i-Q350-RNB (IDS1009)
Hardware User Manual

Contents

DOCUMENT HISTORY

Num	Filename	Version	Author	Date
1	M_EN_i-Q350-RNB_V10	1.0	MOM	28.09.2023
2	M_EN_i-Q350-RNB_V11	1.1	FEK	06.10.2023
3	M_EN_i-Q350-RNB_V12 correct FCC ID	1.2	FEK	15.11.2023

IDENTEC SOLUTIONS BECAUSE IT WORKS

PROPRIETARY NOTICE

THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION PROPRIETARY TO IDENTEC SOLUTIONS1 AND MAY NOT BE USED OR DISCLOSED TO OTHER PARTIES IN WHOLE OR IN PART WITHOUT THE PRIOR WRITTEN AUTHORIZATION FROM IDENTEC SOLUTIONS.

DISCLAIMER AND LIMITATION OF LIABILITY

IDENTEC SOLUTIONS AG AND ITS AFFILIATES, SUBSIDIARIES, OFFICERS, DIRECTORS, EMPLOYEES, AND AGENTS DO NOT MAKE ANY EXPRESS OR IMPLIED WARRANTIES OR REPRESENTATIONS WITH RESPECT TO SUCH INFORMATION INCLUDING, WITHOUT LIMITATION, WARRANTIES AS TO NON-INFRINGEMENT, RELIABILITY, SUITABILITY FOR A PARTICULAR PURPOSE AND ACCURACY. IDENTEC SOLUTIONS SHALL NOT UNDER ANY CIRCUMSTANCES BE LIABLE TO ANY PERSON FOR ANY SPECIAL, INCIDENTAL, INDIRECT OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, DAMAGES RESULTING FROM USE OF OR RELIANCE ON INFORMATION PRESENTED HEREIN, OR LOSS OF PROFITS OR REVENUES OR COSTS OF REPLACEMENT GOODS, EVEN IF INFORMED IN ADVANCE OF THE POSSIBILITY OF SUCH DAMAGES.

OF THIS DOCUMENT SHALL BE SOLELY RESPONSIBLE FOR PROPER SELECTION, APPLICATION, AND USE OF THE PRODUCT DESCRIBED HEREIN, AS WELL AS THE INCORPORATION/INTEGRATION OF SUCH PRODUCT INTO OTHER EQUIPMENT OR SYSTEMS. THE USER SHALL INDEMNIFY AND HOLD IDENTEC SOLUTIONS HARMLESS FROM AND AGAINST ANY AND ALL DAMAGES, LIABILITIES, CLAIMS, OR EXPENSES (INCLUDING REASONABLE ATTORNEYS' FEES) ARISING OUT OF OR RELATING TO (I) IMPROPER SELECTION, APPLICATION, INSTALLATION, USE OR INCORPORATION/INTEGRATION OF THE PRODUCT; OR (II) INFRINGEMENT OF ANY PATENT, TRADEMARK, COPYRIGHT OR OTHER THIRD PARTY INTEREST ARISING OUT OF IDENTEC SOLUTIONS' COMPLIANCE WITH ANY OF THE USER'S DESIGNS, SPECIFICATIONS, OR INSTRUCTIONS RELATED TO THE PRODUCT.

TRADEMARKS

"IDENTEC SOLUTIONS", "INTELLIGENT LONG RANGE", "ILR" AND THE STYLIZED "I" "I-PORT". "IPOINT" AND "BECAUSE IT WORKS" ARE TRADEMARKS OF IDENTEC SOLUTIONS.

COPYRIGHT NOTICE

COPYRIGHT © 2023 IDENTEC SOLUTIONS. ALL RIGHTS RESERVED.

NO PART OF THIS DOCUMENT MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM BY ANY MEANS, PHOTOGRAPHIC, ELECTRONIC, MECHANICAL, OR OTHERWISE, OR USED IN ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE PRIOR WRITTEN PERMISSION OF IDENTEC SOLUTIONS

SUBJECT TO ALTERATION WITHOUT PRIOR NOTICE.

