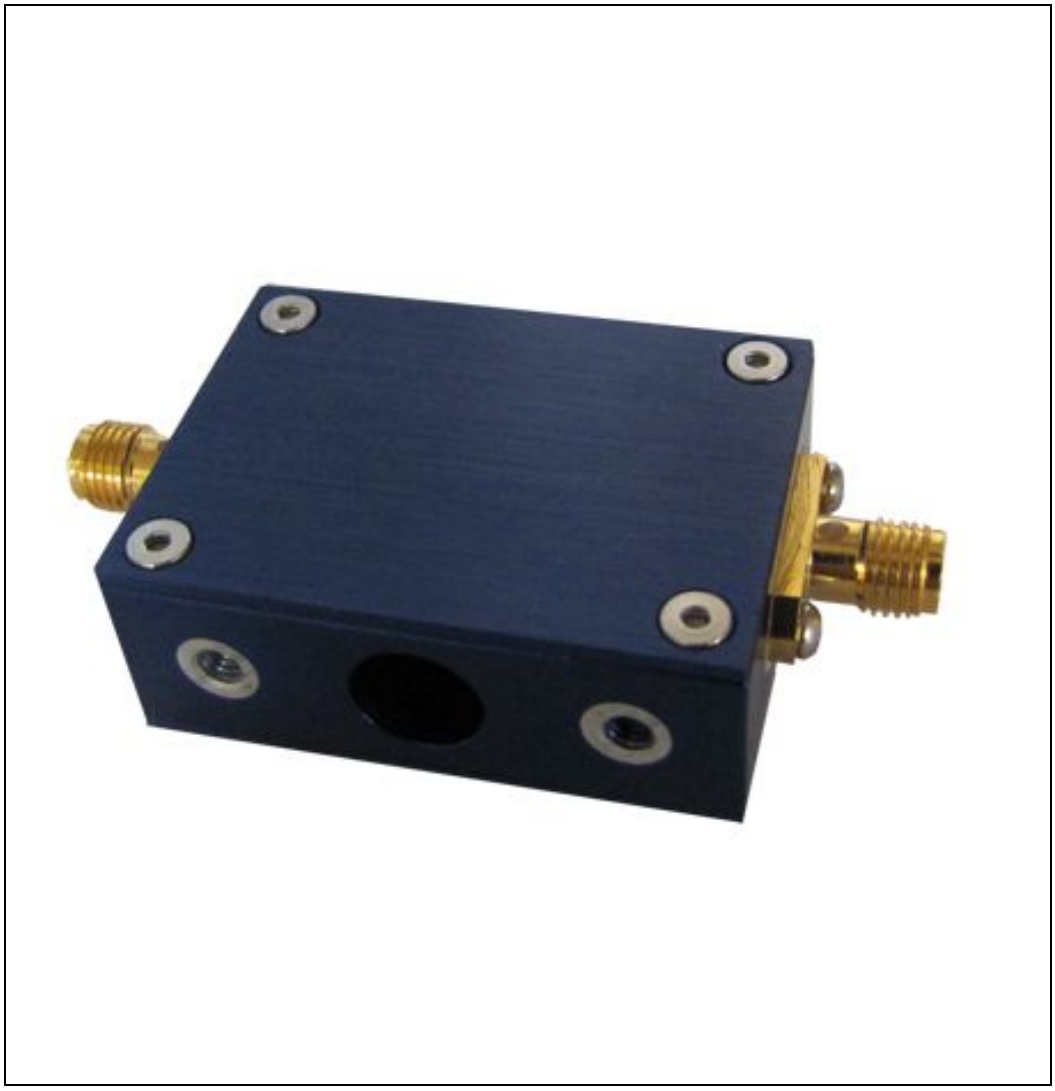
EXTRONICS



CE

Operating Manual

iSOLATE501

Document Number 413569

(See Last Page for Revision Details).

Contents

1 Introduction

The iSOLATE501 is an ATEX and IECEx approved RF galvanic isolator.

