IDENTEC SOLUTIONS
Model IDS1001

iPOINT Si

HARDWARE USER MANUAL

Visibility Delivered.

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Radio Frequency Compliance Statement

IDENTEC SOLUTIONS is the responsible party for the compliance of the following devices:

MODEL:		IDS1001 iPOINT Si
Region/Country	Organization	Marking
EUROPE:	EU	CE
USA:	FCC	FCC ID OO4-IDS1001
CANADA:	IC	3538A-IDS1001

The user(s) of these products are cautioned to only use accessories and peripherals approved, in advance, by IDENTEC SOLUTIONS. The use of accessories and peripherals, other than those approved by IDENTEC SOLUTIONS, or unauthorized changes to approved products, may void the compliance of these products and result in the loss of the user(s) authority to operate the equipment.

European Declaration of Conformity according to RED Directive

IDENTEC SOLUTIONS AG hereby declares that the device iPOINT is in conformity with the essential requirements of Directive 2014/53/EU. The declaration of conformity can be found at: www.identecsolutions.com

Radio Frequency (RF) Exposure Compliance of Radio Communication Apparatus

To satisfy FCC and ISED RF Exposure requirements for mobile devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during operation. To ensure compliance, operation at closer than this distance is not recommended. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Conformité à l'exposition aux champs RF des équipements radio

Pour satisfaire aux exigences FCC et ISED concernant l'exposition aux champs RF pour les appareils mobile, une distance de séparation de 20 cm ou plus doit être maintenu entre l'antenne de ce dispositif et les personnes pendant le fonctionnement. Pour assurer la conformité, il est déconseillé d'utiliser cet équipement à une distance inférieure. Cet émetteur ne doit pas être co-situé ou fonctionner conjointement avec une autre antenne ou un autre émetteur.

Canada Certification

Licence-Exempt Radio Apparatus (ISED)

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.

2. This device must accept any interference, including interference that may cause undesired operation of the device.

Appareils radio exempts de licence (ISDE)

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage;

2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

WARNING - This product should be installed by personnel trained in installation of equipment in industrial environments and meet the representative country's National Electrical Code.

Electrostatic Discharge

This product contains components that are sensitive to electrostatic discharges. Please observe the special instructions for their protection. Incorrect handling can damage the unit and cause the invalidation of the warranty.

Minimum safety precautions against electrostatic discharge:

- Establish earth contact before you touch the unit. (For example, touch the earthing screw on the unit.) Best practice is to use an antistatic ribbon and earth yourself permanently for the time you handle the unit.

- Avoid unnecessary contact with the unit connectors and assemblies inside the unit.

- Only open the unit if the operational settings (as described in the manual) expressly requires it.

- Use antistatic tools for the setting of the unit. (Warning: Do not touch life-threatening voltages with these tools).

- Do not store unit and components without protective packaging.

- Remove unit and components from the packaging only prior to installation.

These notes are not sufficient to guarantee complete protection from electrostatic discharges! We recommend the use of suitable protective equipment.

IDENTEC SOLUTIONS does not accept the return of products where the regulations concerning the ESD precautions and protective packaging materials were not followed.

Safety Instructions

The equipment can be installed in restricted areas.

The system described in this manual is for exclusive operation of trained employees. Only qualified personnel that have knowledge of the potential dangers involved should perform the installation, settings, maintenance and repair of the units used.

Operational Safety

The correct and safe use of these systems assumes that operating and service personnel follow the safety measures described in the manual alongside the generally acceptable safety procedures.

If there is a possibility that safe operations cannot be guaranteed, the system must be switched off, secured against accidental use and the service unit responsible immediately informed.

Safety Documents

The iPOINT was designed, tested and supplied in perfect condition, according to document IEC/EN 60950-1 Safety Requirements.

Condensate / Change of Temperature

To avoid condensation in the system, the unit must be allowed to slowly adjust itself to warmer temperatures after removal from cold and cool environments.

Do not open the Main housing

The Connection Chamber can be opened for required cabling needs, but there is no need to open the main housing (crews from bottom side) in order to set the iPOINT unit. The unit does not have any internal setting elements or displays.

Connections / Power Supply

The supply circuits must comply with the conditions set out for the SELV circuits (see EN 60950-1).

The signal circuits must comply with the conditions set out for the SELV circuits (see EN 60950-1).

Use shielded cables for the Ethernet/PoE & RS422 cables. This is the only way to achieve the prescribed EMC.

During maintenance damage could occur if printed circuit boards or cables are connected or disconnected whilst the power supply is still on. Therefore, only work on the connection and the components when they are not live.

Spare Parts

We recommend that only personnel, original products, spare and replacement parts authorized by IDENTEC SOLUTIONS be used for installation, service and repair. IDENTEC SOLUTIONS does not accept any responsibility for materials used, work carried out or possible consequences from unauthorized third party vendors.

Glossary

- SELV   Safety Extra Low Voltage – Protective measure against dangerous body currents. Protective first voltage, circuit not floating.
- EMC   Electromagnetic Compatibility

Contents

1. Preface

This installation manual must be read carefully prior to starting the installation. The described installation works assuming that installation materials like cables, antennas and any mechanical parts are available.

This document is the hardware description of the iPOINT. This document is intended only for mechanical and electrical installation of these central units.

IDENTEC SOLUTIONS reserves the right to make changes and updates to the content contained herein. It is the user's responsibility to contact the service department for any possible changes or updates to operating and maintenance procedures.

Updates will be provided upon request. The information in this document may be subjected to changes without prior notice.

Check whether delivery is complete and for any damages. If the delivery is not complete or damaged immediately inform the carrier. The dispatch and service organization of IDENTEC SOLUTIONS should also be informed to facilitate the repair or exchange of the system.

