



**ILR 350 Series
i-PORT M 350,
i-SAT 300 RTLS, i-PORT M 350 RTLS
Installation and Operation Manual**

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Radio Frequency Compliance Statement

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

MODEL:		i-PORT M 350
Region/Country	Organization	Marking
EUROPE:	EC	CE
USA:	FCC	FCC ID OO4-ILR-IPM350N
Canada:	Industry Canada	IC:3538A-IPM350N

MODEL:		i-SAT 300 RTLS
Region/Country	Organization	Marking
EUROPE:	EC	CE
USA:	FCC	FCC ID OO4-ILR-ISAT300
Canada:	Industry Canada	IC:3538A-ISAT300

MODEL:		i-PORT M 350 RTLS
Region/Country	Organization	Marking
EUROPE:	EC	CE
USA:	FCC	FCC ID OO4-ILR-IPM350RT
Canada:	Industry Canada	IC:3538A-IPM350RT

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

Warning: This product requires professional installation. Any frequency and RF-power setting not expressly authorized by Identec Solutions is prohibited and will void the users authority to operate the equipment.

European Notification according R&TTE Directive

This equipment complies to Art. 6.4 of R&TTE Directive (1999/5/EC). It is tested for compliance with the following standards: ETSI EN 300 220, ETSI EN 300 440, ETSI EN 301 489, EN 60950.

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.

The user(s) of these products are cautioned to only use accessories and peripherals approved, in advance, by IDEN TEC SOLUTIONS. The use of accessories and peripherals, other than those approved by IDEN TEC SOLUTIONS, or any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The device has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Canada Certification

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication.

2.4 GHz:

This device has been designed to operate with the antennas listed below, and having a maximum gain of 6.0 dBi. Antennas not included in this list or having a gain greater than 6.0 dBi are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

916 MHz:

This device has been designed to operate with the antennas listed below, and having a maximum gain of 2.0 dBi. Antennas not included in this list or having a gain greater than 2.0 dBi are strictly prohibited for use with this device. The required antenna impedance is 50 ohms.

List of antennas:

2.4 GHz: Huber & Suhner 90A-2400/360/6/0/V: 6.0 dBi, 50 ohms

916 MHz: Kathrein K751161: 2.0 dBi, 50 ohms



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. Even better: 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 require this.
- 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.
- Only remove unit and components from the packaging immediately prior to installation.

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

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1 Introduction

The RTLS system is the newest development in IDEN TEC SOLUTIONS' Intelligent Long Range® (ILR®) interrogators. ILR provides highly accurate, real-time data collection with minimal human intervention.

The very long communication range of up to 500 m (1500 ft) allows automated identification, tracking and tracing of assets and people in areas as large as a steel construction workshop without human intervention.

The new RTLS system allows localization of tags down to several meters. This new series of ILR products is the next step forward in wireless applications such as:

- Identification
- Tracking and tracing and
- Localization of assets or personnel.

1.1 Features

Easy Installation	Only few components need to be configured. Only the i-PORTs needs a host connection. The i-SAT only needs power supply.
Cable-free Installation	With the solar installation kit even the power supply is an easy job.
Light Infrastructure	Automatic gathering of information from several i-PORTs. Preprocessing of multiple position information from the RTLS in position sever.
LED on Tag (option)	Provides visual identification of an addressed tag ("pick by light").
32 kByte read/write memory on tag	Allows storage of complete process information on every tag.
Handheld units	Manual finding an object.
Up to 500 m (1500 ft) read/write range	Allows automated identification, tracking and tracing of assets and people without human intervention.
500 Tag simultaneous Identification	Large numbers of tags can be identified virtually simultaneously.
RTLS only used when needed	This saves battery lifetime and installation costs.

1.2 Documents Overview

Manuals

IM.0710.DE	RTLS System Description, German
IM.0710.EN ditto,	English
IM.0711.DE	Description of PC software „Position-Server“, German
IM.0711.EN ditto,	English
IM.0712.DE Manual,	especially for demo and test installations, German
IM.0712.EN ditto,	English
IM.0713.DE	Position node i-SAT 300 hardware and installation manual, German
IM.0713.DE ditto,	English
IM.0714.DE	ILR reader i-PORT M350, i-SAT 300 RTLS, i-PORT M 350 RTLS hardware and installation manual, German
IM.0714.DE	ditto, English (this document)
IM.0732.DE	Marker System Description and Installation manual for i-MARK 2 & i-MARK 3, German
IM.0732.EN ditto,	English

