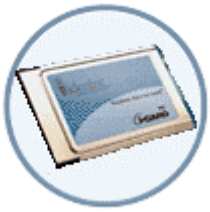
PC i-CARD User's Guide

March 1, 2002



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Radio Frequency Compliance Statement

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

MODEL:	i-PORT	i-CARD	i-Qxx TAGS
FCC ID:	O2E-ILR-IPORT	O2E-ICARD-NA	OO4-ILR-IQ8T or OO4-ILR-IQR
CANADA:	35381032062A	35381032231	35381021756A or 35381021825
EUROPE:	CE 0678(!)	CE 0678(!)	CE 0682(!)
TYPE:	II/S	N/A	SL/xx

The user(s) of these products are cautioned to only use accessories and peripherals approved, in advance, by IDENTEC SOLUTIONS, Inc. The use of accessories and peripherals, other than those approved by IDENTEC SOLUTIONS, Inc., 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.

Operation is subject to the following conditions: (1) these devices may not cause harmful interference, and (2) these devices must accept any interference, including interference that may cause undesired operation of the device.

FCC Compliance

This equipment 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 communication. 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/her own expense.

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

Industry Canada Compliance

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

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

The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada.

Table of Contents

1.0 Purpose

This guide explains how to install and operate the PC version of the i-CARD when using a laptop or desktop computer.

2.0 Overview

2.1 Functionality

The i-CARD is IDENTEC SOLUTIONS' Intelligent Long Range (ILR®) radio frequency mobile interrogator in a type II PC Card format. The PC i-CARD is easily integrated into portable or laptop computers and is used in conjunction with i-LINKS (or other ILR® software) to read and write data to tags. The flexibility of an interrogator on a PC Card allows for easy integration of ILR® into enterprise systems and permits combination with other technologies such as bar code and wireless LAN.

Computers with a PC i-CARD can communicate to tags at a distance of up to 10 meters (33 feet). The i-CARD communicates with the entire i-Q active tag product line including i-Q8, i-Q8T, i-Q32, and i-Q32T tags. The current version of the PC i-CARD is not compatible with the i-D tag product line.

The PC i-CARD is available in 916 MHz or 868 MHz to communicate in a global market. The signal propagation characteristics of the UHF radio band used by ILR® technology provide long-range communication and high-speed transmission rates for reliable data exchange.

The installation and usage instructions for the PC i-CARD are identical for both the 916 MHz and 868 MHz frequencies.

2.2 Components

The i-CARD resembles a standard PC card with one addition: an external antenna. On the exposed end of the i-CARD, there are an MMCX antenna connector, a 15-pin serial connector (not used in the PC version of the i-CARD) and 3 status LEDs indicating *Transmit*, *Receive* and *RF Carrier Detect.* These LEDs are operational after appropriate ILR® software is installed (i.e. i-LINKS).

Figure 1: i-CARD Components

3.0 Installation

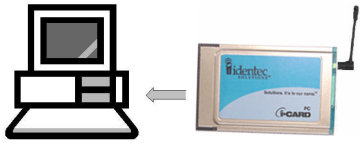
The PC i-CARD is easy to install—simply attach the antenna, insert the i-CARD into the desired computer and install the necessary hardware driver for the specific operating system. The following sections describe each of these steps in detail.

Note: The hardware driver only needs to be installed the first time an i-CARD is inserted into a computer or when performing an upgrade to the driver.

3.1 Hardware

To install the external antenna, grasp its base and insert it into the antenna connector until it locks into place.

Figure 2: Antenna Installation



To remove the antenna, grasp the base firmly and remove carefully to avoid damage.

3.2 Software

The computer being used for i-CARD operations must be running one of the following operating systems: Windows NT/98/ME/2000/CE.

To install the i-CARD, perform the following steps:

1. Insert the **ILR® Installation Disk** (either floppy disk or CD) into the computer that will operate the i-CARD.

2. Insert the i-CARD into the PC card slot of the desktop or laptop computer. An installation wizard will start immediately after the i-CARD is inserted.

3. Complete the wizard instructions and refer to the following sections for additional instructions specific to each operating system:

For O/S:	Go to section:
2000	3.2.1
98	3.2.2
ME	3.2.2
NT	3.2.3
CE	3.2.4

Note: A *readme.txt* file is available for each operating system on the **ILR® Installation Disk** and contains the same instructions that are described in the following sections.