COPYRIGHT © 2023 IDENTEC SOLUTIONS AG

---

[1] IDENTEC SOLUTIONS means IDENTEC SOLUTIONS AG, currently including the following subsidiaries: a) IDENTEC SOLUTIONS Deutschland GmbH; b) IDENTEC SOLUTIONS Norway AS; c) IDENTEC SOLUTIONS Inc; d) IDENTEC SOLUTIONS Australia and New Zealand PTY LTD. IDENTEC SOLUTIONS AG reserves the right to establish additional subsidiaries at its sole discretion at any time without prior notice.

Radio Frequency Compliance Statement

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

MODEL:		i-Q350-RNB
Region/Country	Organization	Marking
EUROPE:	EU	CE
USA:	FCC	OO4-IDS1009
CANADA:	ISED	3538A-IDS1009

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 i-Q350-RNB is in conformity with the essential requirements of Directive 2014/53/EU. The declaration of conformity can be found at: www.identecsolutions.com

USA Certification

FCC Part 15 compliance statement

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.

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.

Radio Frequency (RF) Exposure Compliance of Radiocommunication portable apparatus

This device complies with FCC and ISED Canada RF radiation exposure limits set forth for general population (uncontrolled exposure). This device must not be collocated or operating in conjunction with any other antenna or transmitter.

Conformité à l'exposition aux champs RF des équipements radio portables

Cet appareil est conforme aux limites FCC et ISDE Canada concernant l'exposition aux rayonnements RF établies pour le grand public. (Environnement non-contrôlé)

Cet émetteur ne doit pas être co-situé ou fonctionner conjointement avec une autre antenne ou un autre émetteur.

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

WARNING – This equipment is not suitable for use in locations where children are likely present.

WARNING - 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.

Never open the unit – nothing inside for user interaction or maintenance.

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 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 i-Q350-RNB 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.

Connections / Power Supply

The supply circuits must comply with the conditions set out for the SELV circuits (see EN 62368-1).

The signal circuits must comply with the conditions set out for the SELV circuits (see EN 62368-1).

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.

Battery Inside

All system tags contain a battery; therefore, the following warning should be heeded:

WARNING - Fire, explosion and burn hazard risk of explosion if battery is replaced by an incorrect type. Do not recharge, short circuit, crush, disassemble, heat above 100 °C (212 °F). Do not incinerate, or expose contents to water

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.

1.0 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 i-Q350-RNB. This document is intended only for mechanical and electrical installation of these 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):

- i-Q350-RNB Tag
- Hardware User Manual

Associated Documents

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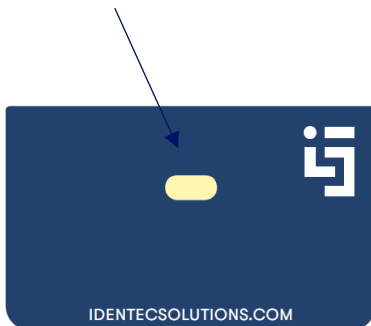- Specific tag and reader manuals

2.0   Introduction

The iQ350-RNB tag uses robust and industry-proven wireless technology, together with a NBIoT & LTE CAT M1 interface and a GPS interface, to deliver true asset tracking and management for exceptional visibility of your goods.

The robust housing can be easily mounted stand-alone on moving assets or used in a ports environment, where it can be attached to a reefer unit to monitor refrigerated units.

