台揚企業集團

ISO 9001 Certified **MTI Group.**

MTI RFID Reader Operation Manual

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REVISED HISTORY				

DWG NO. 43-RFID0900-E1-MANUAL

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Contents

Chapter 1 – Introduction

1.1 Purpose

This document provides users and technicians with instructions for installing and operating the MTI RFID RU-813 Reader Application. The MTI RFID Reader Application and associated documentation are provided as an aid for configuring your MTI RFID reader and is not intended as an engineering design system.

1.2 Unpacking the Reader

After opening the shipping container perform the following:

1. Unpack the contents of container.
2. Inspect the shipping container for damage. If damaged, notify the carrier and Microelectronic Technology Inc. Keep the shipping materials for inspection.
3. Verify your reader package includes the following items:
   - MTI RFID UHF RU-813 Reader
   - Antennas
   - SMA Male to SMA Male Antenna Cables
   - 12 Vdc power adapter
   - Power Cord
   - System documentation CD

1.3 About the MTI RFID RU-813 Reader

The RU-813 is the MTI UHF RFID reader. This device currently supports many of today's most popular UHF tags including EPC G2. The device can read or write to any tag depending on the tag capabilities. The RU-813 incorporates a scalable architecture that enables the reader to be implemented as a stand-alone or included in a networked reader environment using Ethernert LAN connection.

1.4 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 can radiate 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.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an

uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Chapter 2 – Installation

2.1 Antenna Installation

The RU-813 supports from one Tx/Rx to four Tx/Rx external antennas in a variety of configurations. One- and two-antenna configurations are typical for most conveyor and container tracking. Four-antenna configurations are used for portals and loading dock doorways.

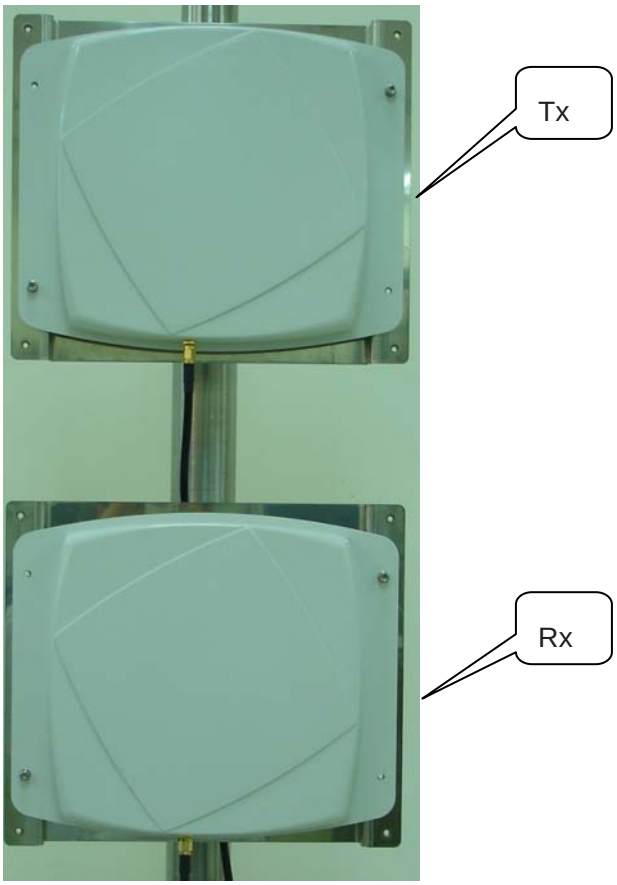


Figure 1 6dBi Flat Antenna Outline

The RU-813 is factory calibrated for operation with the following type of antenna and cable:

Item	Specification
Operating Frequency	902-928MHz
Impedance	50Ohm
VSWR	<1.3
Polarization	Circular
Gain	6dBi
Front to back ratio	20dB
Axial ratio	3dB
Connector	SMA Female
Dimension	140 x140 x30mm

The RU-813 is factory configured to operate with one Tx/Rx antenna connected to Port Tx1/Rx1. However, the reader can operate with up to four Tx/Rx antennas. If additional antennas are to be installed, use RF Command Suite to select the number of antennas in figure 2.

