EXTRONICS iTAG X-Range Real Time Location System Tag Instruction Manual

Contents

Operating Manual

iTAG X-Range

Document Number X124749(6) (See Extronics DDM for the latest Version)

For warranty information, refer to Terms and Conditions at http://www.extronics.com

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1 Introduction

Thank you for purchasing the iTAG X-Range. The iTAG X-Range includes the iTAG X10, X20 and X30 tags with Wi-Fi connectivity, as well as the iTAG X40 with LoRaWAN connectivity. This document gives an overview of the product, its features, how it is configured and maintained. The iTAG X-Range worker location tag with hybrid technology, allows for the accurate location of workers in hazardous and non-hazardous areas. The iTAG X-Range provides audible, visual and tactile (model dependent) alerts to provide real-time alerting and reporting for worker location solutions. iTAG X-Range is designed to work with the Extronics Location Engine (ELE) for to provide “Dot on a map” data.

1.1 What is inside the box?

1 x iTAG X-Range Tag

1 x iTAG X-Range USB Charging Cable

1 x User Guide

1.2 Pre-requisites

Refer to iTAG X Platform Compatibility Matrix (X124937) for compatible software required to use the iTAG X-Range.

1.3 Reference documentation

The datasheets can be referenced for product variants and accessories.

- iTAG X40 Datasheet (X130249)
- iTAG X30 Datasheet (X124634)
- iTAG X20 Datasheet (X127436)
- iTAG X10 Datasheet (X127435)
- Man Down (X127627)

1.4 Nomenclature

Acronym	Description
BLE	Bluetooth Low Energy
CCX	Cisco Compatible Extensions
EDM	Extronics Device Manager
ELE	Extronics Location Engine
GPS	Global Positioning System
IBSS	Independent Basic Service Set
LF	Low Frequency
OTA	Over The Air
PC/PBT	Polycarbonate/Polybutylene Terephthalate
PELV	Protective Extra Low Voltage
PPE	Personal Protective Equipment
SD&CT	Social Distancing and Contact Tracing
SELV	Separated Extra Low Voltage
TED	Tag & Exciter Detector Device
WDS	Wireless Domain Services

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2 Safety Information

2.1 Storage of this manual

Keep this user manual safe and in the vicinity of the product. All persons required to work with the product should

be advised on where the manual is stored.

2.2 Special conditions for safe use

Applies to ATEX / IECEx and MET (North America and Canadian) certification:

- iTAG X-Range must only be charged in a safe area.
- iTAG X-Range must only be charged from a supply meeting the following requirements:
  - A SELV, PELV or ES1 system, or
  - a safety isolating transformer complying with the requirements of IEC 61558-2-6, or technically equivalent standard, or
  - connected to apparatus complying with the IEC 60950 series, IEC 61010-1, IEC 62368, or a technically equivalent standard – see Appendix 1 for suggestions, or
  - fed directly from cells or batteries.
- iTAG X-Range charger input U_m = 6.5Vdc.
- Battery cells must not be replaced in a hazardous area.

2.3 Warnings

Warning! The iTAG X-Range should only be cleaned with a damp cloth.

Warning! Do not open the iTAG X-Range. There are no user-serviceable parts inside.

Warning! Any repairs or replacement of parts MUST be performed by the manufacturer or its nominated sub-contractor or agent.

Warning! This product can be delivered in a number of different variants. Each variant has restrictions on where it can be used. Please read the information on the product label fully and ensure that your iTAG X-Range is suitable for the hazardous area in which it is to be used.

Warning! Before setting the units to work read the technical documentation carefully.

Warning! The iTAG X-Range contains a lithium ion battery. Do not force open, heat excessively or dispose of in fire.

2.4 Marking information

2.4.1 ATEX / IECEx

EXTRONICS

iTAG Xaa ZZZZ

CW10 0HU, UK

IECEx EXV 24.0029X
EXVERITAS 24ATEX1837X

-20°C ≤ T_{amb} ≤ +55°C

CE YYYY

U_m = 6.5Vdc

S/N: XXXXXX

Where:

- aa is the model
- XXXXXX is the serial number
- YYYY is the Notified Body for production
- ZZZZ is a code to identify model variants

Exact layout of markings may differ from that shown.