For Zone 0/1 and mining applications, the iSOLATE501 must be installed in the safe area. For Zone 2/22 applications, the iSOLATE501 must be mounted in an IECEx/ATEX approved Ex ‘n’ or Ex ‘e’ enclosure with minimum IP54 rating while situated in hazardous ***gas*** atmospheres and must be mounted in an IECEx/ATEX approved Ex ‘e’ enclosure with minimum IP54 rating while situated in hazardous ***dust*** atmospheres.

The iSOLATE501 galvanically isolates circuits in the hazardous area from potentially incendive faults using the intrinsic safety concept. When the iSOLATE501 is connected to source equipment with Um ≤ 250V, it blocks DC, low-frequency AC and transient faults from appearing at the output terminal. The iSOLATE501 will allow RF signals at frequencies within its wide pass-band (120MHz - 8GHz) to pass through to its output; these RF signals are incapable of causing ignition if their power level is within that specified in IEC60079-0:2011 Table 4.

The galvanically isolated RF output of the iSOLATE501 allows users to use non-hazardous area certified antennas* with their wireless hardware, such as the Extronics iANT200 range of high quality rugged outdoor antennas.

* Antennas not listed in the Extronics range must be assessed by the user to ensure that they meet the requirements for the installation of equipment in hazardous areas.

2 Safety Information and Notes

2.1 Storage of this Manual

Keep this user manual safe and in the vicinity of the device. All persons who have to work on or with the device should be advised on where the manual is stored.

2.2 Special Conditions for Safe Use

2.2.1 ATEX/IECEx

2.2.1.1 The RF power input to the device must be limited to defined power levels dependent on the Equipment/Gas Group:

Maximum safe input power, defined as in normal operation without user-settable software limits, and must include antenna gain consideration.	Group I	6.0W (37.7 dBm)
	Group IIC	2.0W (33 dBm)
	Group IIB	3.5W (35.4 dBm)
	Group IIA	6.0W (37.7 dBm)
	Group III	6.0W (37.7 dBm)

2.2.1.2 The product must be mounted such that it is earthed before use in accordance with clause 15 in IEC 60079-0:2011.

2.2.1.3 The product shall be mounted in an IECEx/ATEX approved Ex ‘n’ or Ex ‘e’ enclosure with minimum IP54 rating while situated in hazardous ***gas*** atmospheres.

2.2.1.4 The product shall be mounted in an IECEx/ATEX approved Ex ‘e’ enclosure with minimum IP54 rating while situated in hazardous ***dust*** atmospheres.

2.2.1.5 No live connections or disconnections of connectors must be made on the product while situated in hazardous area.

2.2.1.6 The product must only be situated in the safe area when providing ‘ia’ output into mining ‘M1’ area.

2.3 List of Notes

The notes supplied in this chapter provide information on the following.

- Danger / Warning.
    - Possible hazard to life or health.
- Caution
    - Possible damage to property.
- Important
    - Possible damage to enclosure, device or associated equipment.
- Information
    - Notes on the optimum use of the device

Warning!	**For Zone 0/1 and mining applications, the iSOLATE501 must only be installed in the safe area.** **For Zone 2/22 applications, the iSOLATE501 must be mounted in an IECEx/ATEX approved Ex 'n' or Ex 'e' enclosure with minimum IP54 rating while situated in hazardous gas atmospheres and in an IECEx/ATEX approved Ex 'e' enclosure with minimum IP54 rating while situated in hazardous dust atmospheres.**

Warning!	**The RF threshold power must be limited to the levels defined in IEC60079-0:2011 Table 4; the iSOLATE501 does not provide any in-band RF power limitation. See section 3.4.1 for details.**

Warning!	**To maintain safe operation, the iSOLATE501 MUST be earthed. Refer to Section 3.2 for details.**

Warning!	**The antennas connected to the iSOLATE501 must be installed in accordance with the earthing requirements of IEC60079-14:2014 clause 16.2.3.**

Warning!	**The iSOLATE501 does not contain any user-serviceable parts. Any attempt to open the unit may render it unsafe and will void the warranty.**

3 Installation and Setting-to-Work

3.1 Input / Output parameters

The iSOLATE501 has the following input/output parameters:

U_m=250V rms

RF threshold Output Power = Effective RF Transmitter Power Input into the iSOLATE501, multiplied by the antenna gain.

