台 揚 科 技 股 份 有 限 公 司

MICROELECTRONICS TECHNOLOGY INC.

ISO 9001 Certified

MTI RU-824 RFID Reader

Quick Guide

Version 1.1

Chapter 1
Introduction

1.1 Purpose

This guide will help you set-up and configure your RU-824 RFID reader. Following the installation instructions should be quick and easy.

1.2 Configuration

This guide covers the following configuration

Configuration	Part number
US band RFID Reader	RU-824-100
EU band RFID Reader	RU-824-110

1.3 Trademarks

- The product described in this guide is a licensed product of Microelectronics Technology Inc.

- Microsoft, Windows 95, Windows 98, Windows Millennium Edition, Windows NT, Windows 2000, Windows XP, and MS-DOS are registered trademarks of the Microsoft Corporation.

- Java is a trademark of Sun Microsystems, Inc.

- Impinj is a trademark of Impinj Corporation.

- All other brand and product names are trademarks or registered trademarks of their respective owners.

Chapter 2
Product Introduction

2.1　Product Specification

Module Number	RU-824
Features	•Compliant with EPCglobal C1G2 / ISO 18000-6C • Adjustable Output Power • Low Power Consumption • FCC & ETSI Certification • Compact dimensions • Maximum tag read distance of 1 m
Air-interface Protocols	EPC Class 1 Gen 2/ISO 18000-6C
Frequency Band	US: 902~928MHz ; EU: 865~868MHz
Output Power	Adjustable +5 ~ +24dBm in 1dB step
Supply Voltage	Powered by USB
Current Consumption	Idle mode:0.25A Scan mode: Max 1A@ 24dBm
Host Communication Interfaces / Data Rates	USB 2.0 Full Speed: 12 Mb/s
Compliance	US: FCC 47 CFR Part 15, Subpart C (section 15.247), Subpart B, SAR OET 65, EU: ETSI EN 302 208-1 V1.2.1,EN 301 489-1/-3, EN 60950-1, SAR EN 62311
Effective Range	Max. 1m with build-in antenna
Physical	80 mm L x 57 mm W x 14 mm H
Antenna	Build-in linear polarization antenna
Environment	Storage Temperature: -40°C to 85°C Operating Temperature: 0°C to 40°C

Table 1 RU-824 Specification

2.2　Product and Accessories

■　**RU-824 RFID Reader**

■　**USB Cable**

2.3　Hardware Installation

Connected RU-824 RFID reader as shown below

Figure 1 Installation drawing

2.4   Software (Tracer) Installation

2.4.1   Tracer overview

The Tracer application is a .NET-based graphical user interface (GUI) tool that uses the Indy RFID Host Library API to exercise the functionality of the reader platform.

Tracer is dynamically linked to the Indy RFID Host Library. Therefore, there is no need to install the interface library separately. However, the USB host driver must be installed prior to using Tracer.

Tracer is supported on Windows XP only.

It is possible for multiple versions of Tracer to co-exist on a single system, so long as a unique install path is used for each, such as the default installation directory.

2.4.2   Installation Requirements

Tracer requires Microsoft Windows XP Professional with Service Pack 1 (or later). Tracer also relies on release 2.0 of the Microsoft .Net Framework. The Tracer setup program checks to ensure that the correct version of the .Net Framework is installed. If the correct version is not installed, the Tracer setup program offers to install it. The user may also download and install a copy of the .Net Framework from the Microsoft Windows Update Site (http://update.microsoft.com/) or the Microsoft Download Center (http://www.microsoft.com/downloads/).

To take advantage of the data import/export feature, Microsoft Excel 2003 is required.

2.4.3   Installation Procedure

To install the Tracer tool:

1.   Double click the Tracer installer file, Tracer v2.3.0.msi, to launch the installation wizard.

2. When prompted, designate the desired installation directory. The default is [Program Files]\IMPINJ\Tracer v2.3.0\.

3. Installation includes the C++ runtime libraries and adds a desktop shortcut to the Tracer application.

1. To Start the Tracer application:

    ■   Double click the desktop shortcut, or

    ■   Use the Start Menu. For example, if installed to the default directory: Click Start, Select All Programs, IMPINJ, Impinj Tracer v2.3.0, Click Tracer.