One Tx /Rx	Select Port : Tx 1 , Rx 1
Two Tx /RX	Select Port : Tx 1 , Rx 1, Tx 2 , Rx 2
Three Tx /Rx	Select Port : Tx 1 , Rx 1, Tx 2 , Rx 2, Tx 3 ,Rx 3
Four Tx/ Rx	Select Port : Tx 1 , Rx 1, Tx 2 , Rx 2, Tx 3 ,Rx 3 ,Tx 4 , Rx 4

Figure 2 Antenna Port Selection Table

It is highly recommended that the antenna mounting be adjustable in order to obtain the best performance from the system. However, the antennas must be installed on a solid surface or frame to prevent damage or later misalignment. Perform the following to install the antennas.

2.2 Reader Mechanical Installation

TheRU-813 is designed for easy installation. The following instructions provide the information to install your UHF reader.

As shown in figure 3, the reader is designed for horizontal installation. Mounting keyholes are provided on each side of the base plate for easy, non- permanent, installation and removal in figure 4.

Figure 3 RU-813 Reader Installation

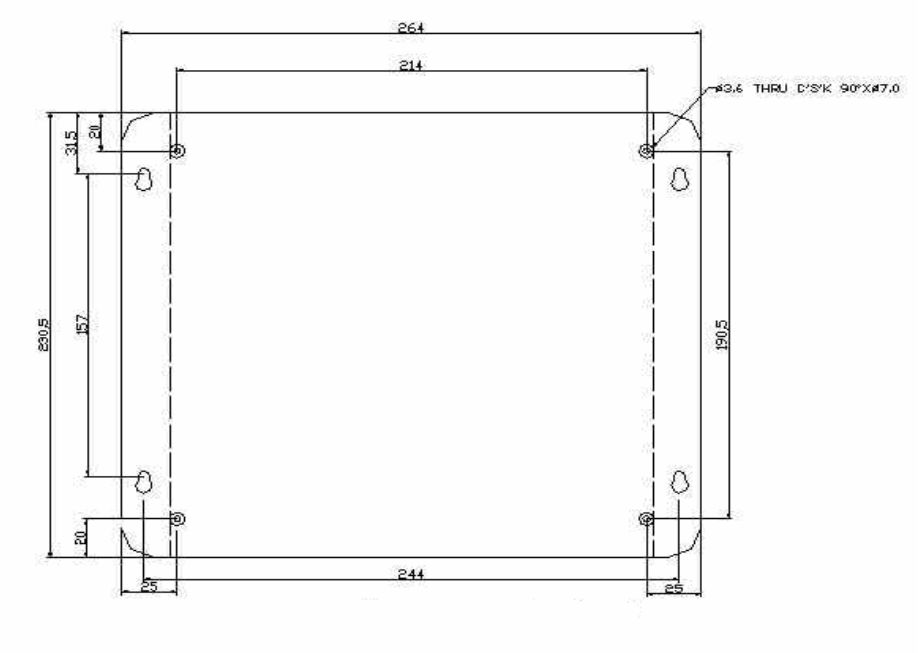


Figure 4 RU-813 Base Plate with Mounting Keyholes

2.2.1 Hollow Concrete Block Wall Mounting

To temporarily mount theRU-813 to a hollow concrete block wall, MTI recommends metal sleeve type concrete anchors that accept a #10 screw and flat washer. To install the reader on a hollow concrete block wall, perform the following.

1. Refer to Figure 4, and mark the location of the mounting screws. Do not install the anchors into the mortar joint.
2. Drill the appropriate size hole for a metal sleeve type anchor.
3. Install the anchors.
4. Install the washers and insert the screws.
5. Tighten the screws to within .375” of the anchor.
6. Install the reader and finish tightening the screws.

2.2.2 Solid Concrete Wall Mounting

To temporarily mount theRU-813 to a solid concrete wall, MTI recommends one-piece expansion type concrete anchors that accept a #10 screw and flat washer. To install the reader on a concrete wall, perform the following.