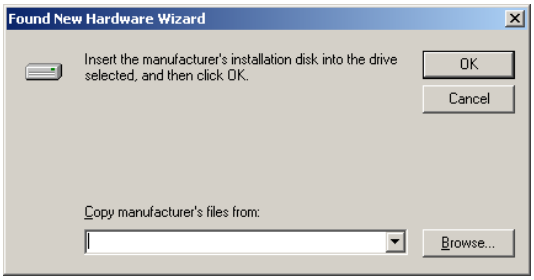
3.2.1 Windows 2000

The following section describes how to install the device driver on Windows 2000. When the i-CARD is inserted into the PC slot, an installation wizard begins automatically and the following screen appears:

Select the *Search for a suitable driver for my device* option and click *Next.*

Selecting a search location depends on the type of **ILR® Installation Disk** you received. If you received a floppy disk, the search location is the **A:** drive. If you received a CD, the search location is the **D:** drive.

For a search location, select the *Floppy Disk Drives* option, and click *Next.* Click the *Browse* button to copy drivers from your **ILR® Installation Disk**:



Using the *Browse* dialog box, select the *drivers**Windows 2000* folder. Select the *i-CARD.inf* file, then click *OK*.

The hardware driver is loaded and a confirmation screen appears. This screen verifies that the installation has completed successfully. Click *Next* to complete the installation.

The hardware driver installation is now complete.

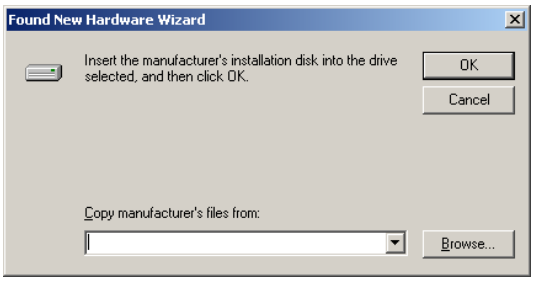
3.2.2 Windows 98/ME

The following section describes how to install the device driver on Windows 98 and Windows ME. When the i-CARD is inserted into the PC slot, an installation wizard begins automatically and the following screen appears:

Select the *Search for a suitable driver for my device* option and click *Next.*

Selecting a search location depends on the type of **ILR® Installation Disk** you received. If you received a floppy disk, the search location is the **A:** drive. If you received a CD, the search location is the **D:** drive.

For a search location, select the *Floppy Disk Drives* option, and click *Next.* Click the *Browse* button to copy drivers from your **ILR® Installation Disk**:



Using the *Browse* dialog box, select the *drivers**Windows 98* folder. Select the *i-CARD.inf* file, then click *OK*.

Note: The driver used for Windows ME is the same as Windows 98 and is stored in the subfolder *Windows 98* on the **ILR® Installation Disk**.

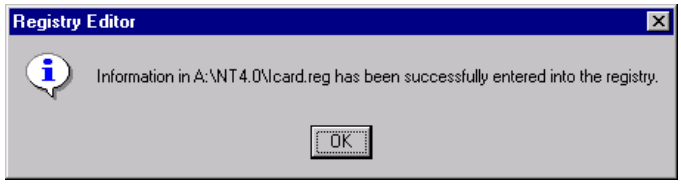
The hardware driver is loaded and a confirmation screen appears. This screen verifies that the installation has completed successfully. Click *Next* to complete the installation.

The hardware driver installation is now complete.

3.2.3 Windows NT

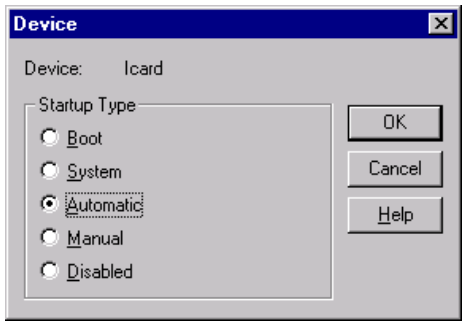
To perform the following steps, administrator rights are required because you will need to modify your machine's registry.

