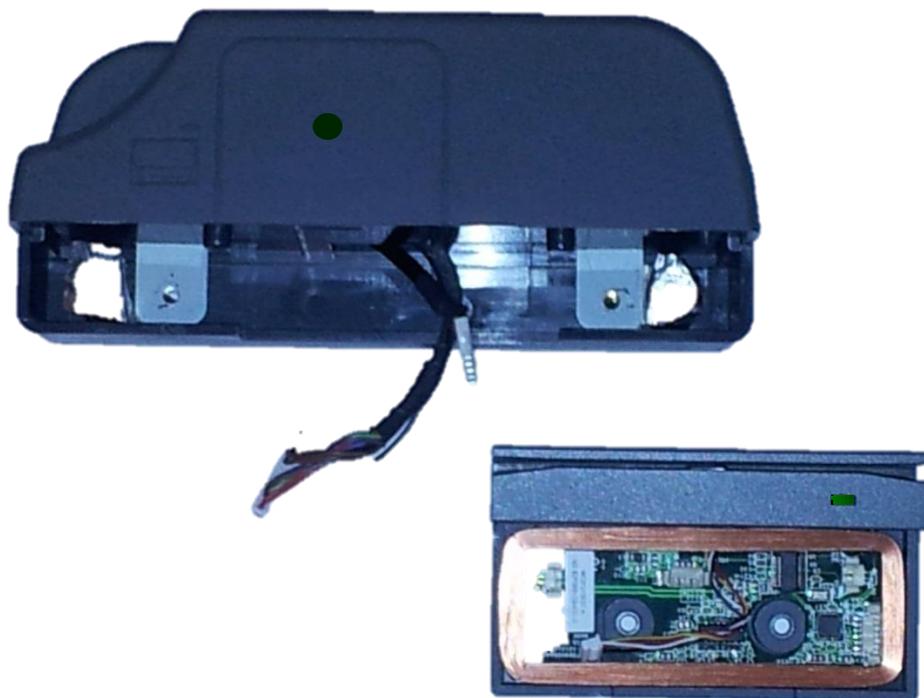




J2 RFID/MSR reader for J2 225 and J2 600 series of POS Computers

Manual



April 2013

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Change history

Version 1.0 Release March 21, 2013

J2 RFID Reader Manual
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Overview

The J2 RFID/MSR reader is a COMBO device integrating a 125 kHz RFID tag reader and three track MSR reader in the same housing. There are two version of this device, one for the J2 225 and the other for the J2 600 series of computers. The 600 series version will work with the J2 615, 625, 630, 680L and 680 POS computers.

The MSR portion of the device is the same as the standard MSR for the J2 225 or 600 series computer. Its operation is not covered in this manual so please refer to the MSR section of the J2 225 or J2 6XX manual for any information required. The RFID reader and MSR are totally separate devices electronically but are housed in the same case.

Description of Operation

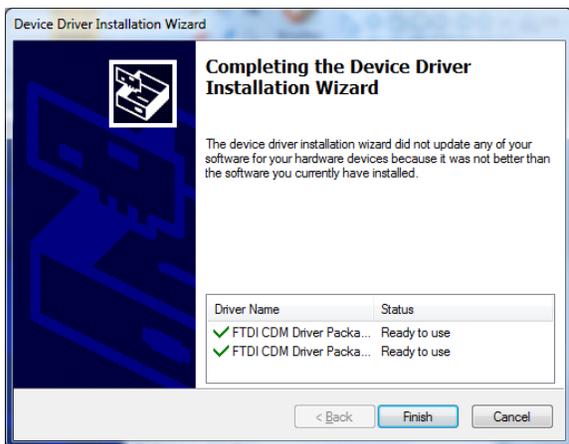
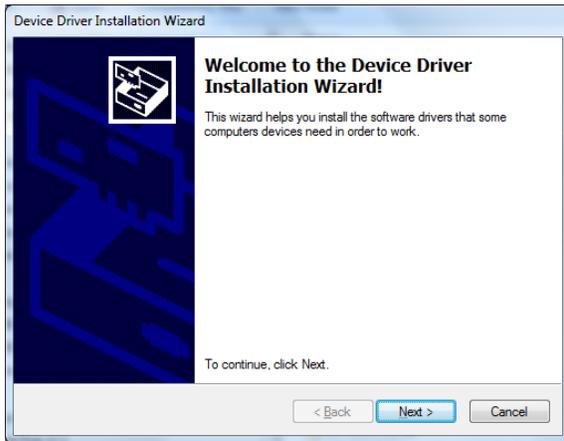
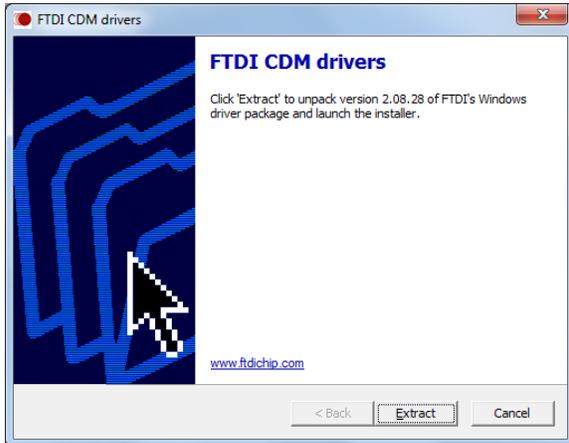
The RFID reader uses commonly available RFID cards/tags based on the EM Electronics EM4100/4200 RFID Transponder chip. The firmware is designed to read tag formatted to use Manchester Encoding with 64 bits of data. These tags output an 8 digit hexadecimal code when read. Each tag has a unique code.

The RFID reader is a USB serial device. On most J2 POS computer it will by default install as COM7 but this port assignment can be changed. By default the baud rate is set to 9,600 baud.