2.4.2 MET (North America and Canada)

EXTRONICS iTAG Xaa ZZZZ

UL / CSA C22.2 No. 62368-1, 60079-0, 60079-11

-20°C ≤ T_{amb} ≤ +55°C

MET c us
ENNNNNN

S/N: XXXXXXX

U_m = 6.5Vdc

Where:

- aa denotes model type
- XXXXXX is the serial number
- ZZZZ is a code to identify model variants

Exact layout of markings may differ from that shown.

3 iTAG X-Range Features

3.1 Emergency call button

The iTAG X-Range features a call button, which can be activated when pushed down, in the case of an emergency. This can be used to trigger an event to show the location of the worker in need of assistance. The LEDs remain red for approximately 30 minutes.

3.2 Visual, audible and tactile indication

The iTAG X-Range features multiple LEDs to indicate to the worker that it is running, the emergency call button has been activated and when it has a low battery. Tactile (not included with the iTAG X10) and audible indications occur to inform the wearer that the emergency call button has been activated.

3.3 BLE based firmware updates

The iTAG X-Range supports firmware updates using BLE. The tag has firmware OTA update capability which can be used when new functionality becomes available. This eliminates the need to return the iTAG X-Range to the factory to enable new features.

3.4 Wi-Fi Beaconing

The iTAG X10, X20 and X30 tags utilise lightweight beaconing communication and can be configured for CCX, IBSS or WDS protocols.

3.5 LoRaWAN messaging

The iTAG X40 tags uses LoRaWAN as its communication method to achieve connectivity over large distances.

3.6 GNSS

The iTAG X30 and iTAG X40 use GNSS (GPS, BeiDou, GLONASS, GAGAN) to accurately locate workers in outdoor areas of the site minimising infrastructure needs for connectivity.

3.7 Wi-Fi range

Outdoor – Up to 200m (line of sight to an Access Point)
Indoor – Up to 80m (infrastructure dependent)

3.8 LF receiver

The iTAG X10, X20 and X30 tags sends out specific location reports upon arrival at a chokepoint or gateway where an LF exciter is positioned The iTAG behaviour can be automatically modified whilst in certain areas after passing through a chokepoint such as a doorway or gate. (Only when used with MobileView software).

3.9 BLE Trilateration

The iTAG X-Range contains a Bluetooth receiver that is capable of measuring the received signal strength from BLE anchors. BLE anchors can be positioned around a site to facilitate improved positional accuracy at a low infrastructure cost. The anchor's identification, signal strength and battery voltage are transmitted in the tag's

beacon message. This information, along with any other location information, is used by the Extronics location engine to enable more accurate positioning on the map.

3.10 Man Down

A motion sensor is incorporated into the iTAG X40, iTAG X30 and iTAG X20 to improve power management and to also provide an alert should a worker fall and be immobilised. The tag's processor features a proprietary algorithm to detect such a fall and after no worker movement for approximately 30 seconds beacons a Man Down alert. This alert can be cancelled by purposefully double tapping the front cover. See X127637 for further details.

3.11 Battery and battery life

The iTAG X-Range has a long lasting rechargeable lithium ion battery. Minimum expected battery service life is 2 years.

3.12 Mounting

The iTAG X-Range comes complete with a stainless steel buckle clip which can clip to PPE or be used with a lanyard.

3.13 Simple configuration

The iTAG X-Range can be configured easily using the Extronics Device Manager software and a Bluetooth Dongle. Refer to EDM Manual X129265 for further information on configuring the tags.

3.14 Motion sensor

The iTAG X-Range contains an on-board motion sensor. When the iTAG X-Range is configured utilising the motion sensor it will enable different transmission intervals whether it is stationary or in motion, reducing unnecessary network traffic and conserving the battery.

3.15 Integrated access control

The iTAG X-Range minimises the number of ancillary products being carried by using integrated access control to gain site access. This easily identifies workers using the Photo ID which is visible on the front.

3.16 Rugged performance

The iTAG X-Range's enclosure is primarily constructed from a PC/PBT alloy, which is permanently static dissipative, ESD protected, UV stabilised and impact modified.

PBT's have excellent resistance to a broad range of chemicals at room temperature, including aliphatic hydrocarbons, gasoline, carbon tetrachloride, perchloroethylene, oils, fats, alcohols, glycols, esters, ethers and dilute acids and bases.

