i-PORT 350/250 USB - BT

SensorSMARTï

Mobile Reader
User Guide

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Radio Frequency Compliance Statement

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

MODEL:		i-PORT 350/250 USB - BT
Region/Country	Organization	Marking
EUROPE:	EC	CE
USA:	FCC	FCC ID OO4-ILR-IPUBT Contains FCC ID X3ZBTMOD5
Canada:	Industry Canada	IC:3538A-IPUBT Contains 8828A-MOD5

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 may result in the loss of the user(s) authority to operate the equipment.

European Notification according R&TTE Directive

This equipment complies to Art. 6.4 of R&TTE Directive (2006/95/EU, 2004/108/EC, 1999/5/EC). It is tested for compliance with the following standards: EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 489-1, ETSI EN 301 489-3, EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011

USA Notification

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

This device complies with Industry Canada's license exempt RSS's. 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.

Le présent appareil est conforme aux CNR d'Industrie 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, et

(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.
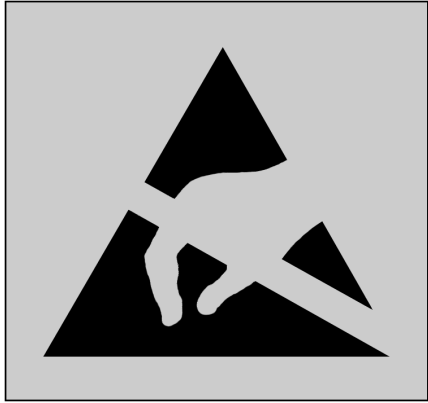
This product contains components that are sensitive to electrostatic discharges. Please observe the special instructions for their protection. Incorrect handling can damage the unit and cause the invalidation of the warranty.

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.

CONTENTS

1. 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-PORT 350/250 was designed, tested and supplied in perfect condition according to document IEC348 Safety Requirements for Electronic Units of Class 1.

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 housing

There is no need to open the housing in order to set the i-PORT 350/250 unit. The unit does not have any internal setting elements or displays. The i-PORT 350/250 is not configured directly. It is managed via the master unit on the i-BUS or via the host software.

Earthing

Before establishing any connections the housing of the system must be earthed.

Connections / Power Supply

The supply circuits must comply with the conditions set out for the SELV circuits (see EN 60950).
The signal circuits must comply with the conditions set out for the SELV circuits (see EN 60950).
Use screened cables for the power supply. 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.

Fuses

Only experts who are aware of the dangers involved may replace the fuses. It must be ensured that only fuses of the required current rating and the correct type are used for replacement. The use of repaired fuses and/or short-circuiting the fuse holders is prohibited.

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.

Electrostatic Discharge

Semi-conductors of the type MOS or CMOS as well as two-pin types and precision resistance are sensitive to ESD. All components, printed circuit boards and auxiliary systems should therefore always be classed as sensitive to electrostatic discharge.

Before opening the cover the unit should be placed onto an ESD-protected surface. As with all work on modern electronic modules, the use of ESD clamps and ESD mats during work on the unit is recommended.

- Sufficiently protect all printed circuit boards that were removed from the unit from damage.
- Observe all normal precautions for the use of tools.
- Use ESD-protected packaging material.

Never use measuring units with low impedance for measuring or testing systems with semi-conductor components. Never use high voltage testing units or dielectric test units to test systems with semi-conductor components.

If it is necessary to check the isolating properties of the field wiring, the assemblies (electronic units and sensors) should be disconnected.
Earth the test units.

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

ESD – Electrostatic Discharge

EMC – Electromagnetic Compatibility

SELV – Safety Extra Low Voltage – Protective measure against dangerous body currents, formerly: protective first voltage range

2. PREFACE

2.1. PREPARATIONS

This installation manual must be read carefully prior to starting the installation. The described installation works assume that installation materials like cable, antenna and data sensor holder, etc. are available.

2.2. SCOPE OF THIS DOCUMENT

This document is the hardware description of the i-PORT 350/250. This document is intended only for mechanical and electrical installation of these central units.

2.3. RESPONSIBILITY

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.

2.4. UPDATES

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

2.5. SCOPE OF DELIVERY—VISUAL INSPECTION

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.