The maximum permitted RF Threshold Output Power is dependent upon the Equipment Group in which the antenna is located, as defined in the following table. See section 3.4 for further details.

ATEX/IECEx Equipment Group	Maximum RF Threshold Power (Watts)	Maximum RF Threshold Power (dBm)
Mining Group I	6	37.7
Gas Group IIA	6	37.7
Gas Group IIB	3.5	35.4
Gas Group IIC	2	33
Dust Group III	6	37.7

Table 1: Maximum permitted RF Threshold Power

3.2 iSOLATE501 Mounting and Earthing

Warning!	**For Zone 0/1 and mining applications, the iSOLATE501 must only be installed in the safe area.** **For Zone 2/22 applications, the iSOLATE501 must be mounted in an IECEx/ATEX approved Ex 'n' or Ex 'e' enclosure with minimum IP54 rating while situated in hazardous gas atmospheres and in an IECEx/ATEX approved Ex 'e' enclosure with minimum IP54 rating while situated in hazardous dust atmospheres.**

Warning!	**To maintain safe operation, the iSOLATE501 MUST be earthed - see Figure 1.**

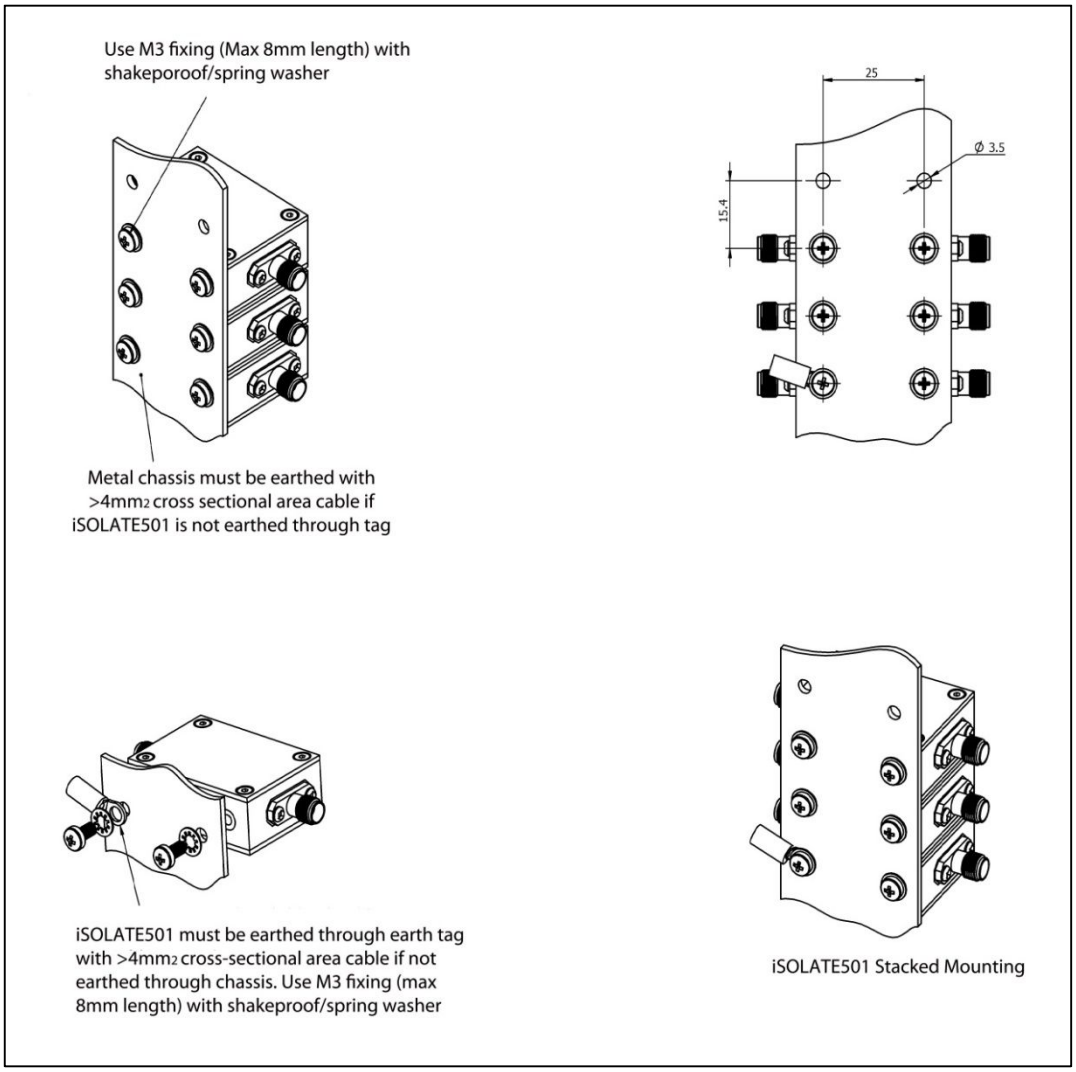


Figure 1: Earthing and Mounting of iSOLATE501

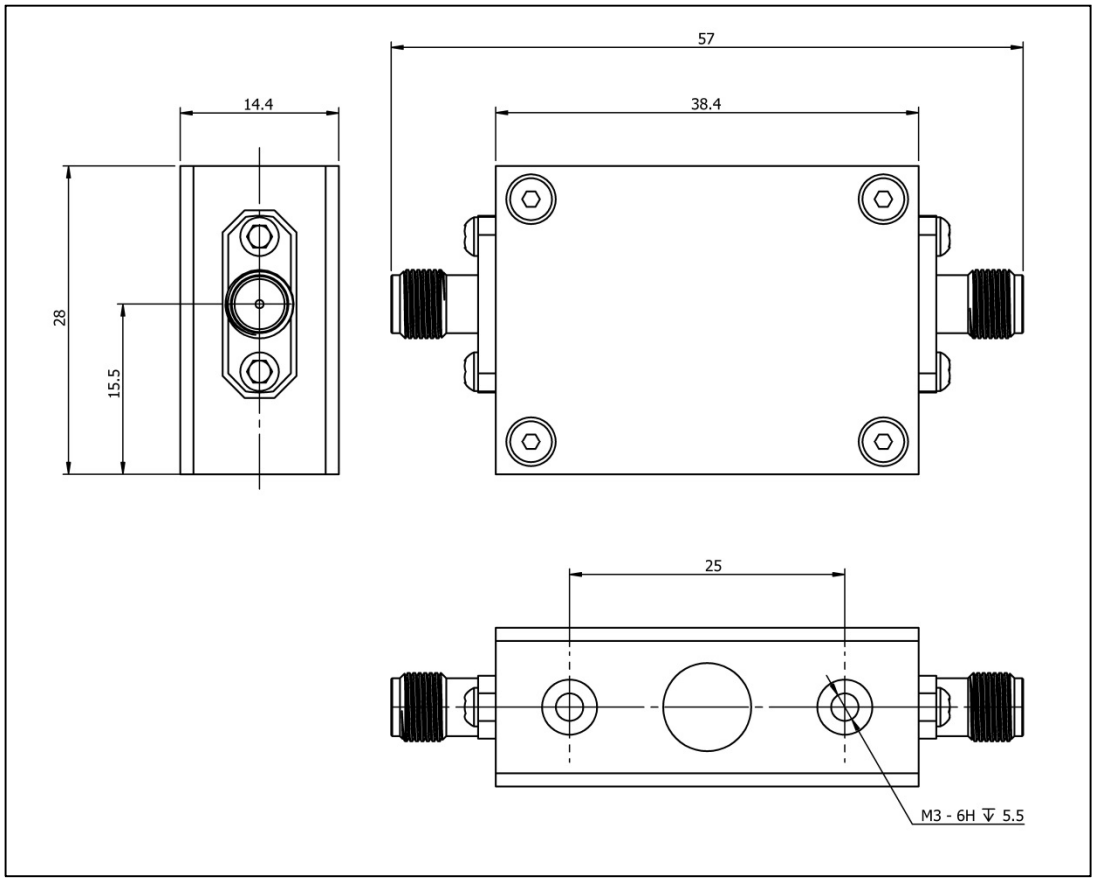


Figure 2: iSOLATE501 Dimensions

3.3 RF Connections