Product Contents (deliverables):

- iPOINT Device
- Mounting Plate
- Cable glands and blind plugs
- Hardware User Manual

Associated Documents

- SDK Online Help
- i-SHARE Manual
- Specific tag manuals

2. Introduction

8

2.1 iPOINT and System Description

The iPOINT device provides a functional combination of: The "zone location" system of an i-MARK, the long-range Reader functionality of an i-PORT as well as close proximity NFC functionality, encased in an attractive, rugged, IP67 housing.
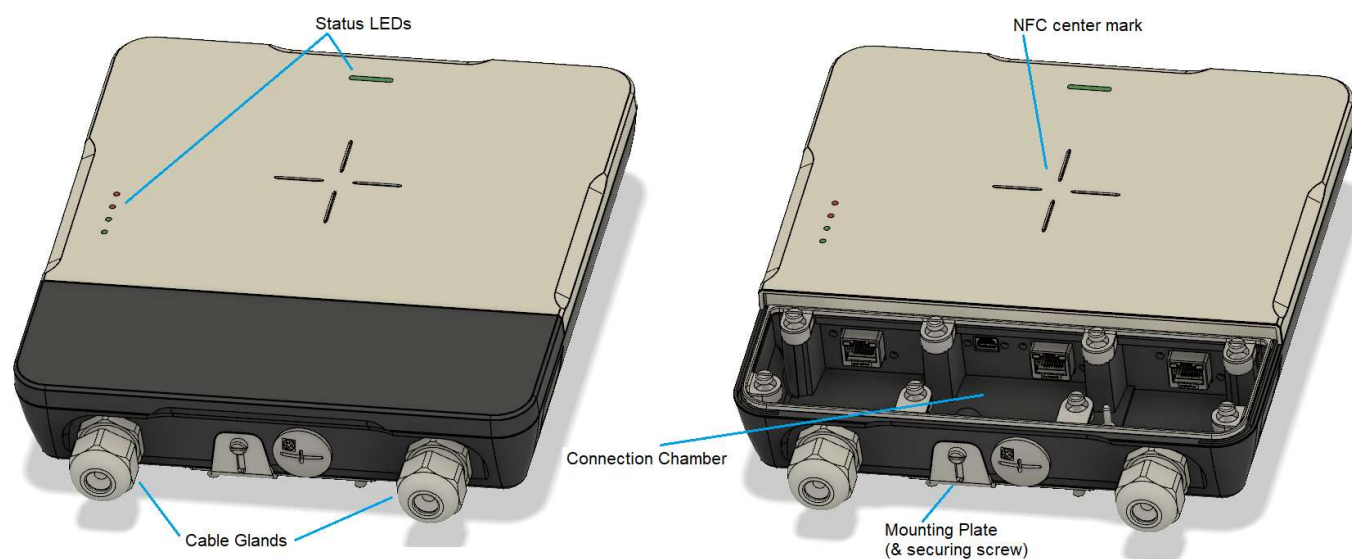
The Housing contains:

- 5 Status LEDs (see Section 3.1)
- a Connection Chamber where the wired interfaces can be accessed
- Relevant cable glands, as wired access points, depending on the device setup
- Mounting Plate and securing screw (see Section 4)

For a detailed description of how to correctly open the connection chamber and other mechanical information, please refer to Section 4.1.

The iPOINT can used as a standalone device or in a daisychain of devices. See Section 2.3 for more details.

Following is a description of the wireless technologies that are available within the iPOINT Device.

2.1.1   UHF Interface

The UHF interface is a wireless communication interface using the UHF ISM frequency band and IDENTEC's protocols.
The iPOINT X has two internal UHF antennas built in and can communicate up to a range of 500 meters with its Tags.

The main benefit of two antennas is the elimination of RF dead spots in static systems.

i-B350 Tags

Beacon UHF

Bidirectional UHF

i-Q355 Tags
i-Q350 Tags
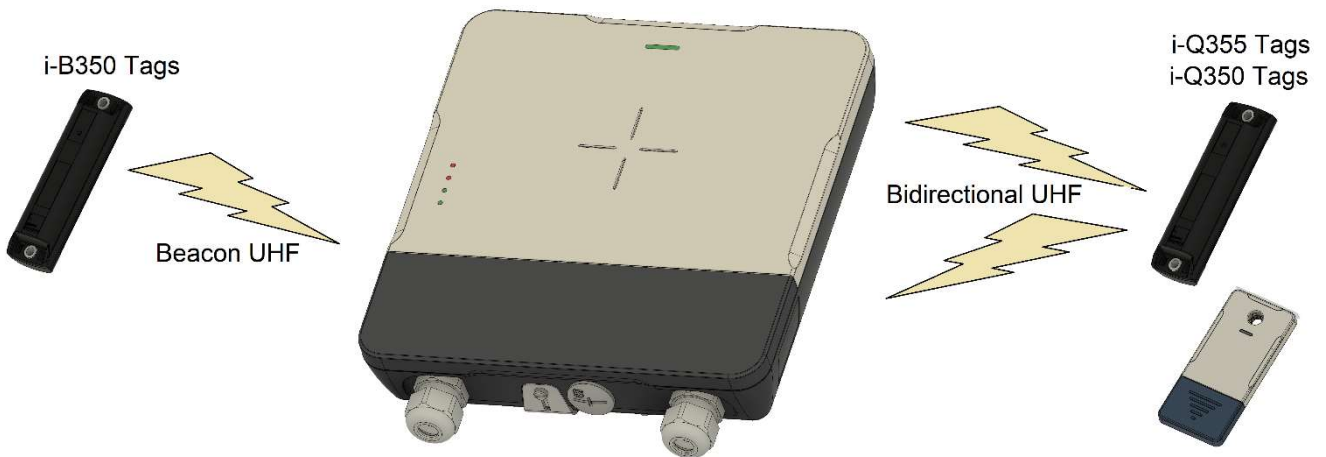
2.1.2   LF Interface

The LF Interface uses IDENTEC's LF^{BOOST} Marker technology. Zone location at Low Frequency can be achieved with a configurable field range up to 5 Meters. This allows Tag detection in a specific area.

