

Rhein Tech Laboratories, Inc.  
360 Herndon Parkway  
Suite 1400  
Herndon, VA 20170  
<http://www.rheintech.com>

Client Identec Solutions, Inc.  
Model i-D2 NA  
Report No 2003025  
Standards FCC 15.249/IC RSS-210  
Date March 10, 2003

## **APPENDIX H: MANUAL**

Please see the following pages.



# i-D2 ILR Tag Operations Manual

---

IDENTEC SOLUTIONS, Inc.  
Suite 102, 1860 Dayton Street  
Kelowna, British Columbia  
Canada V1Y 7W6

Tel: (250) 860-6567  
Fax: (250) 860-6541  
[www.identecsolutions.com](http://www.identecsolutions.com)

---

## **Disclaimer and Limitation of Liability**

IDENTEC SOLUTIONS, Inc. and its affiliates, subsidiaries, officers, directors, employees and agents provide the information contained in this Manual on an "as-is" basis and do not make any express or implied warranties or representations with respect to such information including, without limitation, warranties as to non-infringement, reliability, fitness for a particular purpose, usefulness, completeness, accuracy or currentness. IDENTEC SOLUTIONS, Inc. shall not in 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.

## **Trademarks**

"IDENTEC SOLUTIONS", "Intelligent Long Range", "ILR" and the stylized "i" are registered trademarks and "i-Q", "i-D", "i-CARD", "i-PORT", "i-LINKS", "Solutions. It's in our name." are trademarks of IDENTEC SOLUTIONS, Inc. and/or IDENTEC SOLUTIONS AG.

## **Copyright Notice**

Copyright © 2003 IDENTEC SOLUTIONS, Inc. 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, Inc.

## Radio Frequency Compliance Statement

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

MODEL:	i-D2
TYPE:	IL/NA, IL/NA-H PL/NA, PL/NA-H
FCC ID:	O2E-ILR-ID2NA
CANADA:	3538(A)-ID2NA

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.

## Table of Contents

<b>1.0</b>	<b>INTRODUCTION</b>	<b>5</b>
1.1	FUNDAMENTALS .....	5
1.2	SYSTEM OVERVIEW .....	5
1.3	OPERATIONAL DESCRIPTION.....	5
1.4	FEATURES .....	6
<b>2.0</b>	<b>CONFIGURATION</b>	<b>7</b>
<b>3.0</b>	<b>MOUNTING THE TAG</b>	<b>7</b>
3.1	INDUSTRIAL TAG .....	7
3.2	PERSONNEL TAG.....	7
<b>4.0</b>	<b>TECHNICAL SPECIFICATIONS</b>	<b>8</b>
<b>5.0</b>	<b>TECHNICAL CONTACTS:</b> .....	<b>9</b>

## 1.0 Introduction

### 1.1 *Fundamentals*

IDENTEC SOLUTIONS' ILR® (Intelligent Long Range®) technology is the next generation of long range RFID (Radio Frequency Identification). The objective is wireless and automated data collection over large distances.

### 1.2 *System Overview*

IDENTEC SOLUTIONS' ILR-System consists of four main components:

- Active tags (also called transponders) with internal power supply, which are used to identify goods or to store data and histories
- Interrogator (i-PORT; fixed-mounted) and handheld devices (mobile), which exchange information with the tags and host computer systems
- Antennas for definition of read zone
- A central computer system as basis for control and monitoring

This manual only describes the operations of the i-D2 active tag.

### 1.3 *Operational Description*

The i-D2 tag is a high performance active RFID tag suitable for a wide variety of applications. The tag response to an activation telegram from the interrogator is to transmit its unique identification number. It is available in either a personnel or industrial style housing, and in two receive sensitivity modes, low or high.

The tag has a low current ASK receiver in the UHF band for a data rate up to 38.4 Kbps. The PLL stabilized ASK transmitter has a data rate up to 115.2 Kbps.

The operation range is 6 meters (20 feet) in open air, with a typical operation life of six years.

