Volume

FERMI PRIVATE LIMITED

Software Support

RFID Reader User Manual

SOFTWARE SUPPORT

RFID Reader User Manual

30 Biopolis Street •# 09-02
Matrix, SINGAPORE 138671
Phone +65 6478 8779 •Fax +65 6478 8785

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FCC Interference Statement
This equipment complies with Class B, Part 15 of the FCC rules.
Operation is subject to the following conditions:
1. This device may not cause harmful interference,
2. This device must accept any interference received, including interference that may cause undesired operation.

FCC Information to Users
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For Class B Unintentional Radiators
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 generated, 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. 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 off and on the equipment, the user can correct the interference by the following measures:
1. reorient or relocate the receiving antenna
2. increase the separation between the equipment and receiver
3. connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
4. consult the dealer or an experience radio/TV technician for help.

Please note that changes or modifications not expressedly approved by Fermi Pte Ltd could void the user's warranty to operate the equipment.

Table of Contents

1. Installation

FeRmi Reader Application (hereafter refer as application) is available from 2 sources, either from FeRmi's FTP server or from the installation CD.

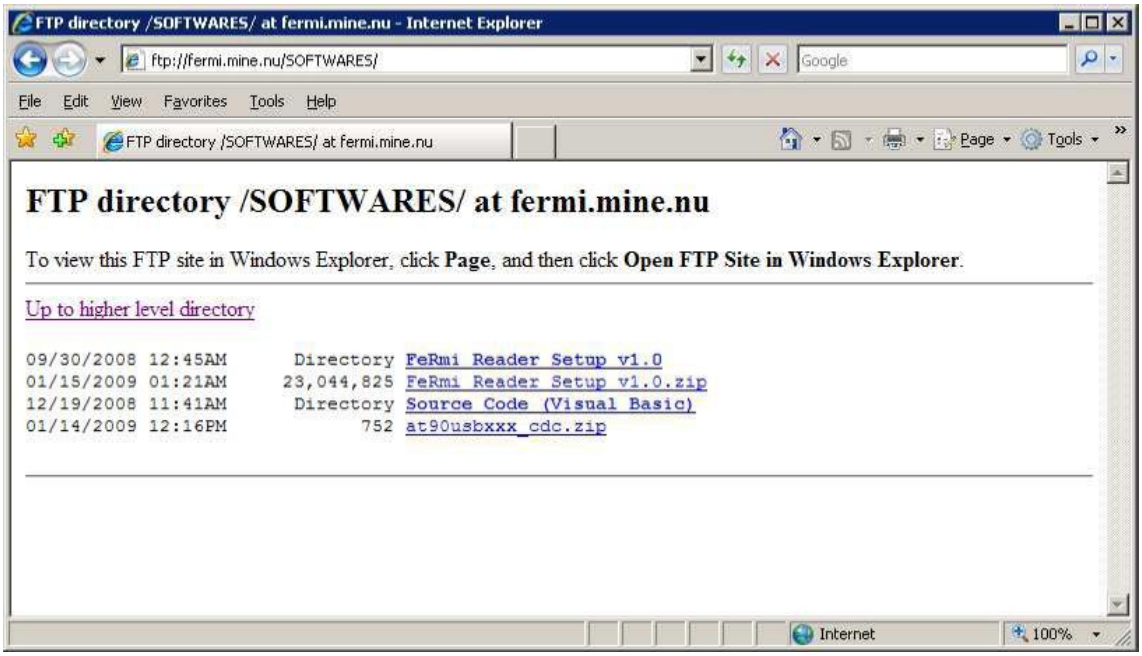
This procedure is applicable to Window XP and installation from the FTP source only.

To download the application from the FTP server, authenication is required and the login details is as follow:

FTP Server: ftp://fermi.mine.nu/

Username: fermi

Password: rfidisgreat

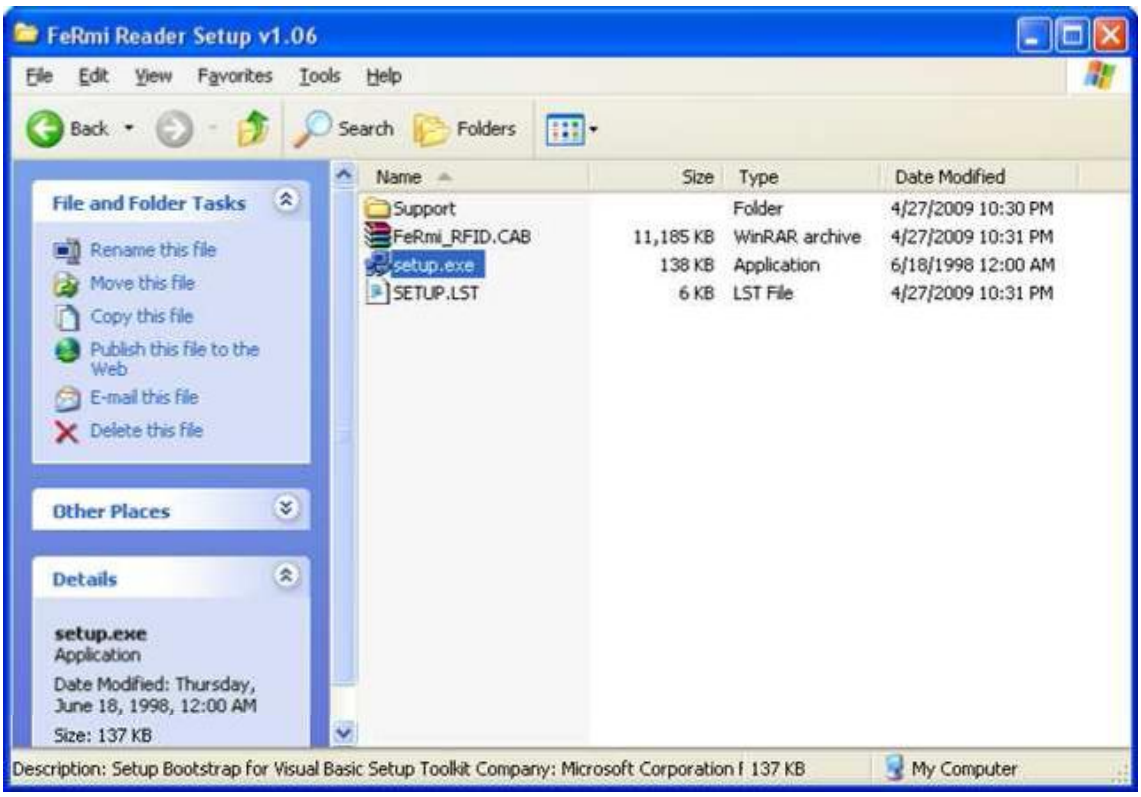


To obtain a copy of the installation CD, please send your email to sales@fermi.com.sg.