When a compatible RFID card/tag comes within range of the RFID reader the reader will read the tag and output the 10 digit code to the serial port. A status LED on the reader will light up to indicate the card has been read and is still in range. In addition to the LED lighting up the serial port sets the CTS line to show that the card is still within range. Once the card goes out of range the CTS line will go inactive and the LED will go out.

USB Drivers

To use the J2 RFID reader USB driver needs to be installed. The name of the Program to install the FTDI USB serial ports drivers is CDM20828_setup.exe available from J2 web site. Once downloaded just run to install the driver. This can be done before or after installing the hardware. Just click, Extract, Next and Finish to install.

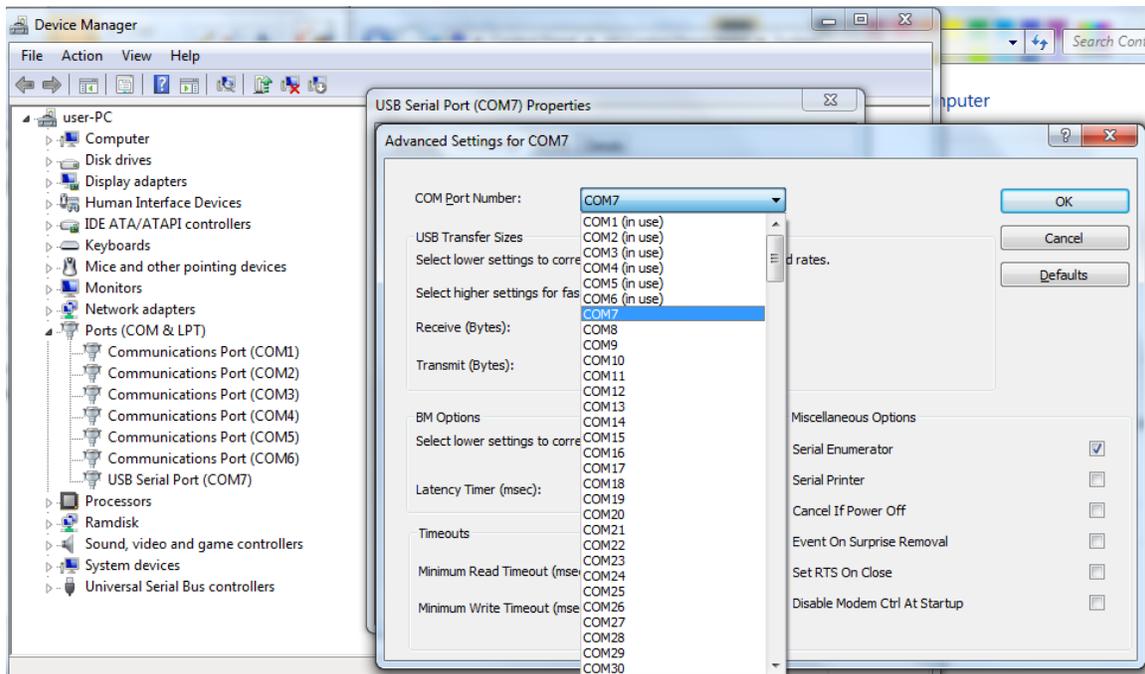


Changing COM Ports

Normally on most J2 POS computers the RFID reader will install as COM7 but this depends on your configuration. If needed the RFID reader can be assigned to whatever COM port number required.

To change the COM port assignment(s) in Windows just go to Control Panel, System and then device manager. Select the USB Serial Port (this is the RFID reader) then Advanced Settings on the properties page. Select the drop down to change ports.

If the port required is already in use it can be moved first to an unused port, then move the RFID reader to that port. Then the other port can be moved to where desired.



Because the USB serial port driver looks at the unique serial number of the RFID board on startup it will not be reassigned the com port even if other USB serial devices are added. This is a common problem with some USB serial port devices, but not this device. If you were to change the RFID reader it would be a message to manually assign the COM port because the driver will assume it is being used by the previously installed reader. When assigning the COM port a warning message will display, just say OK.

Using the J2 RFID Reader

To use the J2 RFID reader the application software just needs to listen to the COM port the reader is assigned to. Anytime a RFID card is read the reader sends a string of data to the COM port that is the cards/tags unique ASCII formatted 8 digit hexadecimal code followed by an ASCII carriage return then line feed (0x0c 0x0A).

Sample card/tag data: `001EADCD`

The reader will set the serial CTS line active when the card is read. The CTS line will stay active till the card is moved out of range of the reader. The status LED will also light any time a card is read and remains within range.

Even though this is a USB device the application software can use it just like any other COM port.

The serial data streams post-amble (0x0c 0x0A) can be change to most any ASCII character. Also a preamble can be added. Please see the J2 RFID Configuration utility in this manual for more information.

Virtual Keyboard Wedge Driver

J2 has available a virtual keyboard wedge driver that allows the RFID reader to appear as a keyboard device rather than a serial port device. This driver can also allow the RFID mimics a MSR reader. This is handy if a user wants to use a RFID for employee login but the software only supports MSR login.

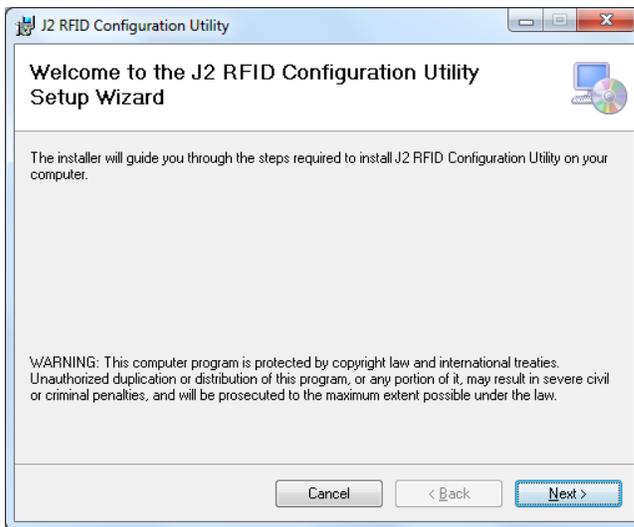
J2 RFID Configuration Utility

The J2 RFID Configuration Utility allows for the configuration and testing of the J2 RFID reader. It does not need to be installed to use the reader but is helpful in testing the device and configuration of option software settings. It can also be used to update the RFID reader internal firmware.