On the **ILR® Installation Disk**, go to the *\drivers\WindowsNT* folder, and double-click on the *icard.reg* file. The following dialogue box appears:



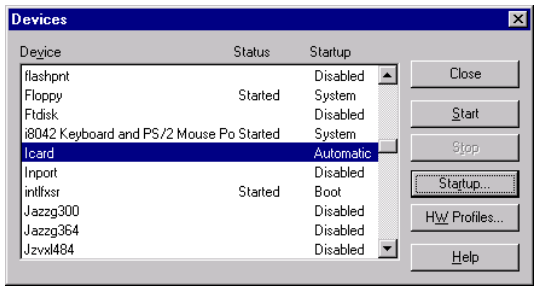
Click *OK*, then copy the *icard.sys* file from the *\drivers\WindowsNT* folder to the *\Winnt\system32\Drivers* folder on the computer operating the i-CARD.

Remove the floppy disk and reboot the computer. The following screen appears during startup:



Select the *Startup Type* of the i-CARD device. The *Startup Type* will vary from user to user depending on the type of PCMCIA software installed. By default, Windows NT does not support plug-and-play devices, therefore the *Startup Type* should be set to *Automatic*. If you have additional software that permits plug-and-play devices, then the *Startup Type* should be set to *Manual*.

If the above screen does not appear, go to *Control Panel→Devices* and select the *Icard* device, click *Startup*, then click *Close*.



The hardware driver installation is now complete.

3.2.4 Windows CE

Be sure that you have your handheld device in its cradle and that you have an Active Sync session established between your PC and the Handheld. As this step may vary depending on your Handheld, consult your Handheld user's manual if you require assistance in establishing an Active Sync session.

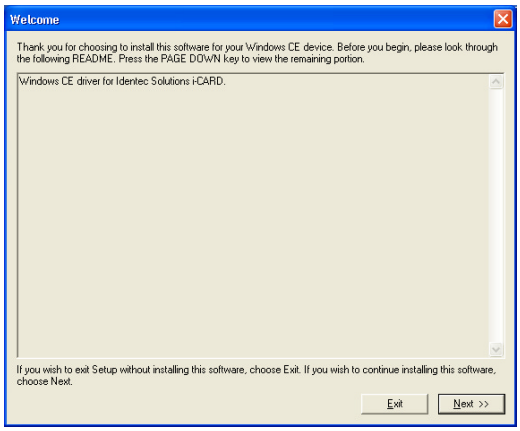
Determine whether your handheld device has a MIPS or StrongArm Processor and select the appropriate folder.

- MIPS = Symbol 27xx series
- StrongArm= Symbol 28xx series, Symbol 81xx series, and Compaq i-PAQs

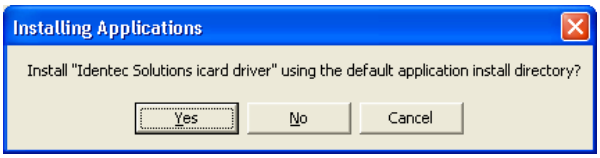
Select the *setup.exe* for your Processor type

icard_mips_setup.exe = MIPS Processor
icard_arm_setup.exe = StrongArm Processor

Double-click on the *setup.exe* and an installation wizard begins with the following screen:



Select *Next* and follow the installation instructions. When the *Default Directory* dialogue box appears, select *Yes* and continue the installation process.



Finally, you will be prompted to check your handheld device for additional installation steps. These steps will vary depending on the handheld device used.

Note: When the installation is finished you must power off your handheld device and power it back on to complete the driver initialization.

The hardware driver installation is now complete.

4.0 Usage

After completing the i-CARD installation, please refer to the user's guide of the applicable software to continue with the system implementation.

The i-CARD can be used in conjunction with a variety of software applications, such as i-DEMO, i-LINKS and other ILR® custom applications.