    ■   Open the Tracer installation folder and double click Tracer.exe

2.4.4   Removal Procedure

To uninstall the Tracer tool:

1. Click **Start**, Select **All Programs**, **IMPINJ**, **Impinj Tracer v2.3.0**, Click **Uninstall Tracer**. When prompted to uninstall this product, click **Yes**.

Alternatively:

1. Open the Control Panel and select **Add or Remove Programs**.

2. Select the entry for the Tracer version to uninstall and click **Change/Remove**.

3. When prompted to remove this product, click **Yes**.

Chapter 3
Tracer Usage

This section describes the features of the Tracer Application.

Tracer has been adapted with reader platform differences in mind. Consequently, Tracer version 2.3.0 supports both the Indy R1000-based and R2000-based reader, but some functions are not used on RU-824 RFID reader. In this situation, they are not described in this document.

3.1   Tracer Appearance

The Tracer consists of a main display window and a floating control panel window. See figure below.

■   The main window contains a menu and a main display area used to show different views of the data received from the reader.

■   The floating control panel is used to start, stop, and pause inventory rounds, and to perform other reader actions.
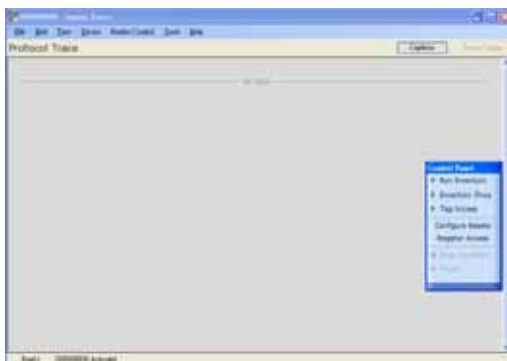

Figure 2 Tracer User Interface Main Window (left) and Control Panel (right)

3.2 Selecting a Device

When the Tracer application starts, it attempts to open all attached readers. Each attached reader is listed separately in the **Device** menu. If no readers are found, the application displays a warning and the **Device** menu is empty.

The reader that is found first is automatically selected as the active device. The name of the active reader device is always displayed on the window caption. To change the active reader, make a selection from the **Device** menu as shown in the figure below.

The application does detect new readers that become active after the application has started. You should power on and connect your readers prior to starting the Tracer application.

Figure 3 The Device Menu

3.3 Controlling a Device

After making a selection from the **Device** menu, you can control the active reader from the **Reader Control** menu or from the floating **Control Panel**. The figure below shows the **Control Panel** buttons and describes the actions they perform.
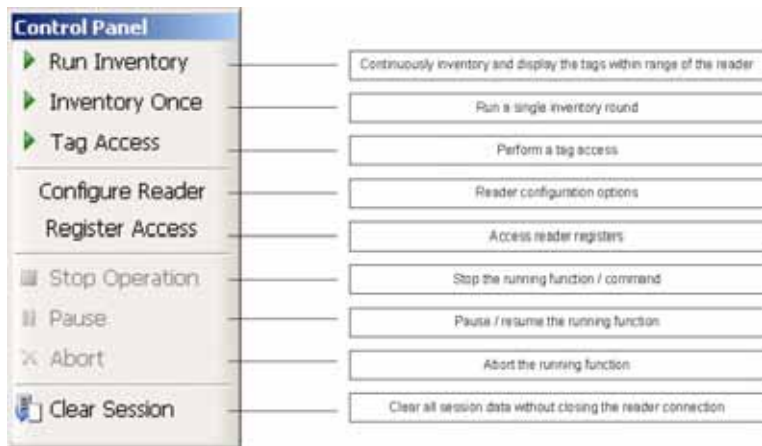
Figure 4 Reader Control Panel