1.1 Setting up the software

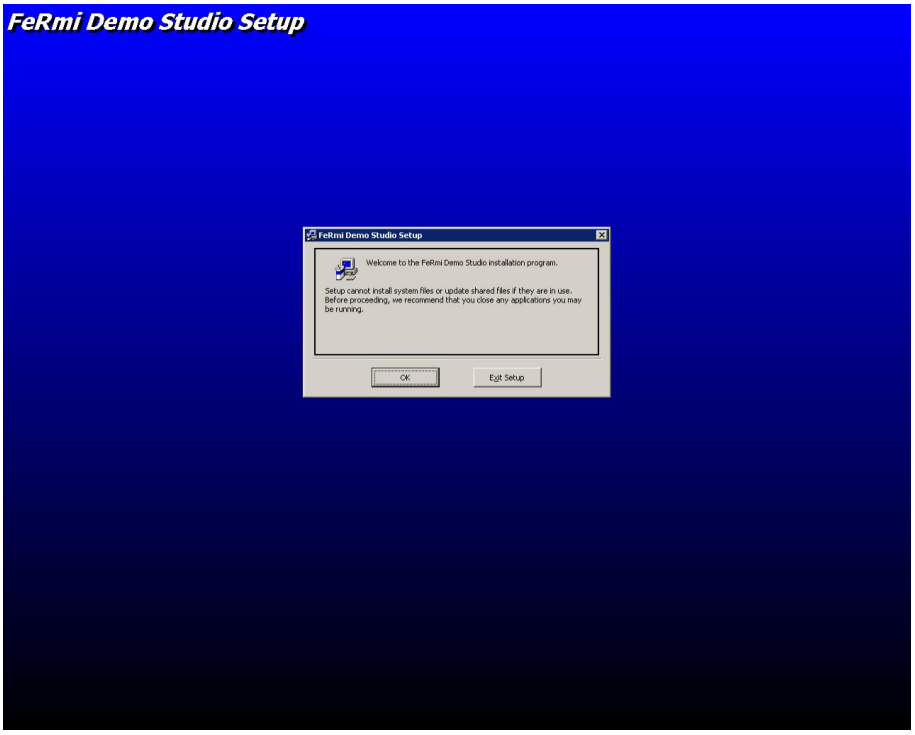
To install the software, perform the following:

1. Download the application (compress version) from the FTP server.
2. Decompress the download file.
3. Locate the decompress directory and double click on the setup.exe.