2.1.   Status Display (LED)

Blinking Green (fast):	Detecting Reefer Unit
Blinking Green (slow):	Reefer Unit detected; monitoring enabled
Blinking Red (fast):	Reefer Unit detection failed (no communication)
Blinking Red (slow): (during detection process)	Detection started, tag battery low;
Blinking Blue (after connection success)	Connection successful, but Reefer Unit not powered

3.0   System Components

3.1.   Readers

Identec offers a range of readers and markers that can be used together with the i-Q350-RNB tag in the system. The tags provide long range communication with the readers/Markers of up to 500 m (1640 ft), using advanced UHF radio frequency technology.
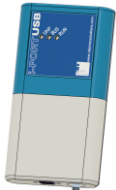
i-PORT M352 Readers

Using advanced UHF radio frequency technology, i-PORT-M352 Reader series can communicate with tags in bidirectional mode at distances of up to 250 m (820 feet). In addition, the tags can be configured to beacon data at a configurable ping rate to a range of up to 500 m (1640 ft).

Identec's i-PORT M352 series of readers can be installed at fixed locations to provide seamless communication with the tags
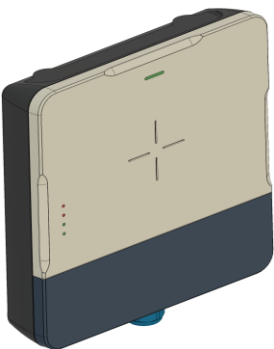
i-PORT-BT-USB Mobile readers

Using advanced UHF radio frequency technology, i-PORT-BT-USB Readers can communicate with tags in bidirectional mode at distances of up to 250 m (820 feet). In addition, the tags can be configured to beacon data at a configurable ping rate to a range of up to 500 m (1640 ft).

Identec's i-PORT BT USB readers can be installed at fixed locations or used as a mobile reader to provide seamless communication with the tags. The mobile reader can then communicate with the host device over Bluetooth or USB connection.

iPOINT

Using advanced UHF radio frequency technology, iPOINT devices can communicate with tags in bidirectional mode at distances of up to 250 m (820 feet). In addition, the tags can be configured to beacon data at a configurable ping rate to a range of up to 500 m (1640 ft).

Identec's multi-purpose iPOINT device combines the functionality of a standard reader, an LF Marker (gate and Zone locationing system, configurable up to 5 m) and NFC (access control) functionality in a single rugged unit.

For more information on the types and configurations of readers available, please visit www.identecsolutions.com

IDENTEC SOLUTIONS BECAUSE IT WORKS

3.2.   I-Q350-RNB Tag

The i-Q350 series of tags are a state-of-the-art generation of active RFID tags.

The tags provide highly accurate, real-time data collection without human intervention in wireless applications such as:

- Identification
- Asset tracking and tracing
- Localization
- Environmental Monitoring & Sensors.

3.2.1 UHF Interface

Using advanced UHF radio frequency technology, i-Q350 RNB tags transmit and receive data at distances of up to 30 meters (100 feet) from a handheld device or up to 500 meters (1,640 feet) from a fixed reader.

Also, LED supports visual signals during search, locate and alarms.

The i-Q350-RNB tag operates in the 850 – 928 MHz UHF band.