1. Refer to Figure 4, and mark the location of the mounting screws.
2. Drill the appropriate size hole for a expansion type anchor and install the anchors.
3. Install the washers and insert the screws.
4. Tighten the screws to within .375” of the anchor.
5. Install the reader and finish tightening the screws.

2.2.3 Wood or Metal Wall Mounting

To temporarily mount the RU-813 to a wood or sheet metal wall, MTI recommends either #10 x 1 inch wood screws or #10 x 3/4 inch sheet metal screws and washers. To install the reader on a wood or metal wall, perform the following.

1. Refer to Figure 4, and mark the location of the mounting screws.
2. Drill the appropriate size hole for screws.
3. Install the washers and insert the screws.
4. Tighten the screws to within .375” of the surface.
5. Install the reader and finish tightening the screws.

2.2.4 Drywall Mounting

To temporarily mount the RU-813 to drywall or sheetrock, MTI recommends either #10 toggle bolts or #10 drywall anchors.

2.3 Ethernet LAN Installation

The RU-813 can be networked with other readers on an enterprise 10/100 BaseT Ethernet LAN with crossover Ethernet cable. The IP address can then be accessed by your network server or host computer, please refer to chapter 3 for further information.

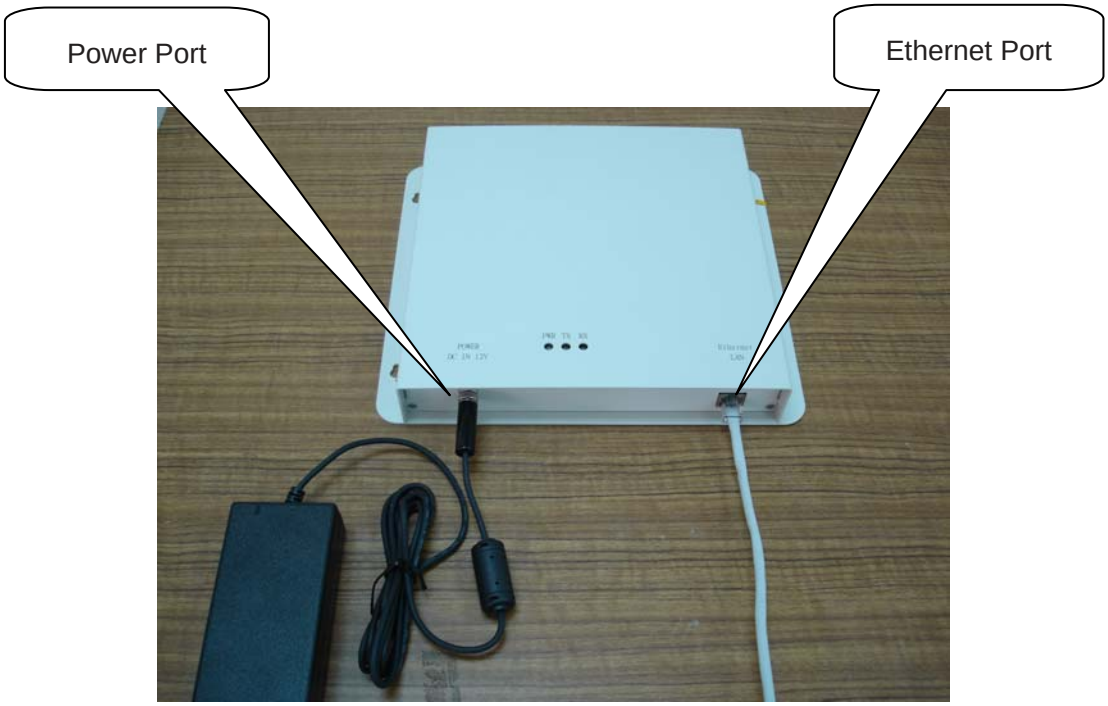


Figure 5 Installation

Chapter 3 – Configuration

3.1 Ethernet Overview

When the reader is installed on a TCP/IP network connected to the internet, the reader must be assigned a unique IP address. The default IP address is set as 192.168.1.200, and the default subnet mask is set as 255.255.255.0, when the reader is shipped from factory. All these can be set by using web browser.

