



Wi.USB-DTS™ User's Manual

Rev 1.0.3



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Document Control

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Engineering Review		
Marketing Review		
Approved – Engineering		
Approved – Marketing		

Revision History

Revision	Author	Date	Description
1.0.0	GWH	2/15/06	Document Created from FCC-DTS 1.0.5
1.0.1	TRM	2/21/06	Removed LMA verbiage, various corrections
1.0.2	TRM	2/23/06	Modified Declaration of Conformity
1.0.3	TRM	3/29/06	Added Class B and exposure statements

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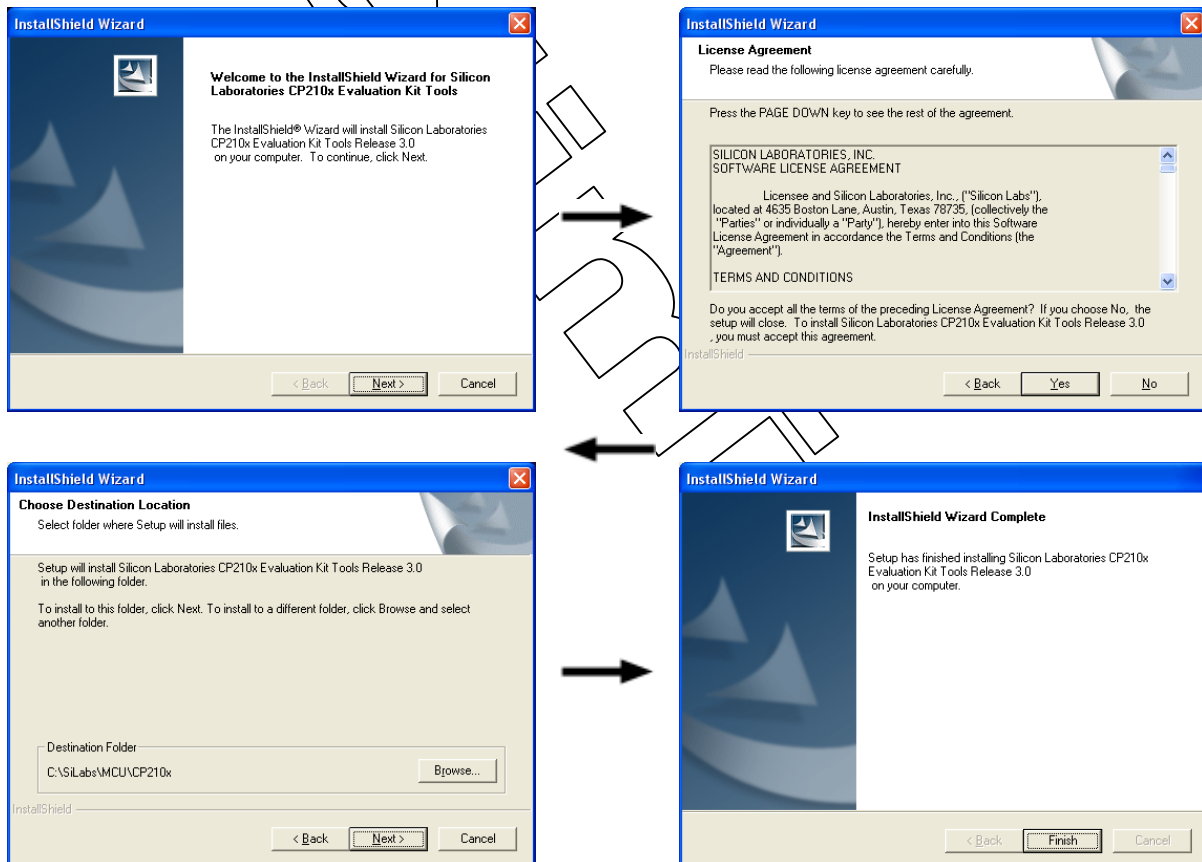
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1 Description

The Wi.USB-DTS™ is a self-powered, standalone desktop transceiver based on the Radiotronics Wi.232DTS module. The unit draws its power from the USB port.

2 Wi.USB Setup

- Install the USB driver in Windows. Do **not** connect the Wi.USB-DTS™ to your PC without first installing the driver. To install the driver, run the Silicon Laboratories CP210x UART to USB Bridge Driver as illustrated below.



