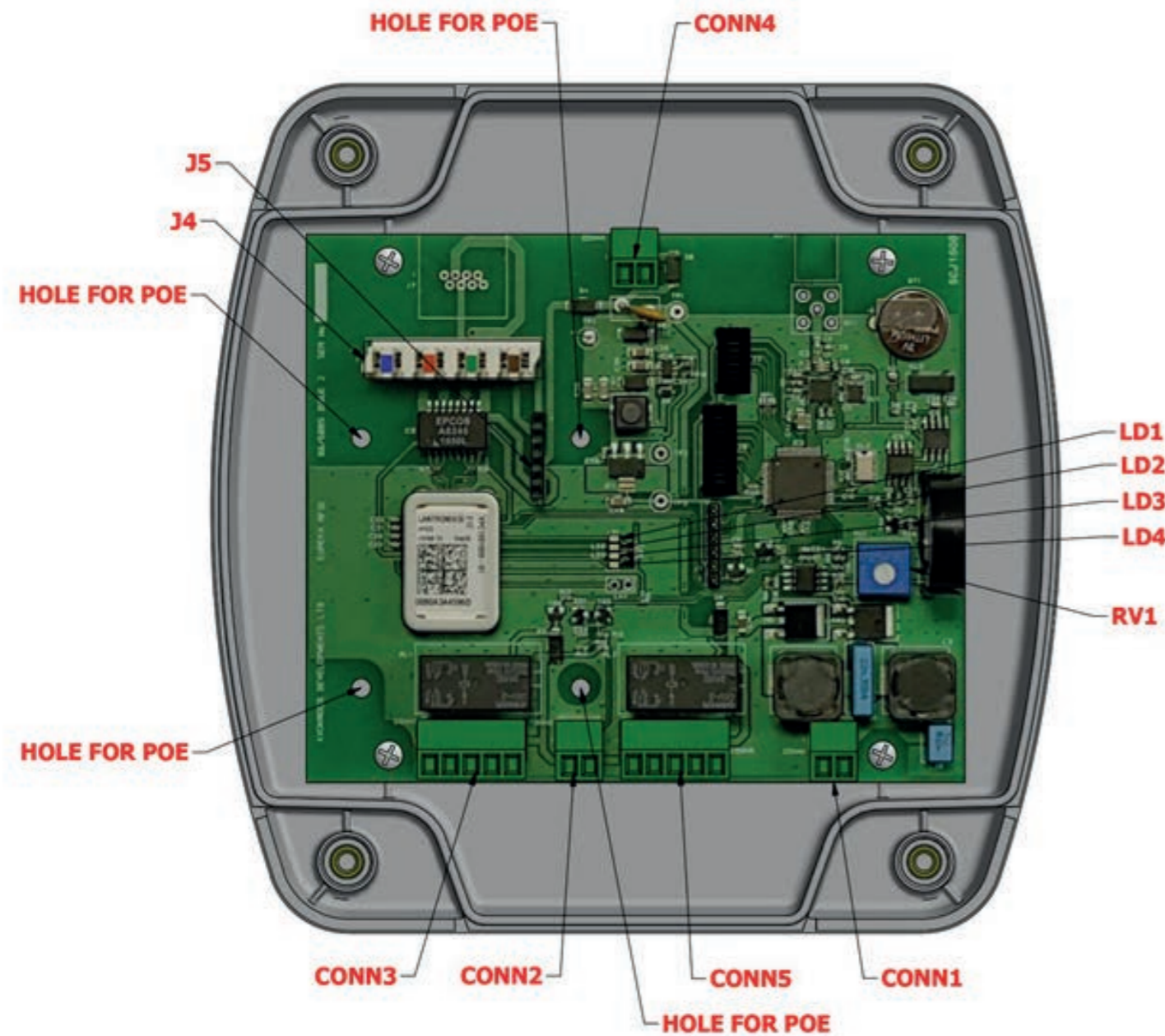
Installation Considerations

- No metal should be within 200mm of the top, bottom and sides of the reader (Figure 1)
- No metal should be in front of the antenna, for example a grille

4.2. Wiring Connection

The Plus Reader unit can be opened using an allen key and unscrewing the screw in each corner of the box revealing the circuit board.

Below is a diagram (Figure 2) showing the location of each wiring connection.



Connection Name	Pin Number	Description
CONN1: ANT (2way for Antenna)	1	Antenna -
	2	Antenna +

Connection Name	Pin Number	Description
CONN2: INPUT (2way for vault free contacts)	1	0V
	2	Input +
CONN3: RELAY1 (5way)	1	0V
	2	Normally Open
	3	Normally Closed
	4	Common
	5	+24v OUT (100mA max)
CONN4: POWER (2way)	1	+24V IN
	2	0V IN
CONN5: RELAY2 (5way)	1	0V
	2	Normally Open
	3	Normally Closed
	4	Common
	5	+24V OUT (100mA max)
J4: ETHERNET (8way)	1	BLUE/WHITE
	2	BLUE
	3	ORANGE/WHITE
	4	ORANGE
	5	GREEN/WHITE
	6	GREEN
	7	BROWN/WHITE
	8	BROWN
J5: HEADER FOR POE		

4.3. PCB LED Indicators

Connection Name	Description	Function
LD1	Ethernet Link	LED is ON when Ethernet port has a valid link
LD2	Ethernet Speed	LED is ON when Ethernet is in 100Mbps mode
LD3	Ethernet Activity	LED blinks when there is activity on the Ethernet port
LD4	Ethernet Duplex	LED is ON when Ethernet is in half duplex mode

4.4. Adjusting The Range

The range on the Plus Reader can be adjusted to detect tags between 1 and 4 metres away. The adjuster is marked as **RV1** in Figure 2 on the previous page. Using a flat bladed screwdriver, turn the adjuster to change the size of the detection zone.

- Turn the adjuster clockwise to increase the size of the detection zone
- Turn the adjuster anti-clockwise to decrease the size of the detection zone

Please note - Maximum and minimum range can be affected by the mounting location of the unit and power supply ratings.

4.5. Fixing The Plus Reader To The Wall

The fixing of the reader can be done from inside the unit through 4 holes drilled by the user as indicated in figure 3 on the opposite page.

Please note there is the option for mounting the reader using Ball mount fixings via the four central threaded inserts on the back as indicated in figure 3 on the opposite page.