3.3.1 Tag Access

Selecting the **Tag Access** option presents the user with the configuration dialog shown in the figure below.
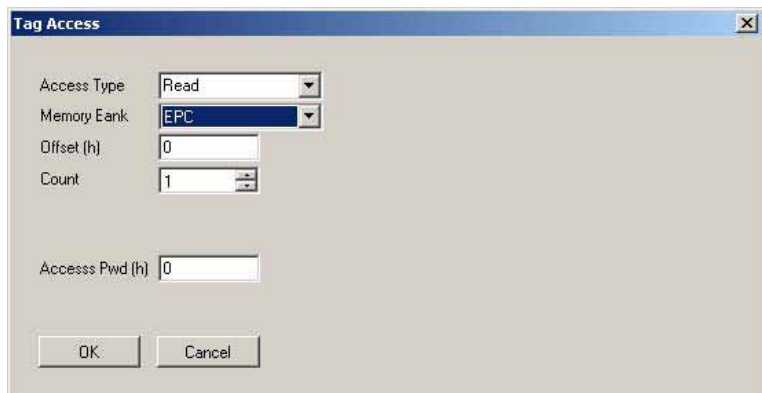

Figure 5 Tag Access dialog box, Access Type Read selected

From the **Tag Access** dialog box, the user can perform many different access operations against tags as follows.

3.3.1.1   Access Type Read

Selecting the **Read** Access Type option displays the configuration dialog shown in the figure above.

From this dialog, the user can perform a read operation against tags and can provide the following configurable parameters:

■ **Memory Bank**—the target for the read operation, has selectable values of either the EPC, TID, User, or Reserved memory bank

■ **Offset**—the offset in hexadecimal of the first 16-bit word to read from the target memory bank

■ **Count**—the number of 16-bit words to read, starting at **Offset**

■ **Access Pwd**—the previously applied access password for the target tag, or no entry for tags with no access permissions

Output from read operations is directed to the primary application window.

3.3.1.2   Access Type Write

Selecting the **Write** Access Type option displays the configuration dialog shown in the figure below.
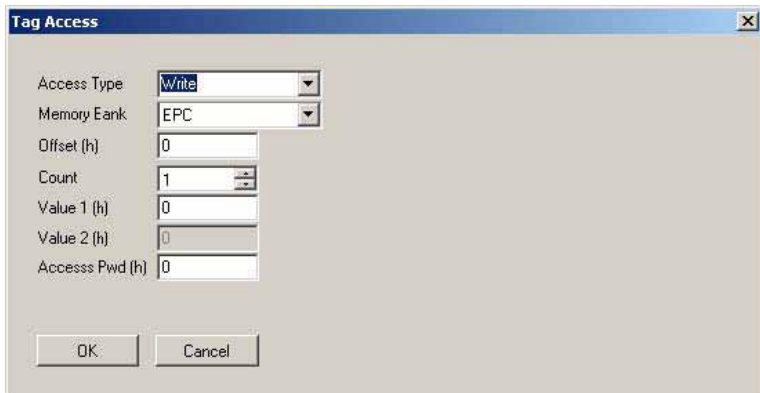
Figure 6 Tag Access dialog box, Access Type Write selected

From this dialog, the user can perform a write operation against tags
and can provide the following configurable parameters:

- ■ **Memory Bank**—the target for the write operation, has selectable values
  of either the EPC, TID, User, or Reserved memory bank

- ■ **Offset**—the offset in hexadecimal of the first 16-bit word to write from the
  target memory bank

- ■ **Count**—the number of 16-bit words to read, starting at **Offset**

- ■ **Value 1**—the hexadecimal value of the 16-bit word to write at **Offset**

- ■ **Value 2**—the hexadecimal value of the 16-bit word to write at **Offset+1**,
  applicable if Count is 2

- ■ **Access Pwd**—the previously applied access password for the target tag,
  or no entry for tags with no access permissions

Output from write operations is directed to the primary application window.