3.2.2 5G/NB-IoT Interface

- 5G Ready, Secure Cloud LTE-M and NB-IoT for ultra-low power applications and multiregional use.
- The tag has an integrated antenna and options for a physical SIM card, or an eSIM.
- It offers IoT security from the device to the cloud
- LTE bands available: 1, 2, 3, 4, 5, 8, 12, 13, 18, 19, 20, 25, 26, 28, 66, 71, 85 (23dBm Power Class)
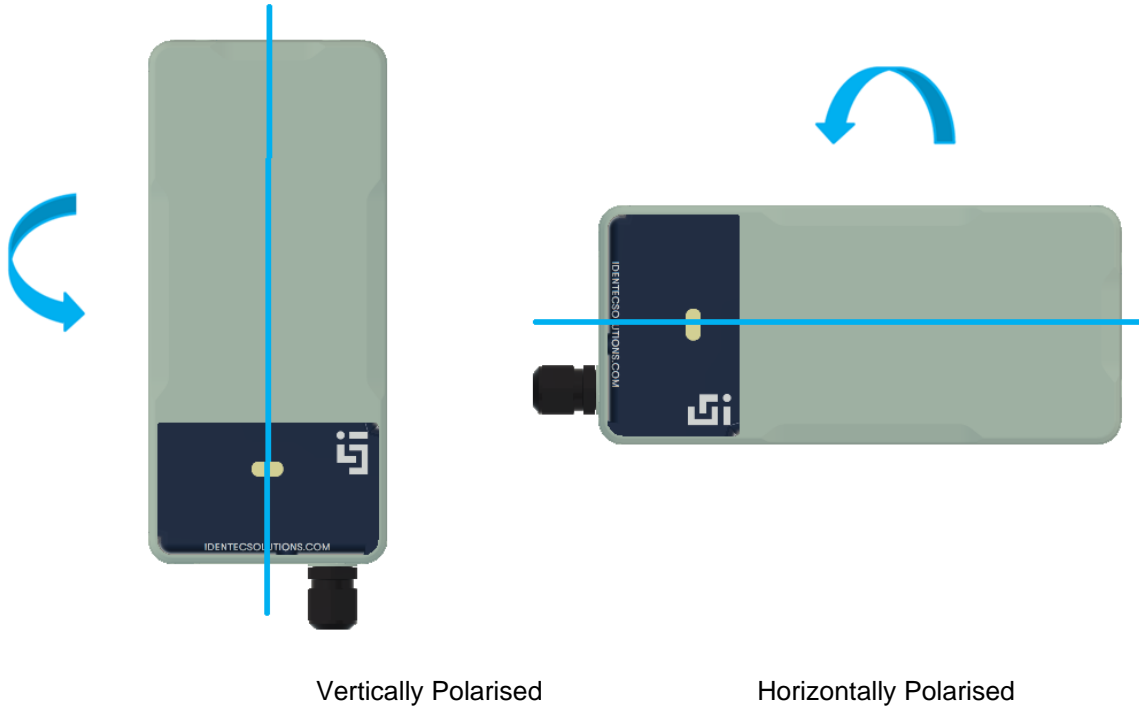
3.2.3 GPS/GNSS Receiver

- Ultra-low-power GNSS receiver for high-performance asset-tracking.
- The tag has an integrated patch antenna.
- <25mW power consumption in continuous tracking mode
- Receiver types include: GPS L1 C/A, QZSS L1 C/A L1S, GLONASS L1OF BeiDou B1I/B1C, Galileo E1B/C SBAS L1 C/A: WAAS, EGNOS, MSAS, GAGAN

3.2.4 Wired Interface

The i-Q350 RNB tag has the option of a serial interface which communicates to container refrigeration units. The tag auto detects the type of the controller and monitors the status and temperature information.
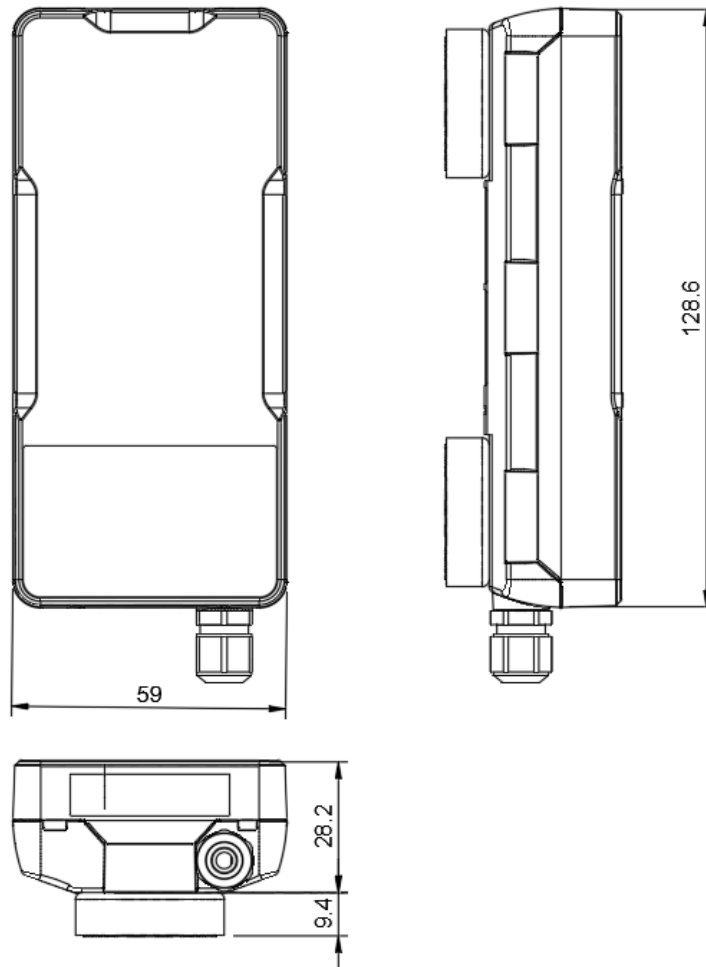
3.2.5 Tag Polarization