To drill the fixing holes:

- Place the back section of the reader so the drill point marks in the plastic are facing up. Make sure you have something underneath where you are drilling so that in the event the drill bit goes too far through the plastic you protect whatever is underneath from being damaged.
- Drill using a 4.2 to 4.5 mm spur point drill bit so that you have four holes which can take a 4mm diameter wood screw or similar.
- Use a manual screwdriver when tightening the fixing screws. Do not overtighten so as to reduce accidental damage to the enclosure.

Cable glands can be installed either through the top or bottom flat side of the enclosure rear section. Carefully drill and enlarge holes to suit the glands as required.

Gland Size	Drill Point	Hole Size
M16	A	16mm
M20	B	20mm

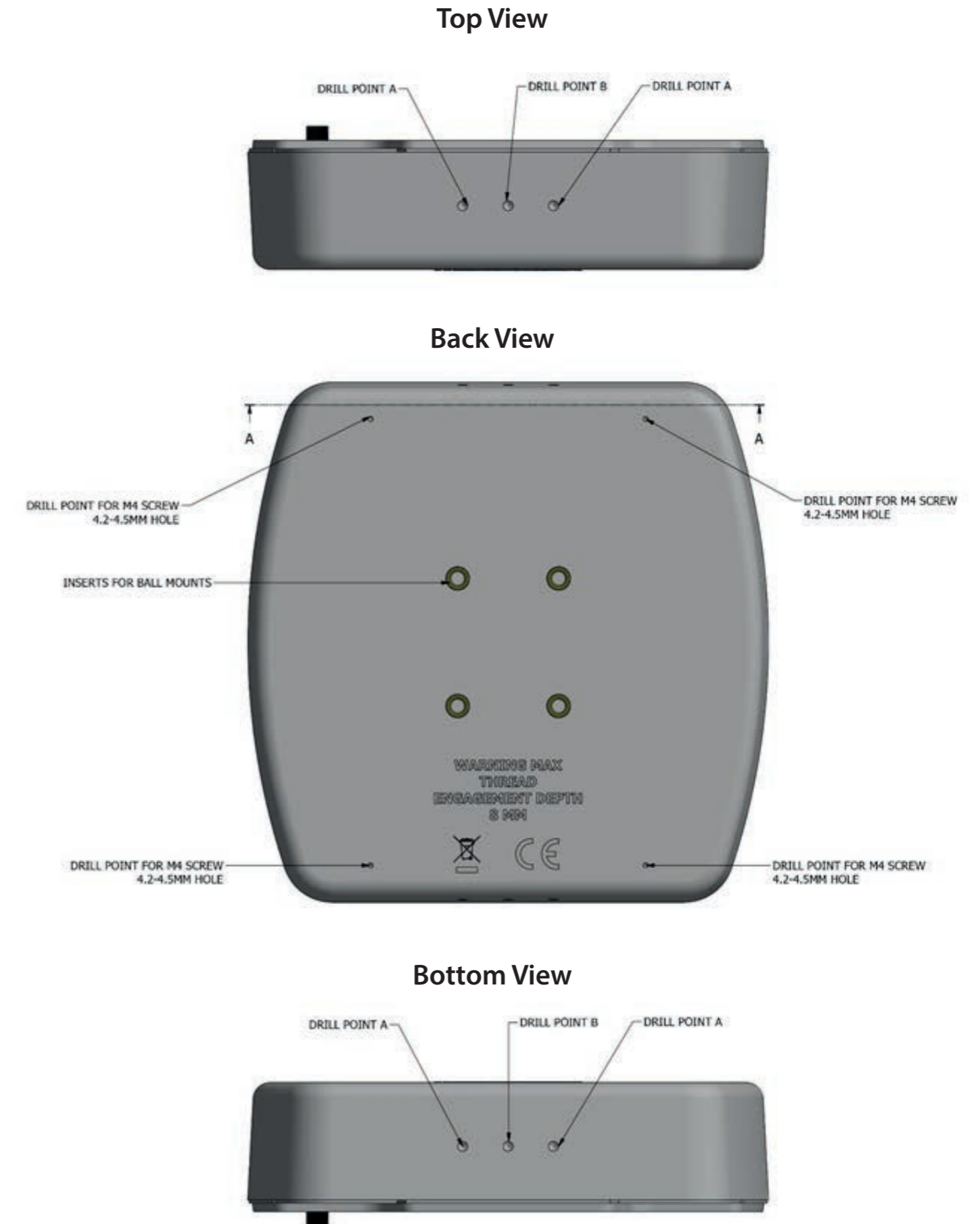
4.6. Ball Mounting Option

The enclosure can be mounted via a ball mounting kit. Various fixing options are available and kits can be supplied by Avonwood. For all mounting styles available you will need a ball mount base kit, for this product we offer one kit for the ball mount.

EURIDM0000 – Ball Mount Base Kit
(Supplied with Fixings)