The enclosure has been designed for durability with ratings of IP65 and IP67 to ensure complete confidence in the product when in harsh environments.

3.17 Model Comparison

The table below summarises the features available on each iTAG X-Range model

FEATURES	 iTAG X10	 iTAG X20	 iTAG X30	 iTAG X40
Unidirectional call button	✓	✓	✓	✓
Support for BLE beacons	✓	✓	✓	✓
Man Down		✓	✓	✓
Sound alert	✓	✓	✓	✓
Vibrate alert		✓	✓	✓
Pressure sensor for elevation			✓	✓
Access control	✓	✓	✓	✓
Certified (ATEX, IECEx, MET)	✓	✓	✓	✓
Connectivity type	**Wi-Fi**	**Wi-Fi**	**Wi-Fi**	**LoRaWAN**
Location technology	**BLE, Wi-Fi, LF**	**BLE, WI-Fi, LF**	**BLE, GPS, Wi-Fi, LF**	**BLE, GPS, WI-Fi**

LF is a specific feature with Mobileview. For more information, contact Extronics.

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4 iTAG X-Range Usage Instructions

4.1 iTAG X-Range configuration

The iTAG X-Range can be configured using the Extronics Device Manager.

To configure using the Extronics Device Manager refer to document X129265.

4.2 LED and audio indications

The iTAG X-Range has multi-colour LEDs on the top and front. Indications are shown in Table 1.

Indication	LED colour	LED position	Sound	Vibrate
Tag on	Green Flashing	Top	N/A	N/A
Low battery	Red Flashing	Top	N/A	N/A
Critical battery	Red Solid	Top	N/A	N/A
Emergency call button activated	Red Solid	Top and Front	Yes	Yes
Error	Rapid Orange Flashing	Top	N/A	N/A

Table 1.

4.3 Wearing the tag

The iTAG X-Range includes a versatile buckle clip, Figure 14. Ensure the iTAG X-Range is worn in an upright position. For best results, wear the tag as high up your body as possible.

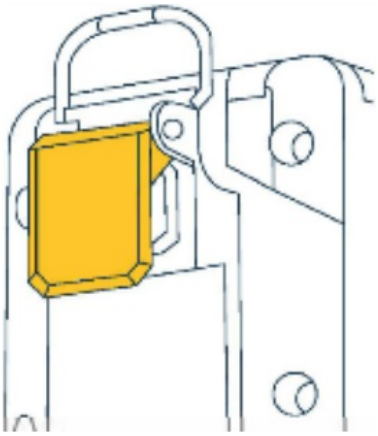

Figure 14.
The iTAG X-Range can be:

- clipped to your pocket.
- clipped to your epaulette.
- clipped to your chest pocket.

The iTAG X-Range has successfully been tested to EN 62311:2008 Section 8.3 Human Exposure Evaluation.

4.4 Battery

The iTAG X-Range has a non-user replaceable, rechargeable Lithium-ion battery. Battery life depends on the configuration, use case and ambient temperature.

4.4.1 Battery levels and charging indications

When using MobileView the iTAG X-Range has the following 3 battery levels indications:

- **High** – Indicates the tag has more than 75%.
- **Medium** – Indicates the tag has between 75% and 30%.

- **Low** – Indicates the tag has less than 30%.

Indication	LED Colour	LED position
Normal operation – high and medium battery	Green flashing	Top
Low battery	Red Flashing	Top
Reserve battery	Red on	Top
Battery charging	Red Slow Flash	Top
Battery fully charged	Green on	Top

4.4.2 Charging the battery

The iTAG X-Range is charged using the USB Charging Cable provided. It is attached and detached from the rear of the tag, as shown in Figure 15.

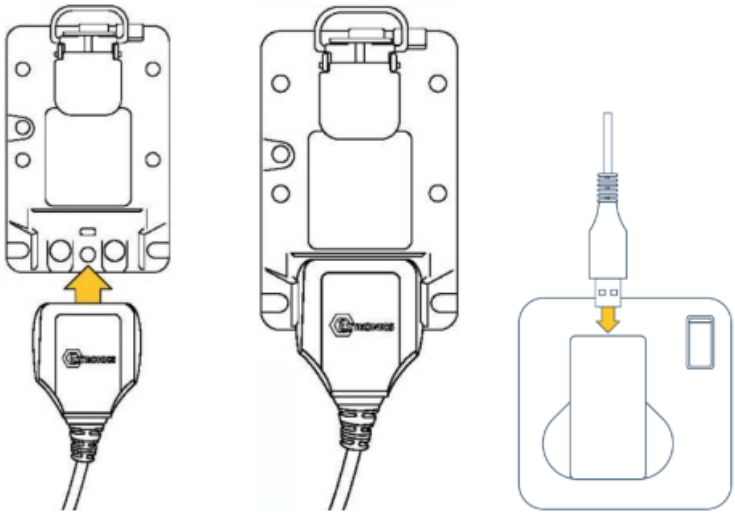

Figure 15.