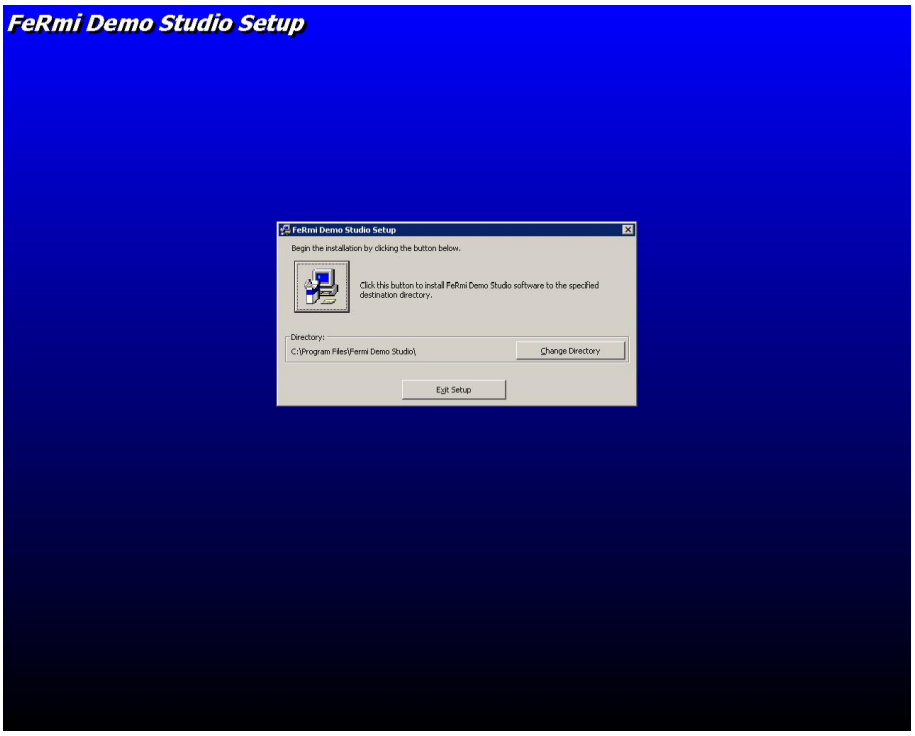


4. The setup screen is displayed.

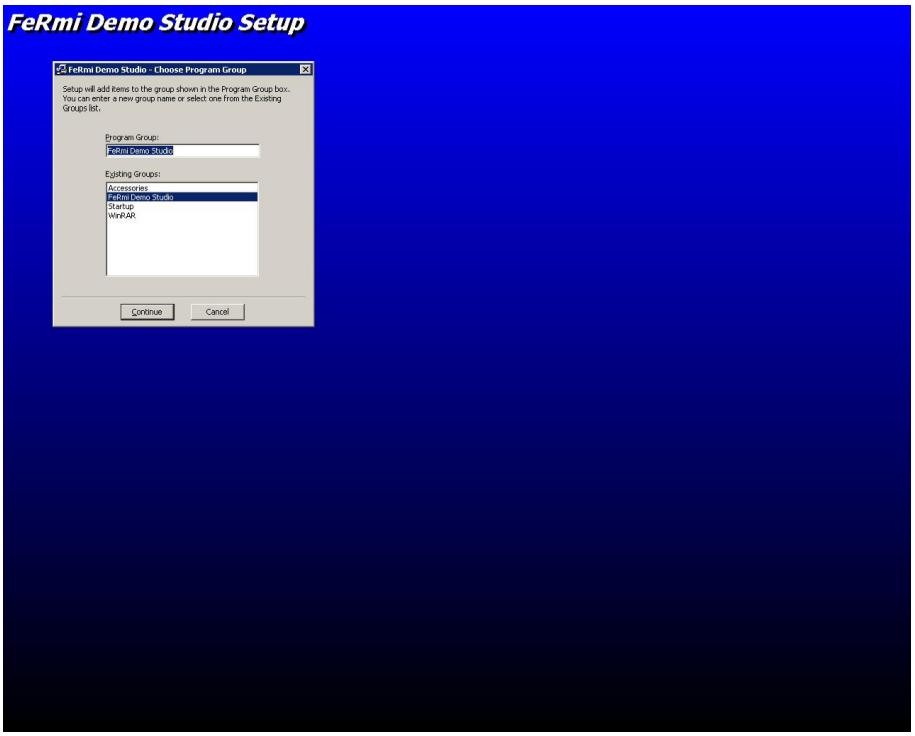
5. Click on the **OK** button.



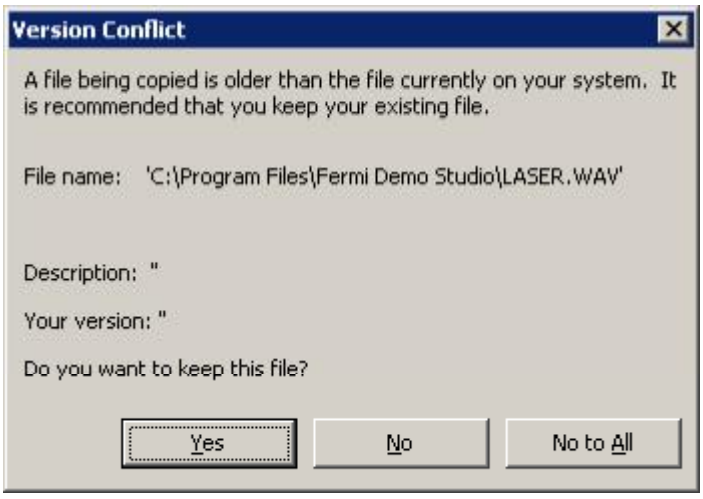
6. Select the destination directory and click on the button to begin setup.



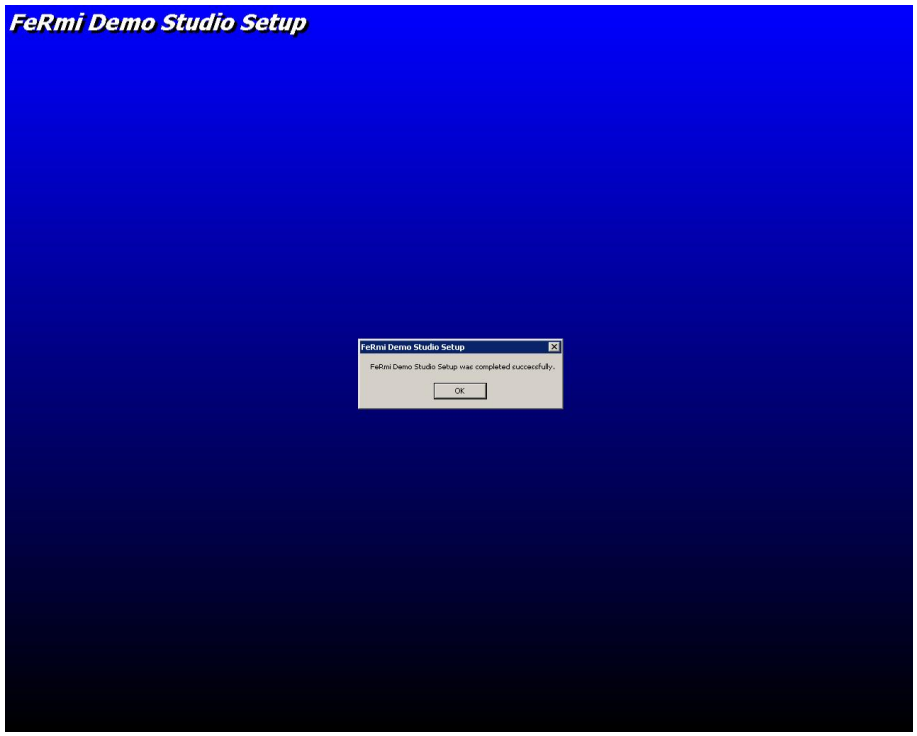
7. Click on the **Continue** button.



8. If there is any version conflict on the file(s) being copied is older than the file currently on the system, click **Yes** to keep the existing file on the system.



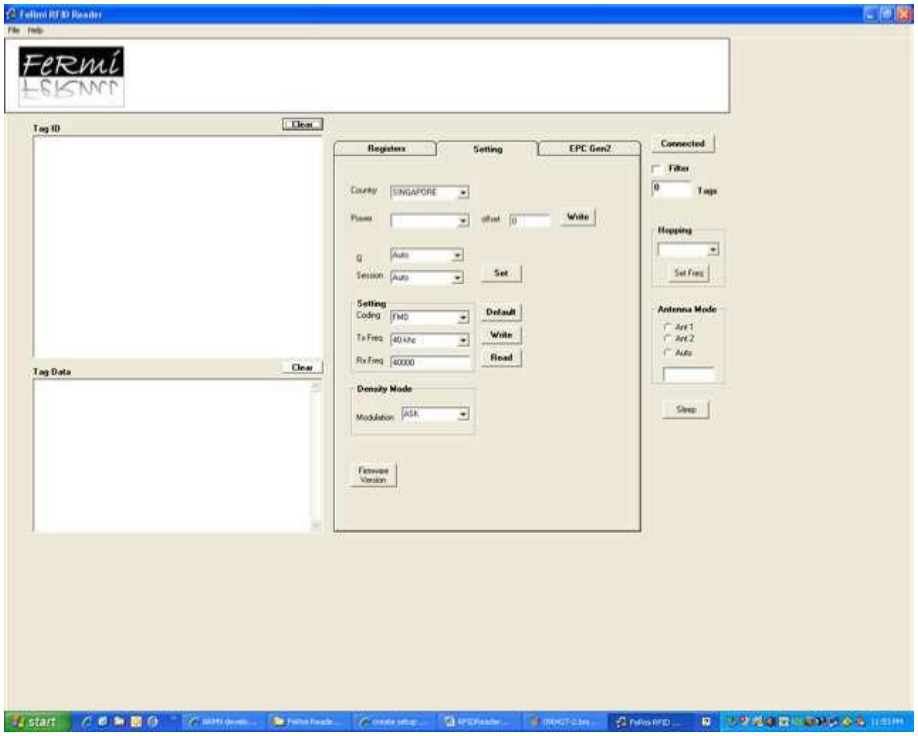
9. Click on OK to complete setup.