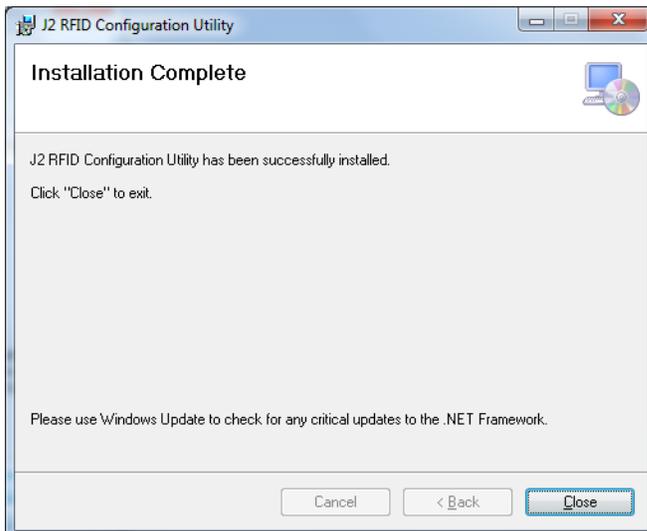
Installing

Download the J2 RFID Configuration Utility Setup program from the J2 Retail Systems web site: <http://support.j2rs.com/>

Once downloaded run J2 RFID Configuration Utility Setup. If another version of the utility is installed it will ask you to remove it first from the control panel.



Just answer Next for the next two screens, when it is complete just close. The install is complete

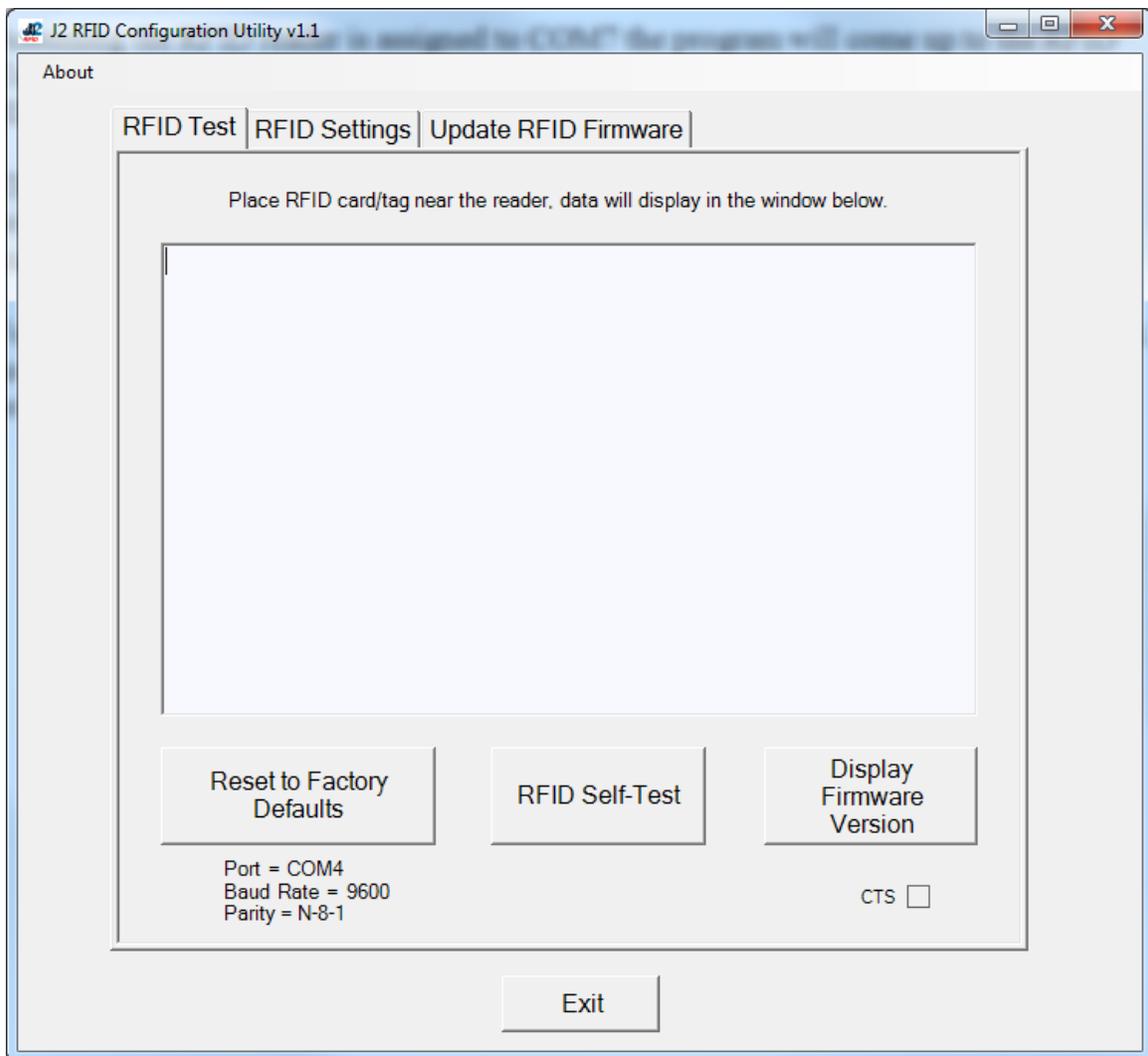


RFID Test Screen

Assuming the RFID reader is assigned to COM7 the program will come up to the RFID Test screen. If not set to COM7 it will display a warning message then come up in the RFID setting screen so the COM port being used can be selected.