2.6. ASSOCIATED DOCUMENTS

Software description and Programmer's Guide
- SDK Online Help
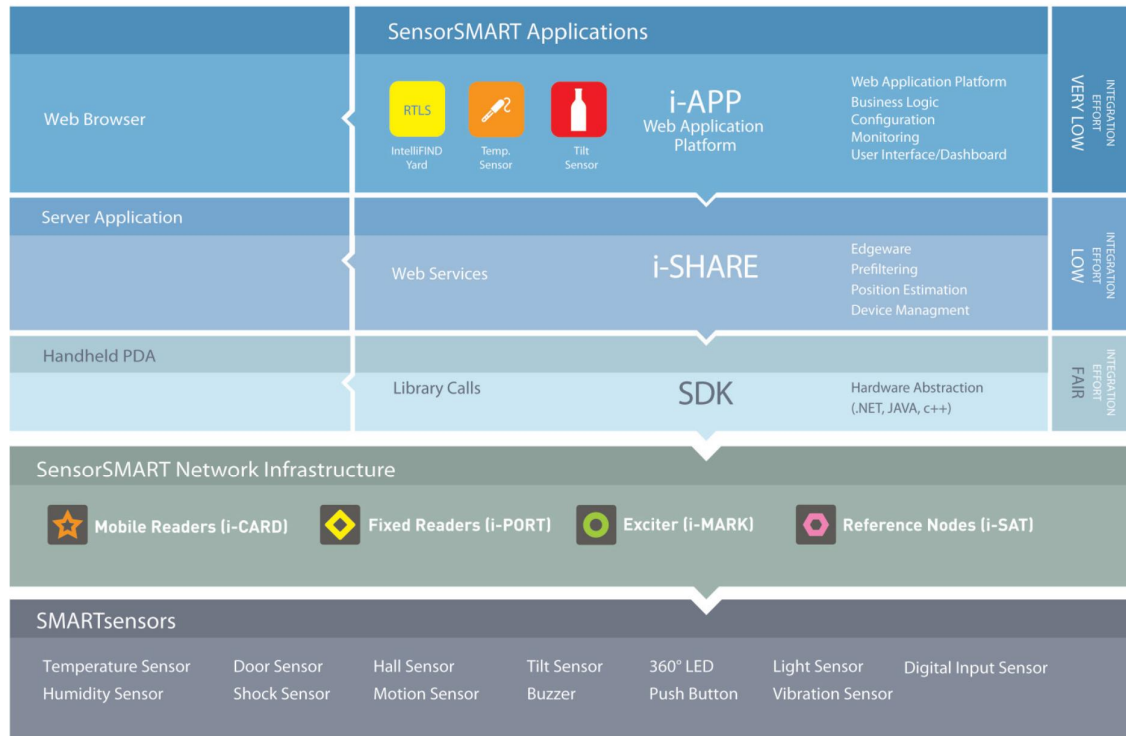- i-SHARE Manual
- Specific sensor manuals

3. INTRODUCTION

3.1. FUNDAMENTALS

The IDENTEC SOLUTIONS' SensorSMART Platform is the latest development in asset management, localization and process optimization. Developed to deliver the last mile in industrial communication, the SensorSMART Platform fulfills a niche not previously addressed by available networks.

The SensorSMART Platform takes the complexity out of managing assets, personnel safety monitoring and/or the tracking of valuable cargo and the need for multiple technologies. The unique combination of active RFID, RTLS and WSN in one platform eliminates the necessity for complex deployments of multiple technologies, or the need to compromise with one technology's specific functionalities. The pinnacle of the SensorSMART Platform is that it captures the best of RFID, WSN, and RTLS while also avoiding the less desirable features of each technology. Third party application development is also simplified for added flexibility.