10. Congratulation! You have successfully installed the reader application.

11. To activate the application, select:

    Start ⇨ All Programs ⇨ FeRmi Demo Studio ⇨ FeRmi Reader Demo



The following steps (step 12 onwards) are only applicable to the USB EasyU reader only.

12. Download the USB driver from the FTP server.

13. Decompress the download file.

14. When the USB cable is connected to the reader from the PC, the system will prompt for the driver. Just follow the on-screen instructions to locate the driver and perform the installation. Upon successful installation of driver, the reader is ready for use.

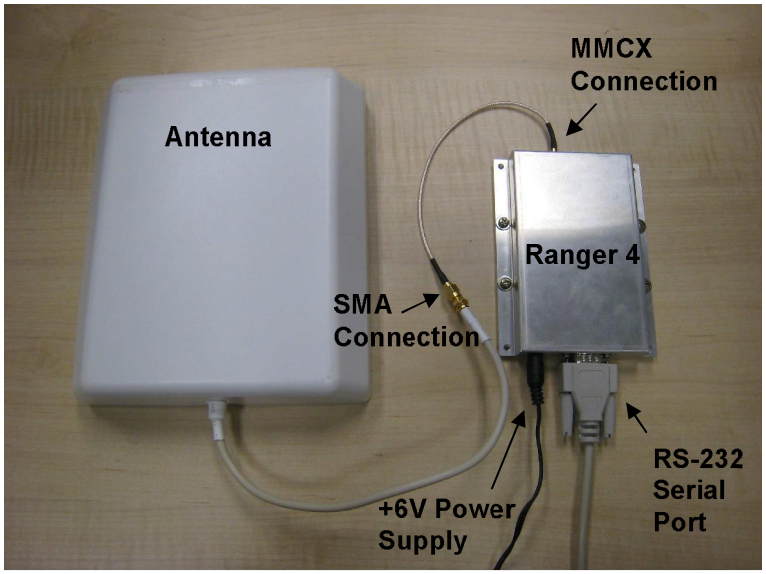
1.2 Setting up the hardware

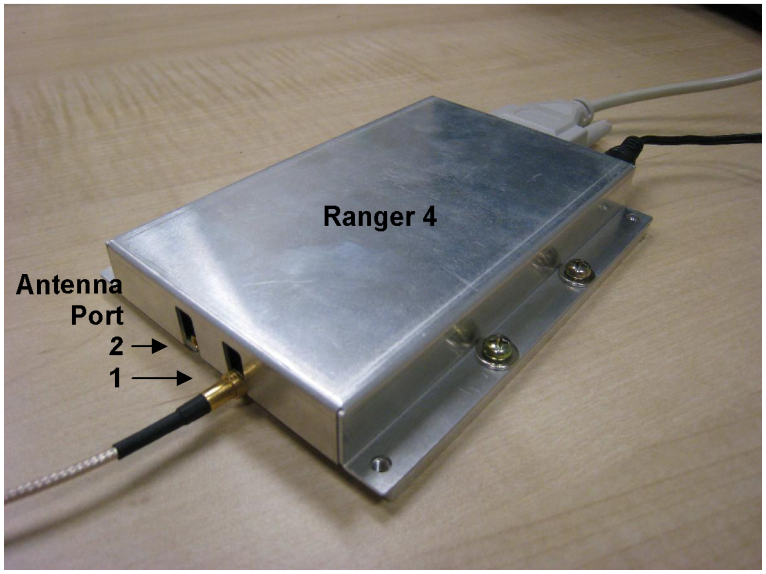
Ranger 4 UHF RFID Reader

When setting up the Ranger 4 UHF RFID Reader (hereafter refer as reader), use the following procedures:

- attach the antenna(s) and 50 Ω terminator to the open antenna port (if any).
- attach the DB9 serial cable from a PC to the reader.
- attach the power adaptor.
- power up the reader.

Do ensure that the antenna(s) is/are connected to the reader using the correct RF connector(s) before the power supply is turn on and use only the right power rating adaptor. Failure to do so may damage the reader.





EasyU UHF RFID Reader

The EasyU UHF RFID reader (hereafter refer as reader) is integrated with an internal antenna.

When setting up the reader, use the following procedures:

- attach the DB9 serial cable (for Serial reader only) from a PC to the reader.
- attach the USB cable from a PC to the reader.

The amber POWER LED will light up.