Data Sheets

ID.0640.DE	RTLS-System Description, German
ID.0640.EN ditto,	English
ID.0643.DE	Position Server Software, German
ID.0643.EN ditto,	English
ID.0626.DE	data tag i-Q350 RTLS, German
ID.0626.EN ditto,	English
ID.0627.DE	ILR reader i-PORT M 350 RTLS, German
ID.0627.EN ditto,	English
ID.0628.DE	position node i-SAT 300, German
ID.0628.EN ditto,	English
ID.0665.DE	position markers i-MARK 2 & 3, German
ID.0665.EN ditto,	English

2 Mechanical Installation

2.1 Hints



Mounting Kit



DIN Rail Clamp



Mounting Kit with DIN Rail Clamp

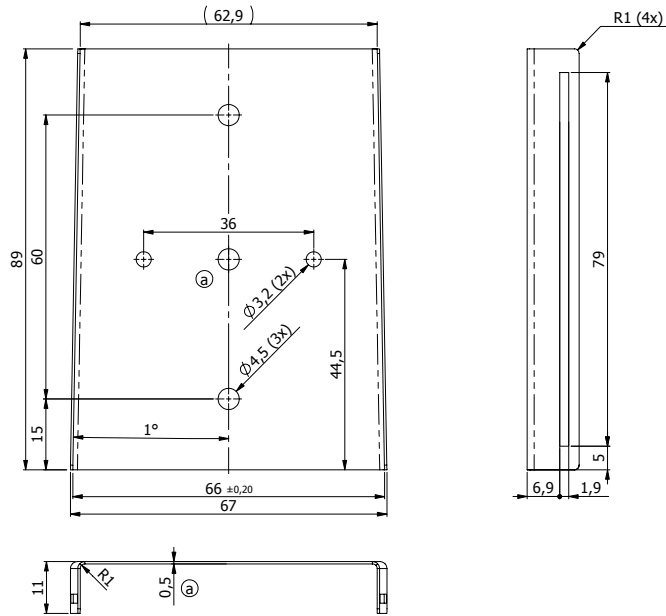
The i-PORT M 350 RTLS is plugged into the mounting kit. Between the mounting kit and the reader module there is 5 mm space left for the screws.

It is intended to always use the mounting kit. If mounting on a DIN rail is desired, the additional clamp is mounted on the rear side of the mounting kit.

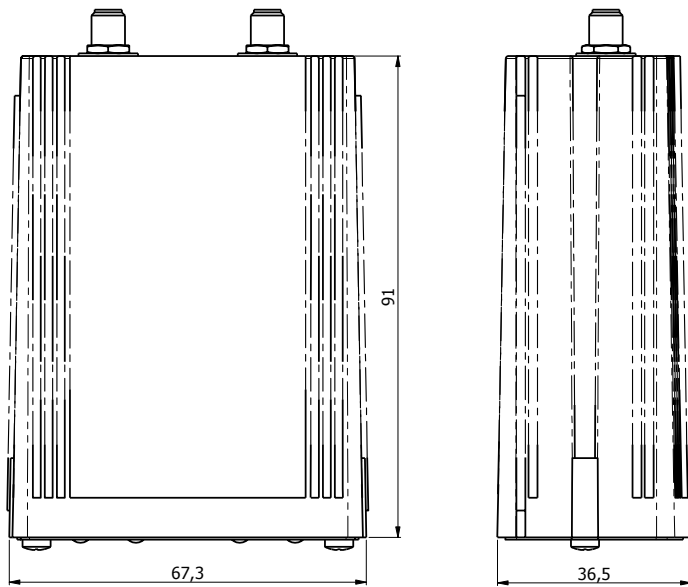
Use the two mounting holes (diameter 4,5 mm) to attach the mounting kit to a suitable mounting surface. Once the mounting kit is fixed, plug in the i-PORT M 350 RTLS reader.

Enclosure rating is IP40 without the end cap and IP64 with. If greater enclosure rating is required, the i-PORT M 350 RTLS must be placed in an additional protective housing, in this situation the end cap could be removed.