The iSOLATE501 is fitted with two SMA female connectors, one at each end. The iSOLATE501 is a totally bi-directional device, and therefore either connector can function as the input or output.

3.4 Connection to a transmitter

The iSOLATE501 may be connected to any radio transmitter operating within its pass-band. It is the responsibility of the installer to ensure that the following requirements are met:

1. The RF threshold power radiated from the antenna must be limited to the levels shown in Table 1. The calculation of this should take into account the power output of the transmitter (as specified by the manufacturer in normal operation) and the gain of the antenna. It is permissible to consider losses in the cable in this calculation.

2. It is permissible for the maximum power output of the transmitter to be limited by a software setting, but it must not be possible for the end-user to override this.

3. Consideration of fault conditions in the transmitter is not necessary when calculating RF threshold power. The transmitter's maximum RF output power should be taken from the transmitter manufacturer's datasheet in normal operation, i.e. the maximum value of RF output power than can be set by the user.

3.4.1 Example of RF threshold power calculation

The following example shows how the RF threshold power may be calculated:

Maximum transmitter output power (from transmitter datasheet) = 20dBm (100mW)
Coaxial cable loss = 2dB
Antenna gain = 5dBi

Threshold power = 20dBm – 2dB + 5dBi
Threshold power = 23dBm (200mW)

3.5 Connection to an antenna

Warning!	**The antennas connected to the iSOLATE501 must be installed in accordance with the earthing requirements of IEC60079-14:2014 clause 16.2.3.**

3.5.1 Example 1

The conductive parts of the antenna must be isolated by at least 500Vrms from nearby conductive structures, to prevent hazardous earth currents from flowing in the coaxial cable. It is the responsibility of the installer to perform the necessary tests to verify this.

Note: As the iSOLATE501 must be earthed, the return path of the RF output connector will also be at earth potential. Therefore the verification of isolation of the antenna from earth must only be carried out when the antenna and iSOLATE501 are not connected.

3.5.2 Example 2

When the iSOLATE501 is installed inside an earthed enclosure, which has a single connection to earth, and the antennas are mounted to this enclosure, the antennas do not require 500V isolation from earth (as it may be earthed through the enclosure to the single earth point along with the iSOLATE501)