Beside, the gateway, destination IP address, destination port, and setup password can be set as the same way as above.

.

Note:

- *The default setting of destination IP address is set as 192.168.1.39*
- *The default setting of destination port is set as 100*
- *The default setting for the setup password is set as empty.*

3.2 IP Address or Subnet Mask Setup

To set up IP address of RU-813 for Ethernet communication, perform the following steps:

1. Verify all cables and power supplies are secure and power up the readers.
2. Set the subnet mask of host computer to the same subnet domain of reader.
3. Open Web browser (IE or Netscape) on your host computer.
4. Type IP address at web address on the browser.
5. Enter password (the default password is empty), then click “Login”.
6. Change IP address.
7. Change subnet mask, if necessary.
8. Click “Update”

IP address	192.168.1.200
Subnet mask	255.255.255.0

3.3 Gateway Address Setup

To set up IP address of RU-813 for Ethernet communication, perform the following steps:

1. Verify all cables and power supplies are secure and power up the readers.
2. Set the subnet mask of host computer to the same subnet domain of reader.
3. Open Web browser on your host computer.
4. Type IP address at web address on the browser.
5. Enter password, then click “Login”.
6. Chang Gateway address
7. Click “Update”

3.4 Destination Address and Destination Port Setup

To set up destination address and destination port of RU-813 for Ethernet communication, perform the following steps:

1. Verify all cables and power supplies are secure and power up the readers.
2. Set the subnet mask of host computer to the same subnet domain of reader.
3. Open Web browser on your host computer.
4. Type IP address at web address on the browser.
5. Enter password, then click “Login”.
6. Chang destination address and destination port
7. Click “Update”

3.5 Setup Password Setup

To set up password of RU-813 for Ethernet communication, perform the following steps:

1. Verify all cables and power supplies are secure and power up the readers.
2. Set the subnet mask of host computer to the same subnet domain of reader.
3. Open Web browser on your host computer.
4. Type IP address at web address on the browser.

5. Enter password, then click “Login”.
6. Chang setup password
7. Click “Update”

Note: Once the Setup password is changed, the new password will be required for next login process.

Chapter 4 – Operation

4.1 Overview

The RFID Reader Application is a Microsoft Windows application that provides a Graphical User Interface (GUI) for MTI RFID Reader Products.