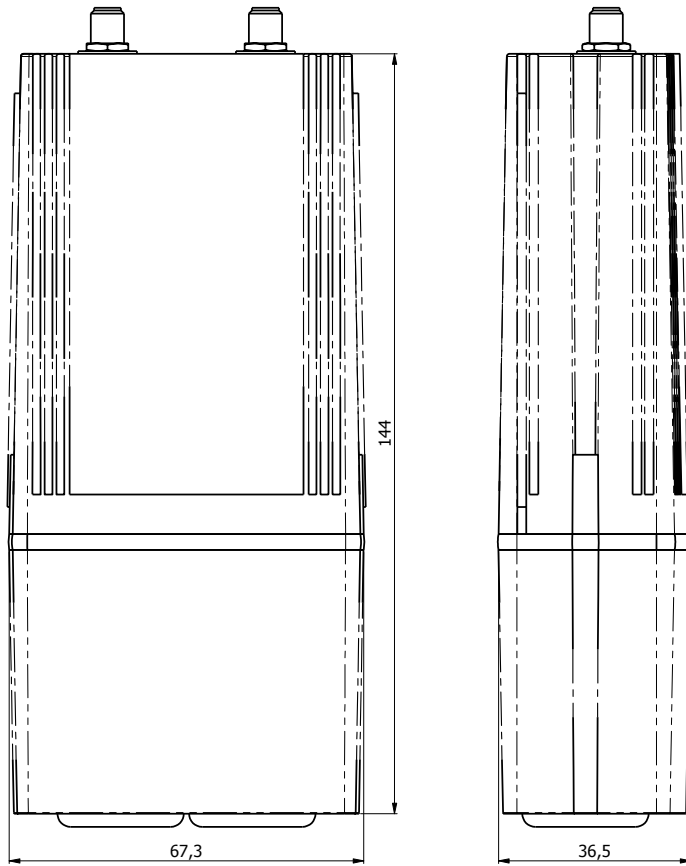
2.2 Dimensional Drawings



Dimensions of mounting kit



Dimensions without end cap (cable inlet protection), but without mounting kit



Dimensions with end cap (cable inlet protection), but without mounting kit

3 Electrical Installation

3.1 Safety Instructions

- The power supply circuit must comply with the requirements of the SELV circuits (see EN 60950).
- The signal circuits must comply with the requirements of the SELV circuits (see EN 60950).
- In the i-BUS connectors there are RS422 levels on its RX and TX Pins, although Ethernet jack/plugs mechanically fit, the device is not Ethernet compatible!
- Industry standard Cat 5 straight patch cables can be used to daisy chain the devices.
- If devices are powered over the i-BUS the RJ 45 cabling must be done with wires of at least AWG24 (0.25 mm²).

Glossary

SELV Safety Extra Low Voltage – Protective measure against dangerous body currents.

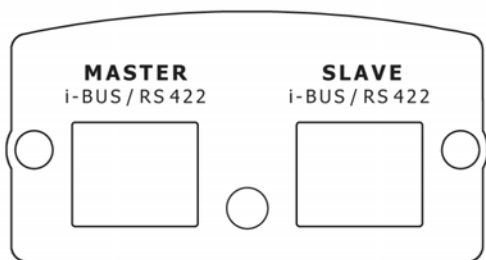
Protective first voltage, circuit not floating.

EMC Electromagnetic Compatibility

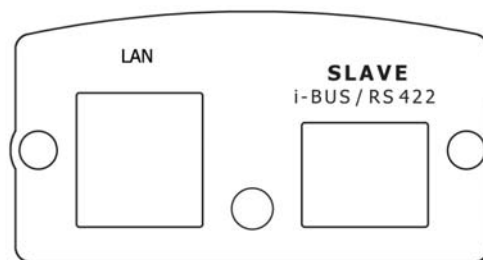
RxD Receive Data

TxD Transmit Data

3.2 Position of Ports



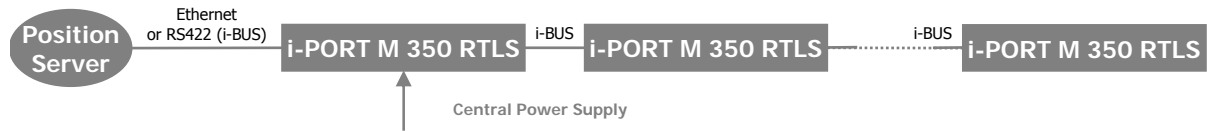
with standard i-BUS connectors



with Ethernet

To Master	RJ 45 connector to the host computer or the slave port of the previous i-MARK or i-PORT in the daisy chain.
To Slave	RJ 45 connector to the master port of the next i-MARK or i-PORT in the daisy chain. Leave this connector open at the last device in the chain.

3.3 Overview



3.4 Power Supply

The i-PORT M 350 RTLS is powered by the i-BUS.

Total Power Consumption—i-PORT M 350 RTLS with 4 i-SAT 300 RTLS

- 1 × i-PORT M 350 RTLS, app. 2 W
- 4 × i-SAT 300 RTLS, app. each 2 W

This gives a maximum sum of 7 W of power consumption.