3.2. COMPONENT OVERVIEW

SensorSMART Platform

	SensorSMART Applications		
Web Browser	RTLS Temp. Sensor Tilt Sensor **i-APP** Web Application Platform	IntelliFIND Yard	Web Application Platform Business Logic Configuration Monitoring User Interface/Dashboard

INTEGRATION EFFORT: VERY LOW

Server Application	Web Services **i-SHARE**	Edgeware Prefiltering Position Estimation Device Managment

INTEGRATION EFFORT: LOW

Handheld PDA	Library Calls **SDK**	Hardware Abstraction (.NET, JAVA, c++)

INTEGRATION EFFORT: FAIR

SensorSMART Network Infrastructure

☆ Mobile Readers (i-CARD) ◆ Fixed Readers (i-PORT) ◉ Exciter (i-MARK) ⬡ Reference Nodes (i-SAT)

SMARTsensors

Temperature Sensor	Door Sensor	Hall Sensor	Tilt Sensor	360° LED	Light Sensor	Digital Input Sensor
Humidity Sensor	Shock Sensor	Motion Sensor	Buzzer	Push Button	Vibration Sensor	

The SensorSMART Platform infrastructure features mobile readers (i-CARD), fixed readers (i-PORT) and exciters (i-MARK). Network sensors offer the highest functionality within the SensorSMART Platform. Robust and reliable, SMARTsensors monitor temperature, humidity, light, shock, tilt, motion, push button, digital input, Hall sensor, etc.

The SDK (software development kit) is an easy to use framework that allows developers high level access without requiring in depth knowledge of sensor or reader protocols, timing or implementations. Extracting, filtering and sharing data as well as calculating an object's position is only part of the i-SHARE (edgeware) functionality.

3.3. MOBILE READER

The battery powered mobile reader with Bluetooth and USB interface communicates with a wide spectrum of handheld devices and tablet computers. It is ideally suited for mobile applications such as laydown yards or personnel safety.

With its integrated Bluetooth interface, the mobile reader can communicate to a wide range of mobile devices independent from platform or operating system.

The combination of low power components, smart battery management and the high performance battery allows an operational time of more than 8 hours. The battery can be recharged within a very short recharge cycle via USB.

The compact housing with internal antenna is designed to be mounted onto a mobile device or a tablet computer.

3.4. TAGS – I-Q350

The brand new i-Q350 series of Tags combines the features of IDENTEC SOLUTIONS' well-established i-Q and i-B series. In addition the i-Q350 series sensors provide an even larger communication range of up to 500 m (1640 ft).

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).

This active sensor is particularly suited for:

- Identification
- Tracking and Tracing
- Localization

The sensors are available with different options:

- Marker technology for locating goods, vehicles, etc. The Marker technology allows selective locating of a transponder for example in adjacent car tracks. Here the inductive Marker field informs the transponder 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.

3.5. TAGS – I-B350

IDENTEC SOLUTIONS' i-B350 Tags are designed to be cost effective, easy to implement while offering maximum flexibility. The beacon sensors 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.

The Marker technology allows the selective locating of a transponder (for example in adjacent car tracks). The inductive Marker field informs the transponder about its current location. In a moment the transponder sends its location information several times to a central unit. For this data transmission it uses its long range RFID abilities.

Even after the transponder has left the Marker field it transmits this data steadily at a configurable ping rate.

The i-B350L series offers an attractive price for continuous monitoring and optimization of logistics in the supply chain.

The main applications are:

- Access control

- Tracking of Vehicles and Containers

- Online inventory

- Localization of assets at specific areas

Using advanced UHF radio frequency technology, i-B350L Tags send data at distances of up to 500 meters (1640 feet) to either a mobile (handheld) or fixed reader (interrogator).

Due to the ultra-low power consumption and configurable ping rate from 0.5 seconds up to 5 minutes, the battery lifetime is exceptionally long.

In the fast transmit rate of 1 second the battery lifetime expectancy is more than 2 years.

The i-B350L Tags from IDENTEC SOLUTIONS is the most economical choice for typical long range RFID applications and an ideal solution for tracking and tracing of mobile objects.

The Tags are available with different options:

- Marker technology for locating i.e. goods, vehicles, etc. The Marker technology allows selective locating of a transponder in adjacent car tracks. In this application, the inductive Marker field informs the transponder about its current location or lane.

- 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.