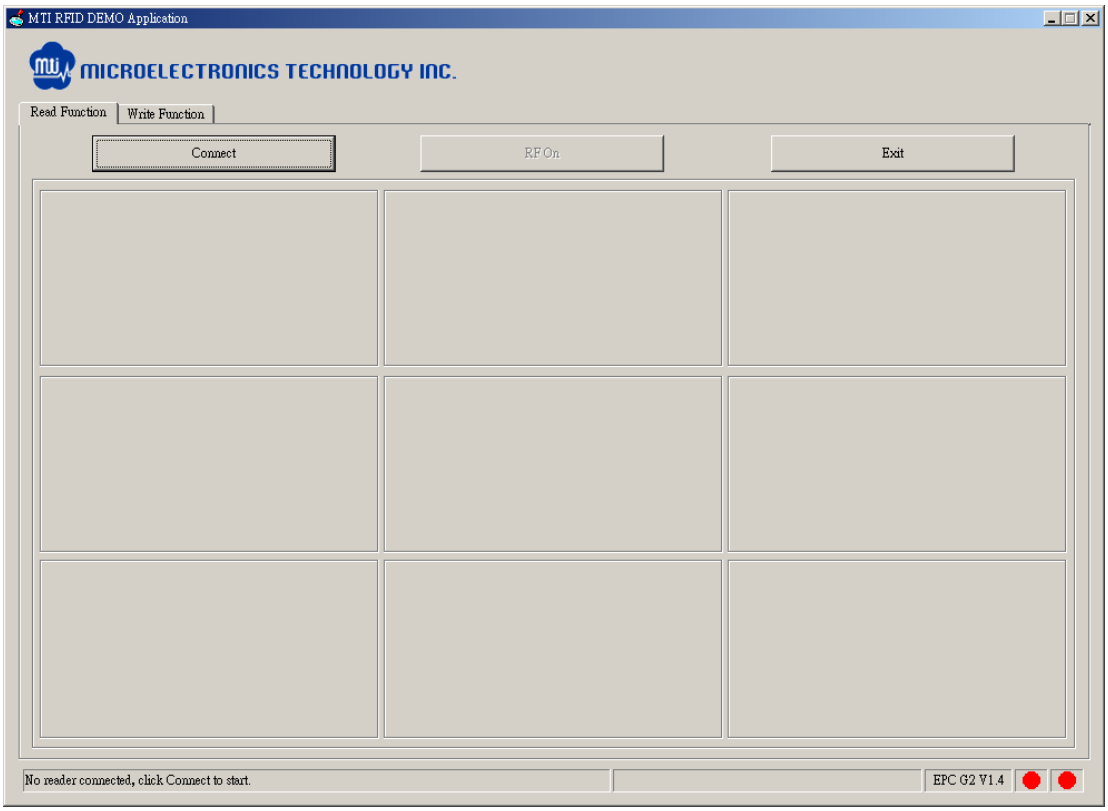


Figure 6 Overview of MTI RFID Reader Application

Functions provided by the RFID Reader Application include the following:

- View tag data
- Write data to tag

4.2 Startup

MTI RFID Reader Application can communicate with all MTI readers through the Ethernet (TCP/IP) port. Verify your reader is connected to the correct port and power up.

After connect power cord, the PWR LED light on the shell of reader will turn on. As figure 7.

Figure 7

To start up MTI RFID Reader Application, perform the following:

1. Execute RFID DEMO AP.exe
2. The application will attempt to connect to using the most recent configuration settings.

Note:

- *The destination port for this application is required to set as 100, please refer to chapter 3 for Ethernet configuration setting.*

4.2 Version Identification

To determine the current version of your MTI RFID Reader Application, refer to the status bar below the application.

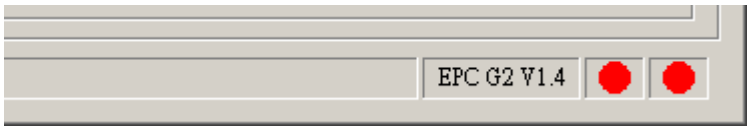


Figure 8 Current version of the application

4.3. Operating

4.3.1 Function Tabs

RFID Reader Application operations are divided into two functional interfaces selected by tabs at the top of the display.

Figure 9 functional tabs

- Read Function: Read tag data.
- Write Function: Write data to tag

4.3.2 Status Bar

At the application below, the status bar provide the information of the operation.

Figure 10 Status bar

Connection light:

- Red: no connect
- Green: connected

RF Power light:

- Red: RF off
- Yellow: RF On

4.3.3 Connect

Before read/write tag, you need to establish connection between PC and reader. Use [Connect] button to connect to reader. If application does not connect, verify the PC and reader's Ethernet network setting. Please refer to Chapter 3 for further information

network	PC
IP address	192.168.1.39
Subnet mask	255.255.255.0
	Reader
IP address	192.168.1.200
port	100

4.3.4 Read Tag Data

To display tag data as the data is received from the reader by clicking the RF On button. When tags are read, they are displayed in the window and the statistics are updated.

When reader accepted the RF On command from computer, the TX LED light on the shell of reader will turn on. On the other hand, TX LED light will turn off when RF OFF. As following figure.

RF ON

RF OFF

Figure 11

During the RF On period, if reader receive the response signal from tag, the RX LED light on the shell of reader will flash one time.

Figure 12 RX LED light

The Tag Read Time displayed in the lower window is the total tag read count since the last reset. The Antenna No is the tag be read by which Tx/Rx antenna.