3.5 Maximum Overall Cable Runs of i-BUS

There are 2 general limitations on the length of the i-BUS cabling:

- The overall length of the i-BUS over all units on the BUS must not exceed 1000 m (3000 ft)
- The distance from one unit to the next on the i-BUS must not exceed 300 m (1000 ft)

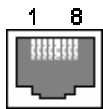
This tables is valid for Cat 5 cabling with gauge diameters of AWG24 (0.25 mm²).

# of i-PORTs	Length (m/ft)	Remark
1	300/1000	Central supply with 24 VDC via the i-BUS
2	600/2000	Central supply with 24 VDC via the i-BUS
3	400/1300	Central supply with 24 VDC via the i-BUS
4	250/820	Central supply with 24 VDC via the i-BUS
4	1000/3000	GND potential free power supplies at every i-PORT M

3.6 The i-BUS Connector

Please Note

- The i-BUS uses RS422 levels on its RX and TX Pins, although Ethernet jack/plugs mechanically fit, the device is not Ethernet compatible.
- As the TxD/RxD crossing is done by the pinout of the connectors, simple straight cabling can be used.
- If devices are powered by the RJ45 cabling of the i-BUS, 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 i-BUS
5	V+ (10 ... 30V)	V+ (10 ... 30V)	White/Blue	Power supply over i-BUS
6	TxD-	RxD-	Green	
7	GND	GND	White/Brown	Power supply over i-BUS
8	GND	GND	Brown	Power supply over i-BUS

Connection Parameters

Signal levels: RS422
 Baud rate: 115200 bits per second
 Data bits: 8
 Stop bits: 1
 Parity: none
 Mode: half duplex
 Flow Control: none

3.7 Ethernet Connector

The Ethernet interface is an option for an i-PORT M 350 RTLS.

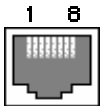
Warning

Do not connect any device to your network before it has been configured. Before connecting to your network, check that the desired IP address has been set. A not-configured device may have any IP address. A device with the wrong settings may impede the functioning of your network.

Ethernet interface with 10 or 100Mbit/s. Connect the central unit to your network with a wired 1:1 network cable. The host connection is a RJ45 socket. Use a regular Ethernet cable here.

The allocation corresponds to that of simple network adapters in PCs (10/100-Base T). Therefore, to connect to the network or the hub, a simple 1:1 network cable is required.

If you want to connect directly to a computer you must use a so-called crossed cable.



View into the connector = crimp/solder side of plug

Pin	To Slave	T568B color	Description
1	TxD+	White/orange	
2	TxD-	Orange	
3	RxD+	White/Green	
4		Blue	
5		White/Blue	
6	RxD-	Green	
7		White/Brown	
8	GND	Brown	

4 Initial Operation

4.1 Checking the Installation

After completing the installation the operation must be systematically checked. The installation check can be divided into three sections:

- Visual test
- Basic operational check
- Detailed operational check

If the basic check of the operational behavior is to be carried out using a (portable) PC a final check via the intended user control system should also be carried out.

4.2 Configuration

4.2.1 Tools Needed

- Standard-PC running Microsoft Windows
- RS422 Interface (USB to RS422 converter, order code 292 771)
- 9 pin D type to RJ45 adaptor with power supply plug (order code 348 369)
- Power Supply Plug (24 VDC, 30 W, order code 367 976)
- 1:1 fully wired RJ45 Patch-Cable, length: 2 m (order code 696 627)
- Configuration Tool "ILR Config" with RTLS plug-in

4.3 Configuration of the Ethernet Interface

Tools needed

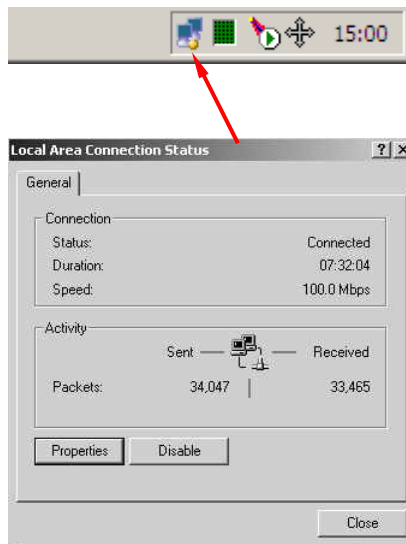
- PC with working Ethernet NIC running MS Windows for configuration software
- Software "Device Discovery Utility"
- Crossover Ethernet cable
- Power supply (24 VDC) for the i-PORT
- Network settings from your network administrator