When the driver installation is complete, you may connect the Wi.USB-DTS™ unit to your PC. Windows will recognize the hardware and automatically install the driver for it.

If Windows cannot find the driver for the CP210x device, you may have to locate it manually. The driver is unpacked to the subdirectory "**SiLabs\MCU\CP210x**" in the root of your default drive when you first run the installation.

- Using a USB cable, connect the Wi.USB-DTS™ to the PC.
- **IMPORTANT NOTE FOR HYPERTERMINAL USERS:** See section 4.1

3 Using Wi.USB-DTS™ Evaluation Software

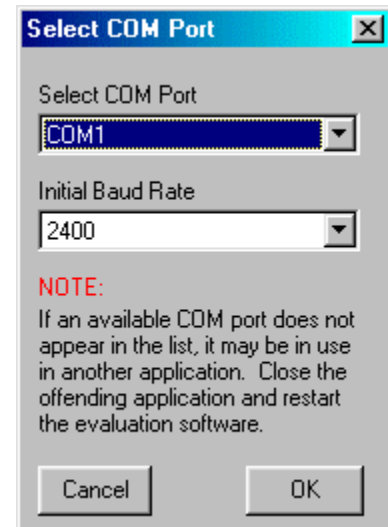
The software supplied with the Wi.USB-DTS™ is used to read and set the volatile and non-volatile registers within the Wi.232DTS™ module contained within. Additionally, it provides a chat interface for basic information exchange. Please refer to the Wi.232DTS™ User's Manual for more information on the register settings.

3.1 COM Port Setup and Selection.

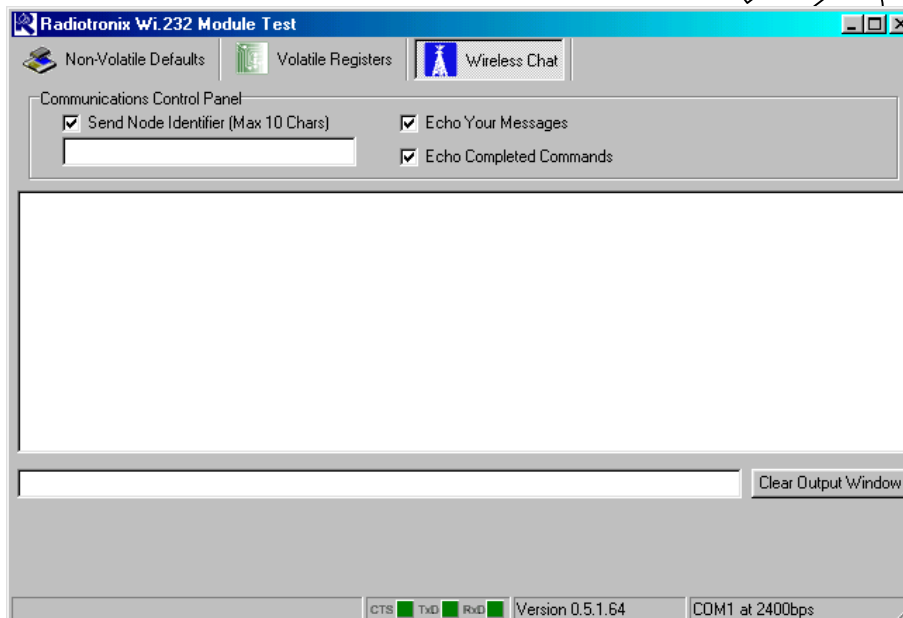
Upon starting the Wi.USB-DTS™ evaluation software, you will be presented with a COM port selection dialog box. Make sure that the Wi.USB-DTS™ unit is already connected to the computer via the USB cable before you start the software. This will ensure that the virtual COM port which is assigned to the USB to UART bridge controller by Windows is visible in the COM port selection list. Select the COM port used by the Wi.USB-DTS™. If you need to find out which COM port this is, go to Control Panel > System Properties > Hardware Tab > Device Manager > Ports (COM & LPT) > CP2101 USB to UART.

The first time you start the Wi.USB-DTS™ evaluation software, the Baud Rate should be left at 2400 baud, since this is the factory default baud rate setting for the unit.