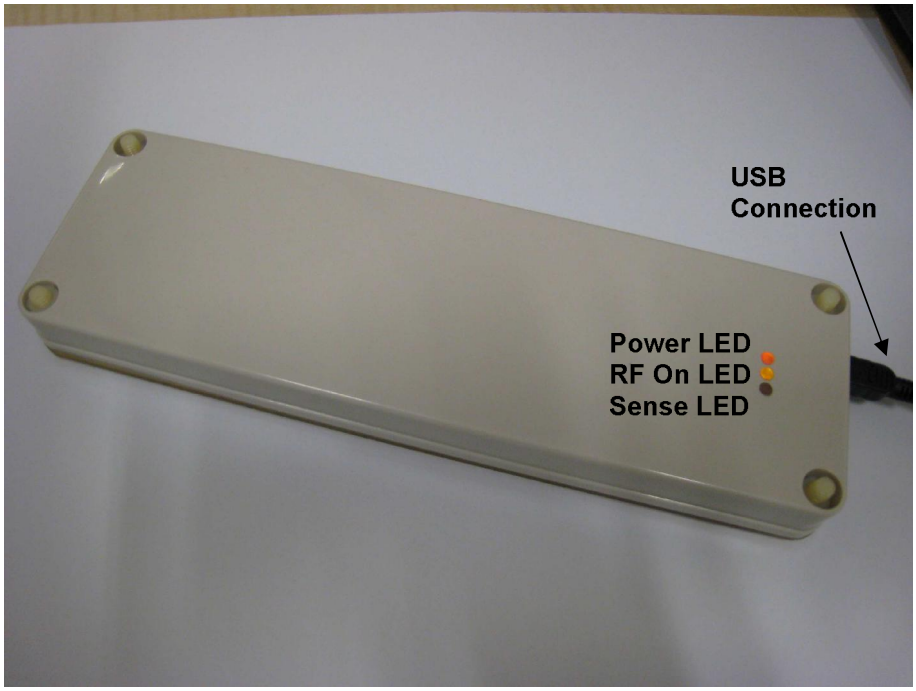
EasyU (+) UHF RFID Reader

The EasyU (+) UHF RFID reader (hereafter refer as reader) is integrated with an internal antenna.

When setting up the reader, use the following procedures:

- attach the USB cable from a PC to the reader.

The amber POWER LED will light up.



2. User Guide

FeRmi Reader Application is written in Visual Basic version 6, and communicate with the reader either through the RS-232 serial port or the USB port (virtual serial).

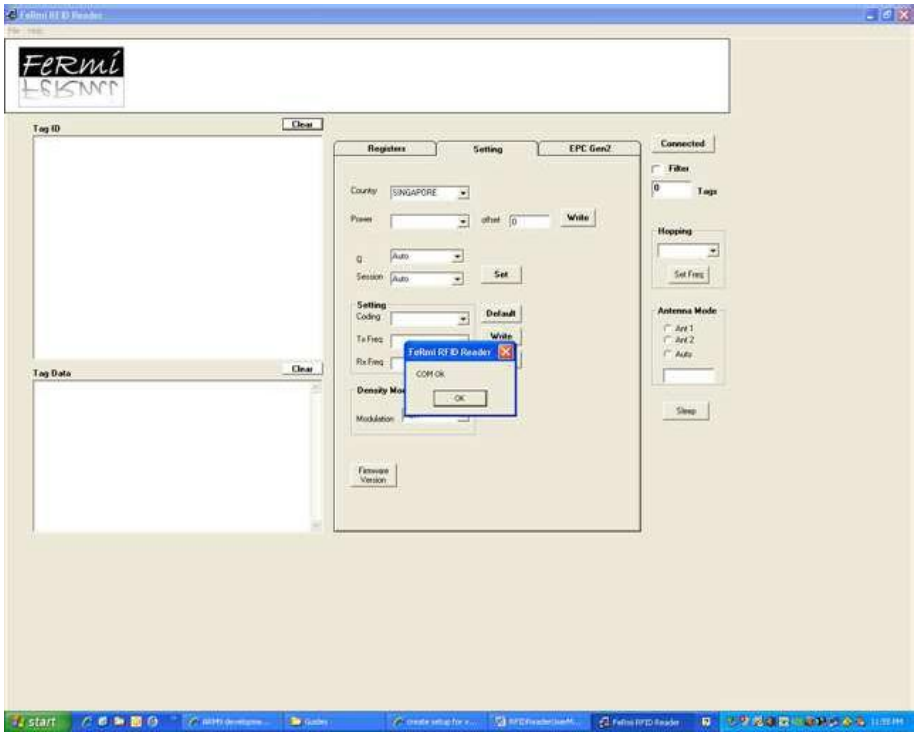
The communication method available for the different readers are shown as below:

UHF RFID Reader	Communication
Ranger 4	RS-232 serial port
EasyU	RS-232 serial port, USB

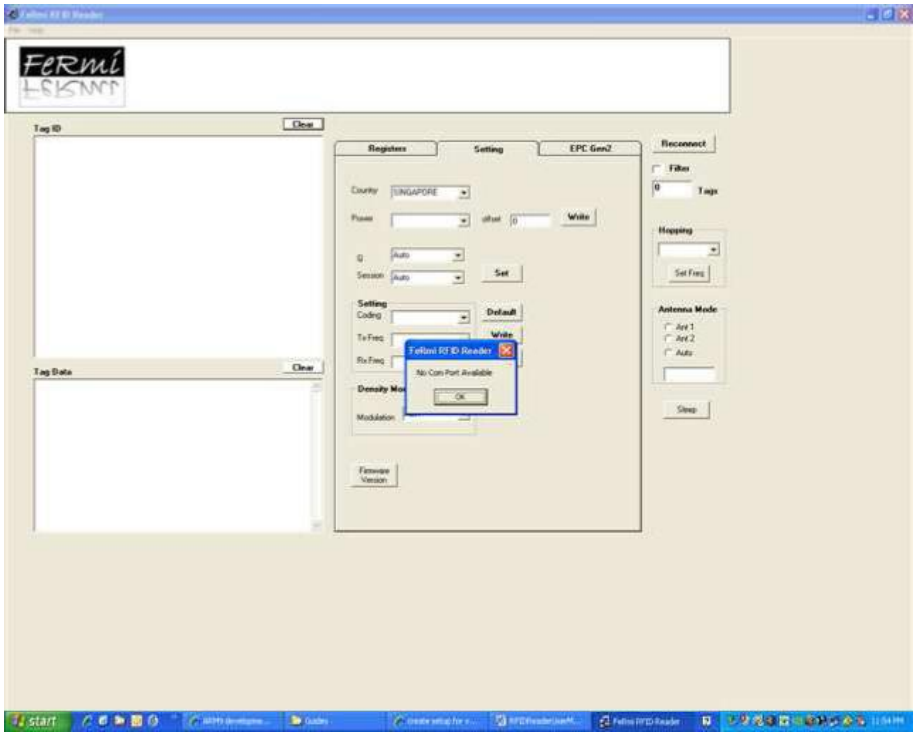
The following procedure explains how to setup the communication link between the application and the reader:

1. Start the reader applications.

2. If the communication between the reader application and the reader is successful, a new window will pop-up showing **COM OK** and the button (top right) will be shown as **Connected**.