The current COM information is displayed at the left corner of the screen. The main window of the screen is used to display any data coming from the RFID reader. This includes card/tag data and status information sent by the reader.

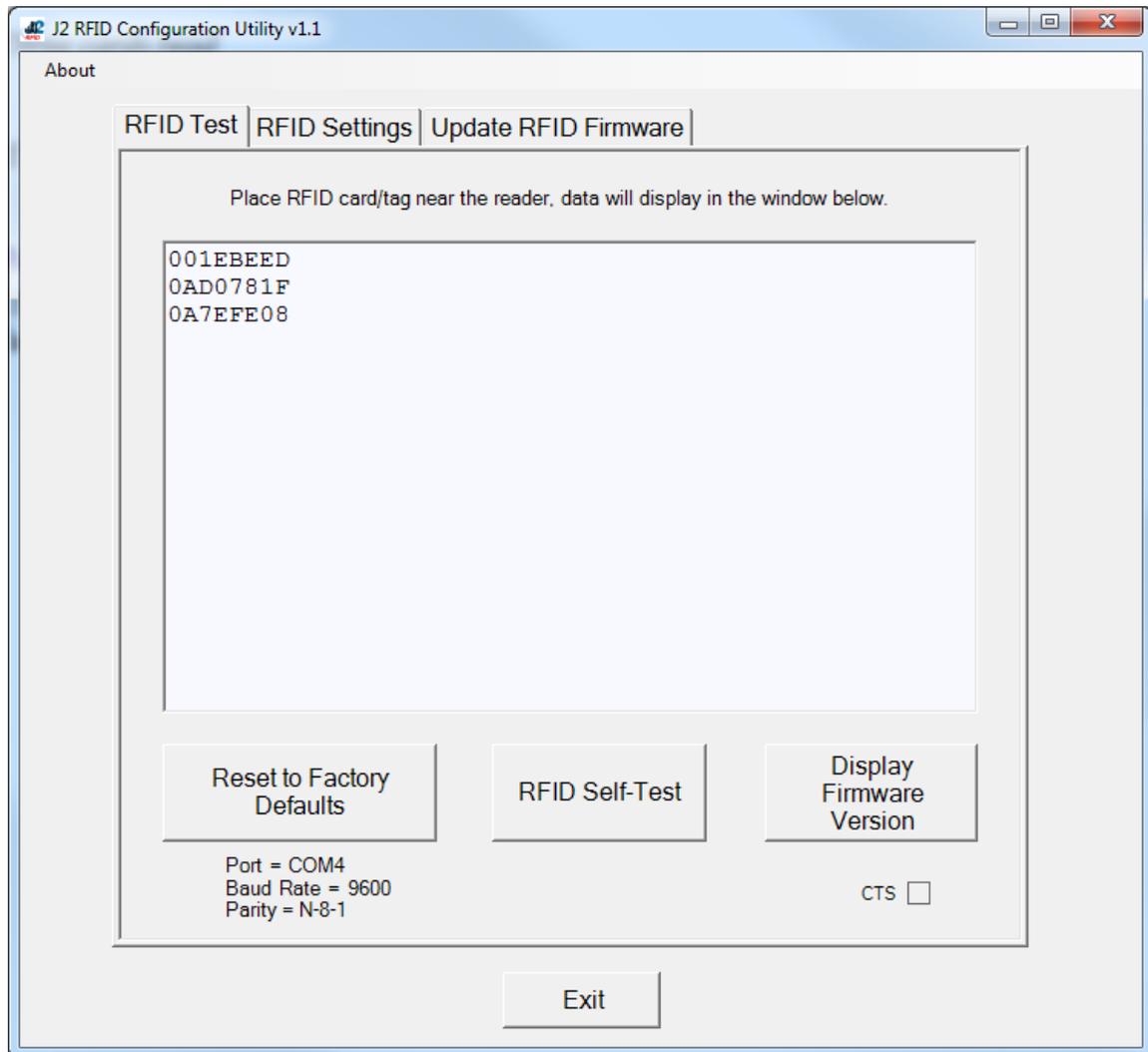
For test purposes the RFID reader echoes any serial data sent to it, except command, back to the serial port. With this echo feature anything typed on the keyboard will display the window.



Testing RFID reader

To test the RFID reader just place any RFID card near the reader and the cards will read. The LED will light up when the card is in range and the data will display one time. To test another card just bring it close to the reader and it will be read. If two or more cards are in range the one with the strongest signal will read or neither.

Three cards read



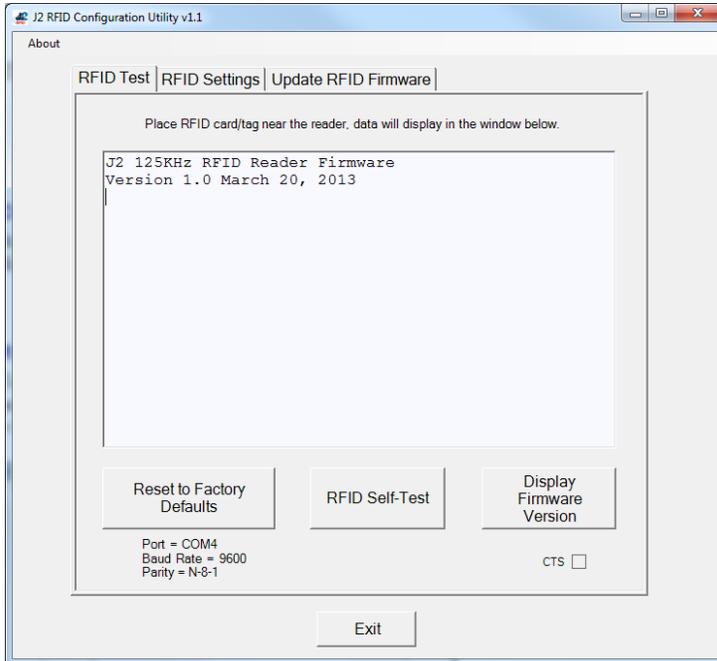
If more than a windows full for cards are read then then screen will scroll when full.