3.3.1.3　Access Type Kill

The kill operation allows the user to render any tag with a matching access and kill password as permanently non-functional. Selecting the **Kill** Access Type option displays the configuration dialog shown in the figure below.
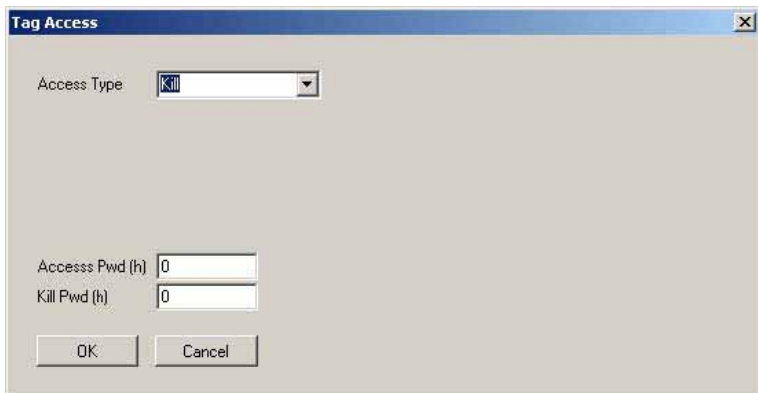

Figure 7 Tag Access dialog box, Access Type Kill selected

Note: Tags with a value of zero for their password are not expected to respond to the kill command.

3.3.1.4　Access Type Lock

The lock operation allows the user to specify the desired exposure of tag kill and access password permissions. It also allows the user to specify write permission and condition levels for the EPC, TID, and User memory banks. Selecting the **Lock** Access Type option displays the dialog box shown in the figure below.
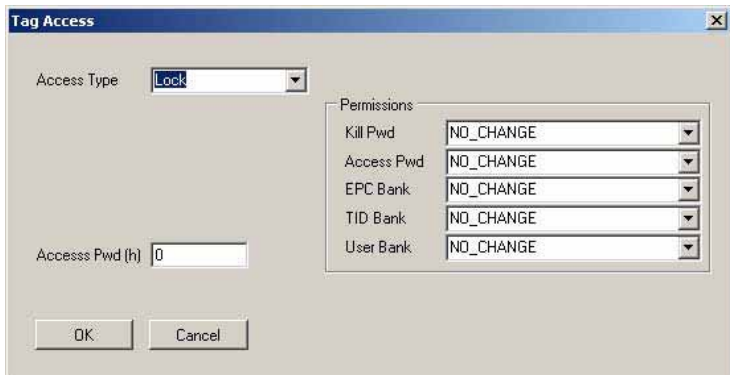
Figure 8 Tag Access dialog box, Access Type Lock selected

Note that all permissions are set in a single operation. In many circumstances, it may be desirable to leave one or more of the target passwords or permissions in an unmodified state. To do this, select the NO_CHANGE option for those targets.

3.4 Configure Reader

The Tracer application allows the user to configure many of the settings of the attached readers.   To access the configuration panel:

Note: This is a quick guide for RU-824 RFID reader. Some functions are not described and released in this document.

From the **Reader Control** menu, select **Configure Reader**. Alternatively, from the **Control Panel,** select **Configure Reader.** See the figure below. This opens the **Tracer Reader Configuration** dialog box.
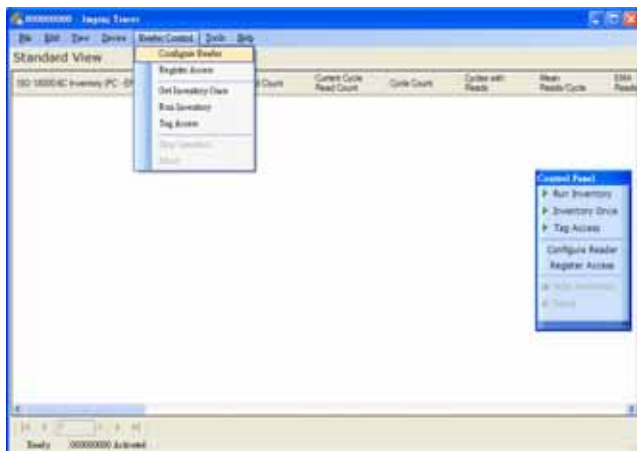
Figure 9 Accessing Reader Configuration

The **Tracer Reader Configuration** dialog contains many function-specific pages, each of which is listed on the left-hand side selection bar. The current selection is always indicated by a visual highlight. For example, in the figure below, the **Settings** page is active.