| Vertically Polarised | Horizontally Polarised |

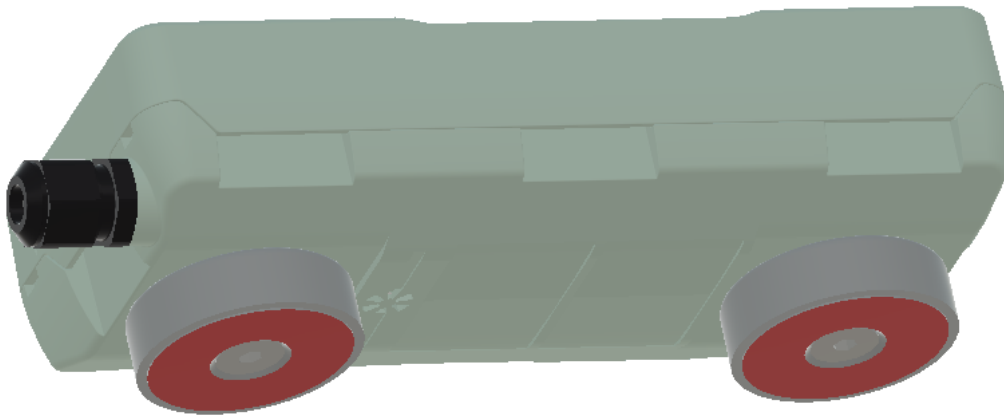Polarization is dependent on orientation and is rotation symmetrical.