Prepare the PC

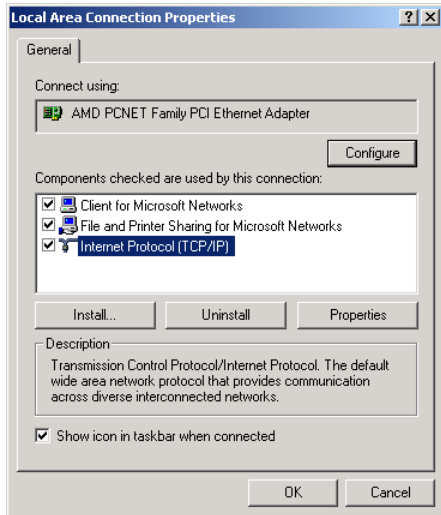
- Disconnect the PC from the network
- Set the Ethernet connection of the PC to DHCP (described below)
- Switch off the proxy settings of the standard web browser

After finishing the configuration of all i-PORTs restore the previous settings of the PC.

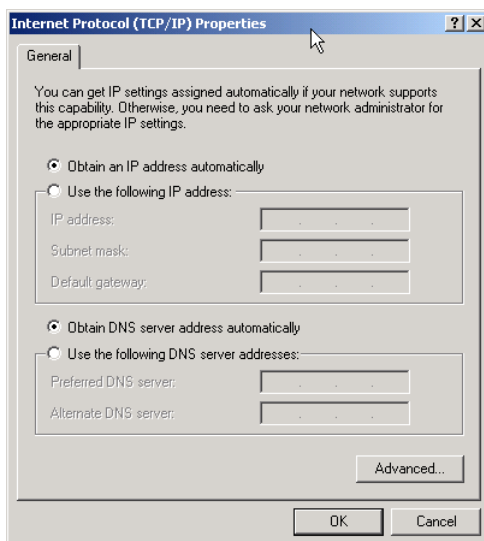
In order to gain access to the network settings of the PC, double click on the network icon in the systray. The icon appears as two computer symbols.



Now click on "Properties".



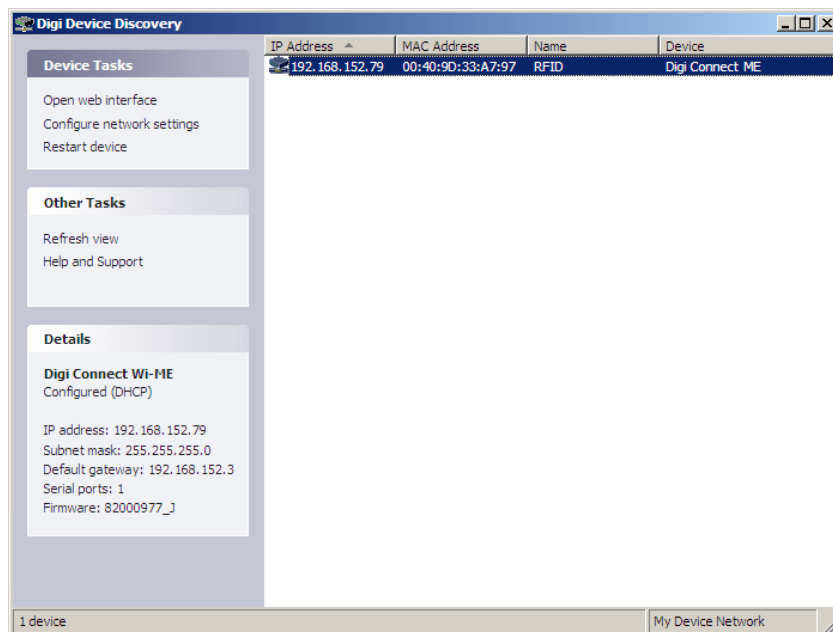
Select "Network Protocol (TCP/IP) and click on "Properties".



Check if both checkboxes "Obtain ... automatically" are checked. Confirm with "OK".

Discover the i-PORT's Ethernet Interface

- Connect the PC with the i-PORT.
- Start the software "Device Discovery Utility". This software will automatically detect the Ethernet device of the i-PORT.
- Select the device listed, then chose "Device Tasks" => "Open Web Interface".



Now the standard web browser on the PC should start, opening the IP address of the Ethernet device. In the following login display use this default access codes:

- Default login name: root
- Default login password: dbps

Note

The web interface automatically logs out after a very short time.

Configuration of the Internal Communication

Home ? Help

Configuration

- Network
- Serial Ports**
- GPIO
- Alarms
- System
- Remote Management
- Users

Port	Description	Profile	Serial Configuration
Port 1	None	RealPort	9600 8N1

In the category "Configuration" select "Serial Ports".