Reset to Factory Defaults

This button will clear the EEPROM memory of the RFID reader and reset all settings to factory defaults. This will clear any pre/post-ambles and set them set to the default.

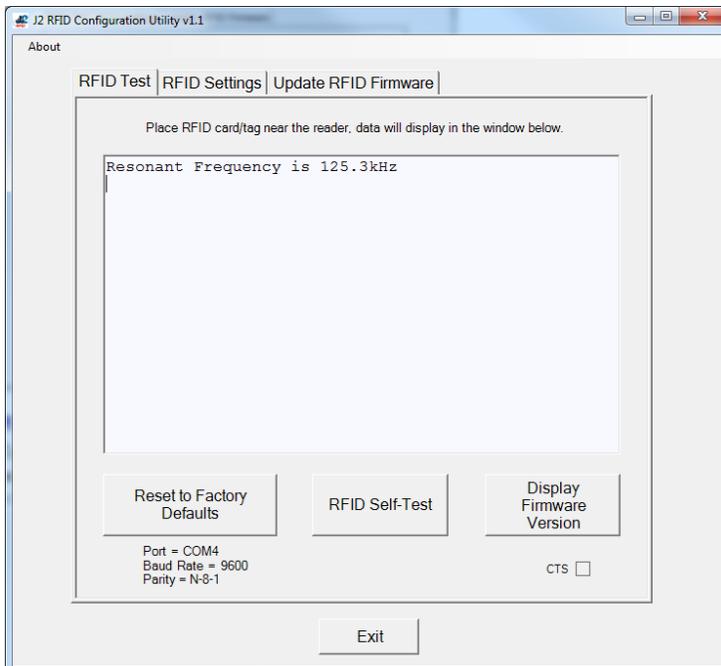
Checking the Firmware Version

Just touch the Display Firmware Version button the current version of firmware will display.



RFID Self-Test

To self-test the reader, just touch the button RFID Self-Test button. The reader will perform an internal test and display the Resonant Frequency which should be 125 kHz +/- 10%.

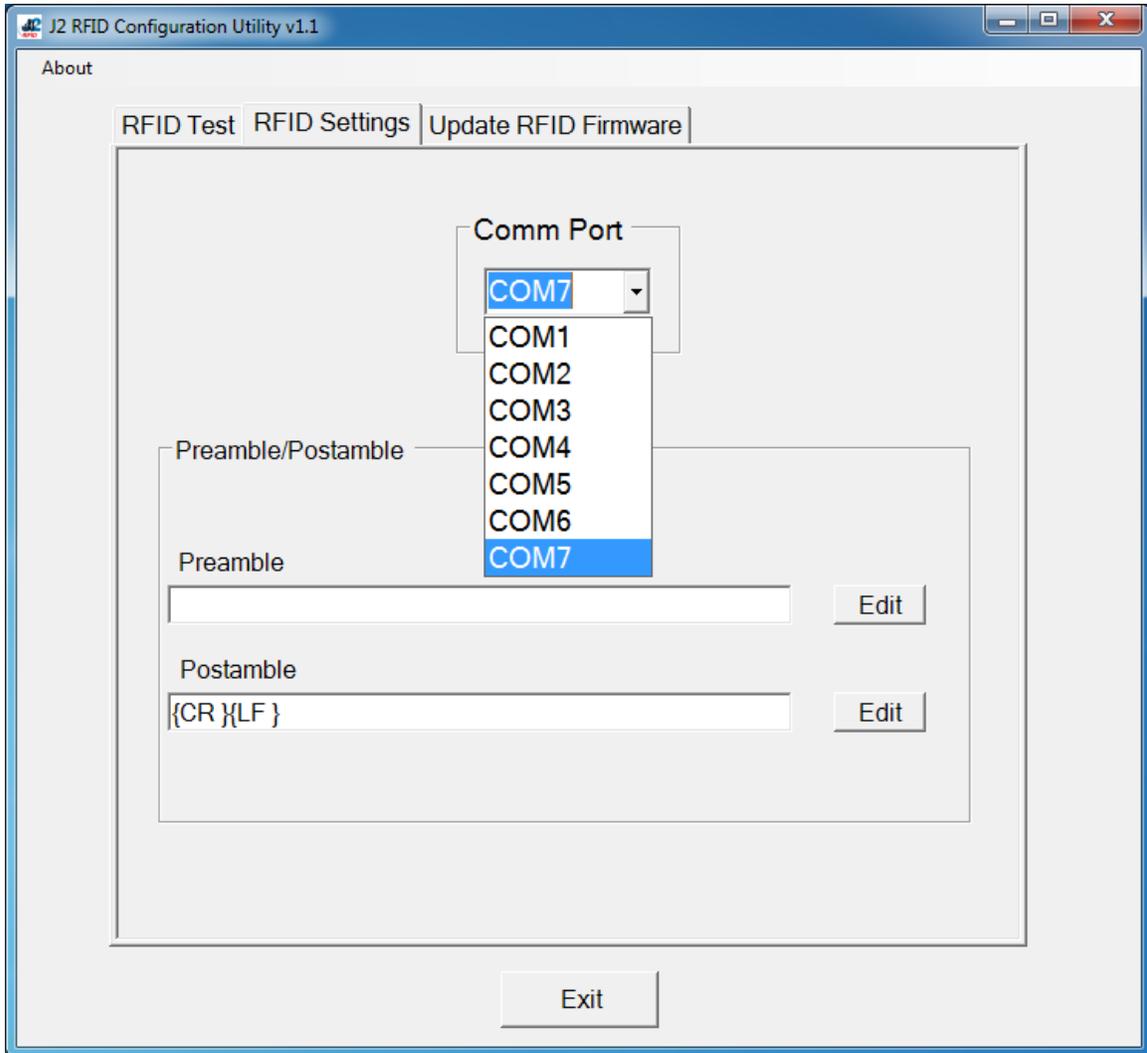


RFID Settings Screen

This screen allows for the setting of the COM port and any preamble or post-amble needed.