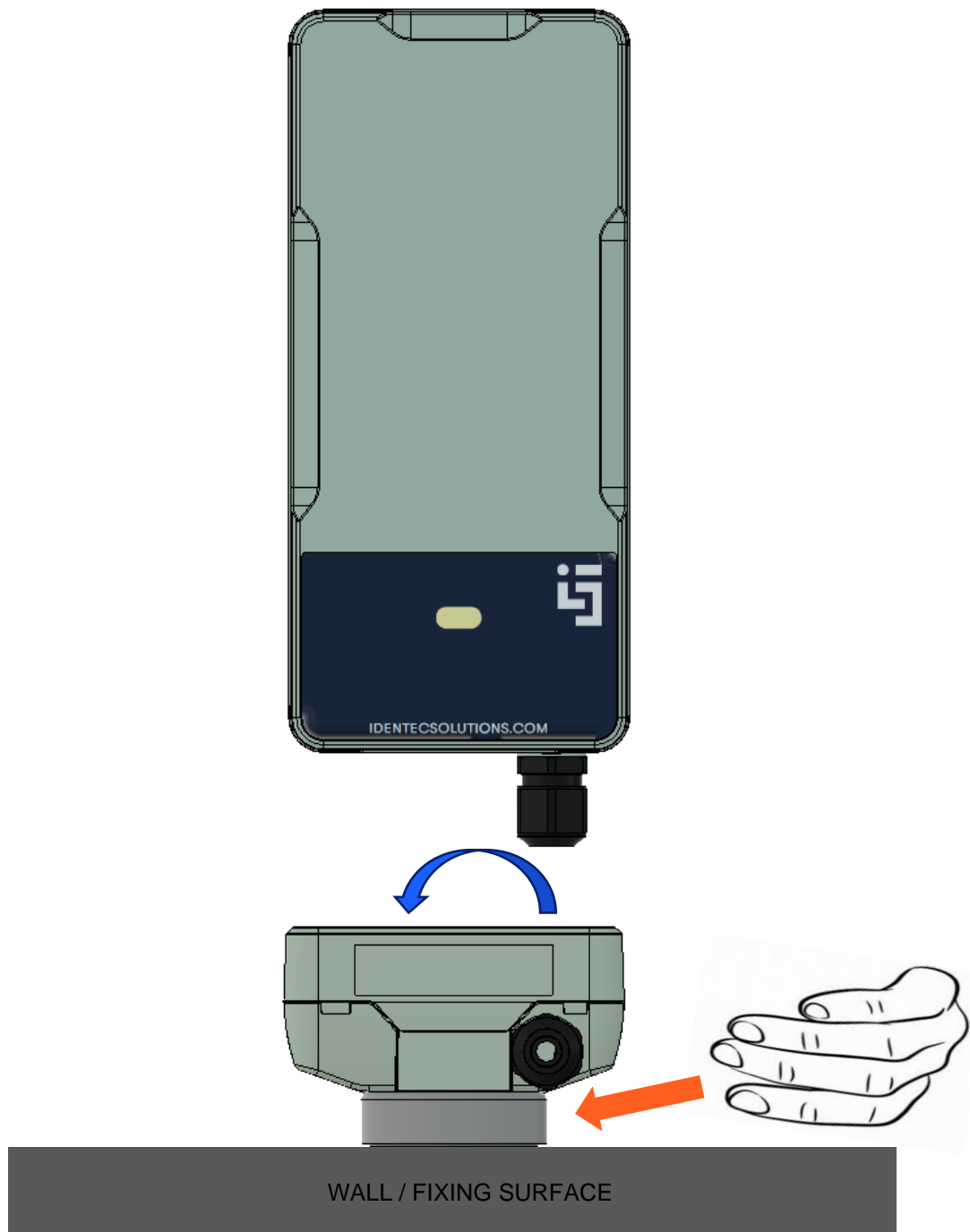# 4.0   Mechanical Information and Installation

4.1.   Dimensions

4.2.   Tag Mounting

The Tag can be mounted using the magnets available on the back side of the unit:

The tag can be easily removed by grabbing it from the side and tilting to one side:
Slightly pull it off the wall and the magnetic holding force is removed at once. DO NOT pull the cable.

WALL / FIXING SURFACE

5.0 Troubleshooting and Maintainance

This chapter covers how faults can be recognized and rectified. There are some common problem sources:

- The environment including large objects between antenna and 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, do 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 screws still tight?
- Is there a sudden malfunction at a specific unit?

4.3.   Maintenance

When installed correctly the tag 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.