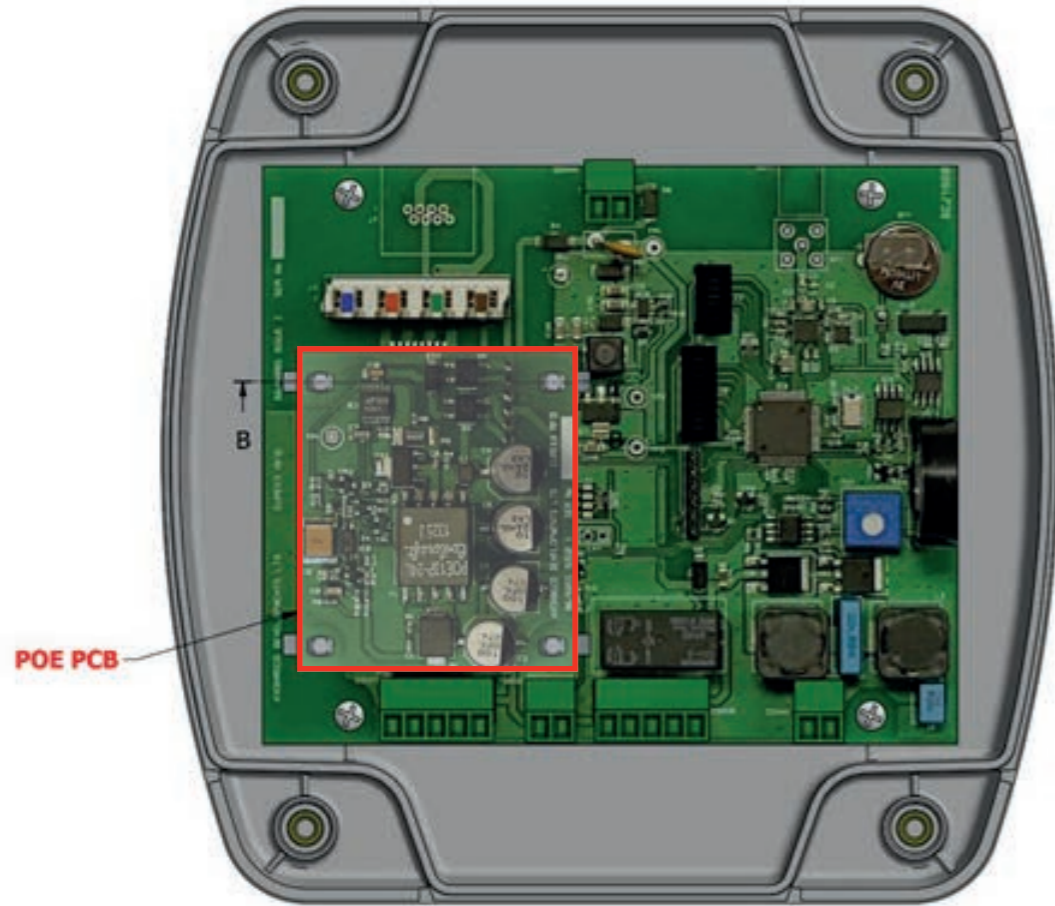
Figure 3



4.7. PoE Daughter Board Kit

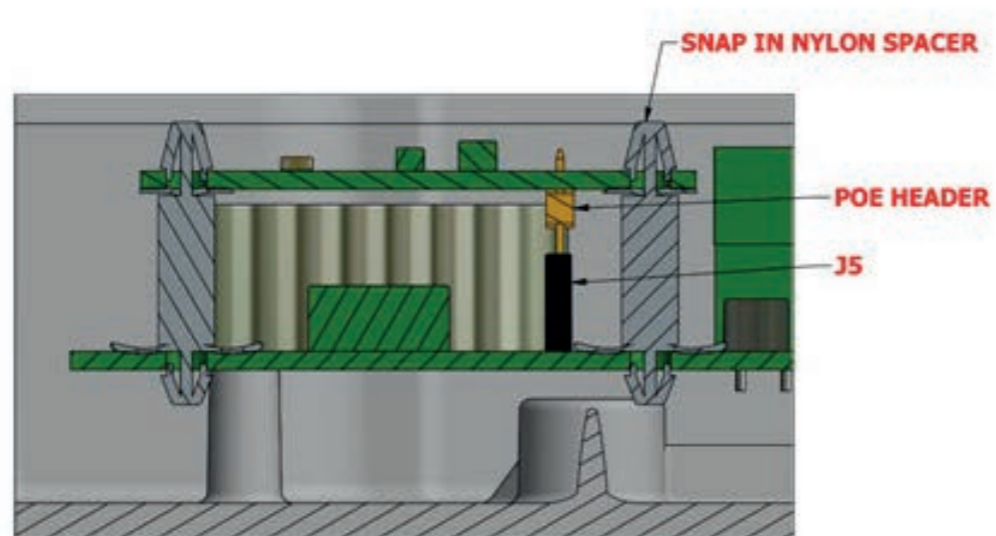
The PoE (Power Over Ethernet) Daughter Board is fitted to the Reader PCB as shown in **Figure 4** below.

Figure 4



Please ensure that the plastic spacers are inserted correctly as per **Figure 5** below. For further information about ethernet wiring, please see page 7.

Figure 5



5. Using The Plus Reader / Tag Tester

Once the Plus Reader is installed and set up with the desired detection zone, the reader is ready to use. In order for the reader to work as part of a system, everyone has to wear a tag. When the person wearing a tag enters the detection zone, the reader will identify the tag and automatically carry out the required function - e.g. the door will open.

Figure 6



The Plus Reader requires a 24VDC ($\pm 5\%$) 10W supply. Dual N/O or N/C relay contacts are available for the addition of external sounders, beacons or electro-mechanical locks. One digital input is provided which can be used for monitoring a door sensor. The reader retains time and date information, stores event data, and provides Ethernet communications.

POWER INDICATOR LED

TAG READ INDICATOR LED

The Plus Reader offers visual and audible indicators for both tag detection & reader status:

- Power LED (Blue flashes 1sec on/off = normal operation)
- Tag Detect LED (Blue flashes 50ms On = tag detected)

Figure 7



The Plus Tag Tester provides an additional way to test the status of each tag worn by all personnel before entering the job site. The unit reads a tag and displays the status of the battery, using red or green indicator LEDs and optional audible indicators. Daily use of the tag test unit ensures tag batteries are always in a serviceable condition.

POWER INDICATOR LED

TAG BATTERY LEVEL IS GOOD

TAG BATTERY LEVEL IS BAD

- Power LED (Blue flashes 1sec on/off = normal operation)
- Battery OK LED (Green 3sec on = tag battery OK)
- Battery Low LED (Red 3sec on = tag battery Low)

6. Tags (see Tag User Manual)

Tags are worn by all relevant personnel. When a tag enters a detection zone a visual and audible indication is provided. Each tag is factory configured with a unique identification number, when detected will be logged by the reader. The data logged from the tag includes its unique number, date/time and any low battery warnings.

7. Plus Reader Configuration

The Plus Reader has an internal web page for configuration of device parameters and enabling additional features, such as sending data to the My ZoneSafe website and managing Access Control. The internal web page can be accessed via web browser using the IP address of the device.

7.1. Network Connection

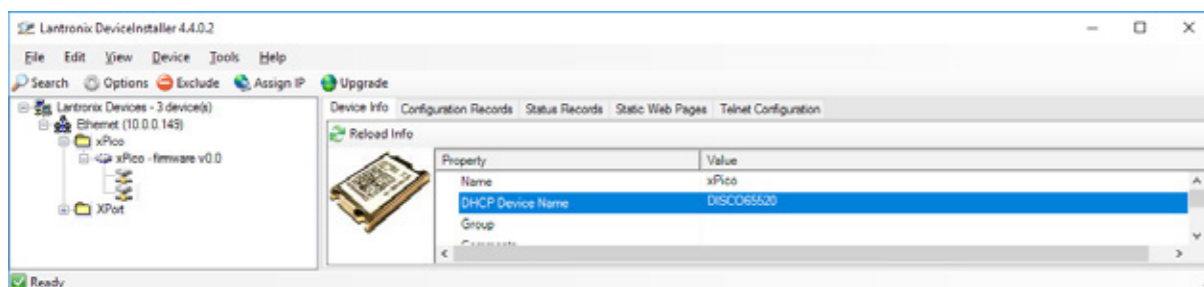
All Plus Readers are shipped with DHCP enabled and a DHCP name using the Serial Number of the device. The Serial Number can be identified from a label inside or on the back of the Plus Reader.