Home ? Help

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Management

- Serial Ports
- Connections

Administration

- File Management
- Backup/Restore
- Update Firmware
- Factory Default Settings
- System Information
- Reboot

Logout

Serial Port Configuration

Port Profile Settings

Current Port Profile: **RealPort** [Change Profile...](#)
The RealPort Profile allows you to map a COM or TTY port to the serial port.

RealPort Settings

RealPort will set the serial port settings as directed by the PC application.

See the User Guide for RealPort installation instructions. The User Guide can be found on your CD or downloaded from <http://www.digi.com/support>.

Basic Serial Settings

Advanced Serial Settings

Click on "Change Profile".

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Select Port Profile...

Profiles allow you to easily configure serial ports by only displaying those items that are relevant to the current profile.

Select the profile below that best matches your configuration.

- RealPort**
The RealPort Profile allows you to map a COM or TTY port to the serial port. [More...](#)
- Console Management**
The Console Management Profile allows you to access a device's console port over a network connection. [More...](#)
- TCP Sockets**
The TCP Sockets Profile allows a serial device to communicate over a TCP network. [More...](#)
- UDP Sockets**
The UDP Sockets Profile allows a serial device to communicate using UDP. [More...](#)
- Serial Bridge**
The Serial Bridge Profile configures one side of a serial bridge. A bridge connects two serial devices over the network as if they were connected with a serial cable. [More...](#)
- Local Configuration**
The Local Configuration Profile allows you to connect standard terminals or terminal emulation programs to the serial port in order to use the serial port as a console to access the command line interface. [More...](#)
- Modem Emulation**
The Modem Emulation Profile allows you to configure the serial port to act as a modem. [More...](#)
- Custom**
The Custom Profile is an advanced option to allow full configuration of the serial port. [More...](#)

In this list chose "TCP Sockets" and confirm with "Apply". Now this page appears:

Changes have been saved successfully.

[? Help](#)

[Home](#)

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[Logout](#)

Serial Port Configuration

▼ Port Profile Settings

Current Port Profile: **TCP Sockets** [Change Profile...](#)
 The TCP Sockets Profile allows a serial device to communicate over a TCP network.

TCP Server Settings

Connect directly to the serial device using the following TCP ports on the network.

<input checked="" type="checkbox"/> Enable Telnet access using TCP Port:	2001	<input type="checkbox"/> Enable TCP Keep-Alive
<input checked="" type="checkbox"/> Enable Raw TCP access using TCP Port:	2101	<input type="checkbox"/> Enable TCP Keep-Alive
<input checked="" type="checkbox"/> Enable Secure Socket access using TCP Port:	2601	<input type="checkbox"/> Enable TCP Keep-Alive

TCP Client Settings

Automatically establish bi-directional TCP connections between the serial device and a server or other networked device.

Automatically establish TCP connections

Establish connection under one of the following conditions:

- Always connect and maintain connection
- Connect when data is present on the serial line
 - Match string:
 - Strip string before sending
- Connect when DCD (Data Carrier Detect) line goes high
- Connect when DSR (Data Set Ready) line goes high

Establish connection to the following network service:

IP Address:

Service:

TCP Port:

Enable TCP Keep-Alive

Apply

▶ Basic Serial Settings

▶ Advanced Serial Settings

Check the port settings and correct if necessary.

Now go on with the "Basic Serial Settings". Adjust them to this parameters and confirm.

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Serial Port Configuration

▶ Port Profile Settings

▼ Basic Serial Settings

Description:

Baud Rate:

Data Bits:

Parity:

Stop Bits:

Flow Control:

Apply

▶ Advanced Serial Settings

This is the last step of the port configuration.

[? Help](#)

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Serial Port Configuration

- ▶ Port Profile Settings
- ▶ Basic Serial Settings
- ▼ **Advanced Serial Settings**

The following settings are advanced settings used to fine tune the serial port and access to the serial interface. The default settings will typically work in most situations.

Serial Settings

- Enable Port Logging
 - Log Size: 32 KB
- Enable RTS Toggle
 - Pre-Delay: 0 ms
 - Post-Delay: 0 ms
- Enable RCI over Serial (DSR)

TCP Settings

- Send Socket ID
 - Socket ID:
- Send data only under any of the following conditions:
 - Send when data is present on the serial line
 - Match string: /x04
 - Strip match string before sending
 - Send after the following number of idle milliseconds
 - 10 ms
 - Send after the following number of bytes
 - 1024 bytes
- Close connection after the following number of idle seconds
 - Timeout: 0 secs
- Close connection when DCD goes low
- Close connection when DSR goes low

Set the TCP Settings to the values shown. Then confirm with "Apply".