4.4.   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
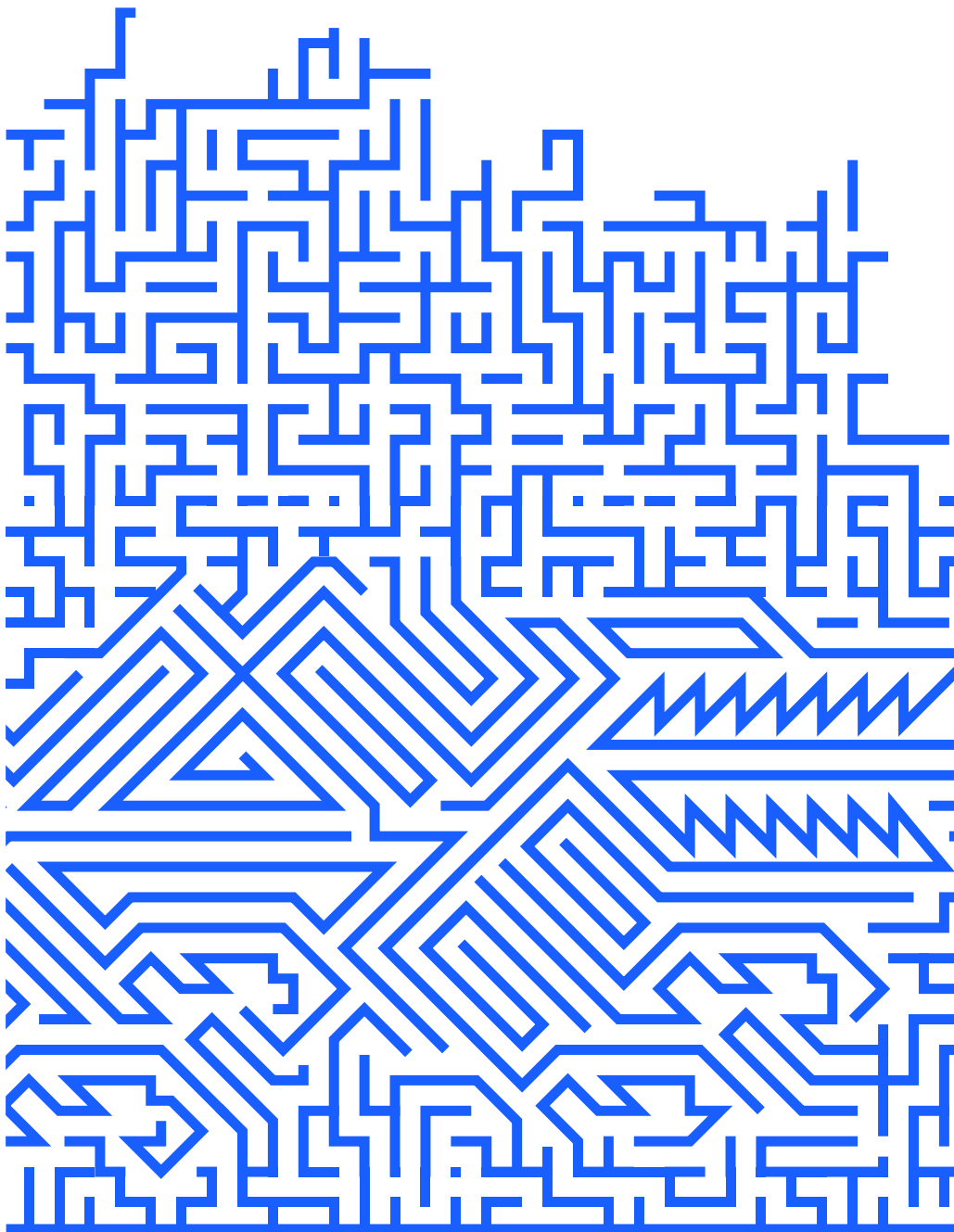Millennium Park 2
6890 Lustenau
AUSTRIA