The charger input conditions listed in the Special Conditions of Safe Use must be observed. Charging is only permitted between 0°C and 45°C. When connecting to a USB power supply, ensure the supply is rated less than 100W.

Warning! Ensure that the Photo ID retention screw is fully tightened prior to charging.

Alternatively the iTAG X-Range can be charged using Extronics' custom Multicharger, Figure 16. Please contact Extronics for further information.

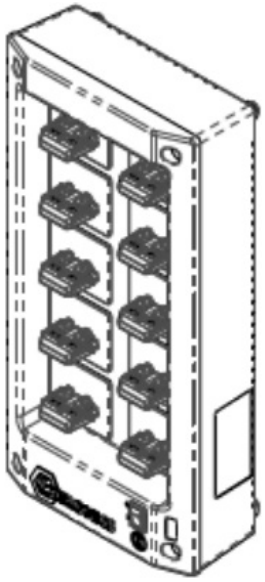

Figure 16.

4.4.3 Variances in battery life

Variances in battery life are based on usage. Actual results may vary due to the following:

- LF exciter usage.
- Changes in tag usage.
- Time in storage before use.
- Changes in transmission interval.
- Temperature.
- Motion.
- Indoor/Outdoor applications.
- Time to receive firm GPS co-ordinates.

The iTAG X-Range uses different proprietary techniques to maximise and optimise the life of the battery.

4.5 Firmware update

When new firmware becomes available the iTAG X-Range's firmware can be updated using the EDM. Note that the tag will need to be in range of the Bluetooth dongle that is used for this functionality.

The tag has a button on the rear that needs to be pressed down, Figure 17.

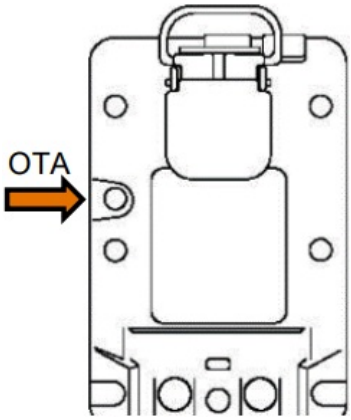

Figure 17.

Updating is performed as follows:

1. Place a pen's nib or similar sized item inside the OTA button and gently and continuously press down.
2. The iTAG will begin beeping (once per second) and the top LED will flash green.
3. Once a faster beep (twice per second) is heard the button can be released. This faster been will occur after approximately ten seconds.
4. The top LED will flash red and front LEDs flash as the iTAG starts to download the new firmware. This can take over 30 seconds depending on network speed.
5. Once the download has completed the top LED will blink green and iTAG will reset.
6. Upon successful install all three front LEDs will flash 4 times.
7. Finally, the top green LED will then flash as usual.

4.6 Inserting the access control / photo ID card

The front of the tag has been designed to incorporate access control or photo ID cards. Access control cards with the built in DESFire EV technology family are specifically designed to fit inside the iTAG X-Range. These photo ID cards are available from Extronics. The pop out card design enables cards to be printed on a standard ID card printer, such as Matica and Magicard printers.

A DESFire EV1 or EV3 RFID Cards / Blank Photo ID card is shown in Figure 18.

1. Kiss cut area

Figure 18.

Once the RFID / Photo ID card has been printed and the Kiss cut area has been removed, the card is ready to be installed into the iTAG.

Unscrew the captive screw located between the battery charging connecter pins using a T8 Torx screwdriver and remove the clear photo ID cover, Figure 19.