If the communication failed, a new window will popped up and report the **No Com Port Available** error, close this window and click on **Reconnect** button (top right) to reconnect.



2.1 Inventorying Tags in Off mode (Programmable Inventorize)

1. Click **RF On** button.

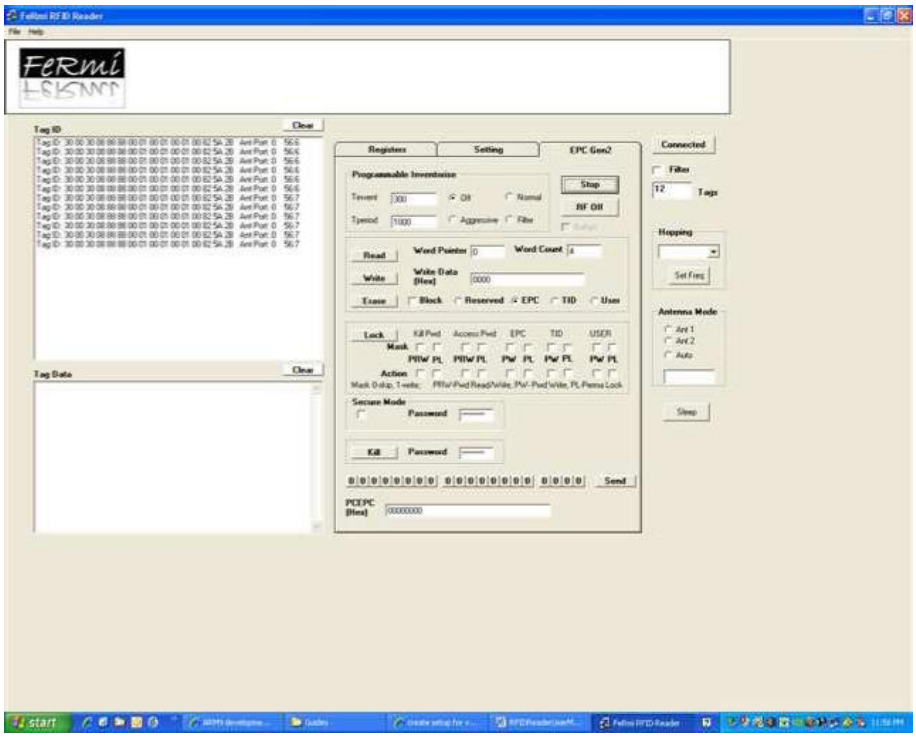
   The reader turn on the RF circuits and the yellow **RF** LED light up (for EasyU only). The **RF On** button is now shown as **RF Off**.

2. Click **Inventorize**.

   The **Inventorize** button is now shown as **Stop**.

   Flash tag(s) at the antenna. The reader reads the tag(s) and starts to display the id(s) in the **Tag ID** display box. It will continuously display the tag(s) found until the **Stop** button is click.

   The green **SENSE** LED will blinks to indicate detection of the tag(s).



3. To stop reading tags, click on the **Stop** button and follow by the **RF Off** button.

2.2 Inventorying Tags in Normal mode (Programmable Inventorize)

1. Click on **Normal** button.

   This put the reader into the time search mode, for every period defined by **Tperiod** in millisecond, the reader will search for any tag(s) for a period defined by **Tinvent** in millisecond.

2. Click **RF On** button.

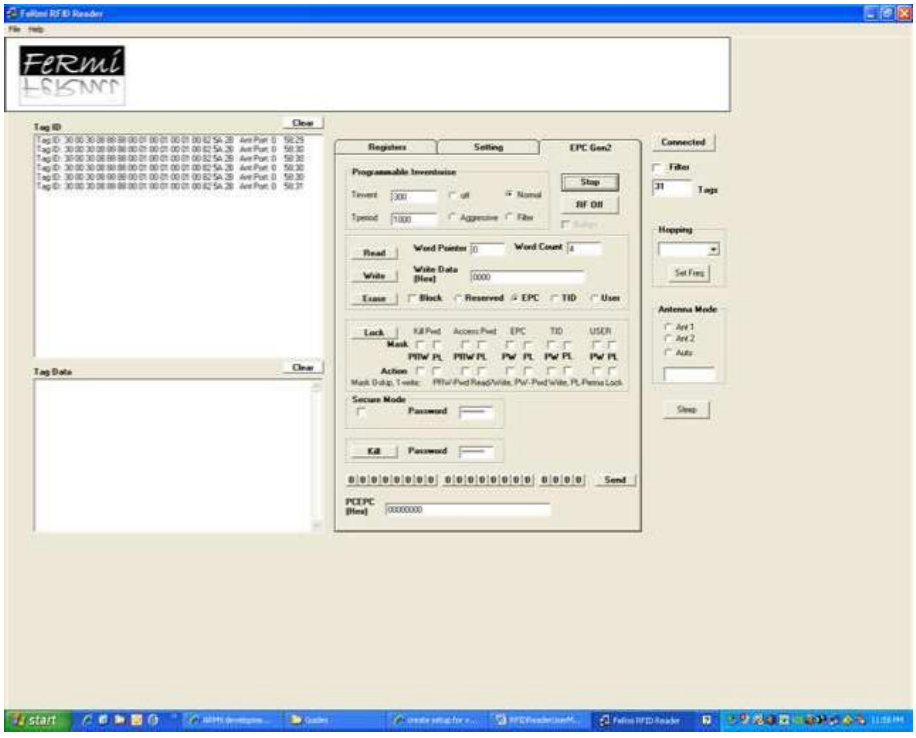
   The reader turn on the RF circuits and the yellow **RF** LED light up (for EasyU only). The **RF On** button is now shown as **RF Off**.

3. Click **Inventorize**.

   The **Inventorize** button is now shown as **Stop**.

   Flash tag(s) at the antenna. The reader reads the tag(s) and starts to display the id(s) in the **Tag ID** display box. It will continuously display the tag(s) found in each **Tinvent** period until the **Stop** button is click.

   The green **SENSE** LED will blinks to indicate detection of the tag(s).