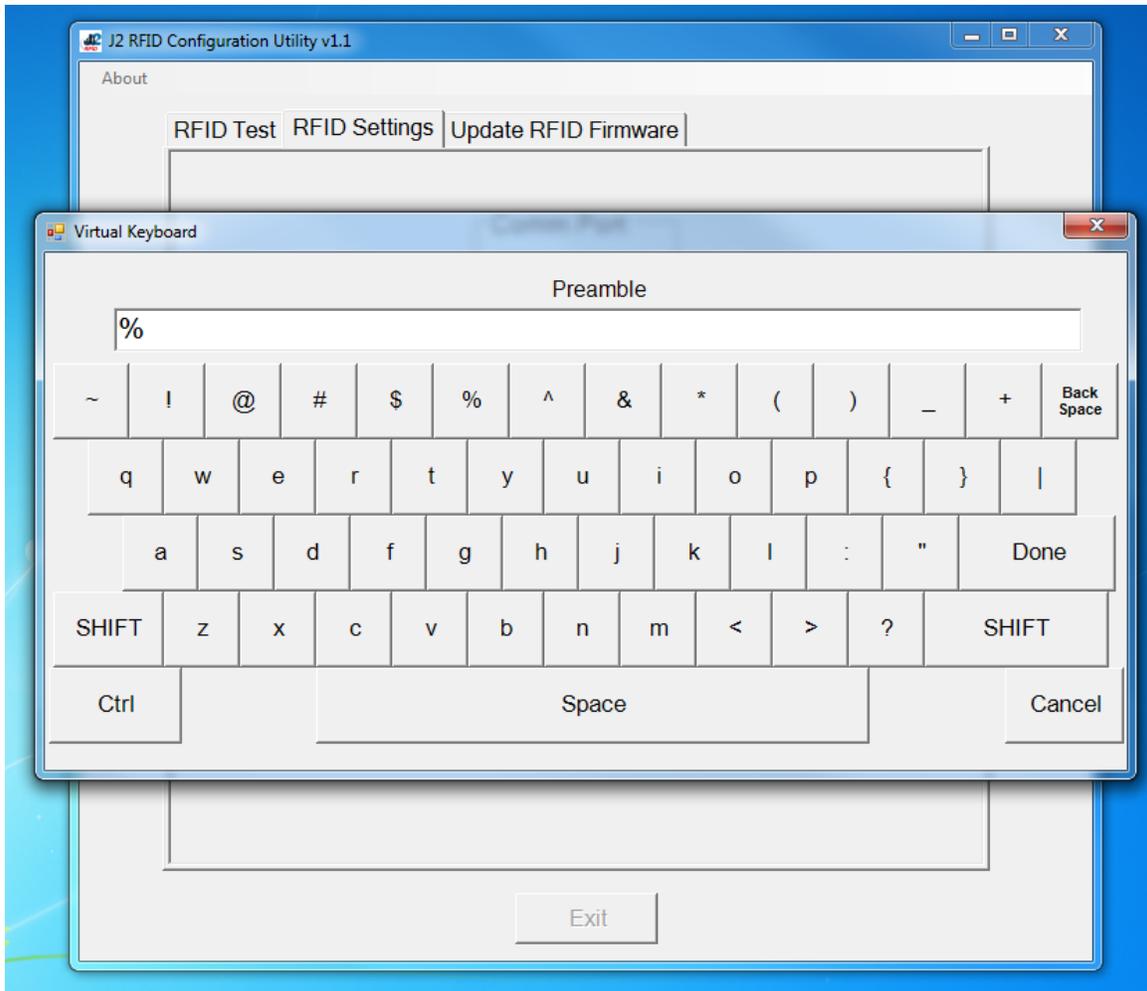
COM Port

Just selected the COM port you desire to use. Only COM ports installed display so the RFID reader and driver must already be installed for this to work. By default COM7 is selected.