Tip: The Wi.USB-DTS™ evaluation software does not auto-detect the baud rate of the module. If you have changed the Non-Volatile Data Rate register, you will have to select the baud rate you set this register to when you start the Wi.USB-DTS™ evaluation software.



3.2 Wireless Chat Page.



The Wireless Chat page in the Wi.USB-DTS™ evaluation software demonstrates the capability of the Wi.USB-DTS™ to be used as a wireless communications link. Wi.USB-DTS™ works as a wireless chat link with no register changes required, out of the box.

To Use Wireless Chat:

Type a message in the lower text field and press Enter. The text you typed will be displayed on the remote system, prefixed with a Node Identifier if you specified one.

3.3 Non-Volatile Register Page.

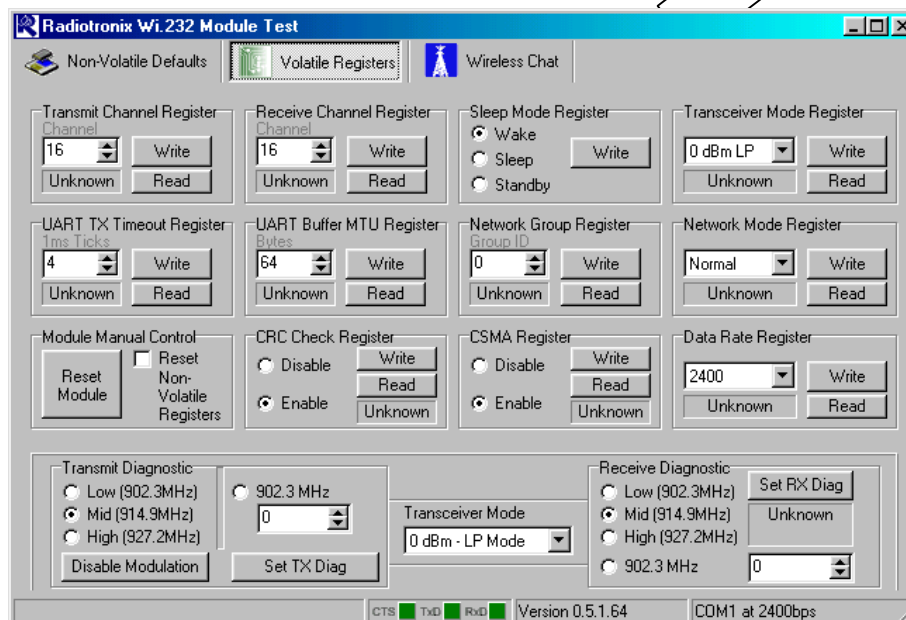


The Non-Volatile Register page in the evaluation software allows you to change the default settings which will be loaded when the module is powered on.

It is important to note that data rates in excess of 19.2kbps cannot be achieved in LP mode due to bandwidth limitations.

Tip: If you change the Non-Volatile Data Rate setting, you will have to select this baud rate when you start the Wi.USB-DTS™ evaluation software.

3.4 Volatile Register Page



In this page, you can change the Volatile settings of the module. Values programmed into these registers are lost of power-down.

The page also provides a means of switching the receiver and transmitter on and off, setting receive and transmit channels, transceiver mode and modulation settings.

It is important to note that data rates in excess of 19.2kbps cannot be achieved in LP mode due to bandwidth limitations.

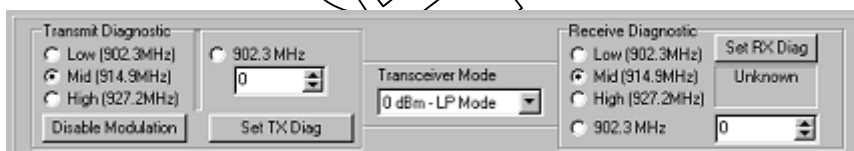
4 Evaluation Software Functions

4.1 Setting Register Values.

On both the Volatile and Non-Volatile pages, the registers are labeled by function. To set a register value, select the value from the options available for that register and click the "Write" button. To perform a read of that register, simply click the "Read" button. Descriptions of the register functions can be found in the Wi.232DTS™ User's Manual.

4.2 Diagnostic Mode Commands

There are a special class of commands available through the evaluation software. These controls are located on the "Volatile Registers" page as seen below.