4. To stop reading tags, click on the **Stop** button and follow by the **RF Off** button.

2.3 Inventorying Tags in Filter mode (Programmable Inventorize)

1. Click on **Filter** button.

   This mode is the add-on feature to the **Normal** mode, except the same tag(s) found during the same **Tinvent** period will be displayed only once.

2. Click **RF On** button.

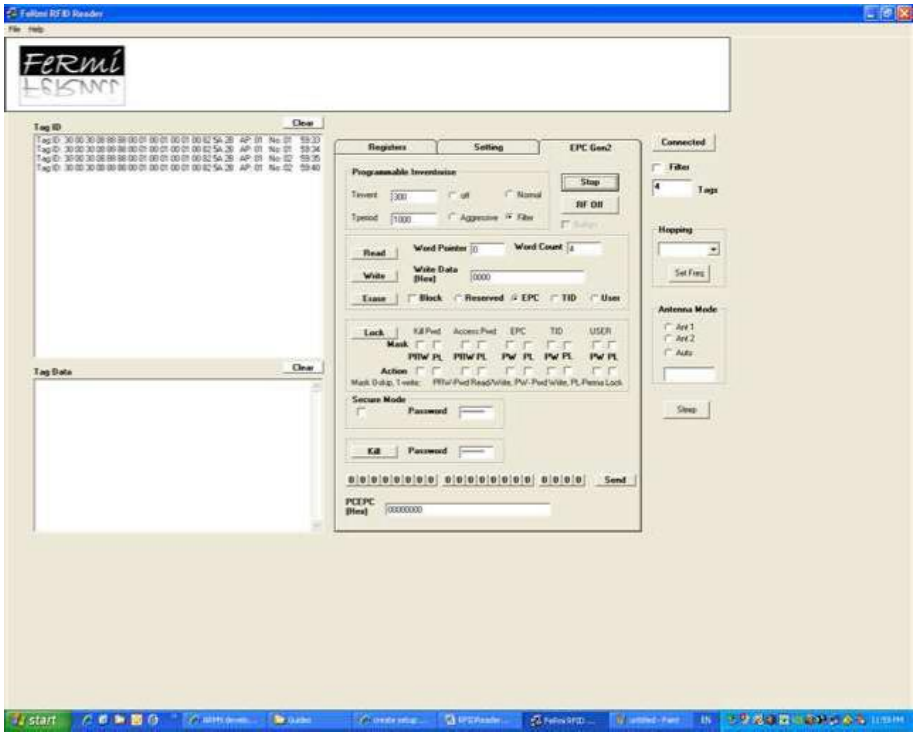
   The reader turn on the RF circuits and the yellow **RF** LED light up (for EasyU only). The **RF On** button is now shown as **RF Off**.

3. Click **Inventorize**.

   The **Inventorize** button is now shown as **Stop**.

   Flash tag(s) at the antenna. The reader reads the tag(s) and starts to display the id(s) in the **Tag ID** display box It will continuously display the tag(s) found in each **Tinvent** period until the **Stop** button is click.

   The green **SENSE** LED will blinks to indicate detection of the tag(s).

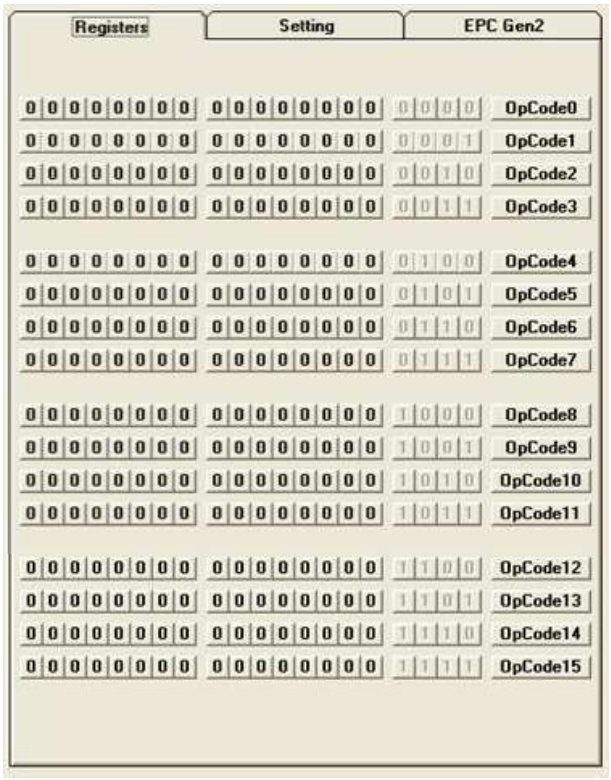


4. To stop reading tags, click on the **Stop** button and follow by the **RF Off** button.

2.4 Controlling the RW910 RFID IC Internal Registers

Under the **Registers** tab, there are 13 options provided to control the internal registers of the RW910 RFID IC. The below table summarized the function of each register.

Op Code	Control Registers	Op Code	Control Registers
0	TX/Rx mode	8	Not used *
1	VGA Gain	9	Integer-N
2	Power Amplifier Gain Attenuation	10	Not used *
3	Modulation	11	Delta Sigma Accumulator
4	Pulse Shaping Filter and LO	12	Reference Divider R
5	LNA Gain and Receiver's Channel Select Filter	13	Not used *
6	VCO band selection	14	ADC/DAC bi-directional pad
7	Synthesizer	15	Power



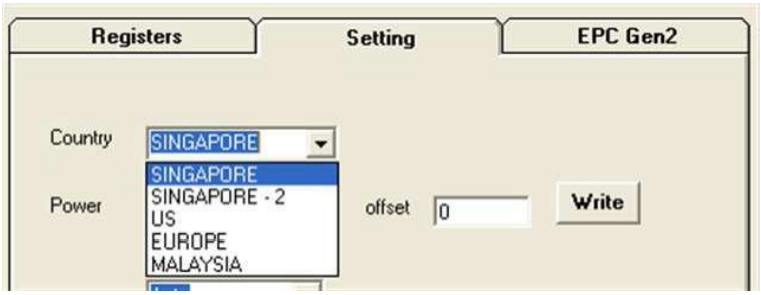
For details on the respective registers, please refer to the RW910 RFID IC datasheet.