Figure 10 Reader Configuration Dialog Box

3.4.1 Settings Page

When the **Reader Configuration** dialog first opens, it displays the **Settings** page shown in the figure above. The settings displayed are the current settings on the reader.

From this page, you can view and/or configure the following items:

- Operating Region (Read only, set within the reader)
- Link Profile
- Data Format (Compact, Normal or Extended)
- Operational Mode (Continuous Mode or Discontinuous Mode)
- Inventory Algorithm (Fixed Q or Dyanmic Q)

3.4.2 Antenna Configuration Page

From the **Antenna Configuration** page, you can configure power level . The maximum power level setting of RU-824 is limited at +24dBm.

Figure 11 Antenna Configuration Dialog Box

3.4.3 Select Criteria Page

Use the **Select Criteria** page to view and configure the selection criteria query settings that can be used for any tag–protocol operations. As shown in the

figure below, this page displays the active selection criteria of the current reader.

The **Display Criterion #** spin box allows you to select the criteria currently being viewed. It has a range of one (1) up to the value displayed under **Active Criteria**.

The **Load** button causes the application to perform a direct query to the current reader and reload the page with the retrieved select criteria settings.

To change the select criteria parameters for the active reader, click the **Edit** button. This displays the dialog box shown in the figure below.
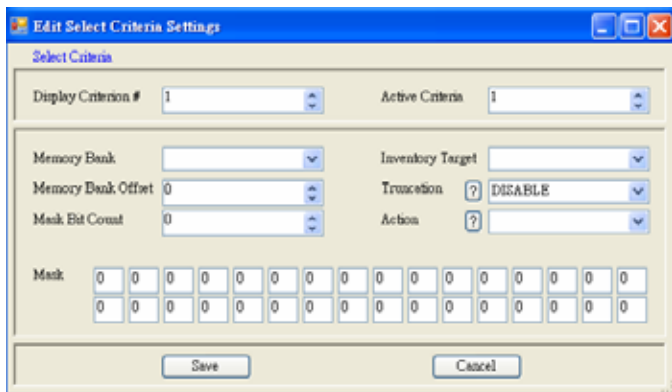

Figure 12 Select Criteria Edit Dialog

This panel allows configuration of individual select criterion parameters.

Note 1: Only one active select criteria is allowed at this time. Attempts to set the **Active Criteria** count (in the **Edit** dialog) greater than one (1) results in an Invalid Parameter error. This error is generated and displayed when the **Save** button is clicked.

3.4.4 Inventory Algorithm Panel

The Inventory Algorithm panels are used to view and configure the reader's

query settings, the parameters for the selected singulation algorithm, and whether select and post singulation filters should be utilized during inventory, read, write and similar operations.

The figure below shows an example of the Inventory Algorithm View panel.

The **Load** button queries the current reader and refreshes the values displayed on the **Algorithm Settings** page.