For more guidance consult IEC60079-14:2014 clause 16.2.3

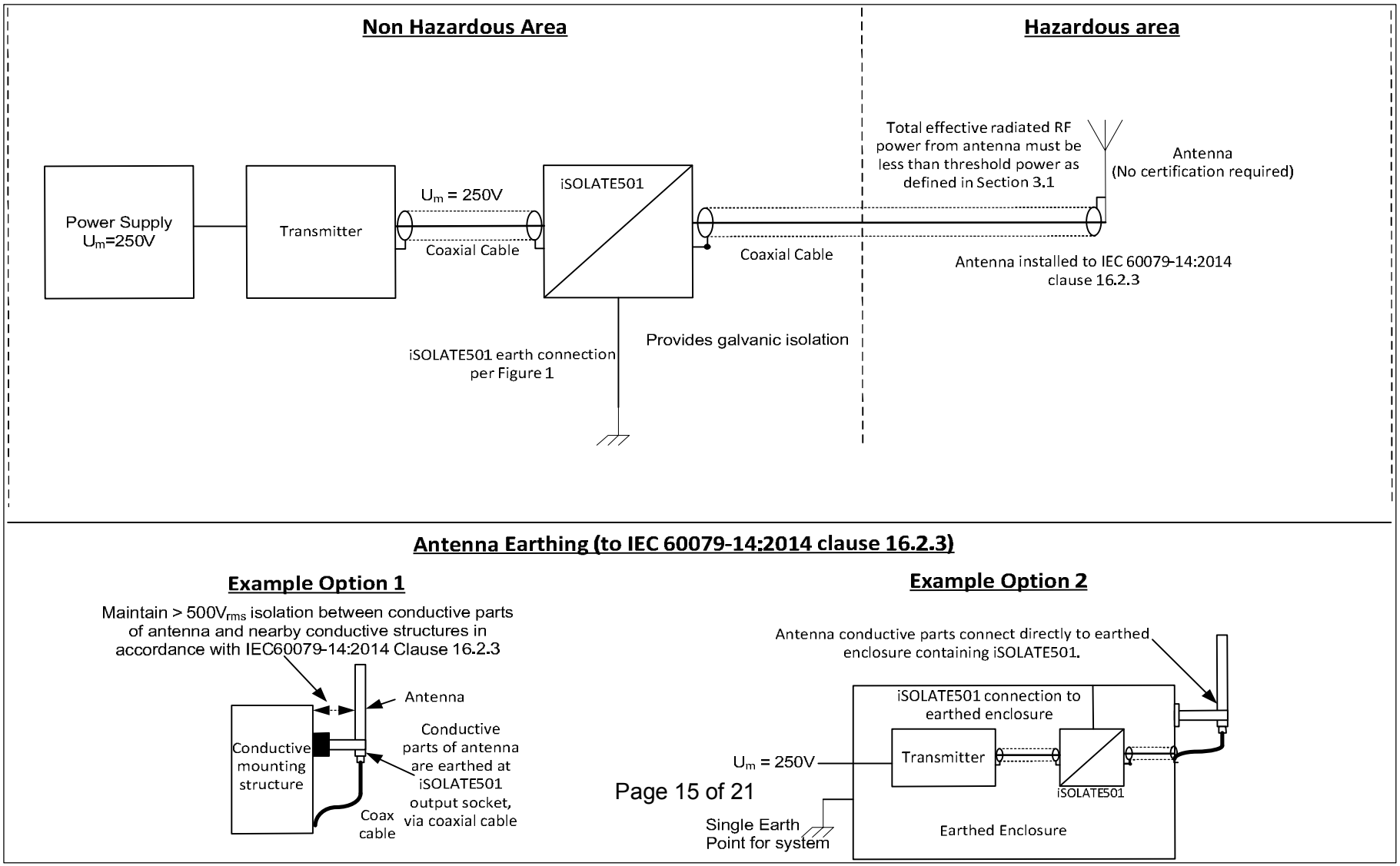


Figure 3: Electrical Installation

4 Intended Purpose Usage

Important	**Before setting the units to work, read the technical documentation carefully.**

Important	**The latest version of the technical documentation or the corresponding technical supplements is valid in each case.**

The iSOLATE501 is built using modern components and is extremely reliable in operation; however it must only be used for its intended purpose. Please note that the intended purpose also includes compliance with the instructions issued by the manufacturer for installation, setting up and service.

Any other use is regarded as conflicting with the intended purpose. The manufacturer is not liable for any subsequent damage resulting from such inadmissible use. The user bears the sole risk in such cases.

4.1 Transportation and Storage

All iSOLATE501 devices must be so transported and stored that they are not subjected to any excessive mechanical stresses.