When the device is connected to a network port it will be assigned an IP address from your network's DHCP server if available. To discover the IP address assigned to a particular device you will need to use the Lantronix Device Installer software, which can be downloaded from <http://www.lantronix.com>.

1. Run the "Lantronix Device Installer" software from a PC on the same network as The Plus Reader. It will automatically start searching for devices on the network.



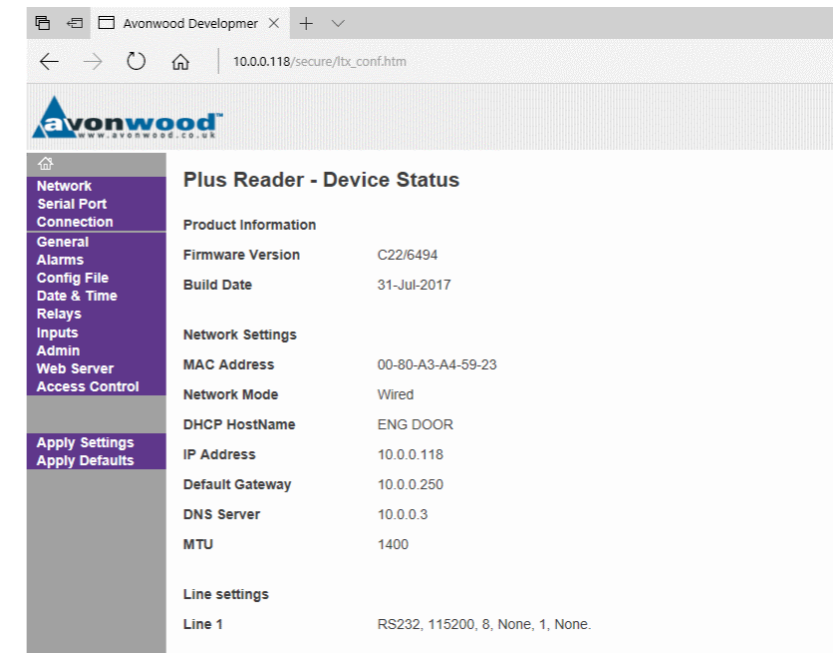
2. Device Installer will show all devices located on your network. To identify the correct device from its Serial Number, double-click a device with the name "xPico". This will show a Device Info tab. Use the DHCP Device Name property value to determine if this is the correct device.



Having determined the correct device, note the IP Address assigned to it and open a web browser to that address, for example <http://10.0.0.121>. When prompted for a username and password, leave both fields blank and click OK.

7.1.2. Internal Web Page

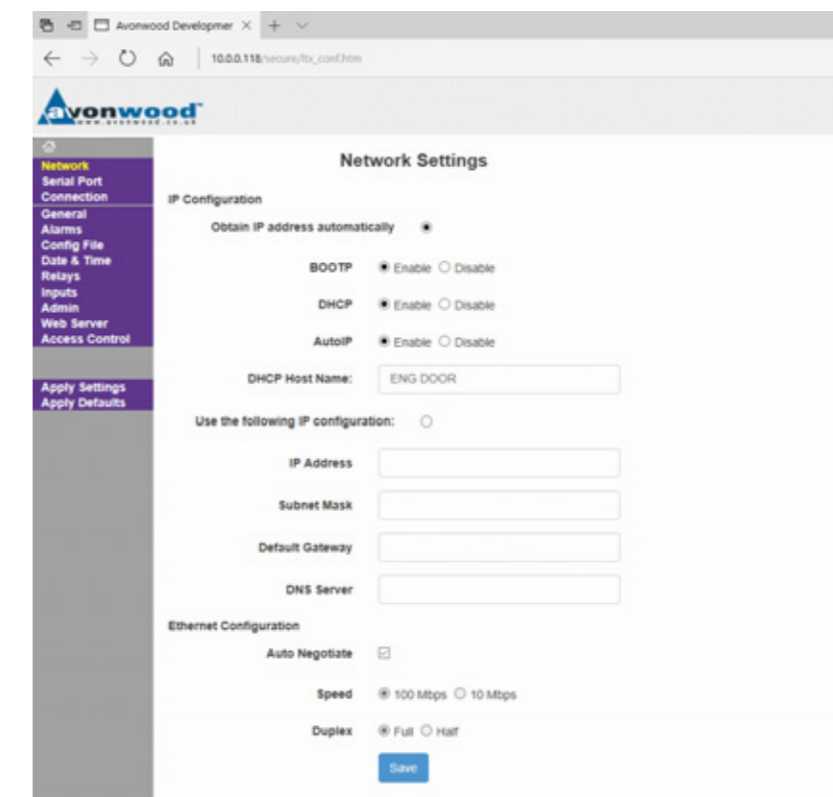
The webpage initially shows the status of various settings of the Plus Reader.



7.1.3. Network

The Network page allows configuration of the TCP/IP settings of the Plus Reader. You can use this page to configure the appropriate settings for the Plus Reader on your network.

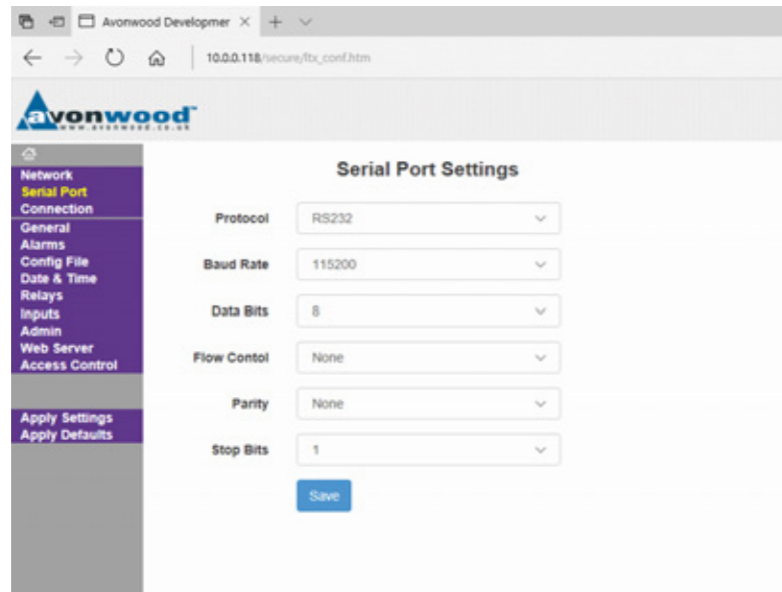
If any of these settings are changed, you must click the Save button and then the "Apply Settings" menu option, then wait for the device to reboot. It may be necessary to use The Device Installer again to discover the updated IP address of the device.