3.5.1. Polarization of Tags
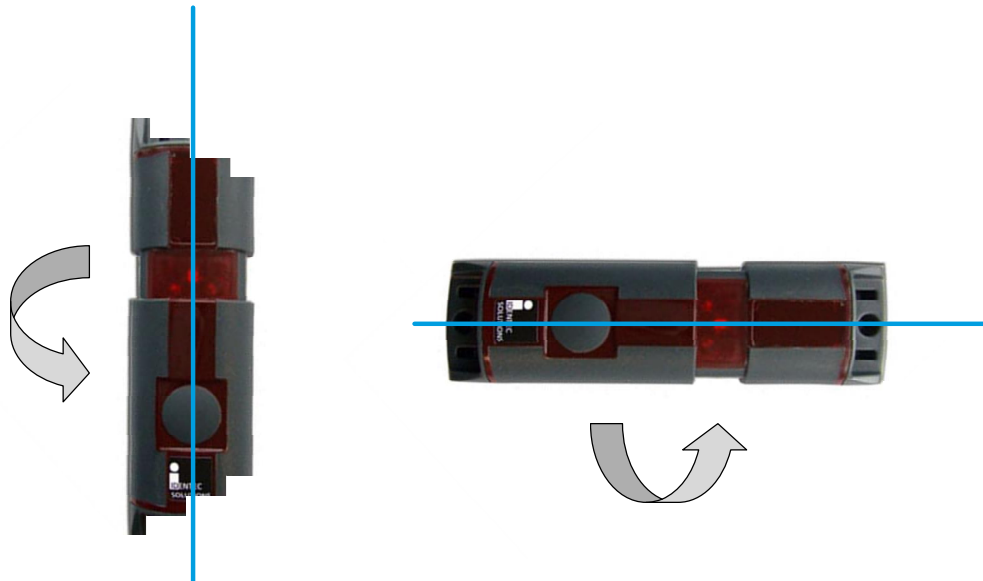
Vertically Polarized   Horizontally Polarized

Polarization is dependent on orientation and is rotation symmetrical.

4. USING THE READER

The reader can communicate to a host device via USB or via built in Bluetooth functionality. The following chapters explain how to establish a connection with either USB or Bluetooth.
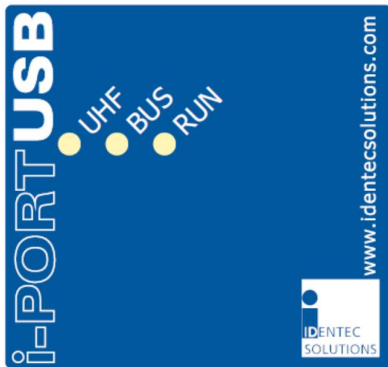
4.1. CHECK CONTENT

1. USB Reader
2. USB AC Adapter
3. USB Cabel

The mobile reader is packaged together with a power supply plug and a USB cable.

4.2. GET FAMILIAR

The reader is packaged together with a power supply plug and a USB cable.

UHF
Sending a command: As long as wake up is sent, the UHF Led is green. If a packet is received as a valid answer, goes red. (Giving an orange effect).
Beacon receiving: beacon message is detected -> UHF goes green. If this sensor is a new Tag in the reader's list, it goes orange. If it is already in the list it stays green.
RUN
Device is running properly (LED blinks at approx 1Hz).
BUS
Blinks GREEN when data is received from the host. Blinks RED when sending data to the host.

DC power supply

MInI USB 2.0 connector

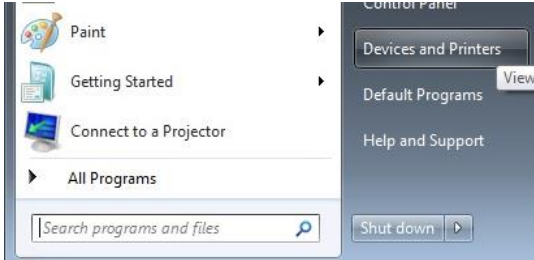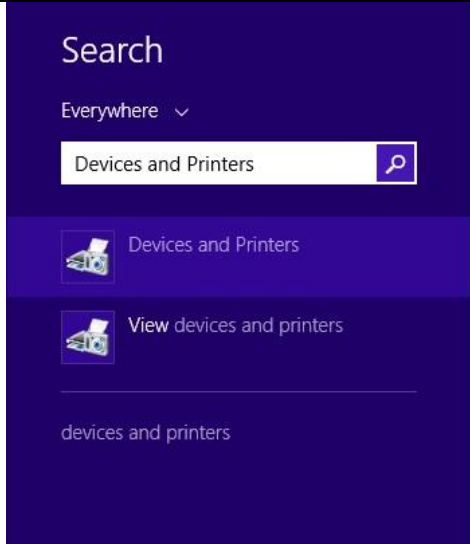## 4.3. ACTIVATE THE READER AND DISABLE FLIGHT MODE

