ETRX357USB and ETRX357USB-LRS STICKS

PRODUCT MANUAL



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1 Introduction



The ETRX357USB and ETRX357USB-LRS wireless mesh networking USB Sticks are effectively RS232 to USB bridges connected to the corresponding ETRX3 series ZigBee® modules. This allows connectivity to a computer's USB port.

The supplied drivers create a virtual COM Port, so that the command line of the ETRX357 can be accessed via any terminal software application.

When using Windows® the Telegesis Terminal application can be used as described in the ETRX357 Development Kit manual.

1.1 Supported Operating Systems

- Windows 98SE
- Windows XP
- Windows Vista
- Windows 7
- Windows CE *
- MAC OS-9
- MAC OS-X *
- Linux *

* Drivers for these systems are available from Silicon Labs. The bridge chip is a CP2102 with Vendor ID 0x10C4 and Product ID 0x8293.

2 Absolute Maximum Ratings

Parameter	Min.	Max.	Units	Condition
Supply Voltage Vdd	-0.3	5.25	V	
Voltage on any pin	-0.3	V_{dd}+0.3, max 5.8	V	
Storage Temperature range	-40	85	℃	

Table 1: Absolute Maximum Ratings

The absolute maximum ratings stated 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℃.

Parameter	Min.	Typ.	Max.	Units	Condition
Supply Voltage, Vdd	4.75	5	5.25	V	
Supply Current ETRX357USB		68[1]		mA	TX set to 8dBm
		57[1]		mA	TX set to 3dBm
		50[1]		mA	TX set to –43dBm
		52.5[1]		mA	RX
		34[1,2]		mA	SED, Awake & Polling
		27[1,2]		mA	SED, Deep Sleep & Polling
		26[1,2]		mA	SED, Deep sleep
Supply Current ETRX357USB-LRS		146[1]		mA	TX set to -7dBm
		95[1]		mA	TX set to -17dBm
		78[1]		mA	TX set to –43dBm
		58[1]		mA	RX
		34[1,2]		mA	SED, Awake & Polling
		27[1,2]		mA	SED, Deep Sleep & Polling
		26[1,2]		mA	SED, Deep sleep
Operating temperature range	-20	25	85	℃	

Table 2: Operating Conditions

4 Other data

For further technical information, including radio certification, see the ETRX357 or ETRX357-LRS modules product manuals.

If you purchase ETRX357USB sticks without printed markings on the case, you may be responsible for applying a marking appropriate to their geographical area of use, such as the FCC certification.

For more information on ZigBee® compliance and the AT command interface firmware please refer to the latest AT command dictionary and the ETRX3 series user guide.

[1] During USB suspend the current will drop by 25.6mA in all modes.
[2] Please note that the power consumption in various power modes is firmware and usage dependent.

5 ETRX357 I/O Connectivity

The I/Os of the built-in ETRX357 are connected as follows:

- PA6 is connected to the LED (drive PA6 low to sink LED current).
- PB3 is the CTS input for the ETRX357. Make sure PB3 is never defined as an output.
- PB4 is the RTS input for the ETRX357.

Important Note: The lines for hardware handshaking are connected, so even when not using hardware handshaking PB3 should never be defined as an output as this would drive against the incoming CTS signal via a 1kΩ resistor and increase the current consumption.

6 Firmware upgrades

The firmware which is loaded onto the embedded ETRX357 Module can be upgraded over the air or via the virtual COM port as described in the ETRX357 Development Kit manual.

Alternatively, access to the SIF programming interface is possible by opening the cover on the side of the ETRX357USB ZigBee USB stick.

7 Driver Installation and Operation

The drivers provided will generate a virtual COM port allowing easy access to the serial port of the embedded ETRX357.

To read more about the ETRX357-LRS wireless mesh networking module and its command line interface please read the corresponding documentation which can be found at www.telegesis.com.