5.0   Technical Specifications

Communication Technology	
Operation Mode	350 Broadcast and Response Communication
Read Range	Up to 300m (1000 ft)[1]
Compatibility	i-PORT, iPOINT
Operating Frequency	UHF ISM Band (868 MHz - EU or 920 MHz - NA) [2]
Antenna	Integrated Antenna
Transmit Power	<1 mW
Communication NB-IoT &LTE CAT M1	
Description	5G Ready, Secure Cloud LTE-M and NB-IoT for ultra-low power applications and multiregional use, integrated antenna
Security	IoT Security from device to cloud
LTE Bands	1, 2, 3, 4, 5, 8, 12, 13, 18, 19, 20, 25, 26, 28, 66, 71, 85 (23dBm Power Class)
GPS	
Description	Ultra-low-power GNSS receiver for high-performance asset-tracking, integrated antenna
Power	<25mW continuous tracking mode
Receiver Type	GPS L1 C/A, QZSS L1 C/A L1S, GLONASS L1OF BeiDou B1I/B1C, Galileo E1B/C SBAS L1 C/A: WAAS, EGNOS, MSAS, GAGAN
Data	
Data Retention	>10 years without power
Write cycles	100,000 writes
Identification Code	48 bit fixed ID
Configuration	
Device	iPOINT
Monitoring	3 configurable monitoring intervals (Parameters to monitor at time intervals)
Interface	
Serial Interface	Wired RS232 serial connection, Deutsch connector 5 pin 1 meter (3.28 ft) cable
LED	Tricolor LED Indicator
Electrical	
Power Source	Lithium Battery (non-replaceable)
Sensor: Accelerometer	3-Axis MEMS Digital Accelerometer
Sensor: Barometer	Absolute MEMS Digital Barometer (opzional)
Battery Monitoring	Yes
Environmental Conditions	
Operating Temperature	-20°C to + 70°C (-4°F to + 158 °F)
Humidity	10-100% relative humidity @40°C
Shock	EN 60068-2-32: Multiple drops to concrete from 1m (3 ft), 5 times EN 60068-2-29: 50G on all 3 axis, 3 times per axis
Vibrations	EN 60068-2-6: 5G, 20s in wave cycles per axis, 5-500 Hz EN 60068-2-64: noise 5 to 1,000 Hz, 90 minutes per axis
Standards / Certifications	
Europe	**CE** (EN 300 220-1, -3; EN 301 489-1,-3; EN 62368-1)
North America	**FCC** Part 15 (US); **ISED** RSS210
Mechanical Data	
Dimensions	125 x 56 x 27 mm (4.9 x 2.2 x 1.0 inches)
Enclosure Material	Plastic (PC-, PAS60)
Enclosure Rating	IP67 / IP69K

IDENTEC SOLUTIONS BECAUSE IT WORKS

Weight	160 g (5.6 Oz) - 1m (3.28ft) cable
Ordering Information	
i-Q350-RNB (IDS1009)	456240

[1] The communication range depends on the antenna type, the antenna cable runs and the environmental conditions.
[2] Other country frequencies are available, please contact IDENTEC SOLUTIONS

IDENTEC SOLUTIONS BECAUSE IT WORKS

IDENTEC SOLUTIONS

CONTACT US

HEAD OFFICE

IDENTEC SOLUTIONS AG

Millennium Park 2
6890 Lustenau
Austria

T +43 5577 87387 0
F +43 5577 87387 15

GERMANY

**IDENTEC SOLUTIONS
DEUTSCHLAND GMBH**

Hongkongstraße 3
20457 Hamburg
Germany

T +43 5577 87387 0
F +43 5577 87387 15

USA

IDENTEC SOLUTIONS, INC

15150 Preston Rd
Suite 300
Dallas, Texas 75248
USA

T +1 972 535 4144

NORWAY

**IDENTEC SOLUTIONS
NORWAY AS**

Andøyfaret 15
4623 Kristiansand
Norway

T +47 38 00 35 30

AUSTRALIA

**IDENTEC SOLUTIONS AUSTRALIA
AND NEW ZEALAND P/L**

Riverview Business Park 72
Maribyrnong St, Footscray,
3011 Australia

T +61 3 9396 8900

EUROPE

T +43 5577 87387 0
E sales@identecsolutions.com

NORTH AMERICA

T +1 972 535 4144
E sales@identecsolutions.com

IDENTEC SOLUTIONS BECAUSE IT WORKS