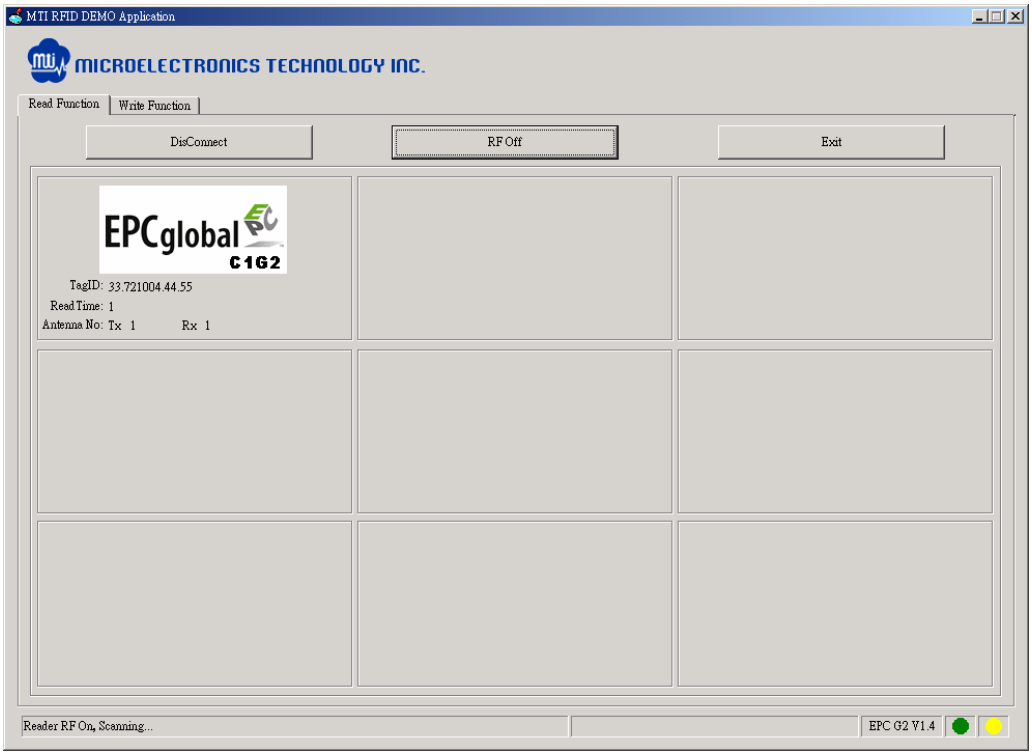
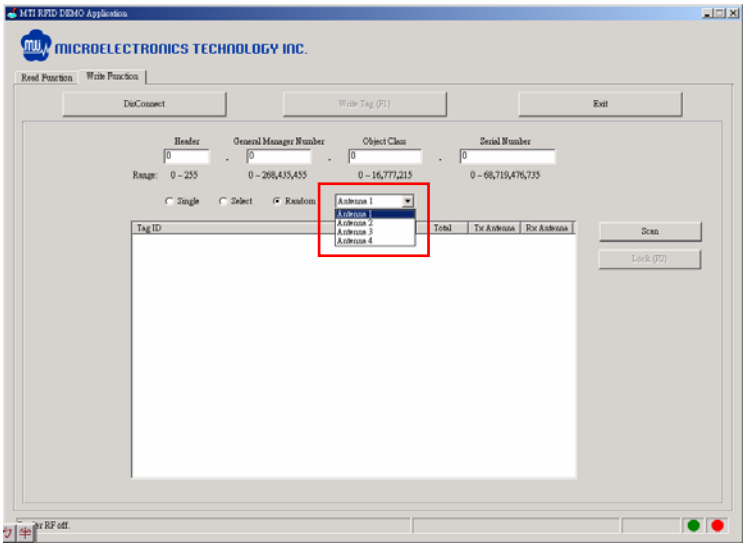