All mobile readers are shipped in flight mode. Before first usage, flight mode has to be disabled by simply connect the mobile reader to a PC or power source via USB.
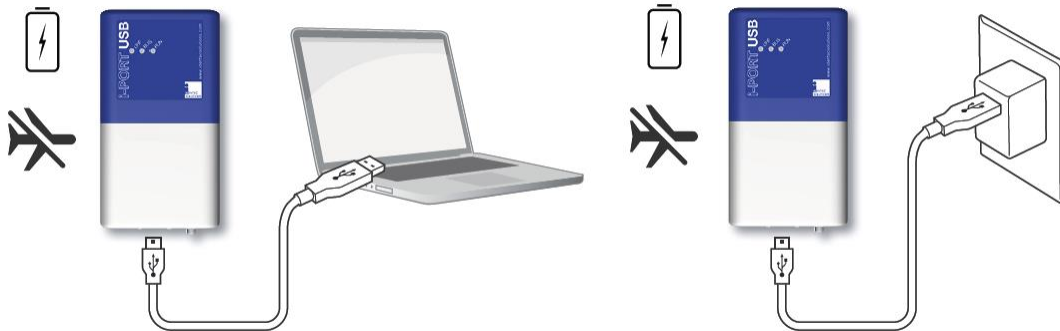
Both connection methods will also charge the internal battery.

4.4. CONNECT VIA BLUETOOTH

Make sure you are running the latest SensorSMART Tools version on a Bluetooth enabled device.
To use the Bluetooth Reader in applications like **SensorSMART Tools**, the device has to be added to the Computers' Devices. Windows provides a wizard to add wireless devices. Make sure that the mobile reader is disconnected from USB. An established USB connection will disable the Bluetooth connection of the reader.

On Windows 7 click the "Start-Button" and choose **Devices and Printers**	On Windows 8/8.1 press Windows + S to open the "Search Charm" and type "Devices and Printers"

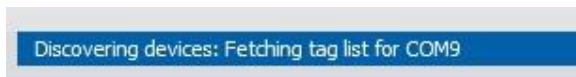Click on "Add a device" in the "Devices and Printers" window.
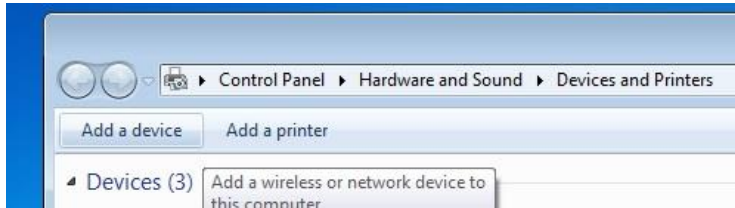
A wizard appears and scans automatically for wireless Bluetooth devices. Note that the Bluetooth reader is detectable by default. Select the Bluetooth reader and click "next".
Windows will automatically detect the device and download the drivers[1].
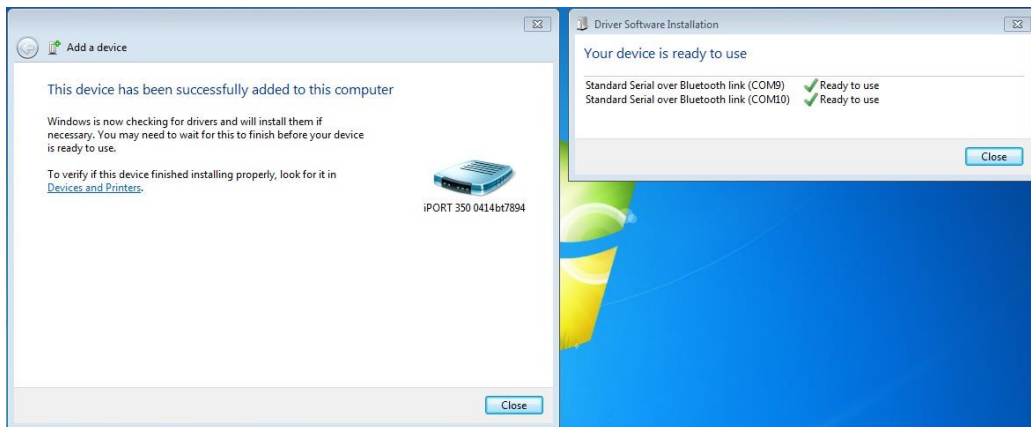