7.1.3. Serial Port

The Serial Port page allows configuration of internal serial port settings of the device.

These settings should not be modified unless instructed by Avonwood Developments. Changing these settings could make your Plus Reader inoperable.

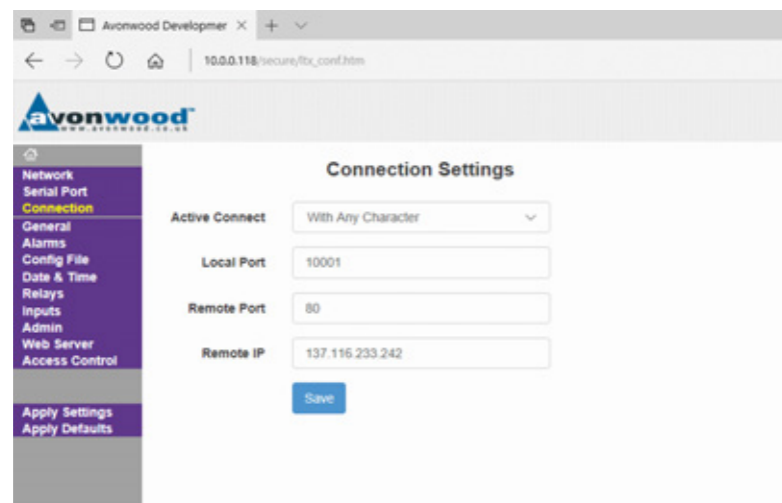


7.1.4. Connection

The Connection Settings page allows configuration of the TCP settings used for sending event data and tag read data to the My ZoneSafe website. The local port can be changed if necessary to be compatible with your network firewall configuration.

The remote IP is used with the web server settings to send event data and tag read data to the My ZoneSafe website.

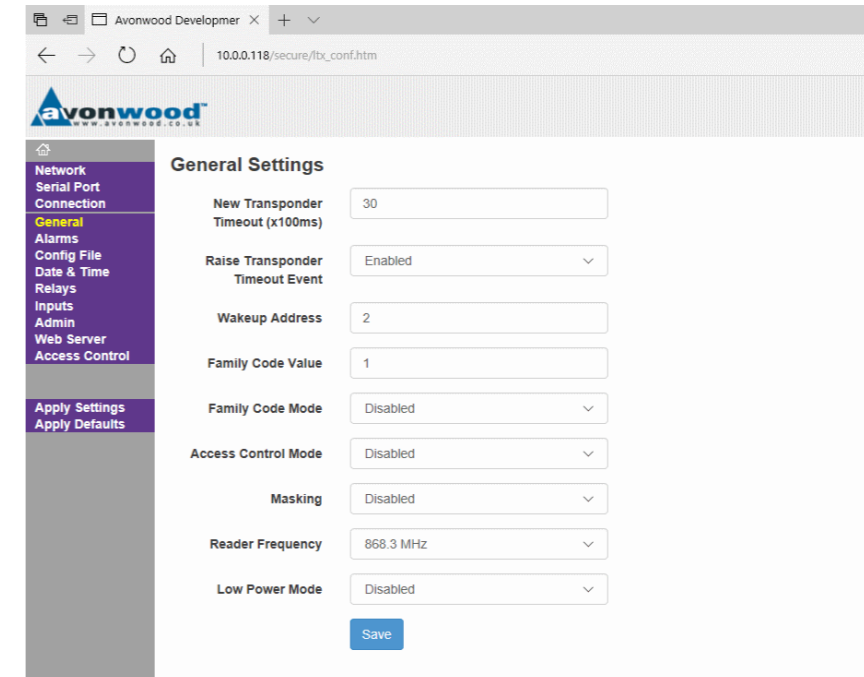
These settings should not be modified unless instructed by Avonwood Developments.



7.2. General

The General Settings page contains the primary user configurable parameters of the device.

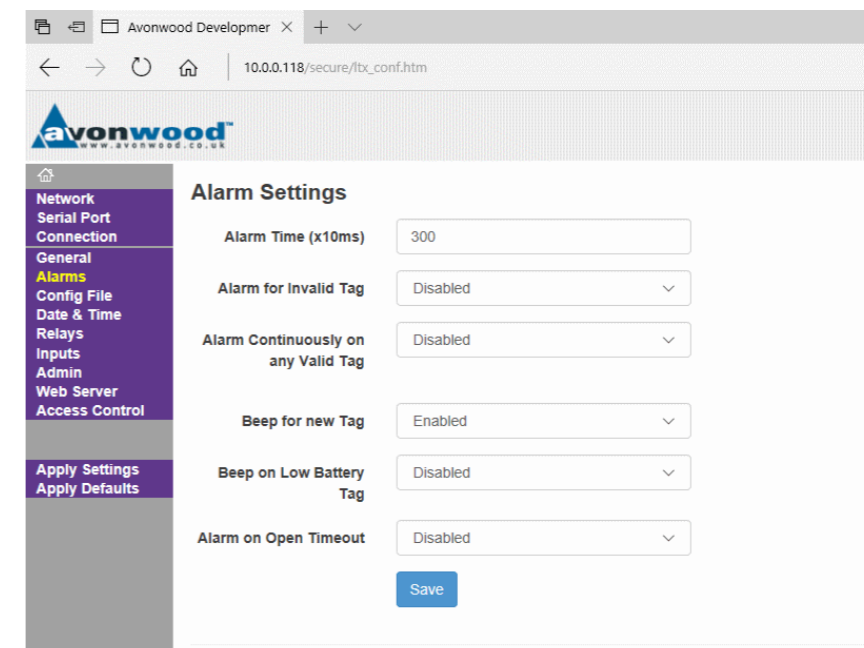
A tooltip is displayed when hovering the cursor over each setting explaining its purpose. Click the Save button for changes to take effect.