4.2 Authorized Persons

Only persons trained for the purpose are authorized to handle the iSOLATE501; they must be familiar with the unit and must be aware of the

regulation and provisions required for explosion protection as well as the relevant accident prevention regulations.

4.3 Cleaning and Maintenance

The iSOLATE501 and all its components require no maintenance. All work on the iSOLATE501 by personnel who are not expressly qualified for such activities will cause the Ex approval and the guarantee to become void.

4.4 Safety Precautions

Important	**For the installation, maintenance and cleaning of the units, it is absolutely necessary to observe the applicable regulations and provisions concerned with explosion protection (IEC 60079-14), as well as the Accident Prevention Regulations.**

4.5 Cleaning and Maintenance Intervals

The cleaning intervals depend on the environment where the system is installed.

4.6 Aggressive substances and environments

The iSOLATE501 is not designed to come into contact with aggressive substances or environments, please be aware that additional protection may be required.

4.7 Exposure to external stresses

The iSOLATE501 is not designed to be subjected to excessive stresses e.g. vibration, heat, impact. Additional protection is required to protect against these external stresses.

The iSOLATE501 will require additional protection if it is installed in a location where it may be subjected to damage.

5 Technical Data

<table>
<tr><td>Certification Type</td><td>Ex nA [Ex ia Ga] IIC T6 Gc
Ex ic [Ex ia Da] IIIC T85°C Dc
[Ex ia Ma] I
II 3 (1) G D
I (M1)</td></tr>
<tr><td>Maximum Input / Output Power</td><td>
<table>
<tr><th>ATEX/IECEx Equipment Group</th><th>Maximum RF Threshold Power (Watts)</th><th>Maximum RF Threshold Power (dBm)</th></tr>
<tr><td>Mining Group I</td><td>6</td><td>37.7</td></tr>
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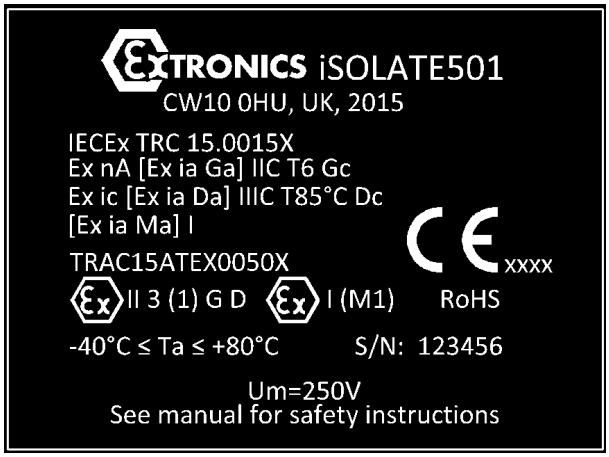
<tr><td>Gas Group IIC</td><td>2</td><td>33</td></tr>
<tr><td>Dust Group III</td><td>6</td><td>37.7</td></tr>
</table>
</td></tr>
<tr><td>Enclosure Material</td><td>Aluminium with chromate finish</td></tr>
<tr><td>Environmental</td><td>Ambient temperature: -40ºC to +80ºC
Relative humidity; 0 to 95%, non-condensing</td></tr>
<tr><td>Dimensions (w x h x d)
Weight</td><td>38.4 x 28 x 14.4 mm (57 mm including SMA connectors)
37g</td></tr>
<tr><td>RF Connections</td><td>SMA Female</td></tr>
<tr><td>Certification</td><td>TRAC15ATEX0050X, IECEx TRC 15.0015X</td></tr>
<tr><td colspan="2">[1] Please note that it is the customers' responsibility to ensure the maximum values for RF Threshold power as per Table 4.0 of IEC 60079-0:2011 are not exceeded. The maximum RF output of the wireless transmitter and antenna gain must be taken into account when installing equipment. Refer to manual for full details.</td></tr>
</table>

6 Label Drawing



Where xxxx = Notified Body Number

7 Manual Revision History

Revision	Description	Date	By
1.0	Initial release of manual	29/09/2015	DC