Users Configuration

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[Logout](#)

Users Configuration

Users

Enable user logins

[Configure Users](#)

User Name	Action
root	

In order to change the password for the user "root" click on the user name and fill in the fields with the old and new password. The new password needs to be typed twice to prevent typos.

Network Configuration

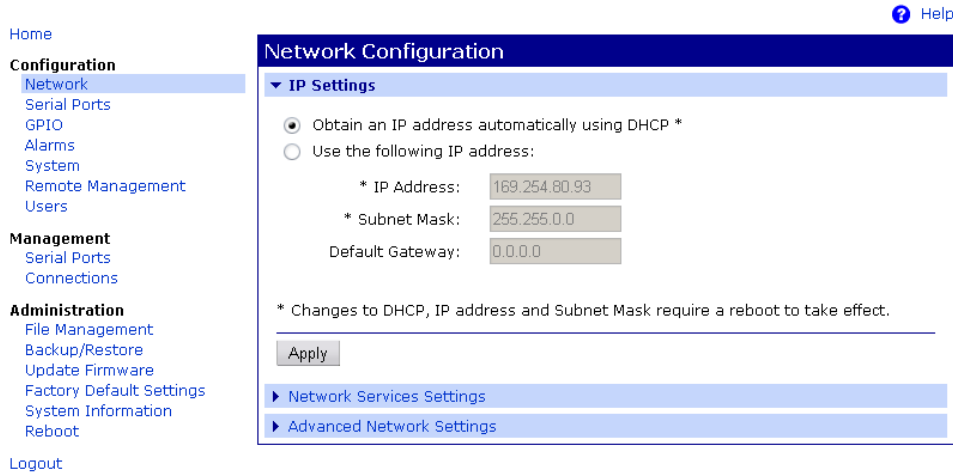
Important Note

As the connection to the Ethernet device will probably be lost, after the network configuration it is recommended to do this as the last step of configuration.

The screenshot shows the 'Advanced Network Settings' page in the network configuration utility. The left sidebar contains navigation links for Home, Configuration (Network, Serial Ports, GPIO, Alarms, System, Remote Management, Users), Management (Serial Ports, Connections), and Administration (File Management, Backup/Restore, Update Firmware, Factory Default Settings, System Information, Reboot), along with a Logout link. The main content area is titled 'Network Configuration' and includes sections for IP Settings, Network Services Settings, and Advanced Network Settings. The Advanced Network Settings section contains a text block explaining that these settings are used to fine-tune network connections. Below this are three sub-sections: 'IP Settings' with a 'Host name' input field and a checked 'Enable AutoIP address assignment' checkbox; 'Ethernet Interface' with 'Speed' set to 'Auto' and 'Mode' set to 'Half-Duplex'; and 'TCP Keep-Alive Settings' with an unchecked 'Ignore TCP Keep-Alive settings from DHCP' checkbox, 'Idle Timeout' set to 2 hrs 0 mins 0 secs, 'Probe Interval' set to 75 secs, 'Probe Count' set to 9, and a checked 'Store extra byte in TCP Keep-Alive packets' checkbox. An 'Apply' button is located at the bottom of the settings area.

In the category "Configuration" chose "Network" and change to the "Advanced Network Settings". Here you can give the i-PORT a useful name for identification in the network. Confirm with "Apply".

The screenshot shows the 'Network Services Settings' page in the network configuration utility. The left sidebar is identical to the previous screenshot. The main content area is titled 'Network Configuration' and includes sections for IP Settings, Network Services Settings, and Advanced Network Settings. The Network Services Settings section contains a list of services with checkboxes to enable or disable them, and input fields for their respective ports. The services and their ports are: Enable Device Discovery (ADDP) (TCP Port: 1027), Enable Encrypted RealPort (TCP Port: 515), Enable Line Printer Daemon (LPD) (TCP Port: 771), Enable RealPort (TCP Port: 513), Enable Remote Login (rlogin) (TCP Port: 514), Enable Remote Shell (rsh) (TCP Port: 161), Enable Network Management Protocol (SNMP) (UDP Port: 161), Enable Secure Shell Server (SSH) (TCP Port: 22), Enable Telnet Server (TCP Port: 23), Enable Web Server (HTTP) (TCP Port: 80), and and Secure Web Server (HTTPS) (TCP Port: 443). Each service also has an unchecked 'Enable TCP Keep-Alive' checkbox. An 'Apply' button is located at the bottom of the settings area.



In the category "Configuration" chose "Network". Now adjust the network settings as required. Then finish by click on "Apply". Finally, in the category "Administration" choose "Reboot".

