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## **TG-ETRX2USB-PM-004-103**

### **ETRX2USB USB STICK**

### **PRODUCT MANUAL**



# Telegesis

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## 1 Introduction

The ETRX2USB wireless mesh networking USB Stick is effectively an RS232 to USB bridge connected to an ETRX2 wireless meshing module. This allows connectivity to a computer's USB port.

The supplied drivers create a virtual COM Port, so that the command line of the ETRX2 can be accessed via any terminal software application.

When using Windows® 9x/XP/2000 the Telegesis Terminal application can be used as described in the Development Kit manual.

### 1.1 Supported Operating Systems

- Windows 98SE
- Windows XP
- Windows 2000
- MAC OS-9
- MAC OS-X
- Linux

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## 2 Absolute Maximum Ratings

Parameter	Min.	Max.	Units	Condition
Supply Voltage Vdd	-0.3	5.25	V	
Voltage on any pin	-0.3	V <sub>dd</sub> +0.3, max 5.8	V	
Storage Temperature range	-40	150	°C	

**Table 1: Absolute Maximum Ratings**

The absolute maximum ratings given above should under no circumstances be violated. Exceeding one or more of the limiting values may cause permanent damage to the device.

## 3 Operating Conditions

Typical values at 5V 25°C.

Parameter	Min.	Typ.	Max.	Units	Condition
Supply Voltage, Vdd	4.75	5	5.25	V	
Supply Current		62 <sup>1</sup>		mA	TX 3dBm
		55 <sup>1</sup>		mA	TX – 28dBm
		62 <sup>1</sup>		mA	RX
		32 <sup>1,2</sup>		mA	Power Mode 01
		27 <sup>1,2</sup>		mA	Power Mode 02
		26 <sup>1,2</sup>		mA	Power Mode 03
Operating ambient temperature range	-20	25	85	°C	

**Table 2: Operating Conditions**

## 4 Other data

For further technical information, including radio certification, see the ETRX2 or ETRX2PA Module Product Manual.

Please note that the R2xx Telegesis AT-Command line Interpreter is based on a private application profile and uses the Ember meshing and self-healing stack, so interoperability with wireless mesh networking solutions from other manufacturers is unlikely when using the default firmware. For more information on ZigBee® compliance and the AT command interface please refer to the latest AT command dictionary and the ETRX2 user guide.

<sup>1</sup> During USB suspend the current will drop by 25.6mA in all modes.

<sup>2</sup> Please note that the power consumption in various power modes is firmware and usage dependent.

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## 5 ETRX2 I/O Connectivity

The I/Os of the built in ETRX2 are connected as follows:

- I/O1 is connected to the LED (drive I/O1 low to sink LED).
- I/O2 is the CTS input for the ETRX2. Make sure I/O2 is never defined as an output.
- I/O4 is the RTS input for the ETRX2.

**Important Note:** The lines for hardware handshaking are connected, so even when not using hardware handshaking I/O2 should never be defined as an output as this would drive against the incoming CTS signal via a 1k $\Omega$  resistor and increase the current consumption.

Note that if you use the command "AT&F" on the USB stick, I/O1 will revert to being an input and the LED will not light up. To restore its function as a pilot light, use the command "ATS0E=00FA" followed by a reset.

## 6 Firmware upgrades

The firmware which is loaded onto the embedded ETRX2 Module can be upgraded over the air or via the virtual com port as described in the Development Kit manual.

Alternatively access to the SIF programming interface is possible by opening the cover on the side of the ETRX2USB wireless meshing USB stick.

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## 7 Driver Installation and Operation

The drivers provided will generate a virtual COM port allowing easy access to the serial port of the embedded ETRX2.

To read more about the ETRX2 wireless mesh networking module and its command line interface please read the corresponding documentation which can be found at [www.telegesis.com](http://www.telegesis.com).

### 7.1 Windows 9x/XP/2k Driver Installation

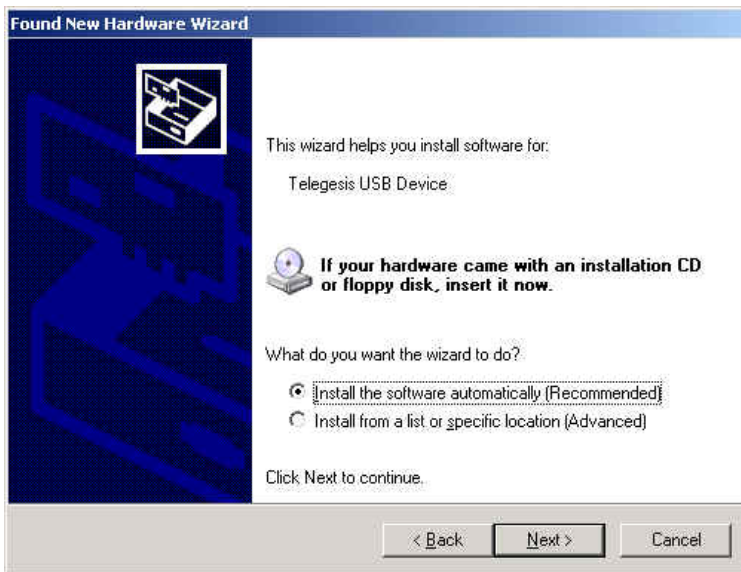
The driver package downloadable from [www.telegesis.com](http://www.telegesis.com) should be unzipped into a local folder. When executing the file 'PreInstaller.exe' prior to plugging in the ETRX2USB stick an installer will guide you through the steps required for the driver installation. If prompted that the driver hasn't passed the windows logo test simply press 'Continue Anyway'.