Up to 5m

Tag
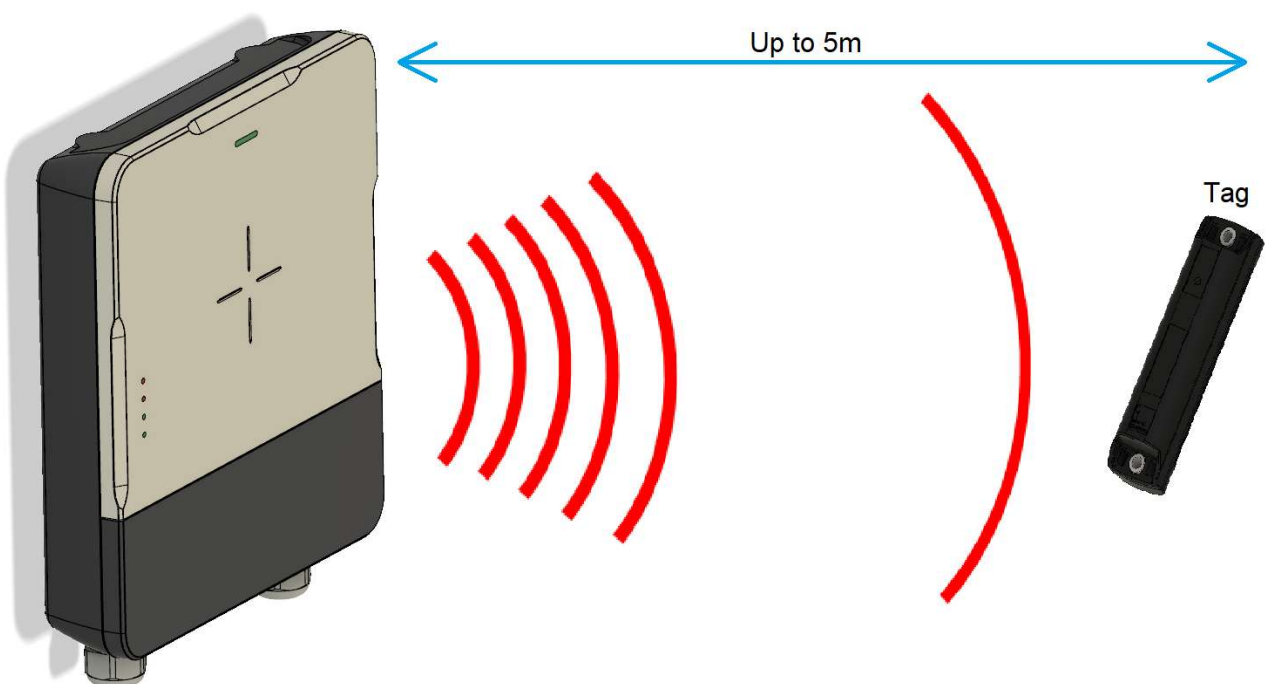
2.1.3 NFC Interface

The NFC Interface is a Near Field Communication interface. The iPOINT can be used as an entry terminal or for other NFC communication. The range to the Tag is around 10-15cm and is compatible with the i-Q355 Series of Tags as well as standard NFC cards.

Tag

Card

2.2   System Components – Tags

Identec offers a wide range of tags that can be used with the iPOINT. The tags provide long range communication with the readers of up to 500 m (1640 ft), using advanced UHF radio frequency technology.

i-Q355 Tags

Using advanced UHF radio frequency technology, i-Q355 tags transmit and receive data at distances of up to 250 m (820 feet). In addition, they can be configured to beacon data at a configurable ping rate to a range of up to 500 m (1640 ft).

These active RFID tags are particularly suited for:

- Access Control
- Identification
- Tracking and Tracing
- Zone localization

i-Q350 Tags

Using advanced UHF radio frequency technology, i-Q350 tags transmit and receive data at distances of up to 250 m (820 feet). In addition, they can be configured to beacon data at a configurable ping rate to a range of up to 500 m (1640 ft).

These active RFID tags are particularly suited for:

- Identification
- Tracking and Tracing
- Localization
- Environmental Data Sensing

i-B350 Tags

IDENTEC SOLUTIONS' i-B350 tags are designed to be cost effective and easy to implement, while offering maximum flexibility. The beacon ILR® Tags continually send out their ID at pre-programmed intervals. They do not need to be interrogated in order for them to send their information—they do it automatically.

These active RFID tags are particularly suited for:

- Access control
- Tracking of Vehicles and Containers
- Online inventory
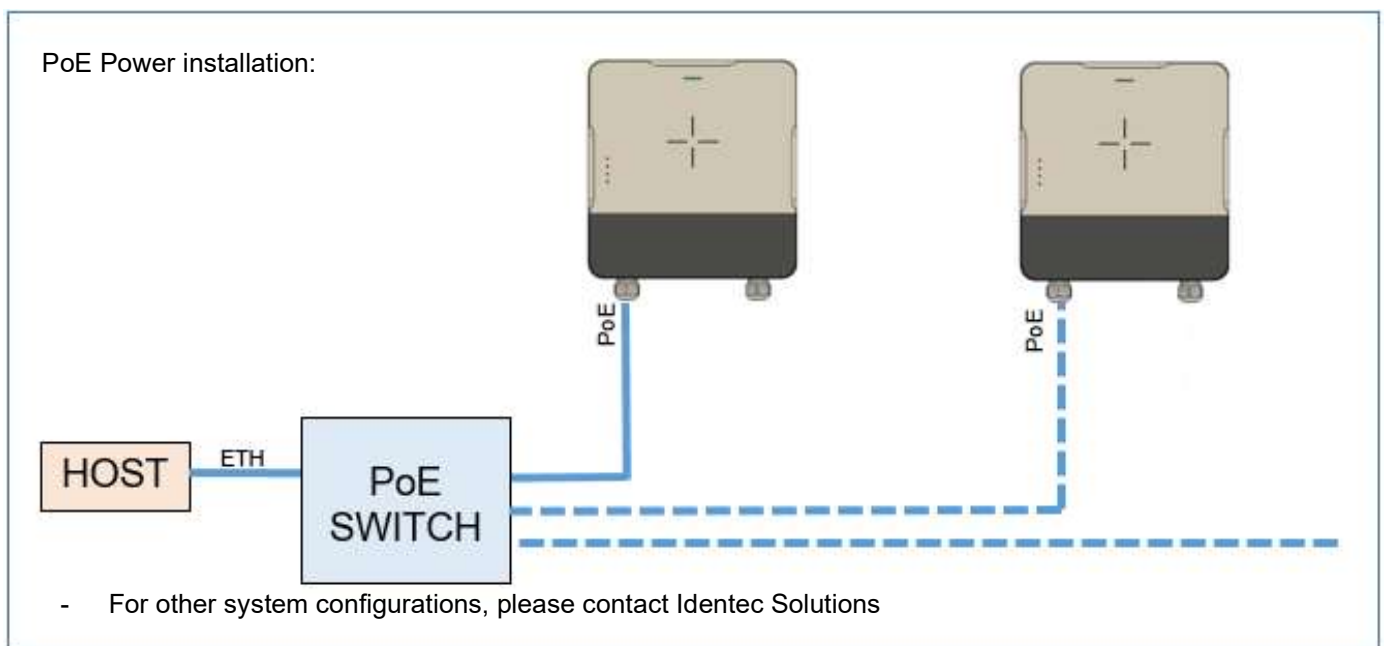- Localization of assets at specific areas

All Tag types are available with the following options:

- *Marker technology* for locating goods, vehicles, etc. The Marker technology allows selective locating of a transponder, for example in adjacent car tracks or gate applications. Here the inductive Marker field informs the ILR® Tag about its current location.

- *Temperature sensor and logging*: These types contain an internal sensor for temperature monitoring in order to measure and log the temperature of goods in definable intervals. They are also available with external sensors.