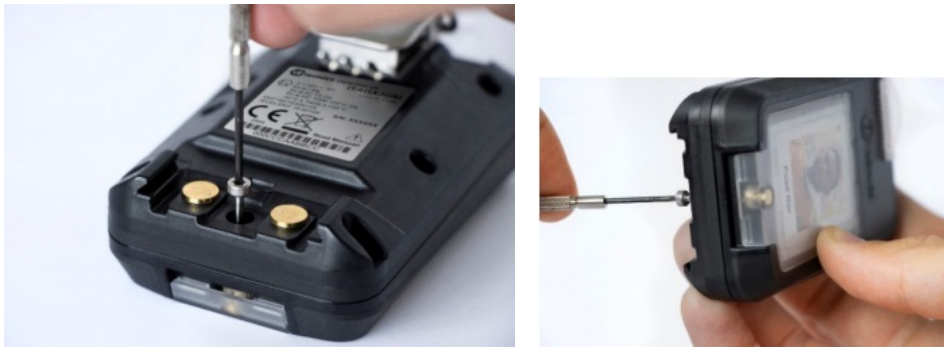

Figure 19.

Insert the RFID / Photo ID card, Figure 20. If using the Blank Photo ID card with a iCLASS HID RFID tag then stick the iCLASS HID tag to the iTAG or the ID card prior to inserting the card.

Figure 20.

Replace the clear photo ID cover, Figure 21.

Figure 21.

Gently hand tighten the captive screw – do not over-tighten.

4.7 Transport

All iTAG X-Range must be transported and stored such that they are not subjected to excessive mechanical or temperature stresses.

4.8 Authorised persons

The iTAG X-Range is provided ready assembled and must not be disassembled by the user. Only persons trained for the purpose are authorised to service the iTAG X-Range. 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.

4.9 Cleaning and maintenance

The iTAG X-Range and all its components require no maintenance and are selfmonitoring. Any work on the iTAG X-Range must be carried out and performed by Extronics approved personnel. The cleaning interval depends on the environment where the system is installed. A damp cloth will usually suffice.

Some cleaning materials include aggressive ingredients that can affect the iTAG X-Range's materials. We recommend that you do not use compounds containing:

- Combinations of isopropyl alcohol and dimethyl benzyl ammonium chloride.
- Combinations of ethylene Diamine Tetra Acetic Acid and Sodium Hydroxide.
- Benzul-C12-16-Alkyl Dimethyl Ammonium Chlorides.
- D-Limonene.

UV cleaning is not supported.

The iTAG X-Range must not be subjected to excessive stresses e.g. vibration, shock, heat and impact.

4.9.1 Pressure sensor hole

The iTAG X-Range is fitted with a pressure sensor (model dependant) as explained in Section 3. This hole could potentially get filled with detritus. Extreme care should be taken when removing any detritus so that the weather proof patch on the inside of the hole doesn't get damaged.

4.10 Assembly and Disassembly

The iTAG X-Range is provided ready assembled and should not be dismantled by the user.

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5 EU Declaration of Conformity

EXTRONICS
a BARTEC brand

EU Declaration of Conformity

Extronics Ltd, 1 Dalton Way, Midpoint 18, Middlewich, Cheshire CW10 OHU, UK

Equipment Type: **iTAG X10, iTAG X20, iTAG X30, iTAG X40**

This declaration is issued under the sole responsibility of the manufacturer

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Directive 2014/34/EU Equipment and protective systems intended for use in potentially explosive atmospheres (ATEX)

Provisions of the directive fulfilled by the equipment:

Ⓔx II 1 GD / I M1
Ex ia I Ma
Ex ia IIC T4 Ga
Ex ia IIIC T_{200} 147°C Da
-20°C ≤ T_{amb} ≤ +55°C

Notified Body ExVeritas 2804 performed EU-Type Examination and issued the EU-Type Examination certificate.

EU-Type Examination Certificate: EXVERITAS24ATEX1837X

Notified Body for Production: ExVeritas 2804

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

Harmonised standards used:

EN IEC 60079-0 :2018	Explosive atmospheres – Part 0: Equipment – General requirements
EN 60079-11:20 12	Explosive atmospheres – Part 11: Equipment protection by intrinsic safety “i” Equipment prot ection by intrinsic safety “i”

Conditions of safe use:

- Tag must only be charged in safe area only
- Tag must only be charged from a supply meeting the following requirements:
  - a SELV, PELV or ES1 system; or
  - via a safety isolating transformer complying with the requirements of IEC 61558-2-6, or technically equivalent standard; or
  - directly connected to apparatus complying with the IEC 60950 series, IEC 61010-1, IEC 62368 or a technically equivalent standard; or
  - fed directly from cells or batteries.
- Tag charger input U_m = 6.5Vdc.