Appendix A: Technical Specifications

Type II PC i-CARD

Compatibility	
ILR® i-Q tags	
Performance	
Read range (adjustable)	10 m (33 ft)
Write range (adjustable)	10 m (33 ft)
Max. response time	< 150 ms
Read rate (ID only)	100 tags/s
Read rate	35 tags/s @ 128 bit data reading
Multiple tag handling	Up to 2,000 tags in the read zone
Communication	
Frequency	868 MHz (EC) or 915 MHz (NA) ISM Band
Certification	EN 330 220 (EC); FCC part 15 (US); Industry Canada
Number of antennas	1
Output power	Up to 0 dBm, digitally controlled (255 steps)
Sensitivity	Up to –80 dBm, digitally controlled (255 steps)
CPU	
Hardware drivers for different O/S	Windows NT/98/ME/2000/CE, PALM
Program memory	2 MB Flash
User Interfaces	
Parallel interface	PCMCIA
Option serial interface	RS-232
Number of status indications	3 LEDs
Electrical	
Input power	5 V DC
Power consumption	100 mW maximum
Standards / Safety	CE
Environmental	
Operating temperature	0°C to +70°C (32ºF to +158ºF)
Option ext. temperature range	–40°C to +80°C (–40ºF to +176ºF)
Storage temperature	–40°C to +80°C (–40ºF to +176ºF)
Humidity	90% non-condensing
Physical	
Dimensions	Standard Type II PC Card
Enclosure	Metal
Mass	32 grams (1.13 oz)

Appendix A - Technical Specifications (con't)

i-Q Series Tags

Performance	
Read rate (ID only)	Up to 100 tags/s
Read rate	Up to 35 tags/s @ 128 bit data reading
Response time	< 150 ms (single tag)
Multiple tag handling	Up to 2,000 tags in the read zone
Communication	
Read range to i-PORT II	Up to 100 m (300 ft) @ free air
Operating frequency	868 MHz (EC) or 915 MHz (NA) ISM Band
Data rate (download to tag)	115.2 kbits/s
Data rate (upload to reader)	115.2 kbits/s
Maximum transmission power	0.75 mW ERP
Standards / Certification	EN 330 220 (EC), FCC Part 15 (US), Industry Canada
Electrical	
Power source	Lithium battery (not replaceable)
Expected battery life	5 Years @ 600 times 128 bit readings/day
Battery monitoring	Yes
Temperature logging (Optional)	
Number of samples	1,024 (i-Q8T) / 13,312 (i-Q32T)
Interval	User-definable in intervals from 1 to 1000 minutes
Accuracy	+/- 0.5°C over a range of –20°C to +50°C +/- 1°F over a range of –4°F to +122°F
Resolution	0.25°C (0.5°F)
Data	
Data retention	>10 years without power
Write cycles	100,000 writes to a tag
Memory size	7,855 byte user-definable (i-Q8) 32,431 byte user-definable (i-Q32)
Identification code	48 bit fixed ID
Environmental	
Operating temperature	–40°C to +70°C (–40ºF to +158ºF)
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 6 5 G, noise 5 Hz to 1000 Hz, 30 minutes DIN IEC 68-2-64
Physical	
Dimensions	131 mm x 28 mm x 21 mm (5.2 in. x 1.1 in. x 0.85 in.)
Enclosure	Plastic (ASA / Luran® 5)
Mass	50 g (1.75 ounces)
Enclosure rating	IP 65 — Totally protected against dust and low-pressure jets of water from all directions.

Appendix B: RF Output Power Calculation

The following is the licensed limit allowable by the appropriate regulatory bodies for operation of IDENTEC SOLUTIONS' RFID devices:

In North America, the approved frequency is 916.5 MHz. Our equipment is certified to transmit an Effective Radiated Power (ERP) of 50mV/m @ 3m. This equates to transmitting 0.75mW from the antenna, or –1.25 dBm.

In Europe, the approved frequency is 868.35 MHz. Our equipment is certified to transmit an ERP of 5mW (6.99dBm) @ 3m.

To calculate the power being transmitted from the antenna, the following formula may be applied:

Effective Radiated Power (ERP) = [i-CARD Output Setting] - [Cable/Connector Loss] + [Antenna Gain]

The variables are defined as follows:

[i-CARD Output Setting] = User defined

[Cable/Connector Loss] = Variable, depending on the type of cable and connectors being used. A typical installation may use RG-58 cable with a loss of 0.2 dBm/ft. Typical connector loss is around 0.5dB per junction

[Antenna Gain] = –2.15 dBm for our standard PC i-CARD antenna: P/N 210265-001

NOTE: It is the responsibility of the installer to ensure that operation is within the limits of the appropriate regulatory body where the equipment is being used.