## 1.4 Features

Features	Benefits
Low cost	Tracks large quantities of assets economically using high-speed active technology.
2000-tag simultaneous identification	Provides high-speed data collection to facilitate warehousing and inventory-based applications.
Wireless triangulation	Allows fast, precise location of assets in a warehouse or an inventory yard.
64-byte data memory	Stores process information onto the tag to provide real-time tracking and tracing.
100-tags/sec. identification rate	Provides reliable identification of fast moving objects.
6-meter read/write range	Allows identification, tracking and tracing of personnel and assets without human intervention.
LED (option)	Provides visual identification of an addressed tag ( <i>pick-to-light</i> ).
6-year battery life time	Delivers long time maintenance-free operation, without battery replacement.
Credit card-style packaging	Offers thin, lightweight, versatile packaging in two styles suitable for personnel or asset tracking.
On-demand communication	Eliminates RF flooding by using application-driven read/write operations.
UHF operating frequencies	Operates interchangeably on standard North American and European ISM band frequencies so the same infrastructure can be used for global transport.
Non-line-of-sight data transmission	Allows tags to be buried while transmitting for improved tracking/locating efficiency.

## 2.0 Configuration

The i-D2 tag requires no special configuration. Options are configured at the factory. It is controlled by commands from the ILR Interrogation device.

## 3.0 Mounting the Tag.

### *3.1 Industrial Tag*

The industrial tag is designed with two mounting holes so it can be firmly mounted onto virtually any surface. It can be mounted using various methods dependent on the particular application.

Among the common types of mounting are:

- Screws
- Rivets
- Double sided tape

Note: Mounting hardware is not supplied with the tag.

### *3.2 Personnel Tag*

The personnel tag is designed with only one mounting hole so a chain or clip device (not supplied) worn by an individual can be used to hold the tag.

## 4.0 Technical Specifications

### Performance

Read rate	Up to 100 tags/s (Identification Code only)
Max. response time	Up to 35 tags/s @ 128 bit data reading
Multiple tag handling	< 10 ms (single tag) Up to 2,000 tags in the read zone

### Communication

Read/write range to i-PORTIII	Up to 6 m (20 ft) (free air)
Operating frequency	868 MHz (EC) or 915 MHz (NA) ISM band
Data rate (download to tag)	38.4 kbits/s
Data rate (upload to reader)	115.2 kbits/s
Maximum transmission power	0.75 mW ERP
Certification	EN 300 220 (EC), FCC Part 15 (US) Industry Canada

### Electrical

Power source	Lithium battery (not replaceable)
Expected battery life	> 6 Years @ 600 times 64 bit readings/day
Battery monitoring	Yes
Optional features	LED

### Data

Data retention	>10 years without power
Write cycles	100,000 writes to a tag
Memory size	64 bytes (56 byte user definable)
Identification code	48 bit fixed ID (one in one trillion)

### Environmental

Operating temperature	-20°C to +70°C (-4°F to +158°F)
Shock	50 G; 3 times DIN IEC 68-2-27 1-meter multiple drops to concrete
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

### Package rating

Personnel tag	IP52 — Protected against dust and direct sprays of water up to 15 degrees from vertical.
Industrial tag	IP52 — Protected against dust and direct sprays of water up to 15 degrees

### Physical

Dimensions personnel tag	87 mm x 50 mm x 7 mm (3.94 in. x 1.97 in. x 0.27 in.)
Dimensions industrial tag	100 mm x 50 mm x 7 mm (3.44 in. x 1.97 in. x 0.27 in.)
Case material	Plastic (Luran® S)
Mass of industrial tag	27 grams (0.95 ounces)
Mass of personnel tag	24 grams (0.84 ounces)

## 5.0 Technical contacts:

### **In North America:**

#### **IDENTEC SOLUTIONS Inc.**

#102 – 1860 Dayton Street  
Kelowna, BC  
Canada  
V1Y 7W6

Tel: (250) 860-6567  
Fax: (250) 860-6541

### **In Europe:**

#### **IDENTEC SOLUTIONS AG**

Millennium Park 2  
A-6890 Lustenau  
Austria

Tel: +43 (0)5577 87387-0  
Fax: +43 (0)5577 87387-15