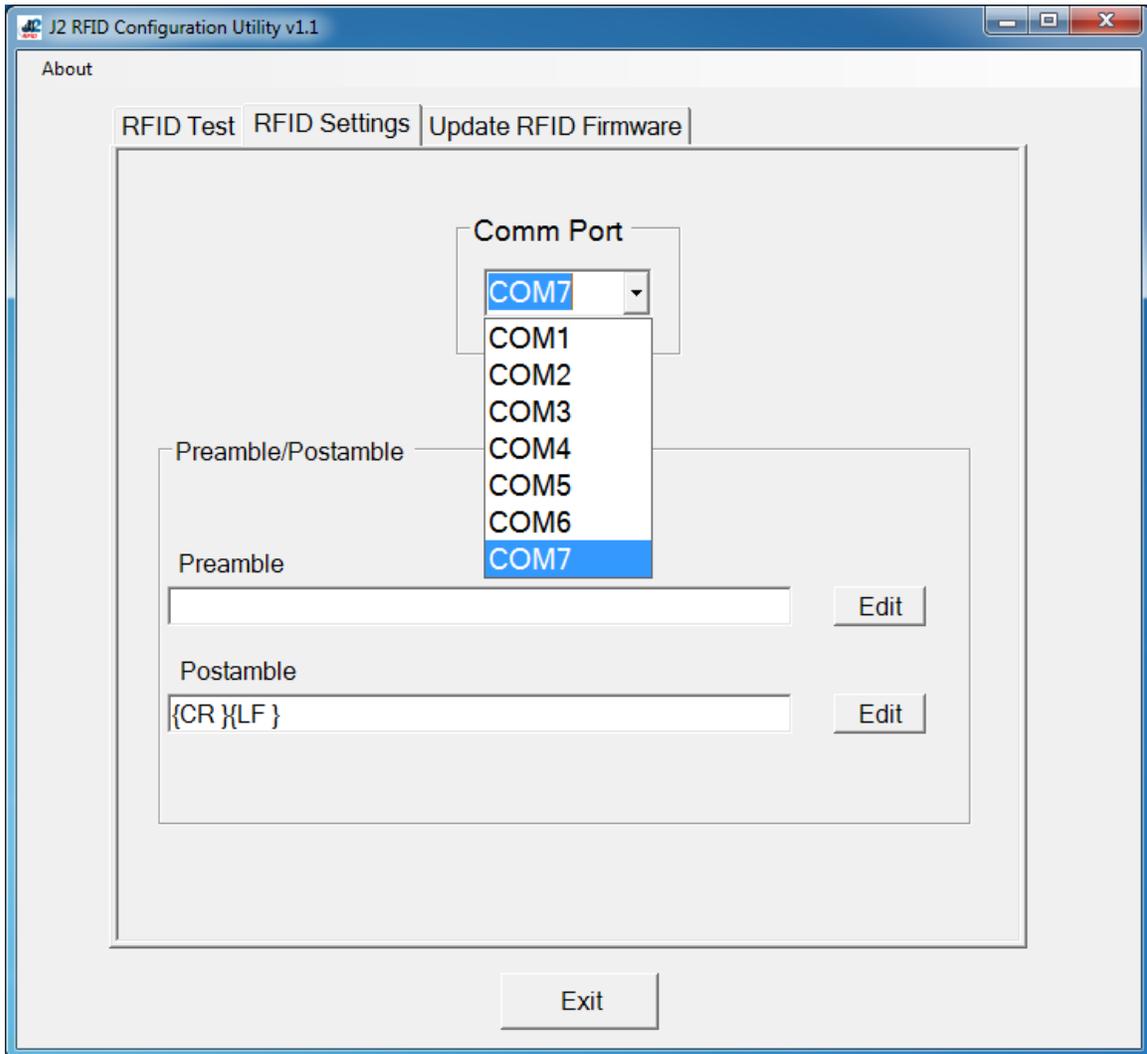
Preamble

A preamble may be added to the serial data stream. Most ASCII characters are allowed except for NUL, STX and ETX. These characters are sent before the tag data. They are stored in the RFID reader's EEPROM so are nonvolatile. Click the Edit key and a keyboard will be displayed. Shift and Ctrl can be used to enter printable and nonprintable characters. Up to 20 characters can be entered. The Done key causes the preamble to be written to the RFID readers EEPROM memory. The preamble can be cleared with the Reset to Factory Default button or an empty line in the keyboard input box then typing the Done key.



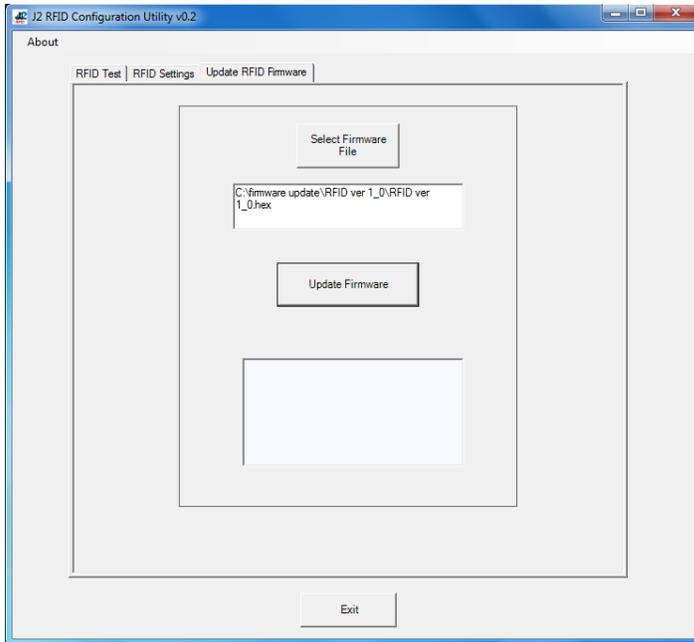
Post-amble

A Post-amble may be added to the serial data stream. Most ASCII characters are allowed except for NUL, STX and ETX. These characters are sent before the tag data. They are stored in the RFID reader's EEPROM so are nonvolatile. Click the Edit key and a keyboard will be displayed. Shift and Ctrl can be used to enter printable and nonprintable characters. Up to 20 characters can be entered. The Done key causes the Post-amble to be written to the RFID readers EEPROM memory. The Post-amble can be cleared with the Reset to Factory Default button or an empty line in the keyboard input box then typing the Done key.