7.3. Alarms

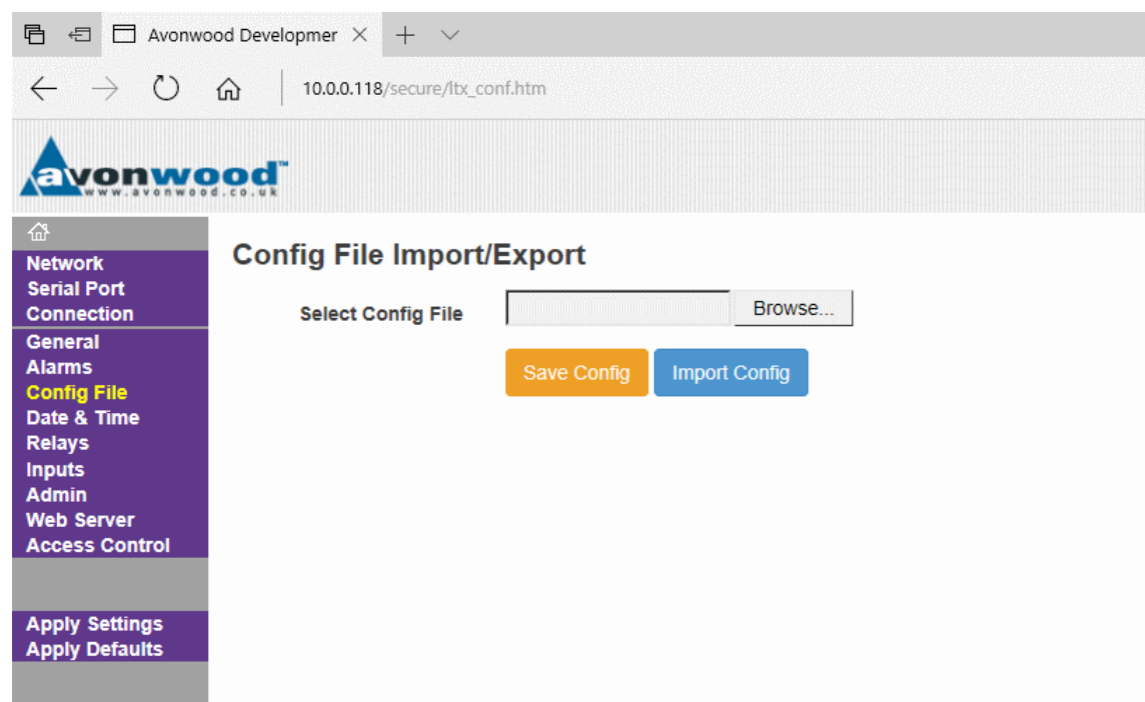
The Alarms page contains the alarm settings for the device.

A tooltip is displayed when hovering the cursor over each setting explaining its purpose. Click the Save button for changes to take effect.



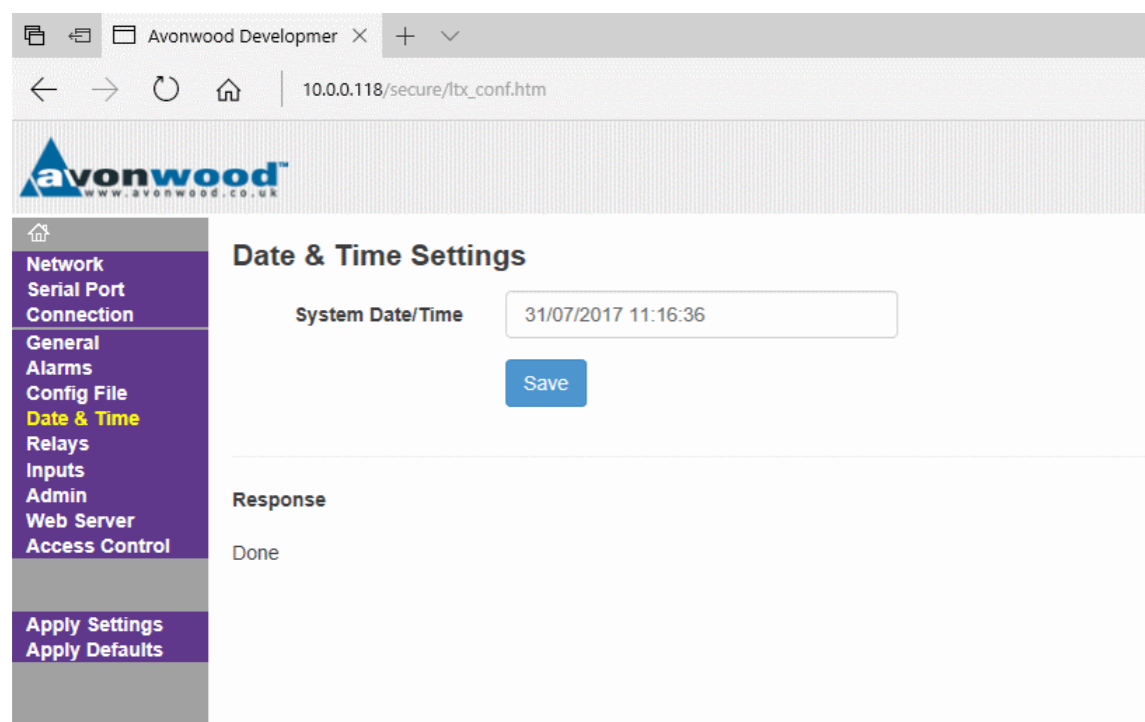
7.4. Config File

The Config File page contains the ability to export the configuration of the device or import a new configuration. Click “Save Config” to obtain an XML configuration file of the current parameter settings of your device. Use the “Import Config” button to load a selected XML configuration file into the device. Normally this should only be required when advised by Avonwood Developments.