These commands place the module into special diagnostic modes that can be used to test the module's performance, or to activate the transmitter for RF testing purposes. It is important to note that once a module executes a diagnostic command, it should be reset or have the power cycled to return to normal operation.

4.2.1 Transceiver Mode

This selects the modulation mode and power output of both the transmitter and receiver. The mode is not set until "Set TX Diag" or "Set RX Diag" is pressed. If "Set RX Diag" is pressed, the power output value is ignored.

4.2.2 Transmit Diagnostic

Transmit Diagnostic consists of four radio buttons which select the transmit channel. Low, Mid and High are quick reference buttons which can be used to select the lowest, the middle, or the highest channel. Any specific channel can be selected by using the controls below the "Set TX Diag" button.

The "Set TX Diag" button switches the transmitter on using the channel and mode selected in the channel selector and transceiver mode controls.

A "...1010101010101..." bit pattern is transmitted for bit error testing with another system or RF carrier analysis.

4.2.3 Receive Diagnostic

Receive Diagnostic consists of four radio buttons which select the transmit channel. Low, Mid and High are quick reference buttons which can be used to select the lowest, the middle, or the highest channel. Any specific channel can be selected by using the controls above the "Set RX Diag" button.

The "Set RX Diag" button switches on the receiver using the channel and mode selected in the channel selector and transceiver mode controls. Additionally, the module enters the diagnostic bit error test.

If a "...1010101010101..." bit pattern is received at the frequency and baud rate set up in the relevant registers, the BER test will return the number and percent of bit errors. This information is displayed in the panel below the "Set RX Diag" button. If no transmission is present, or the transmission is at the wrong frequency or data rate, the module may enter an infinite loop waiting for the beginning of the data. In this case, the module should be powered down and back up to return the module to its normal operating mode.

5 Notes

5.1 Microsoft Windows / Hilgraeve HyperTerminal

The Wi.USB-DTS™ can be used with HyperTerminal to receive and transmit RS-232 data and send files using file transfer protocols such as ZMODEM. HyperTerminal and many other terminal programs assert RTS by default. In the Wi.USB-DTS™, the RTS line is tied to the CMD pin on the module inside the Wi.USB-DTS™. When the CMD pin is held low, which is the case when the RTS line is asserted, the module will be placed in command mode.

In command mode, all UART data sent to the module will be interpreted as commands and will NOT be sent to the RF engine for transmission. Additionally, if a Wi.USB-DTS™ is powered on in the presence of an asserted RTS line, it will perform a full hardware and flash reset to the factory defaults.

To use the Wi.USB-DTS™ with HyperTerminal or other terminal program, you must remove the cover, locate the jumper "JP2", and remove it. Removing this jumper will disconnect the RTS line from the CMD pin on the Wi.232DTS™ module inside, allowing normal operation. It must be noted that while this jumper is removed, commands cannot be sent to the Wi.USB-DTS™. Everything sent to the Wi.USB-DTS™ will be sent over RF.

6 FCC Statements of Compliance

6.1 Class B Digital Device Statement

FCC NOTICE (FCC ID: Q7V-3F090012X)

This product has been tested and complies with the specifications 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 according to 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 is found by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment or devices
- Connect the equipment to an outlet other than the receiver's
- Consult a dealer or an experienced radio/TV technician for assistance

Product:

Wi.USB-DTS™

FCC ID: Q7V-3F090012X

6.2 Declaration of Conformity

FCC NOTICE (FCC ID: Q7V-3F090012X)

This device complies with the rules set forth in Part 15 by the Federal Communications Commission. Operation is subject to the following two conditions:

- 1) This device may not cause harmful interference
- 2) This device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by Radiotronix, Inc. could void the user's authority to operate the equipment.

Responsible Party:

Radiotronix Inc.
905 Messenger Lane
Moore, OK 73160
phone: (405) 794-7730

Product:

Wi.USB-DTS™
FCC ID: Q7V-3F090012X

6.3 Radiation Exposure Statement

FCC NOTICE (FCC ID: Q7V-3F090012X)

The antennas used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Product:

Wi.USB-DTS™

FCC ID: Q7V-3F090012X

6.4 Modifications

FCC NOTICE (FCC ID: Q7V-3F090012X)

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Product:

Wi.USB-DTS™

FCC ID: Q7V-3F090012X