**Figure 1: Found New Hardware Wizard**

After insertion of the stick Windows® will prompt that new hardware has been found. If you have run the 'PreInstaller.exe' windows will be able to install the driver by automatically as shown in figure 2. In case you haven't run 'PreInstaller.exe' you will have to manually point to the directory into which you have unzipped the driver.

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**Figure 2: Install software Automatically**

If prompted that the driver hasn't passed the windows logo test simply press 'Continue Anyway'.



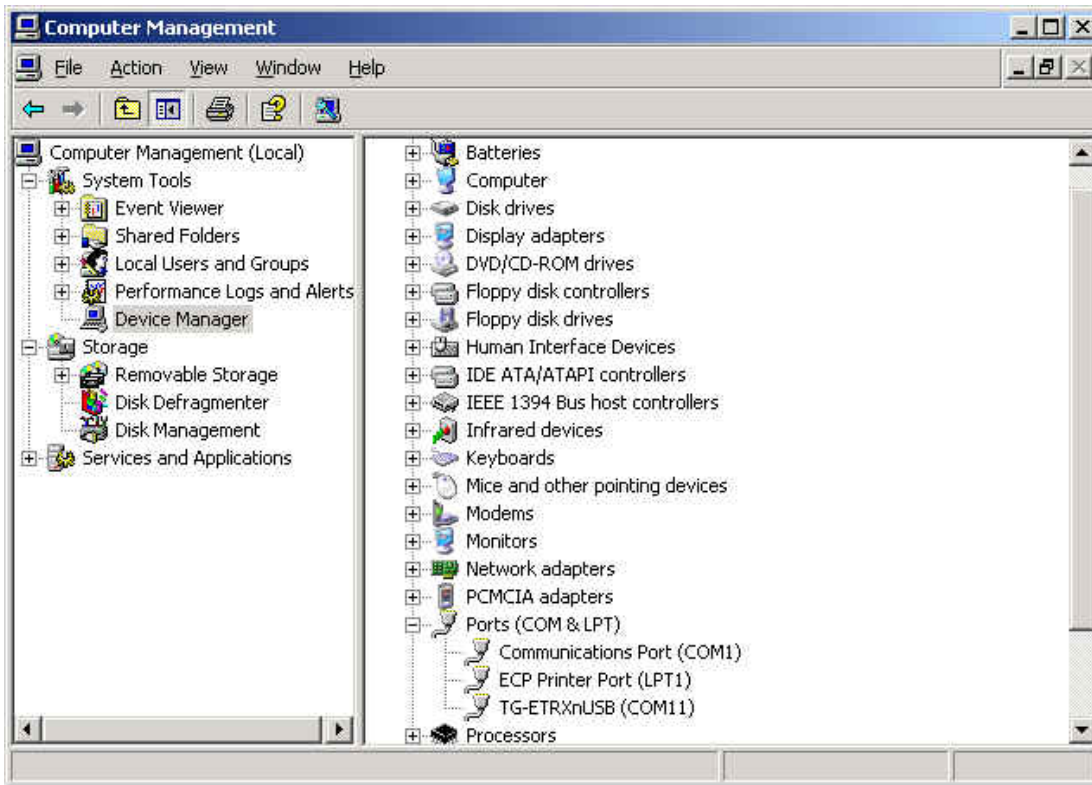
**Figure 3: Windows Logo Test**

After completing the installation of the USB device the new hardware wizard will start again in order to install the virtual com port in identical manner.

Please note that each ETRX2USB has a unique serial number which requires the installation procedure to be repeated with every new ETRX2USB being attached to the computer. This allows multiple ETRX2USB sticks to be used on the same computer at any one time.