7.5. Date & Time

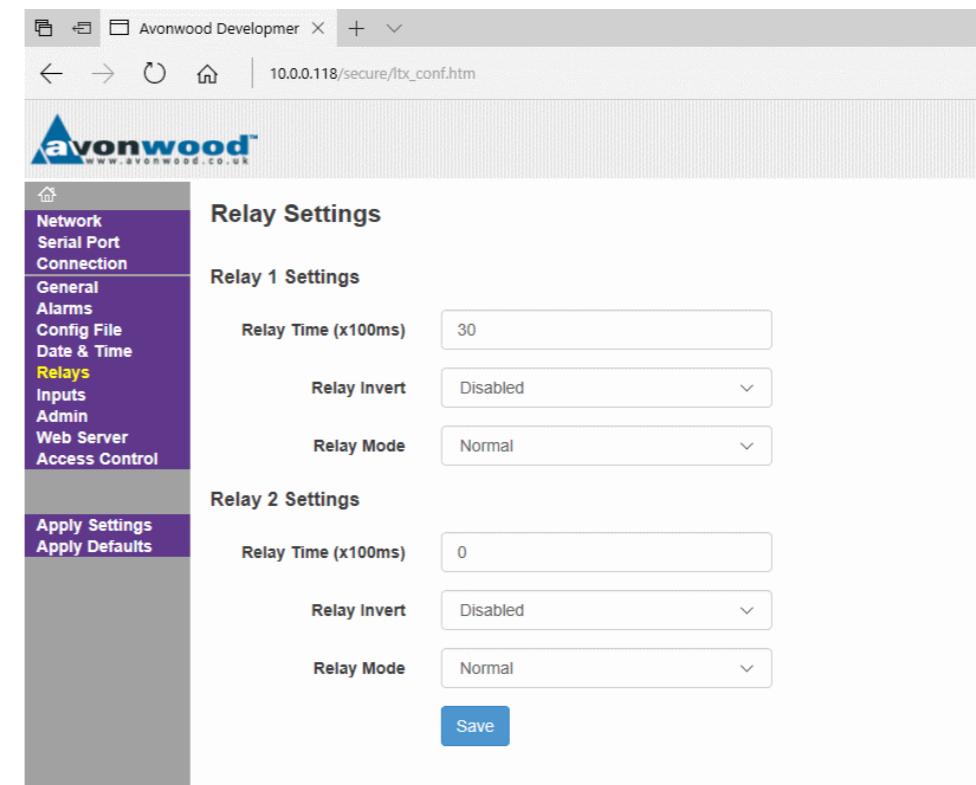
The Date & Time settings allow you to check and set the current date/time on the device. This value will be used to record the time of events and tag reads. Click the Save button for changes to take effect.



7.6. Relays

The Relays page contains the relay settings for the device.

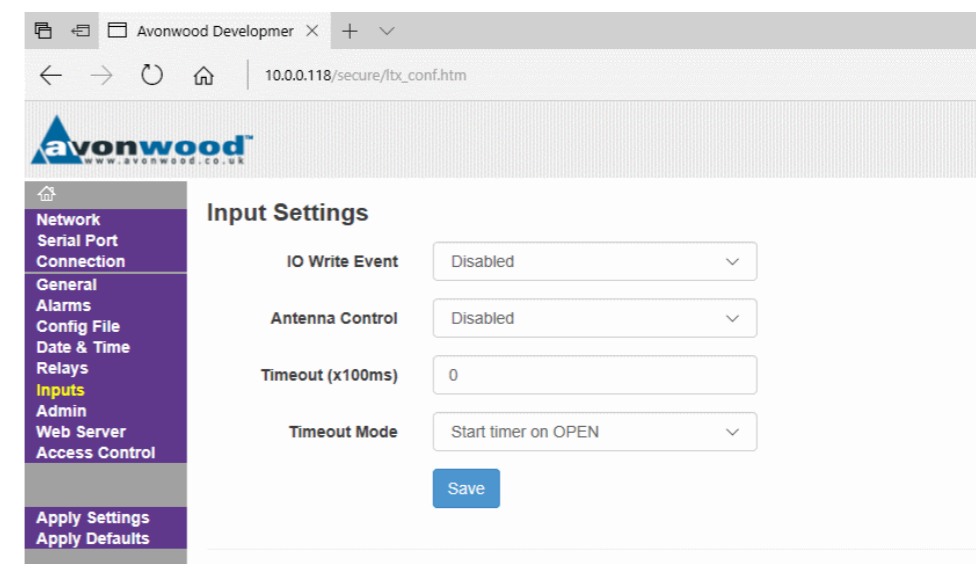
A tooltip is displayed when hovering the cursor over each setting explaining its purpose. Click the Save button for changes to take effect.



7.7. Inputs

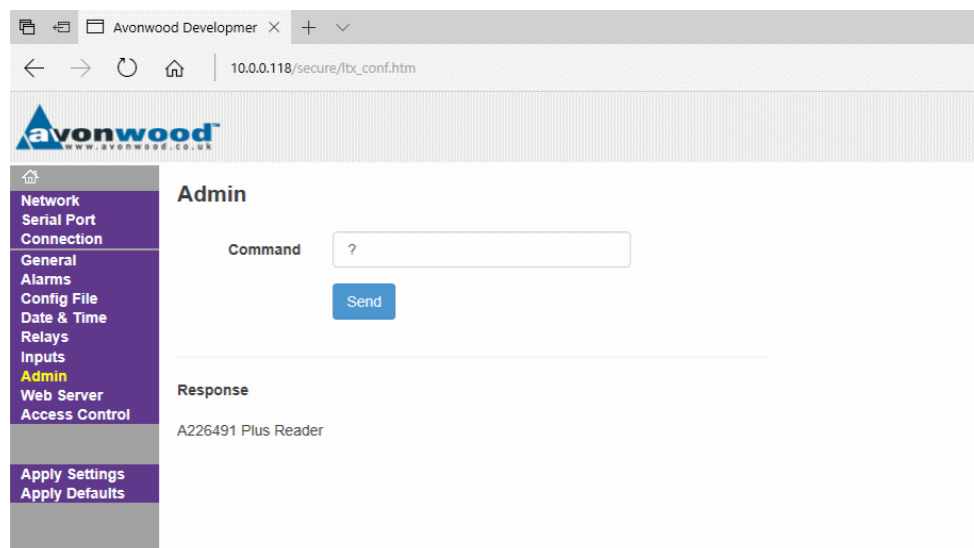
The Inputs page contains the input settings for the device.

A tooltip is displayed when hovering the cursor over each setting explaining its purpose. Click the Save button for changes to take effect.