- *LED* for visual recognition, such as, for example, for "pick by light" applications. The light is visible from almost every direction.
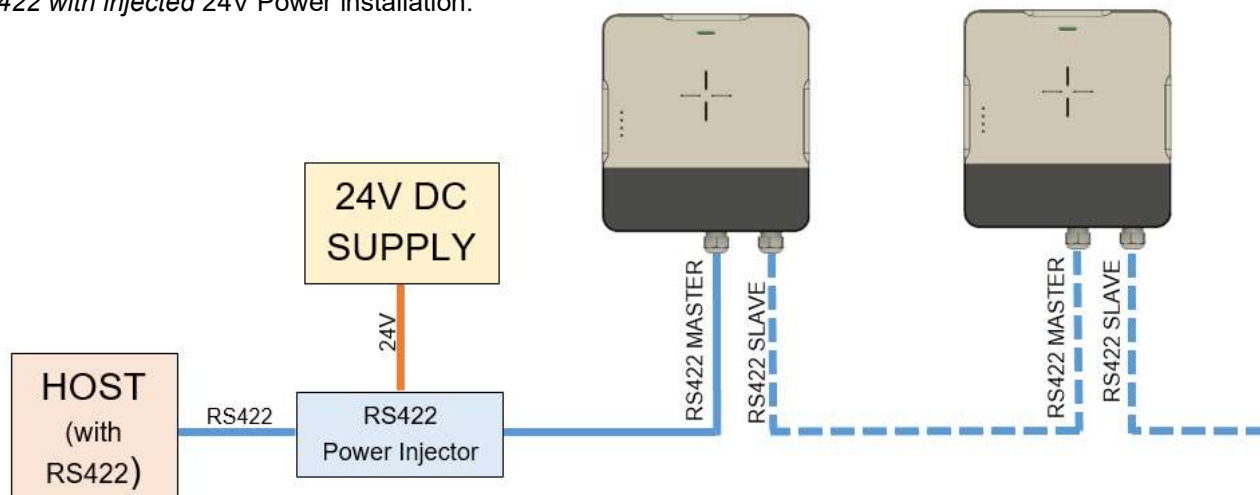
2.3 Ports Overview & Topologies
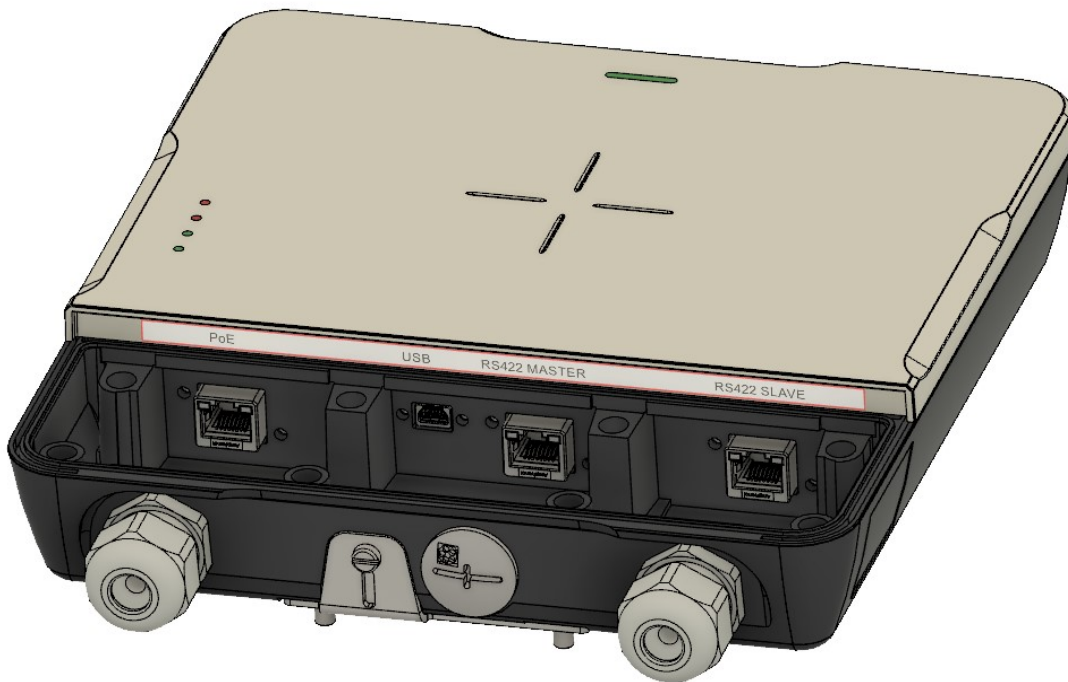
PoE	RJ45 PoE cable connector to the host computer or switch
USB	USB Mini connector for debugging, low power operation and device configuration
RS422 MASTER	RJ45 RS422 cable connector to the host computer or previous Slave port in the daisychain
RS422 SLAVE	RJ45 RS422 cable connector to the master port of the next i-PORT in the daisy chain. Leave this connector open at the last device in the chain.

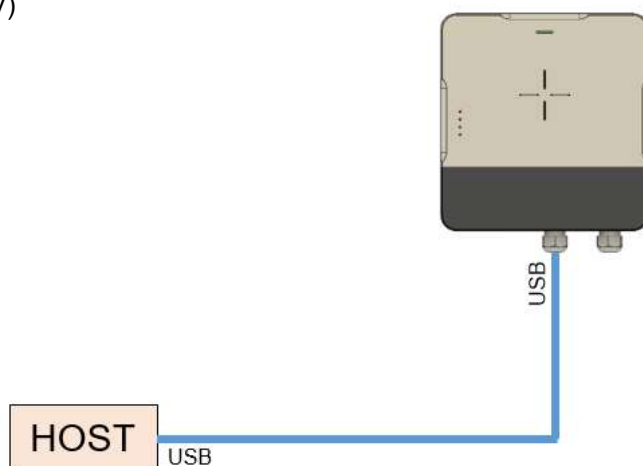
PoE Power installation:

- For other system configurations, please contact Identec Solutions

RS422 with injected 24V Power installation:

24V DC SUPPLY

HOST (with RS422)

RS422

RS422 Power Injector

24V

RS422 MASTER

RS422 SLAVE

RS422 MASTER

RS422 SLAVE

- Make sure power supply can handle all iPOINTs in the system
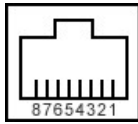
USB Mode (5V)

USB

HOST

USB

- Local USB mode over Mini-USB Connector for debugging, low-power operation and Configuration
- No Slave mode under USB operation

- Maximum power consumption of an iPOINT is 7W.

2.3.1   PoE Connector & Pinout

<u>PoE interface:</u> Shielded wire connection with PoE voltage, according to the Standard. RJ45 Plug.