To enable the register, assigned the required binary value to the register, click on the **OpCode*** button, and followed by the read tag procedure (session 2.1 to 2.3). Do note the setting here is temporary stored in the memory only.

To program the internal registers, the reader must be in the RF Off state.

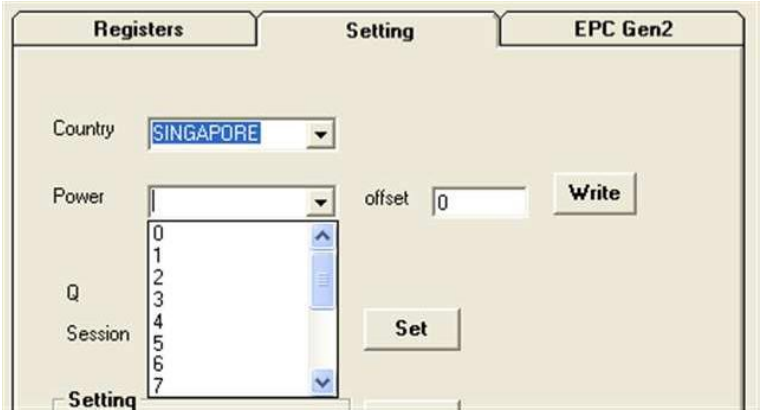
2.5 Setting the Regions

Under the **Setting** tab, the **Country** drop down menu defined the selection of the Operational Frequency for the different regions.



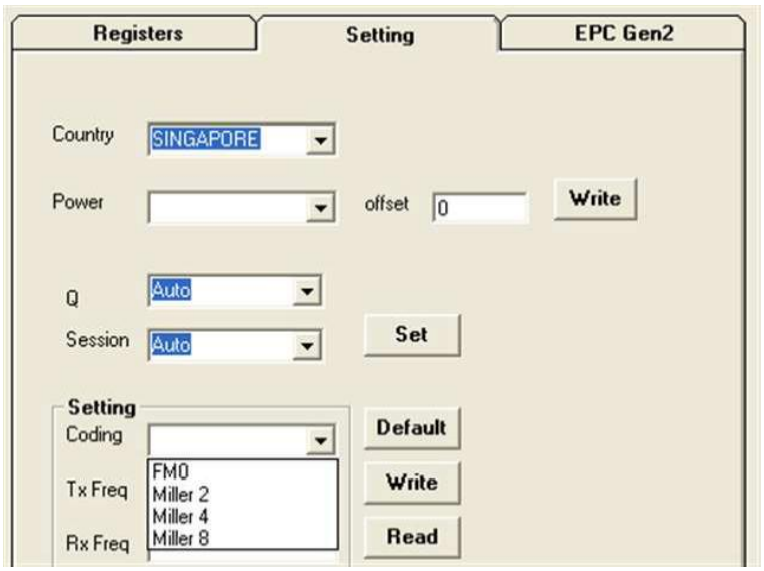
2.6 Setting the Power

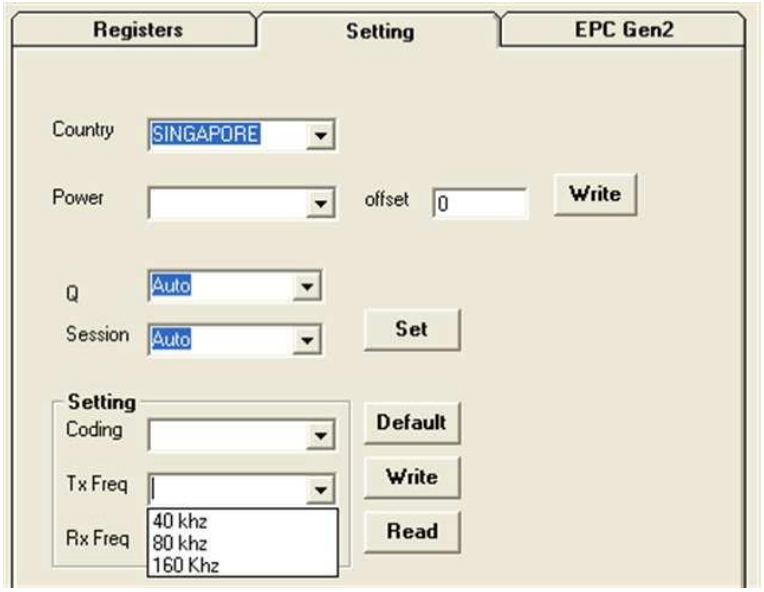
Under the **Setting** tab, the **Power** drop down menu defined the selection of 16 power levels.



2.7 Setting the Modulation method & Carrier Frequency

Under the **Setting** tab, the **Setting field** defined the selection of the reader modulation method, transmit and receive carrier frequency.





2.8 Setting the Density mode

This function is not implemented in this application.

2.9 Sleep mode

This function is not implemented in this application.

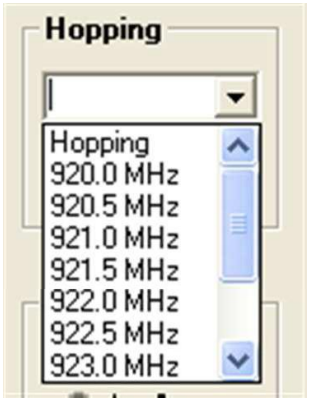
2.10 Enabling the unique TagID Filter mode

This function enabled the same tag(s) to be display once only. It is designed to work under the **Programmable Inventorize - Off and Normal mode** only.

2.11 Frequency Hopping

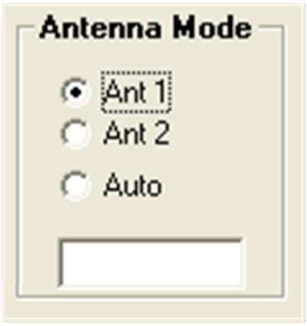
This function programmed the reader to transmit at a single fixed frequency or hopping within the allowable frequencies for the selected region.

The hopping frequency is randomly selected every 400ms.



2.12 Antenna(s) Selection

This function defined the antenna port used. If 2 antennas are used for the Ranger 4 UHF RFID reader, the 2 antennas can be programmed to switch at a time internal (ms) as defined in the box provided.



The default antenna is port 1.

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