4.4 Status Display (LEDs)



ANT 1: This is the antenna of the 2.45 GHz RTLS part. LED blinks green when a valid packet has been received. It blinks RED when a ranging of type 1 has been successfully done.

ANT 2: This is the antenna of the UHF part.
 Sending a command: As long as wake up is sent, the ANT2 Led is green. If a packet is received as a valid answer, goes red. (Give orange effect).

Beacon receiving: beacon message is detected -> ANT2 goes green. If this tag 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 1 Hz).

BUS: Blinks GREEN when data is received on the i-BUS. Blinks RED when sending data to the i-BUS.

ERR: Blinks RED when an error occurs.

5 Maintenance

5.1 General

In principle, the ILR system is maintenance-free. When correctly installed it operates for many years without any problems.

5.2 Precautionary Maintenance

Regular checking of all ports and cables belonging to the system is recommended. Unstable connections could lead to damage and malfunctions of the system and therefore should be repaired as soon as possible.

A Brief Checklist

- Are all casing intact?
- Are all cables intact?
- Are all connectors intact?
- Are all connectors securely fastened?
- Are all screws still tight?
- Is there suddenly a malfunction at a specific unit?

5.3 Spare Parts

5.3.1 Recommended spare parts stock

In order to keep the down time of the system during malfunctions as short as possible it is recommended to have certain spare parts in stock. At least one central unit, one antenna and one antenna cable should be available. With larger systems with more than approx. 15 i-PORTs the doubling of the recommended stock quantity should be considered. Furthermore, it is recommended to have several spare tags in stock, corresponding to approx. 0.5 – 1 % of the total number of tags.

5.3.2 Preparing the spare parts

In general all spare parts can be used immediately after delivery from IDENTEC SOLUTIONS. However, for the compact communicator there are various settings of the communication parameters. In order to keep the down times short it is recommended to set these parameters 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.

5.3.3 Examination and repair of exchanged parts

The data tags and compact communicators 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 carried out.

5.4 Returns

Parts or main components returned for repair or exchange must be handled with great care. PC cards must be returned in the appropriate ESD-protecting packaging material. All returns should include a completed returns form (see appendix) and be sent to the local distributor or to:

IDENTEC SOLUTIONS AG
Service Department
Millenium Park 2
6890 Lustenau
AUSTRIA / AUTRICHE

6 Technical Data

Operating Data Long-Range RFID (ILR, 2400 – 2485 MHz ISM Band)

Read/write/localization range	Up to 180 m (590 ft) in free air with line of sight
Channels	3 Non-Overlapping channels (for EU and US) or 7 Overlapping channels
Data rate	250 kbits/s and 1 Mbits/s
Maximum transmission power	100 mW EIRP or local regulation
Standards/Certification	ISO 24730 part 5 (upcoming standard), FCC part 15, EN 300 328 (EU)
Compatibility	i-Q350 RTLS series tags

Operating Data Long-Range RFID (ILR, UHF Band)

Read/write range	Up to 300 m (900 ft) in free air with line of sight
Frequency	868 MHz band (EU) and 902 - 928 MHz (NA)
Data rate (read and write)	19.2 up to 115.2 kbits/s
Maximum transmission power	0.75 mW ERP
Standards/Certification	FCC Part 15 (US), Industry Canada, EN 300 220 (EU)
Compatibility	i-Q350 and i-Q350 RTLS series tags

Performance

Identification code	48 bits fixed ID
Read rate	Up to 100 tags/s (identification code only)
Localization rate	Up to 400 tags per min per zone
Multiple tags handling	Up to 500 tags in the read zone

Antennas

RFID	1 SMA connector for external antenna at 868 (EU) or 915 MHz (US)
Localization	1 SMA connector for external antenna at 2.4 GHz

Electrical

Power source	10 – 30 VDC
Power consumption	< 2 W
Host interface	RS422, 115.2 kbit/s or Ethernet 10/100 Mbit/s

Environmental

Operating temperature	-30 °C to +70 °C (-22 °F to +158 °F)
Shock	50 G, 3 times DIN IEC 68-2-27 Multiple drops to concrete from 1 m (3 ft)
Vibration	3 G, 20 sine wave cycles, 5 Hz to 150 Hz, DIN IEC 68-2-6 5 G, noise 5 Hz to 1000 Hz, 30 minutes, DIN IEC 68-2-64
Humidity	90 %, non-condensing

Physical

Dimensions	97 × 67 × 97 mm (3.8 × 2.6 × 3.8 in.) 153 × 67 × 97 mm (6.0 × 2.6 × 3.8 in.) incl. cover
Case Material	Plastic
Mass	150 grams (5.29 ounces)
Enclosure rating	IP 64 with cover