4.5. START SENSEORSMART TOOLS TO SCAN FOR TAGS

After the connection is established SensorSMART Tools can be started. It will automatically scan all COM Ports and identify the Bluetooth Reader. SensorSMART Tools installer is part of the shipment package.
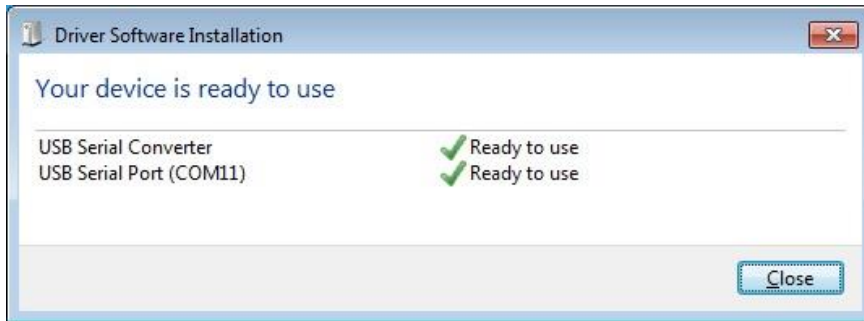

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[1] This is the default behavior of Windows, if you have changed this, you can go to sDevices and Printers‰ and allow the option by right-clicking on the name of your computer and define the %Device installation settings+

Note: it's recommended to configure the "time before sleep" in the readers configuration mask to 60 minutes. This time defines the period between the last valid command the Bluetooth Reader has received and the time before it turns into a "sleep mode" where Bluetooth is disconnected. If the reader is not continuously in use, expand the time to avoid that the software handling the reader needs to reconnect for each command.
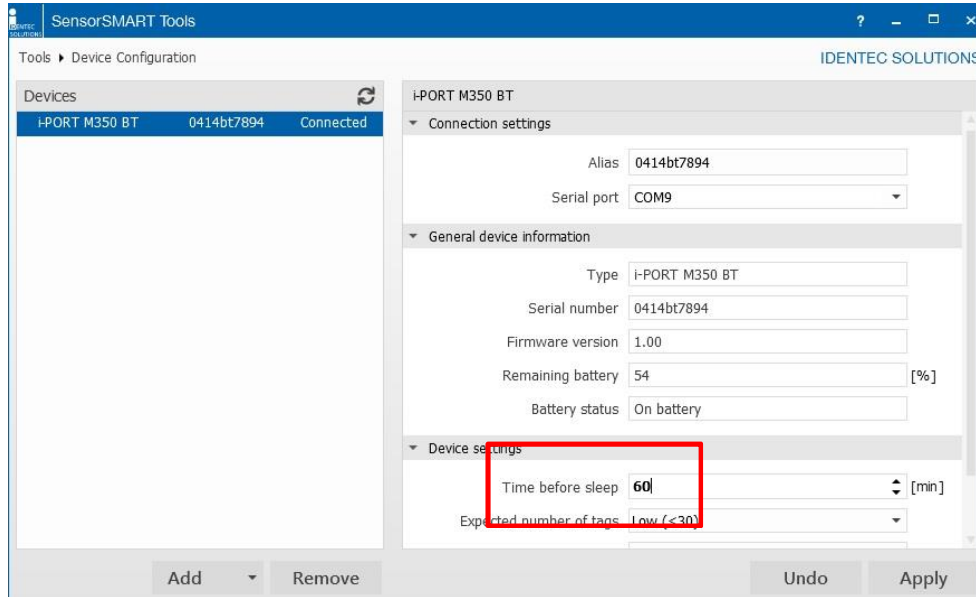
4.6. CONNECT VIA USB