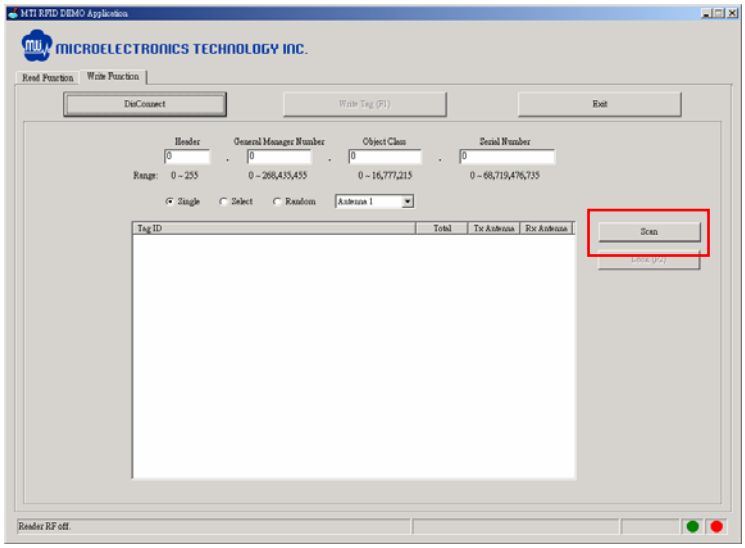
Figure 13 display tag data

4.3.5 Write Data to Tag

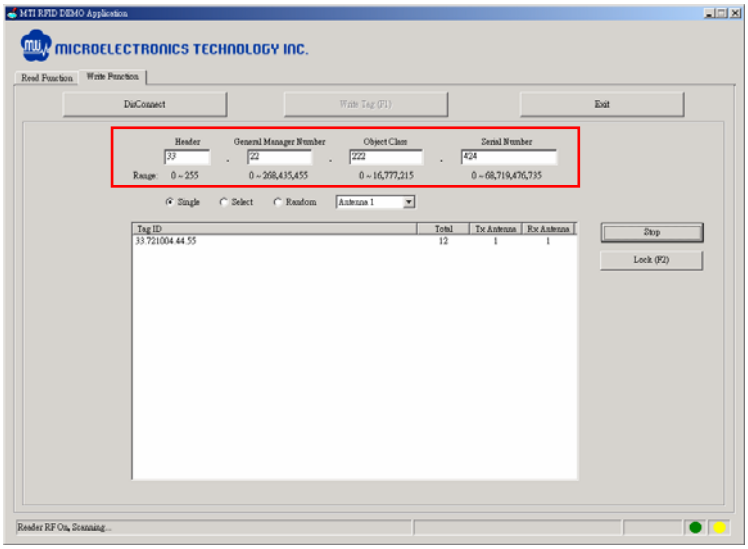
Step 1: Select which antenna to write data to tag.



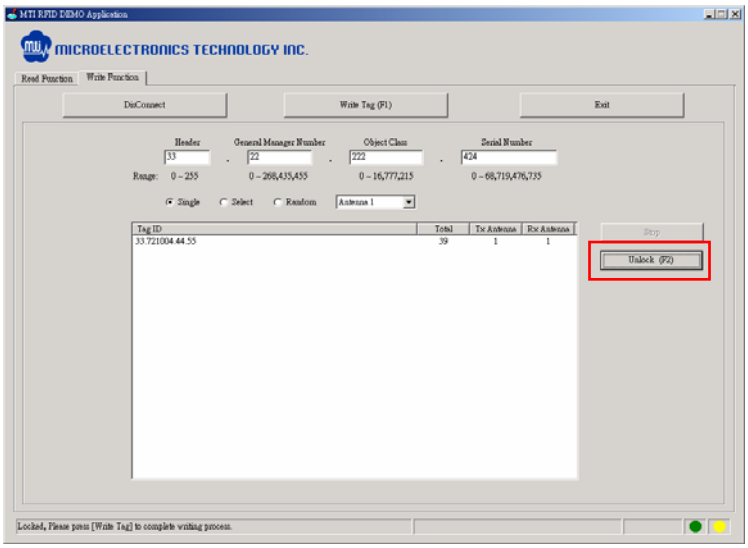
Step 2: Click the Scan button to search the tag in the range of antenna.