View into the connector = crimp/solder side of plug

Pin	Symbol	T568B color
1	Rx+	White/orange
2	Rx-	Orange
3	Tx+	White/Green
4	Vdc+	Blue
5	Vdc+	White/Blue
6	Tx-	Green
7	Vdc-	White/Brown
8	Vdc-	Brown

2.3.2   RS422 Connectors & Pinout

There are limitations on the RS422 Master/Slave cabling:

- Shielded cables must be used to achieve the prescribed EMC
- The overall length of the RS422 Master/Slave over all units in the chain must not exceed 1000 m (3200 ft).
- The distance from one unit to the next must not exceed 300 m (1000 ft).

This table is valid for Cat 5 cabling with gauge diameters of AWG24 (0.25 mm²).

# of i-PORTs	Length (m/ft)	Remark
1	300/1000	Central supply with 24 VDC via the RS422 Master/Slave
2	600/2000	Central supply with 24 VDC via the RS422 Master/Slave
3	400/1300	Central supply with 24 VDC via the RS422 Master/Slave
4	250/820	Central supply with 24 VDC via the RS422 Master/Slave

WARNING

- The RS422 Master/Slave uses RS422 levels on its RX and TX Pins, although Ethernet jack/plugs mechanically fit, the device is not Ethernet compatible.
- If devices are powered by the RJ45 cabling of the RS422 Master/Slave, wire gauge must be at least AWG24 (0.25 mm²).
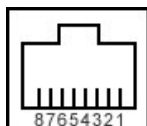
View into the connector = crimp/solder side of plug

| Pin	To Master	To Slave	T568B color	Description
1	RxD+	TxD+	White/orange	
2	RxD–	TxD–	Orange	
3	TxD+	RxD+	White/Green	
4	V+ (10 … 30V)	V+ (10 … 30V)	Blue	Power supply over bus
5	V+ (10 … 30V)	V+ (10 … 30V)	White/Blue	Power supply over bus
6	TxD–	RxD–	Green	
7	GND	GND	White/Brown	Power supply over bus
8	GND	GND	Brown	Power supply over bus

As the TxD/RxD crossing is done by the pinout of the connectors, simple straight cabling has to be used.

Connection parameters

Signal levels: RS422

Baud rate: 115200 bits per second

Data bits: 8

Stop bits: 1

Parity: none

Mode: half duplex

2.3.3   USB Connector & Pinout

- A Standard Mini-USB Cable and connector can be used to connect to the iPOINT
- Standard 5V power is supplied to the device
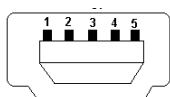
View into the connector (female, receptacle)

Pin	Description	Colour
1	+5V	Red
2	Data -	White
3	Data +	Green
4	ID / not Connected	None
5	GND	Black

2.4   USB Only mode – Function and specification

- The iPOINT Device can be used with a single connection over the Mini USB port.
- During this operation, 5V is supplied and powers the device.
- This can be a fast way to access the device in the field for configuration purposes.
- The device can also be fully functional in USB mode, using a low-power, short range LF driver
- TBD: Enter config/debugging info

2.5   Communication Interface Priorities

The priorities for the wired connections will be:
1. **USB**: Highest priority. A connection over USB will terminate all other existing connections
2. **Ethernet**: A connection via Ethernet (PoE interface) will terminate all serial connections
3. **Serial**: RS422 Serial connections

When a higher priority connection is disconnected, bus access is released to the next priority connection.

2.6   Lid Open Detection

There is a feature in the iPOINT where automatic detection of the housing being opened can be communicated to the Host system. This can be used as a safety feature or as a tamper alert.

3. Initial Operation / Configuration

The configuration of the iPOINT is managed via the host software.

Available Identec Solutions Software

- Setup Scout
- i-Share
- Crew Companion

Please refer to the relevant software User Manuals for details.

3.1 Status LEDs

UHF

This is the UHF Communication LED. LED blinks green when a valid command has been sent to Tag. It blinks Orange when a response or a broadcast is received.

LF

This is the LF Communication LED. LED blinks green when Marker Loop ID is sent. It blinks red if LF is not working properly (e.g. loop broken or loop current too low).

COM

This is the wired interface LED. It blinks green when a command is received and orange when responding over RS422 or RS485.

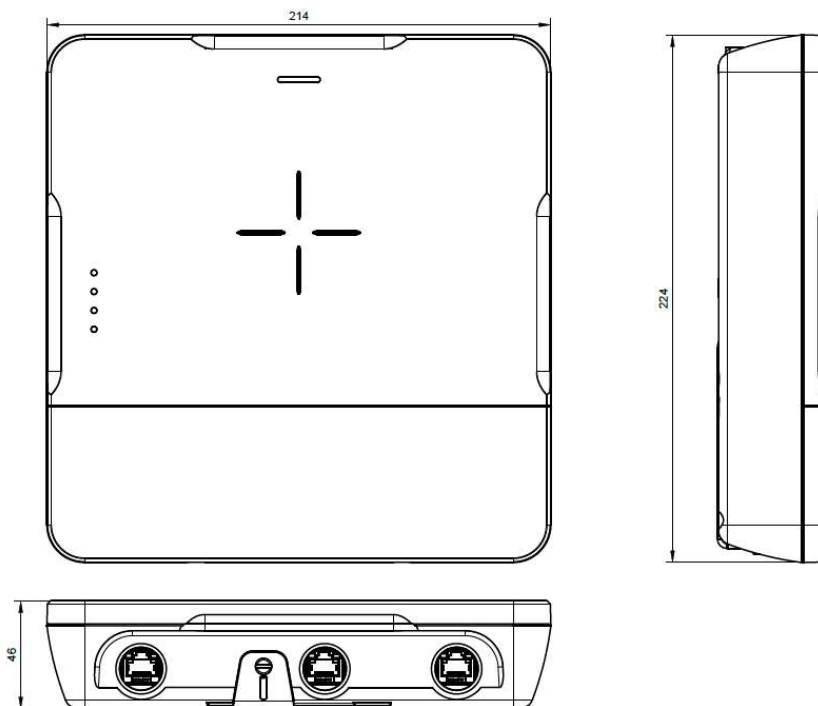Note: Because of short communication you can see just the orange blink.