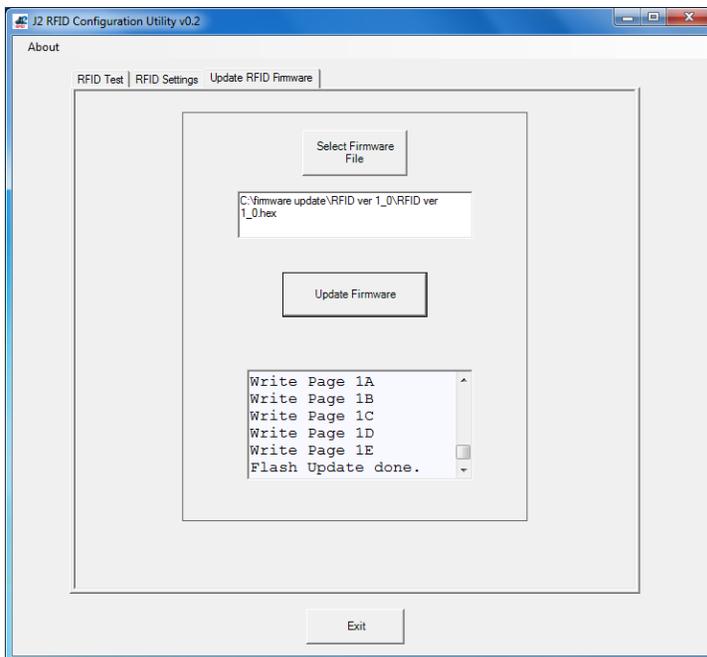


Update RFID Firmware

To update the firmware download the new firmware file and unzip it in any folder. The file extension should be hex. Using the Select Firmware File button will bring up a file browser window to select the correct file with. Be sure the file is for the J2 RFID reader.



The status of the firmware update will show in the window and shows when complete. The RFID reader will reset itself and be working. Any setting change will need to be reenter and the RFID reader will be returned to factory defaults.



J2 RFID Reader Command

These commands are what the utility uses to program the setting of the RFID reader. They can be integrated in the user application if desired.

Set Baud Rate, <STX ENQ B n ETX>, 0x02 0x05 0x42 0x30~37 0x03

Set the baud rate of the RFID reader to the value specified by “n” as shown in the table below. The new baud rate will take effect when the last character of the command is received. After this command is sent any other command sent must be at the new baud rate. It is recommended to leave set to 9,600 baud if possible.

n	Baud Rate
30	9600 (default)
31	4800
32	2400
33	1200
34	600
35	300
36	38400
37	19200

Reset to Factory Defaults <STX ENQ S 3 ETX>, 0x02 0x05 0x53 0x31 0x03

This command resets the RFID reader to the factory defaults. Serial port set to 9600 baud, 8-N-1 parity. No preamble and postamble of <CR LF>, 0x0D 0A.

Get Firmware Version <STX ENQ V R ETX>, 0x02 0x05 0x56 0x52 0x03

This command will return the current Firmware Version via the serial port.

Get EEPROM Value <STX ENQ R x ETX>, 0x02 0x05 0x52 0x00~FF 0x03

Read value in EEPROM with n = location. Value returned as two digit ASCII HEX character.

Update Firmware Command <STX ENQ J 2 ETX>, 0x02 0x05 0x4A 0x32 0x03

Update RFID reader's firmware. Command to be followed by new firmware file in Intel HEX format. Status is output on ASCII on the serial port.

Set Preamble <STX ENQ P R string ETX>, 0x02 0x05 0x50 0x52 string 0x03

This command writes the RFID preamble to the RFID EEPROM. The string can be up to 20 characters long but cannot contain the character ETX, STZ or NUL. The string will be sent in the serial data stream before the tag data.

Set Postamble <STX ENQ P T string ETX>, 0x02 0x05 0x50 0x54 string 0x03

This command writes the RFID post-amble to the RFID EEPROM. The string can be up to 20 characters long but cannot contain the character ETX, STZ or NUL. The string will be sent in the serial data stream before the tag data.

RFID Self-Test Command <STX ENQ F R ETX>, 0x02 0x05 0x46 0x52 0x03

This command cause the RFID to execute a internal self-test and sends the status of the test to the serial port.

Hardware Installation

Installing on 600 Series POS

Remove the MSR cover plate. You will see the RFID/MSR reader has three cables, one for the MSR, one for the RFID reader and a static electricity drain wire. Connect as should below.



Now using the two screws provided attach the RFID/MSR to the unit.

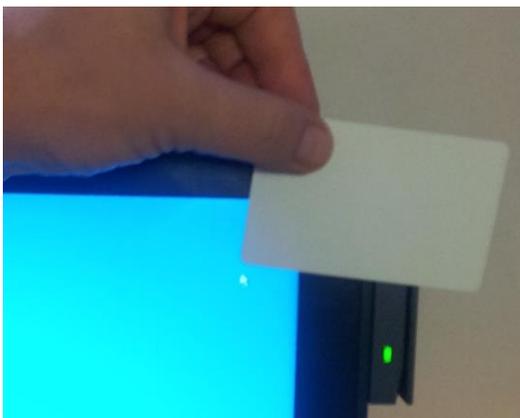
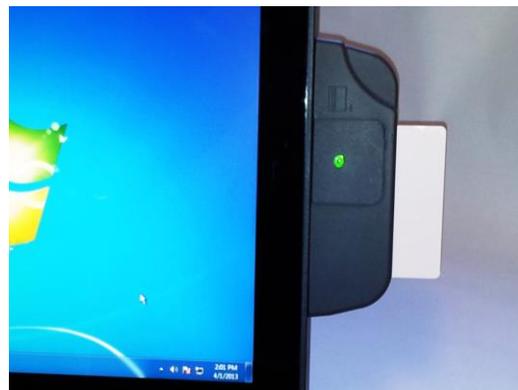


Installing RFID/MRS reader on J2 225

Remove mounting point cover as show in the J2 225 manual. Connect the two cables as shown below. (For older J2 225 units the RFID data cable may not be preinstalled in the J2 225 and will need to be added.) Screw on as show being care not to pitch cables.



The RFID card can be read either by just getting the card with in one or two cm of the reader or can be slide into the MSR slot allowing the MSR reader to act as a clip to hold the MSR in place as shown below.



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