Connecting the Reader via USB switches off the BT module until the USB cable is physically unplugged. The device will be charged via the USB connection and work on a different COM-port if the device has been used with Bluetooth before. Windows will detect a new device that is connected through USB and install the drivers automatically.[2]
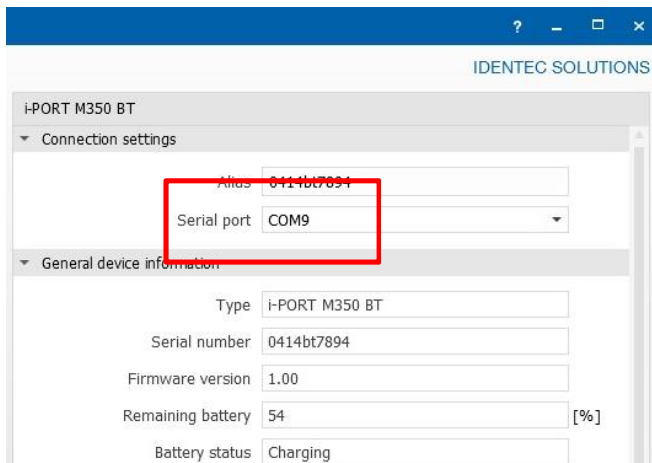

SensorSMART Tools will connect automatically at start up.
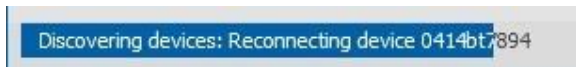
The "Battery status" shown in the device configuration mask has changed to "Charging" which identifies that the device is connected via USB.

Note: make sure that the correct serial port is selected. This might change when the type of connection is changed from Bluetooth to USB or vice versa.


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[2] This is the default behavior of Windows, if you have changed this, you can go to "Devices and Printers" and allow the option by right-clicking on the name of your computer and define the "Device installation settings"

4.7. CHARGING THE READER

The i-PORT 350/250 X USB BT can be charged by using a standard mini USB cable or the optional DC power plug. A suitable USB charger is part of the shipment package.

Use Case for the DC power plug:
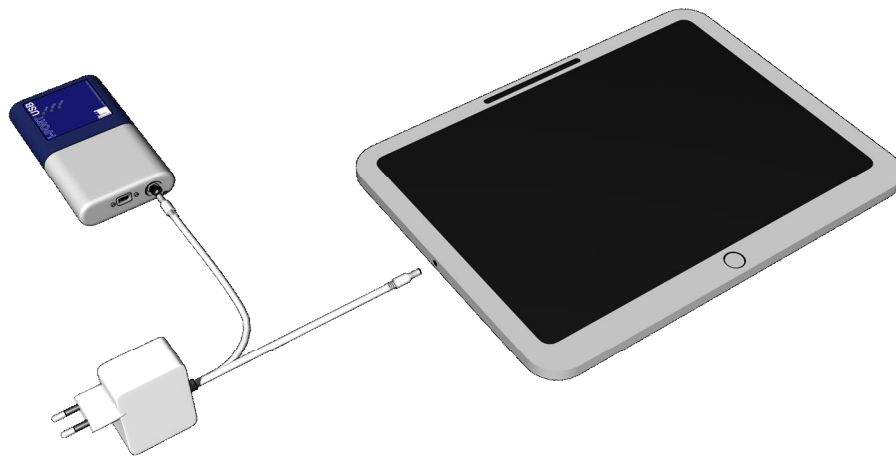
The DC power plug can be used when a permanent connection is required. For instance can the plug be used to share a power supply for simultaneous charging a tablet pc and the reader. The connected reader will remain IP65 rates as the DC power supply plug sealed. Removing the rubber USB protection plug and connecting USB will reduce the IP rating to IP52.