To modify the algorithm settings for the current reader, click the **Edit** button. This opens a dialog box similar to the one shown in the figure below.
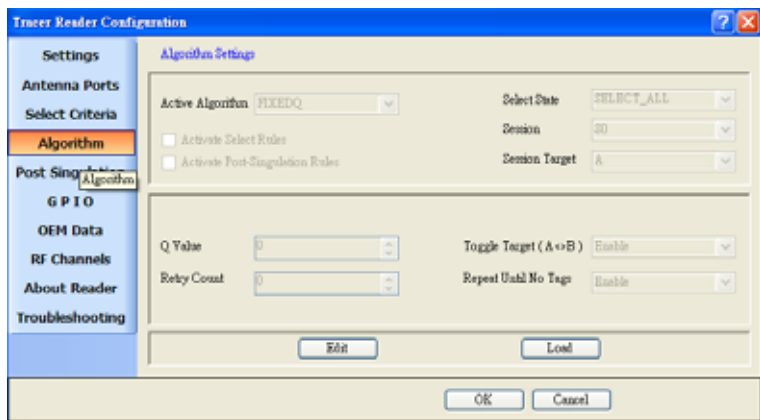

Figure 13 Inventory Algorithm Edit Page

In the **Active Algorithm** dropdown box, you can select between the Fixed Q and Dyanmic Q algorithm. When you select a new algorithm, the configurable fields displayed in the center sub-panel change to match those available with the selected algorithm.

The **Activate Select Rules** and **Active Post-Singulation Rules** checkboxes control whether the select and post singulation criteria that have been configured should be utilized during inventory, read, write, and similar operations.

3.4.5　Post Singulation Criteria Page

Use the **Post Singulation** page to view and configure reader settings that define the manner in which tags and post singulation are filtered (based on all or part of the tag's EPC).

The **Display Criterion #** spin box allows you to select the criteria currently being viewed. It has a range of one (1) up to the value displayed under **Active Criteria**.

The **Load** button causes the application to perform a direct query to the current reader and reload the page with the retrieved post singulation criteria settings.

To change the post singulation criteria parameters for the active reader, click the **Edit** button. This displays the dialog box shown in the figure below.

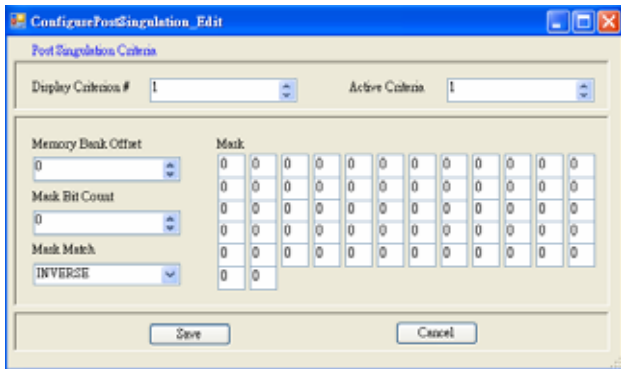Figure 14 Post Singulation Criteria Edit Dialog

This page allows configuration of individual post singulation criterion parameters.

Note: Only one active post singulation criteria is allowed at this time. Attempts to set the **Active Criteria** count greater than one (1) in the **Edit** dialog result in an Invalid Parameter error. This error is generated and displayed when the **Save** button is clicked.

3.4.6   GPIO Pin Configuration Page

RU-824 does not support GPIO configuration

3.4.7   OEM Data Page

The **OEM Data** page allows the user to read product data from the OEM area on the Indy Firmware microcontroller.
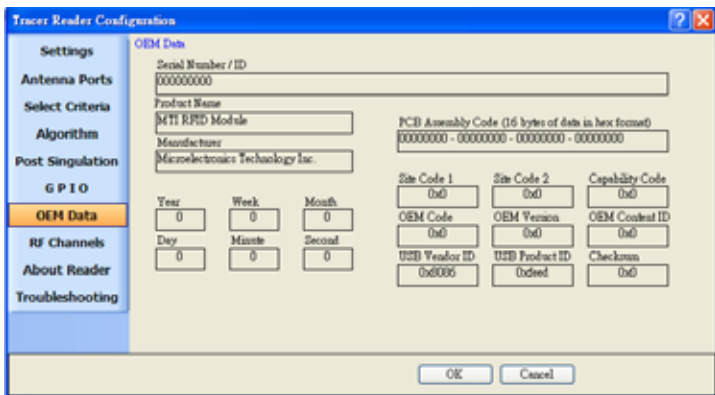