RUN

This is the general Device run LED. It blinks Green if everything is OK. Blinks red if the voltage is too low or a Hardware issue is detected
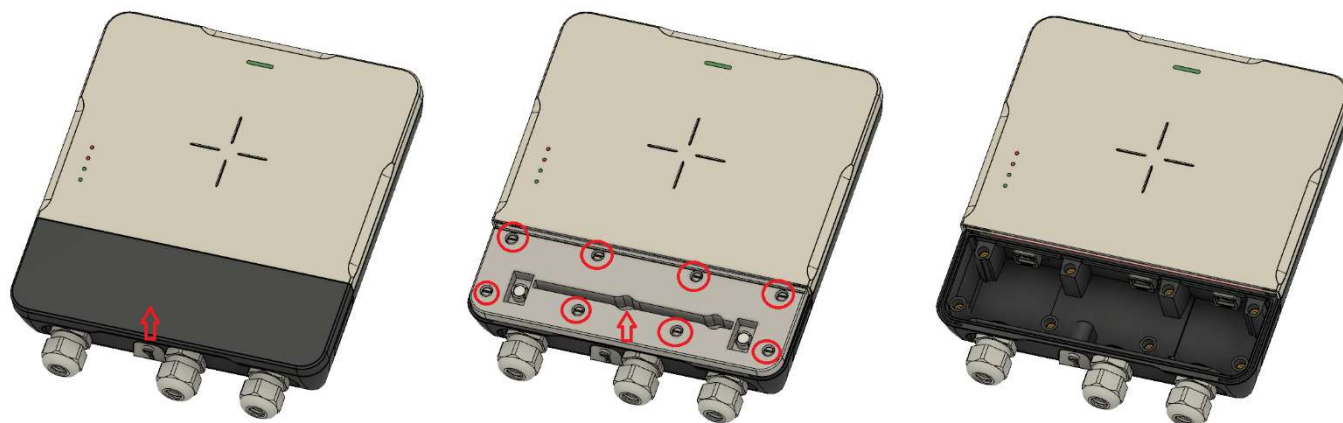
NFC (top)

This is the NFC Card read LED. Is green when access is granted, red when access is denied.

4. Mechanical Information & Installation

Housing Dimensions

## 4.1 Opening the connection Chamber

1. Lift up the cover using thumbs from the front side until magnetic connection is released, lift off.
2. Loosen the 8x screws, be aware, DO NOT pull out the screws out completely, the gasket can be damaged.
3. Lift off the lid.
4. Now you have access to the Connection Chamber

Note: when replacing the lid, be sure that the sealing gasket is correctly in place.

Note: The rest of the housing cannot be accessed. There is no settings or modifications to be made there.

4.2 Mounting Options

MOUNTING PLATE

SECURING SCREW
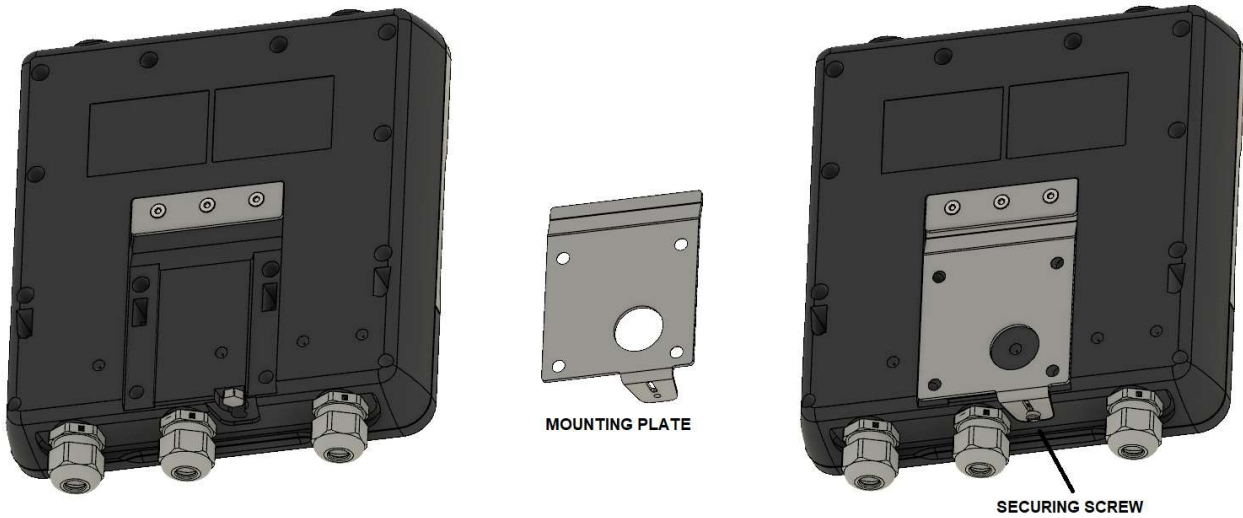
The mounting plate can be attached to a wall, pole mount bracket, extension bracket or DIN rail. There are 4 fixing holes for attaching the relevant bracket or screwing to a wall.

For mounting with a pole mount bracket or extension bracket, please see relevant Installation guides provided with the kits.

For Direct wall mounting, using the mounting plate only, 4x countersunk screws are required with a maximum diameter of 5mm or M5 screws. Length and type shall be chosen depending on wall material.
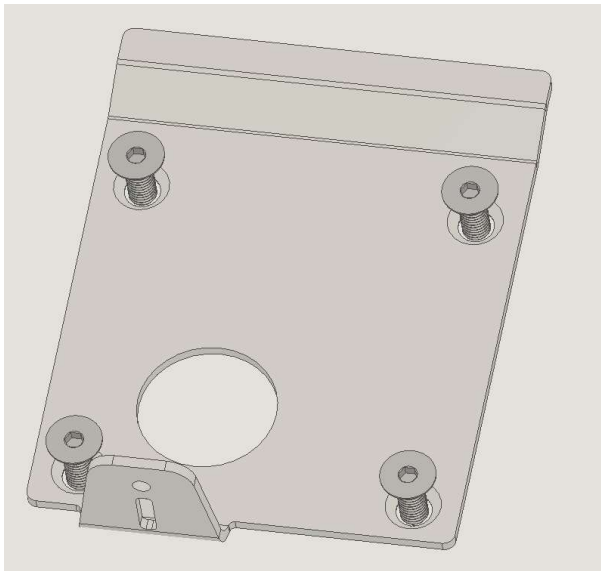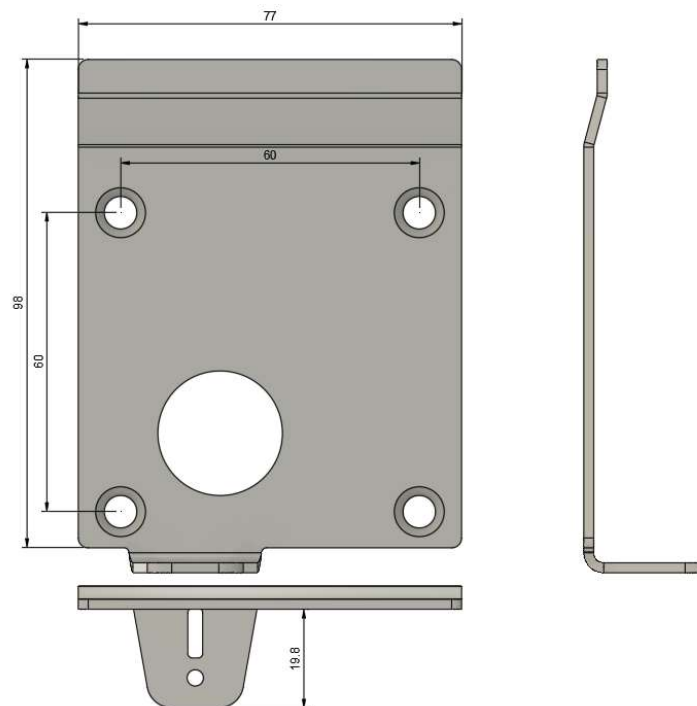