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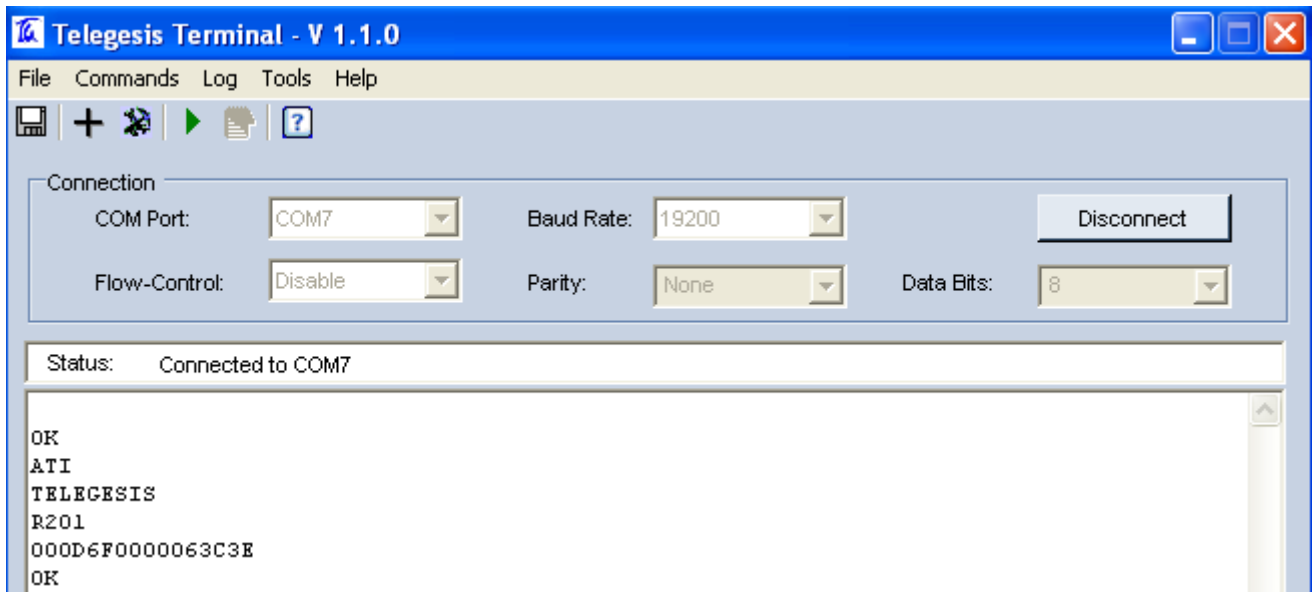
In order to find out the identity/number of the virtual com port the card has been assigned to, please enter the Device Manager under the Windows Computer Management screen (see below) and click on the Ports (COM and LPT) section where you should find the new virtual COM port. By double clicking on the entry of the virtual COM port you can also change the number assigned to the virtual COM port when entering the advanced setup of the device.



**Figure 4: Device Manager**

Once the correct COM port has been selected, the Terminal software can be used to control the ETRX2USB stick as per the Development Kit Manual.

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**Figure 5: Telegesis Terminal**

## 7.2 Macintosh and Linux drivers

Drivers for Mac and Linux can be downloaded from our website at [www.telegesis.com/ZigBee/Dsoftware.htm](http://www.telegesis.com/ZigBee/Dsoftware.htm).

In addition, one of our customers has written a Linux driver that will be included in the 2.6.25 kernel. It can be found at [www.kernel.org/pub/linux/kernel/people/gregkh/gregkh-2.6/patches/](http://www.kernel.org/pub/linux/kernel/people/gregkh/gregkh-2.6/patches/). (Note that this is for information only, and this software was developed entirely outside Telegesis.)

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## 8 Custom Firmware Development

If you intend to develop custom firmware to go onto the ETRX2USB you need to contact Ember to obtain access to their suite of development tools and their stack.

In order to download custom firmware onto the ETRX2, the Ember bootloader can be used or alternatively the ETRX2USB can be directly connected to the Ember InSight Adapter for programming and real time debugging.



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## 9 Ordering Information

Ordering/Product Code	Description
ETRX2 *	Module with: <ul style="list-style-type: none"> <li>• AT Style Command Interpreter</li> <li>• Integrated 2.4GHz Antenna</li> <li>• <u>No</u> Harwin Connector</li> </ul>
ETRX2CF *	Compact Flash Card <ul style="list-style-type: none"> <li>• Type II Compact Flash Card Design</li> <li>• AT Style Command Interpreter</li> <li>• Integrated 2.4GHz Antenna</li> <li>• Based on the ETRX2</li> </ul>
ETRX2HR *	Module with: <ul style="list-style-type: none"> <li>• AT Style Command Interpreter</li> <li>• Hirose U.FL Antenna Connector</li> <li>• <u>No</u> Harwin Connector</li> </ul>
ETRX2USB *	USB Stick: <ul style="list-style-type: none"> <li>• AT Style Command Interpreter</li> <li>• Integrated 2.4GHz Antenna</li> <li>• Based on the ETRX2</li> </ul>

### Notes:

- Customers' PO's must state the Ordering/Product Code.
- There is no "blank" version of the ETRX2 Module available. All Modules carry both the Ember Stack and the Telegesis AT style Command Layer. Where customers wish to add their own firmware they can erase and write it to the flash memory of the Ember EM250.
- Please contact Telegesis if you require additional AT style commands or specific integration assistance.

**Table 11. Ordering Information**

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## 10 Trademarks

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## 11 Disclaimer

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## 12 Contact Information

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## 13 References

Telegesis - [www.telegesis.com](http://www.telegesis.com)

Ember - [www.ember.com](http://www.ember.com)