Figure 15 Inventory Algorithm Edit Page

3.4.8   RF Channel Definitions Page

The **RF** (Radio Frequency) **Channel Definitions** page provides to view the reader's frequency channels. An example of this page is shown below in the figure below. The table is limited by F/W configuration.
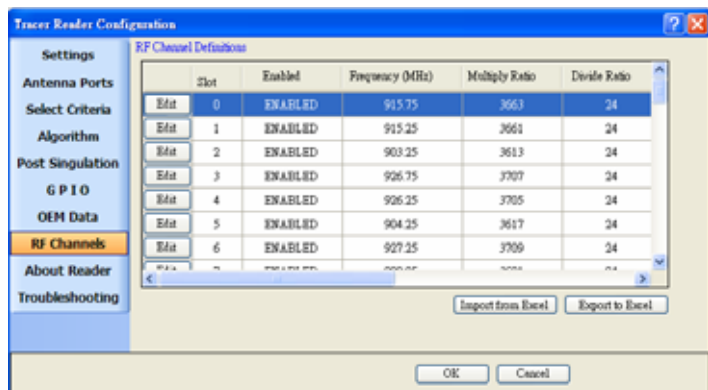
Figure 16 RF Channels Page

the detail channel definition of US and EU band are as follow.

Channel	Frequency	Channel	Frequency
Channel 0	902.75 MHz	Channel 25	915.25 MHz
Channel 1	903.25 MHz	Channel 26	915.75 MHz
Channel 2	903.75 MHz	Channel 27	916.25 MHz
Channel 3	904.25 MHz	Channel 28	916.75 MHz
Channel 4	904.75 MHz	Channel 29	917.25 MHz
Channel 5	905.25 MHz	Channel 30	917.75 MHz
Channel 6	905.75 MHz	Channel 31	918.25 MHz
Channel 7	906.25 MHz	Channel 32	918.75 MHz
Channel 8	906.75 MHz	Channel 33	919.25 MHz
Channel 9	907.25 MHz	Channel 34	919.75 MHz
Channel 10	907.75 MHz	Channel 35	920.25 MHz
Channel 11	908.25 MHz	Channel 36	920.75 MHz
Channel 12	908.75 MHz	Channel 37	921.25 MHz
Channel 13	909.25 MHz	Channel 38	921.75 MHz
Channel 14	909.75 MHz	Channel 39	922.25 MHz
Channel 15	910.25 MHz	Channel 40	922.75 MHz
Channel 16	910.75 MHz	Channel 41	923.25 MHz
Channel 17	911.25 MHz	Channel 42	923.75 MHz
Channel 18	911.75 MHz	Channel 43	924.25 MHz
Channel 19	912.25 MHz	Channel 44	924.75 MHz
Channel 20	912.75 MHz	Channel 45	925.25 MHz
Channel 21	913.25 MHz	Channel 46	925.75 MHz
Channel 22	913.75 MHz	Channel 47	926.25 MHz
Channel 23	914.25 MHz	Channel 48	926.75 MHz
Channel 24	914.75 MHz	Channel 49	927.25 MHz

Table 2 Operating channel definition in RU-824-100

Channel	Frequency
Channel 0	865.7 MHz*
Channel 1	866.3 MHz*
Channel 2	866.9 MHz*
Channel 3	867.5 MHz*