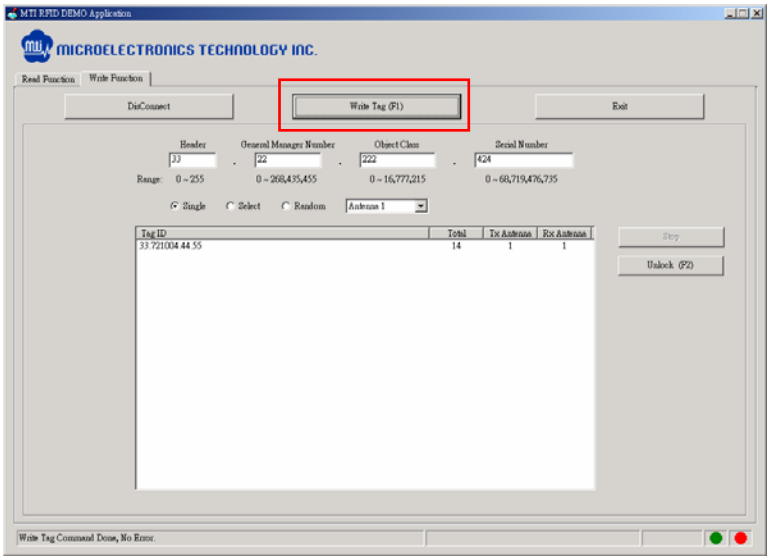
Step 3: Fill up the four columns of the new tag ID.



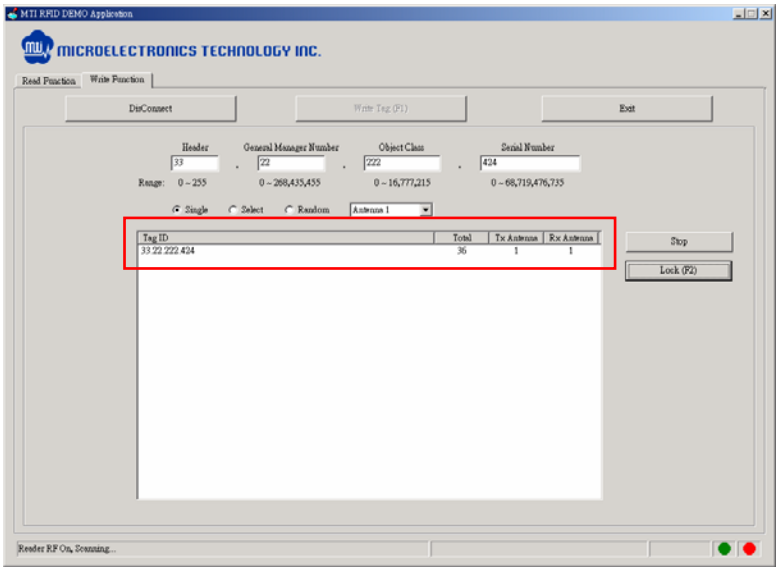
Step 4: Click the Lock button, then the button will change to Unlock.



Step 5: Click the Write Tag button.



Step 6: If write command success done, click Unlock to re-scan. And the new tag ID will display.



Chapter 5 – Specification

This chapter describes the specification for MTI RFID RU-813 Reader

Operating Frequency	910-920 MHz
RF output power	29dBm
RFID protocol	EPC C1G2 V1.09
Humility	0~99% Non-Condensing
Modulation	Amplitude Modulation
Operation Channels	51
Occupied Channel 20dB Bandwidth	200KHz
Operating Temperature	-20 ~ +50 degree C
Storage Temperature	-40 ~ +70 degree C
Antena	8 port TX/RX Separate for 4 reading points/ 6 dBi circular polarization
Power Supply	12VDC/Max 2A
Communication interface	RJ45
LAN Interface	Ethernet/TCP/IP
Indicators	Power/TX/RX
Dimension	230 mm x 264 mm x 40mm
Weight	1.365 kG /2.989 lb