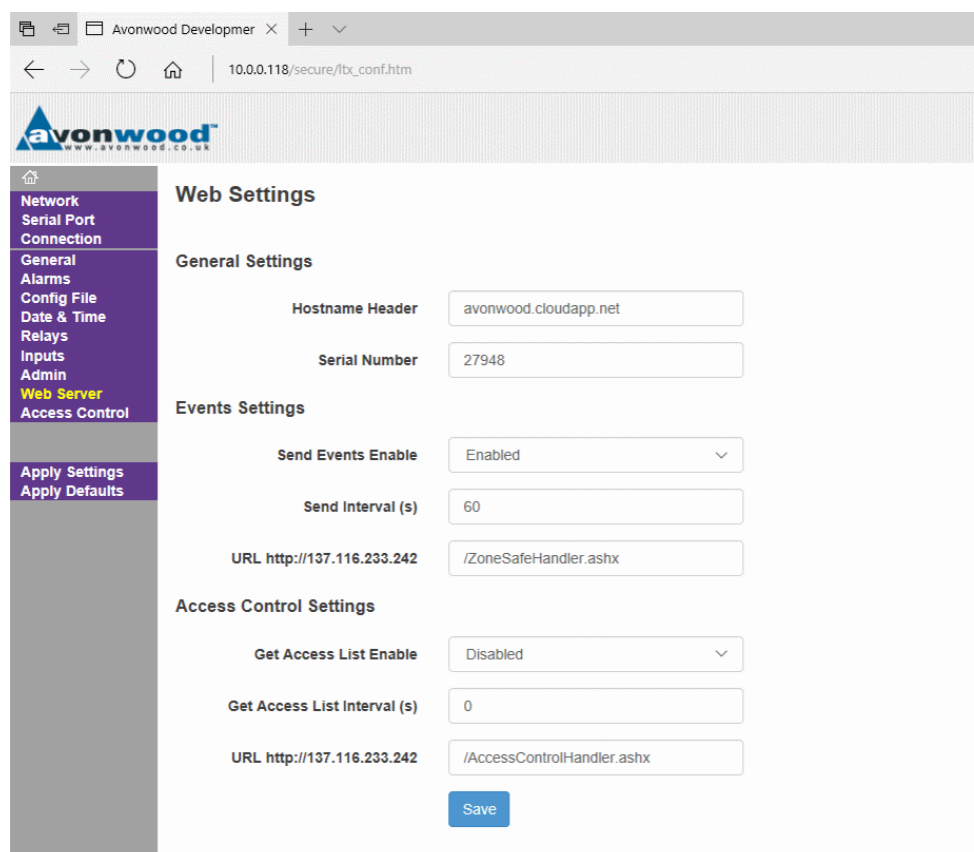
7.8. Admin

The Admin web page allows advanced configuration of the Plus device to be undertaken. This feature should not be used unless instructed by Avonwood Developments.



7.9. Web Server

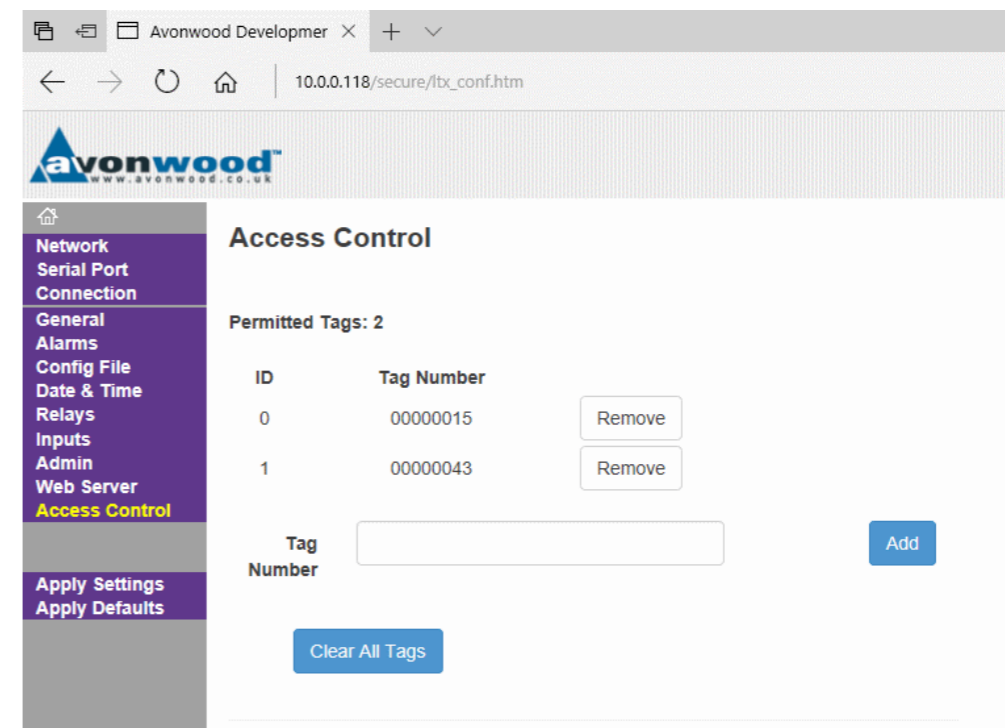
The Web Server page allows configuration of the HTTP settings for sending event data and tag read data to the My ZoneSafe website and retrieval of Access Control settings. A tooltip is displayed when hovering the cursor over each setting explaining its purpose. Click the Save button for changes to take effect.



8. Access Control

The Access Control web page displays a list of RFID tag numbers that are permitted if the Access Control Mode is enabled in the General settings (See section 11). Tag numbers can be manually added or removed using this page. The Clear All Tags button will remove the complete list of permitted tags from the device.

If the "Get Access List Enable" option is enabled, the software will periodically request a list of permitted tag numbers for this device from the My ZoneSafe website.



9. Specification

Specification	Type	Description
Electrical	Voltage	24V DC Input ($\pm 5\%$)
	Power	<10W
Mechanical	Dimensions	155mm x 155mm x 60mm
	Connectors	IP68
	Relay	2x Rated Current 1A @ 30V
Communication	Input	1 x
	Ethernet	10-BaseT or 100-BaseTx
Environment	Ingress Protection	IP67
	Temperature	-10°C to +55°C

10. FCC Compliance Information

Note: 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.

FCC ID: 2ACWNZSR6663

11. Declaration of Conformity

EU Declaration of Conformity (DoC)

We,

Company Name: Avonwood Developments Ltd

Address: Knoll Technology Centre, Stapehill Road,
Wimborne, Dorset. BH21 7ND

Declare that the DoC is issued under our sole responsibility and belongs to the following product:

Product Range: Plus Reader Series

Type Designations: ZSR6663-EU Plus Reader
ZSR6663-EU-T Plus Tag Tester

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

Radio Equipment Directive 2014/53/EU

The following harmonised standards and technical specifications have been applied:

Reference & Date	Title
EN 300 220-2 V3.1.1 (2017-02)	Short Range Devices (SRD) operating in the frequency range 25 MHz to 1 000 MHz
EN 300 330 V2.1.1 (2017-02)	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
Draft EN 301 489-1 V2.2.0 (2017-03)	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services
Draft EN 301 489-3 V2.2.1 (2017-03)	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services
Draft EN 301 489-17 V3.2.0 (2017-03)	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services

Signed for and on behalf of: Avonwood Developments Ltd

Place of issue: Knoll Technology Centre

Date of issue: 16th January 2018

Name: Adrian Nash

Position: Engineering Manager

Signature:



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EUREKA® RFID



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