Table 3 Operating channel definition in RU-824-110

3.4.9   About Reader Page

The **About Reader** page is a static page that provides versioning information for the Indy components of the reader. It provides a single place to find the

version information for the Indy device, Indy Firmware, Indy USB host driver, and Indy Host Library API Interface. The figure below shows a sample About Page.
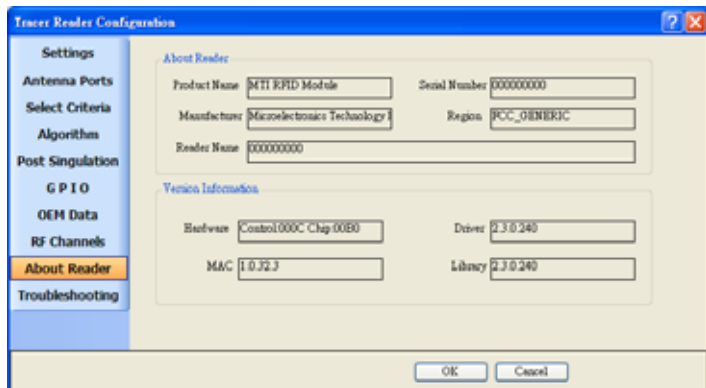

Figure 17 About Reader Page

3.4.10   Troubleshooting Panel

The **Troubleshooting** page provides access to the Indy Firmware error register as well as the ability to clear the error and reset the Indy Firmware. See the figure below.
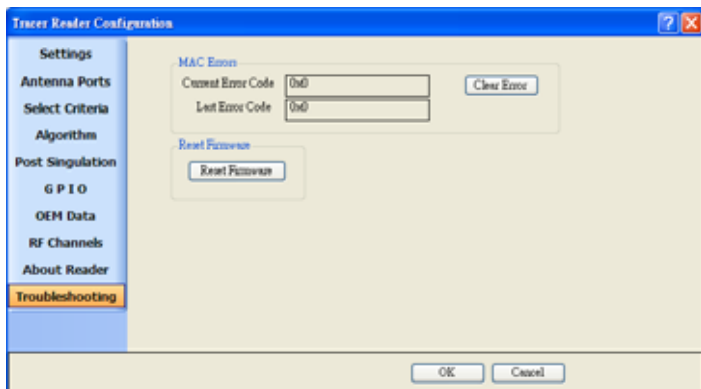
Figure 18 Troubleshooting Page

Note: Performing a **Reset Firmware** operation causes a reset of the connection to the current reader. The reader will no longer be accessible via the application until the application is restarted.

Appendix A: Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.　This equipment generates, uses and radiates radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.　However, there is no guarantee that interference will not occur in a particular installation.　If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

-　Reorient or relocate the receiving antenna.

-　Increase the separation between the equipment and receiver.

-　Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-　Consult the dealer or an experienced radio/TV technician for help.

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.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

FCC RF Radiation Exposure Statement:
1.　This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2.　This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment.

This device was tested for operations with the device maintained the use of distance 5mm to the human body to the back side of the Phantom. To maintain compliance with FCC RF exposure compliance requirements, avoid direct contact to the transmitting antenna during transmitting.

Appendix B: Declaration of Conformity for R&TTE Directive 99/5/EC

We,

MICROELECTRONICS TECHNOLOGY INC.

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Hereby, declare that the essential requirements set out in the **R&TTE Directive 99/5/EC**
have been fully fulfilled on our product with indication below:

Product Name: **RFID UHF USB READER**

Model / Brand Name: **RU-824 /MTI**

The following standards have been applied for the investigation of compliance:

(Radio Standard Name) (Standard Version)ETSI EN 302 208-2 V1.3.1:2010

(EMC Standard Name) (Standard Version) ETSI EN 301 489-1 V1.8.1 2008-4

ETSI EN 301 489-3 V1.4.1 2002-08

(Safety Standard Name) (Standard Version)EN 60950-1:2006+A11:2009

(EMF Standard Name) (Standard Version) EN62311:2008

And apply notified body assessment:

Notified Body number 0700

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Furthermore, the ISO requirement for the in-process quality control procedure as well as
the manufacturing process has been reached. The technical document as well as the test
reports will be kept for a period at least 10 years after the last product has been
manufactured at the disposal of the relevant national authorities of any Member State for
inspection.

Detail contact information for this declaration has been listed below as the window of any

issues relevant for this declaration.

European Representative **Manufacturer Contact**

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_____ 2010-10-26   _____ 2010-10-26

Signature   Date   Signature   Date