5. SPECIFICATIONS I-PORT 350 USB- BT

Communication Broadcast 350
Operation Mode	Receiving Tag ID's and Data
Read Range	up to 200m (660ft)
Compatibility	i-B350 and i-Q350 series of Tags
Operating Frequency	868 MHz (EU) or 920 MHz (NA)

Communication Response 350
Operation Mode	Bi-directional communication (reading log, blink LED, write/read data)
Communication Range	up to 100m (330ft)
Compatibility	i-Q350 series of Tags
Operating Frequency	868 MHz (EU) or 920 MHz (NA)
Transmit Power	<1mW

Antennas
Broadcast/Response	Internal

Performance
Multiple Sensor Handling	Up to 1000 Tags

Interfaces
Bluetooth	Bluetooth-version 3.0
USB	Mini USB 2.0
Integration	i-SHARE, SensorSMART Tools, .NET SDK for mobile

Supported Platforms
Windows	Windows 7 and above, Windows Phone, Windows Mobile

Electrical
Battery	Rechargeable Lithium Battery (not replaceable)
Battery lifetime	8 hours with UHF and Bluetooth active with a fully charged battery
Battery recharge time	< 8 hours via mini USB
Power Supply	9 to 24 VDC on power supply plug (minimum 3 Watts) USB (charging current limited to 500 mA)

Environmental Conditions
Operating Temperature	-20°C to +60°C (-4°F to +140°F)
Storage Temperature	-20°C to +45°C (-4°F to +113°F)
Charging Temperature	0°C to +45°C (+32°F to 113°F)
Humidity	10% to 95% relative humidity @ 30°C
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 60068-2-6: 5G, 20 sin wave cycles per axis, 5-500Hz EN 60068-2-64: noise 5 to 1000Hz, 90 minutes per axis

Standard/Certification
Europe	EN55022; EN55024; EN301489-3; EN301489-17; EN61000-3-2; EN61000-3-3; EN300328; EN300220-2; EN60950-1; EN62479
North America	FCC part 15 (US) and IC RSS-210

Mechanical Data
Dimensions	110 x 65 x 17mm (4.33 x 2.56 x 0.67in)
Enclosure Material	PAS-POT-E

IP Rating	IP 65
Weight	150gr

Order Code

i-PORT 350 USB -BT	455404

6. SPECIFICATIONS I-PORT 250 USB- BT

Communication Broadcast 250

Operation Mode	Receiving Tag ID's and Data
Read Range	up to 100m (330ft)
Compatibility	i-B250 and i-B2 series of Tags
Operating Frequency	868 MHz (EU) or 920 MHz (NA)

Antennas

Broadcast/Response	Internal

Performance

Multiple Sensor Handling	Up to 1000 Tags

Interfaces

Bluetooth	Bluetooth-version 3.0
USB	Mini USB 2.0
Integration	i-SHARE, SensorSMART Tools, .NET SDK for mobile

Supported Platforms

Windows	Windows 7 and above, Windows Phone, Windows Mobile

Electrical

Battery	Rechargeable Lithium Battery (not replaceable)
Battery lifetime	8 hours with UHF and Bluetooth active with a fully charged battery
Battery recharge time	< 8 hours via mini USB
Power Supply	9 to 24 VDC on power supply plug (minimum 3 Watts)
	USB (charging current limited to 500 mA)

Environmental Conditions

Operating Temperature	-20°C to +60°C (-4°F to +140°F)
Storage Temperature	-20°C to +45°C (-4°F to +113°F)
Charging Temperature	0°C to +45°C (+32°F to 113°F)
Humidity	10% to 95% relative humidity @ 30°C
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 60068-2-6: 5G, 20 sin wave cycles per axis, 5-500Hz
	EN 60068-2-64: noise 5 to 1000Hz, 90 minutes per axis

Standard/Certification

Europe	EN55022; EN55024; EN301489-3; EN301489-17; EN61000-3-2; EN61000-3-3; EN300328; EN300220-2; EN60950-1; EN62479
North America	FCC part 15 (US) and IC RSS-210

Mechanical Data

Dimensions	110 x 65 x 17mm (4.33 x 2.56 x 0.67in)
Enclosure Material	PAS-POT-E
IP Rating	IP 65
Weight	150gr

Order Code

i-PORT 250 USB -BT	455510