- Battery cells must not be replaced in a hazardous area.

Directive 2014/53/EU Radio Equipment Directive

Standards used:

ETSI EN 300 328 V2.2.2	Wideband transmission systems; Data transmission equipment operating in the 2.4 GHz band; Harmonised Standard for access to radio spectrum
ETSI EN 303 413 V1.1.1	Satellite Earth Stations and Systems (SES); Global Navigation Satellite System (GNSS) receivers; Radio equipment operating in the 1164 MHz to 1300 MHz and 1559 MHz to 1610 MHz frequency bands; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU
ETSI EN 300 330 V2.1.1	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; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU

Directive 2014/30/EU Electromagnetic Compatibility (EMC) Directive

ETSI EN 301 489-1 V2.2.3	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMacinetic Compatibility
ETSI EN 301 489-19 V2.1.1	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 19: Specific conditions for Receive Only Mobile Earth Stations (ROMES) operating in the 1,5 GHz band providing data communications and GNSS receivers operating in the RNSS band (ROGNSS) providing positioning, navigation, and timing data; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU
ETSI EN 301 489-17 V3.2.2	ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised Standard for ElectroMagnetic Compatibility

Directive 2014/35/EU Low Voltage Directive

IEC 62368-1:2023	Audio/video, information and communication technology equipment – Part 1: Safety requirements

Directive 2011/65/EU Restriction of the use of certain hazardous substances (RoHS)

Compliant

For and on behalf of Extronics Ltd, I declare that, on the date the equipment accompanied by this declaration is placed on the market, the equipment conforms with all technical and regulatory requirements of the above listed directives.

Signed:

Nick Saunders
Operations Director
Date: 2nd October 2024

X126827(3)

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6 Applicable Standards

North America and Canada:

The iTAG X range conforms to the following standards:

- UL62368-1, Second Edition: Audio/video, information and communication technology equipment – Part 1: Safety requirements, Rev. December 13 2019
- CSA C22.2 No. 62368-1, Second Edition: Audio/video, information and communication technology equipment – Part 1: Safety requirements, 2014
- UL 60079-0, 7th Ed: Standard for Explosive Atmospheres – Part 0: Equipment General Requirements; 2019-03-26
- UL 60079-11, Ed 6: Explosive Atmospheres – Part 11: Equipment Protection by Intrinsic Safety ‘i’; 2018-09-14
- CSA C22.2 NO 60079-0: 2019; Standard for Explosive Atmospheres – Part 0: Equipment – General Requirements
- CSA C22.2 NO 60079-11: 2014 (R2018); Standard for Explosive Atmospheres – Part 11: Equipment protected by Intrinsic Safety “i”

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7 Manufacturer

The iTAG X-Range is manufactured by:

Extronics Ltd,
1 Dalton Way,
Midpoint 18,
Middlewich
Cheshire
CW10 0HU
UK

Tel. +44(0)1606 738 446
E-mail: info@extronics.com
Web: www.extronics.com

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8 FCC Statements

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. The End user must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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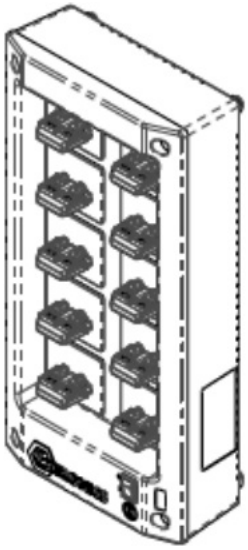
9 Appendix 1

Image	Order reference
	VEL05US050-XX-BB
	X128417 Multicharger UK X128418 Multicharger US X128437 Multicharger EU

Documents / Resources

	EXTRONICS iTAG X-Range Real Time Location System Tag [pdf] Instruction Manual EXTRFID00005, 2AIZEEXTRFID00005, iTAG X-Range Real Time Location System Tag, iTAG X-Range, Real Time Location System Tag, Time Location System Tag, Location System Tag, System Tag, Tag

References

- Hazardous Area Solutions | Process Industries | Extronics
- User Manual