Wall

- 4x countersunk screws
- Choose screw type and length depending on wall material
- Maximum diameter of 5mm

- Screw plate securely to the wall using all 4 screws

- the iPOINT device can then be clipped onto the plate and secured with the securing screw

Warning: Don't screw the mounting plate directly to a metal surface that extends the size of the whole device. This will have an influence on the UHF and LF performance. If a metal fixing surface is required, please use the extension bracket as a standoff.

Warning: when unmounting device from the mounting plate, first lift the device up, then out; do not pull device directly or there's a risk of damage.
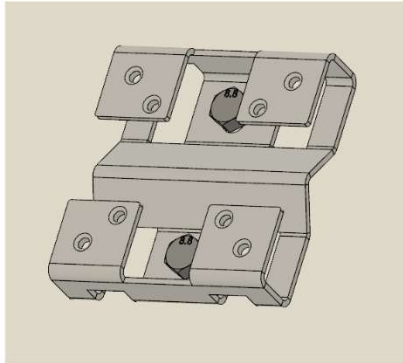

4.2.1   Optional Extra: Pole Mount Bracket Kit
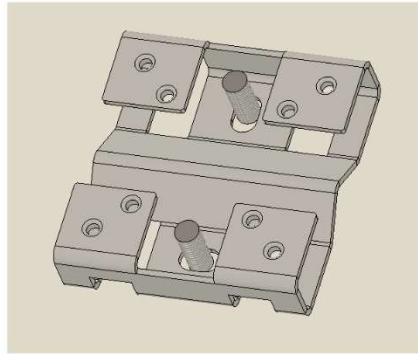
A *Pole Mount Bracket Kit* is available.
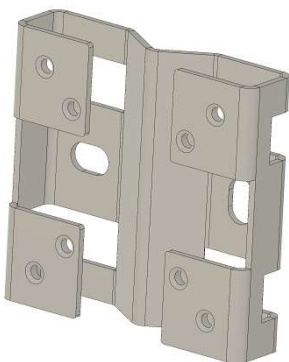
- Pole Mount Bracket Kit:

  o Contains the bracket and accessories

  o The bracket can be mounted to a wall with M8 Bolts or via threaded rods (e.g. wall anchors)

  o The bracket can also be mounted onto vertical or horizontal poles

  o Refer to "*Pole Mount Bracket Kit – Quick Installation Guide*" documentation for more details.
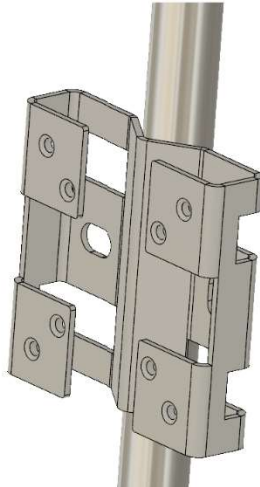
Wall Mounted (bolts)

Wall Mounted (threaded Rods)

Vertical Pole Mounted

Horizontal Pole Mounted
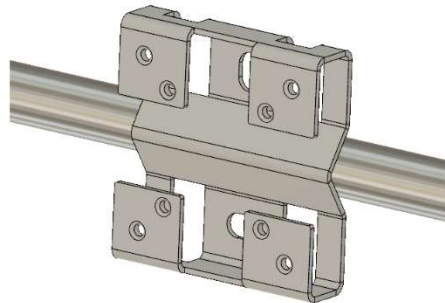
4.2.2   Optional Extra: Extension Bracket Kit

An *Extension Bracket Kit* is available
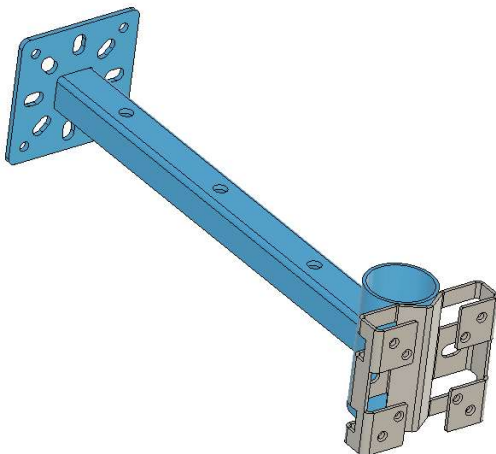
- Extension Bracket Kit:

   o   Contains the bracket and accessories

   o   The bracket can be mounted to a wall with M8 Bolts or via threaded rods (e.g. wall anchors)

   o   Multiple mounting options, including use of the pole mount bracket

   o   Refer to "*Extension Bracket Kit – Quick Installation Guide*" documentation for more details.

**Pole mounted
(via additional pole mount bracket)**
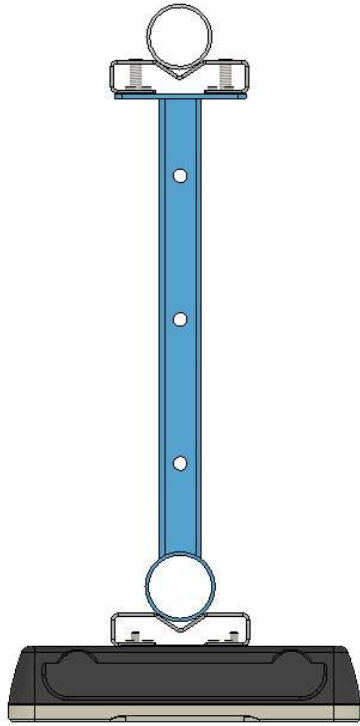
Wall mounted (direct)

Rotatable

22
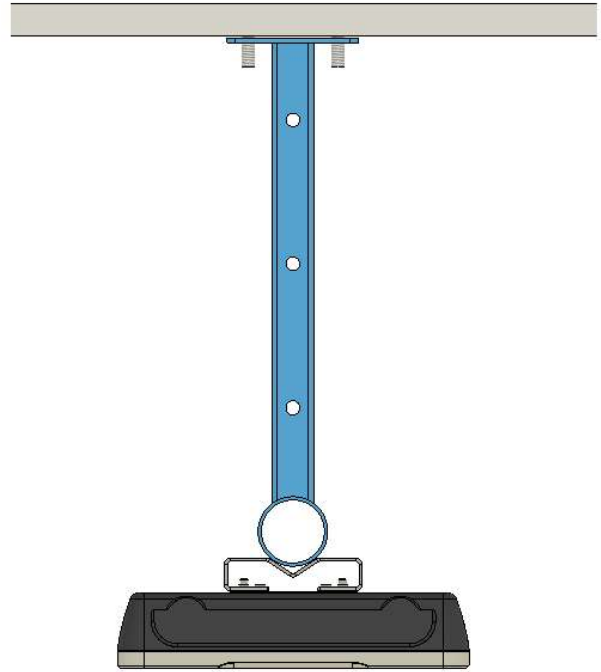
5. Troubleshooting

This chapter covers how faults can be recognized and rectified. There are potentially four main problem sources:

- The user control system, including task requirements, communication cables, peripheral units with possible object recognition switches.
- The Crew Companion platform including peripheral units and their cables, also potential object recognition switches.
- The environment including large objects between antenna and ILR® Tags, electrical disturbance sources, intervention by persons, etc.
- The quality of the technical design, including alignment between antenna, data, ratio of task requirements/available communication time etc. The information about system performance is contained in the relevant datasheets.

When planning the total system, not overlook the problem sources and "Fault finding procedures on system level" should be included in the host system. How this could look in detail depends on the relevant system concept and very likely varies from one system to another.

A Brief Checklist

- Are all housings intact?
- Are all cables intact?
- Are all connectors intact?
- Are all connectors securely fastened?
- Are all screws still tight?
- Is there a sudden malfunction at a specific unit?
- What are the status of the LEDs? is the 'RUN' LED flashing?

6. Maintenance

When installed correctly the iPOINT system will operate virtually maintenance free for many years. However, in the event maintenance is required, only trained and authorized personnel are permitted to perform the updates, changes and necessary maintenance.

Regular Cleaning of the Surface

If the device needs cleaning, use a soft cloth moistened with a mild rinsing agent. Do not use cleaning products containing chemical additives.

Precautionary Maintenance

A regular check of the system is recommended. Unstable connections could lead to damage and malfunctions of the system and should therefore be repaired as soon as possible.

6.1 Exchanging an iPOINT within the daisy chain

- Exchange only one unit after another, not several in one step.
- Exchange the device with one of the same type.
- If necessary, configure the iPOINT in your system software

6.2   Firmware Update

The firmware is stored in a FLASH memory and can be updated if needed.

6.3   Spare Parts

Recommended spare parts stock

In order to minimize the downtime in the event of a malfunction, it is recommended to have certain spare parts on stock. For larger systems with more than 15 iPOINTs, doubling of the recommended stock quantity is recommended.

Furthermore, it is advised to have several spare ILR® Tags in stock, corresponding to approx. 0.5 – 1 % of the total number of ILR® Tags.

Preparing the spare parts

In general, all spare parts can be used immediately upon delivery from IDENTEC SOLUTIONS. However, for the iPOINT there are various settings of the communication parameters.

In order to keep down times short it is recommended that these parameters are set before the component is entered into the spare part stock system. In most cases all units within an identification system are used in the same way so that only one setting is required.

Examination and repair of exchanged parts

The data ILR® Tags and iPOINT X devices are complex electronic power units on which the customer can carry out only very limited repairs. Normally the repairs are carried out at IDENTEC SOLUTIONS or possibly at a distributor. Before a part is sent in for repair a short examination should be conducted.

6.4   Returns

Parts or main components returned for repair or exchange must be handled with great care. All returns should include an error description and a short application overview and be sent to the local distributor or to:

> IDENTEC SOLUTIONS AG
> Service Department
> Millennium Park 2
> 6890 Lustenau
> AUSTRIA

For full details, refer to our "Return and Repair Policy" on our website.

7. Technical Specifications

Communication ILR³⁵⁰ technology

Operation Mode	UHF Broadcast or response communication
Read Range	up to 500 m [1]
Compatibility	i-B350, i-Q350, iQ355 Tags
Operating Frequency	UHF ISM Band: 868 MHz (EU) or 920 MHz (NA)[2]
Antenna / Transmit Power	2x Internal Antennas / <1mW

Communication LF^boost Marker

Operation Mode	Sends Marker ID at a predefined interval
Exciter Range	up to 5m (adjustable) [1]
Compatibility	LF^boost enabled tags
Operating Frequency	125kHz

Communication NFC

Antenna	Integrated 13.56MHz coil (read/write)
Standards	ISO/IEC 15693, ISO/IEC 14443A&B, Sony FeliCa
Status Notification	NFC detection notification via Buzzer and LED

Performance

Multiple Tag handling	Up to 1000 ILR Tags per read zone
Marker ID	16bit programmable

Interfaces

Data Interface Master/Host	RS422 – RJ45
Data Interface Slave	RS422 – RJ45
Data Interface PoE	PoE – RJ45
Data Interface USB	USB Mini
Status Display	5 LEDs (UHF, LF, COM, RUN & NFC)

Electrical

Power Source	PoE	12-30VDC (RS422 Master)
Power Consumption	according to 802.3af3	Max. 7 Watt

Environmental Conditions

Operating Temperature	-40°C to +70°C (-40°F to +158 °F)
Storage Temperature	-40°C to +85°C (-40°F to +185°F)
Humidity	Up to 50%, non-condensing (open), 100% (closed)
Shock:	EN 60068-2-32: Multiple drops to concrete from 1m (3ft), 5 times
	EN 60068-2-29: 50G on all 3 axis, 3 times per axis
Vibrations	EN 60068-2-64: noise 5 to 1000Hz, 90 minutes per axis
	EN 60068-2-6: 5G, 20 sin wave cycles per axis, 5-500Hz

Standard/Certification

Europe	**CE** (EN 300 220-1, -2; EN 301 489-1,-3; EN 62368-1; EN 300 330; EN 50364; EN 62369-1; EN62311)
North America	**FCC** Part 15 (US); **IC** RSS210

Mechanical Data

Dimensions	(L) 224 x (W) 214 x (T) 46 mm
Housing Colours	*Front:* RAL 9002 Gray-White, *Back/Lid:* RAL 7024 Graphite-Grey
Enclosure Material	Plastic (PC-ASA)
Enclosure Rating	IP67
Weight	iPOINT Si: 1200g

Order Code

iPOINT Si (IDS1001)	455970
Pole Mount Bracket (kit)	456001

[1] The communication range depends on environmental conditions and national regulation limits
[2] Other country frequencies are available, please contact IDENTEC SOLUTIONS

Visibility Delivered.

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