7.1 Windows XP/Vista/7 Driver Installation

The driver package downloadable from the *Support → Software download* page of www.telegesis.com should be unzipped into a local folder. When executing the file 'TgVCPInstaller.exe' prior to plugging in the ETRX357USB stick an installer will guide you through the steps required for the driver installation.



Figure 1: Found New Hardware Wizard

After insertion of the USB stick, Windows® may prompt that new hardware has been found. If you have run the 'TgVCPInstaller.exe' Windows will be able to install the driverautomatically, but if you have not run 'TgVCPInstaller.exe' you will have to manually point to the directory into which you have unzipped the driver.

Please note that each ETRX357USB has a unique serial number which requires the installation procedure to be repeated with every new ETRX357USB being attached to the computer, though the process is not obtrusive. This allows multiple ETRX357USB sticks to be used on the same computer at any one time.

In order to find out the identity/number of the virtual COM port the stick has been assigned to, please open 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.

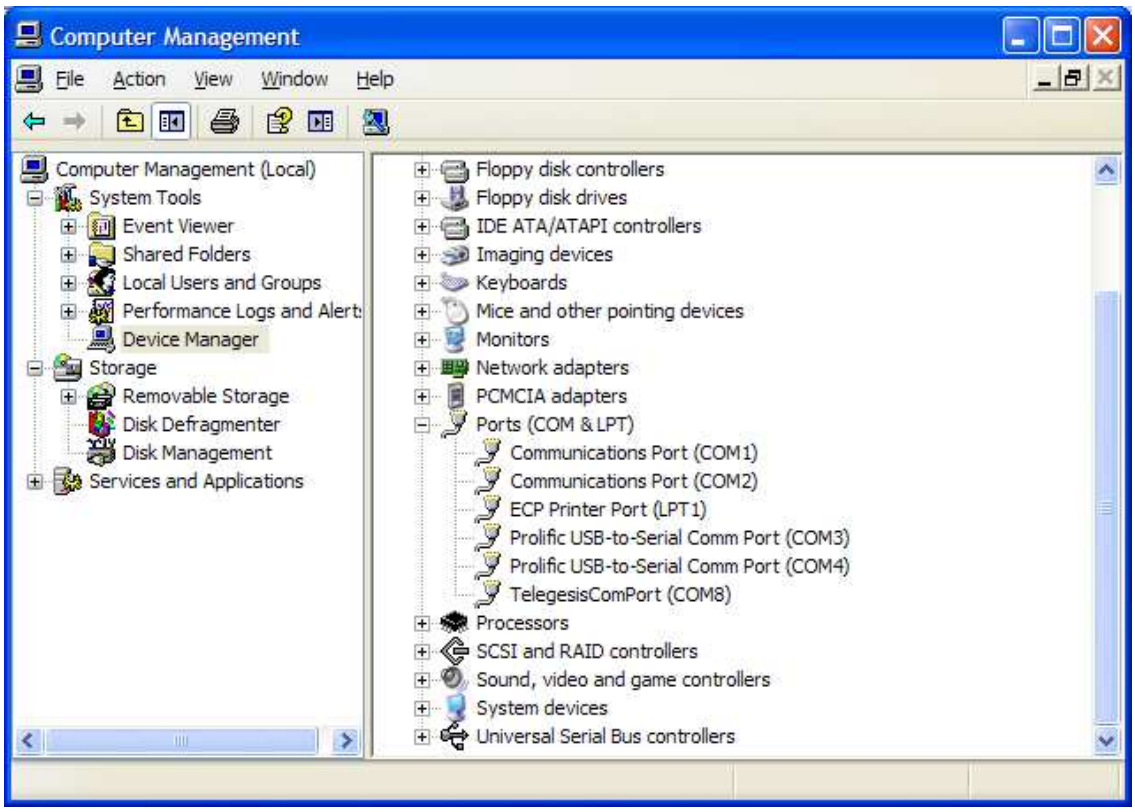


Figure 2. Device Manager

Once the correct COM port has been selected, the Terminal software can be used to control the ETRX357USB stick as per the Development Kit Manual.

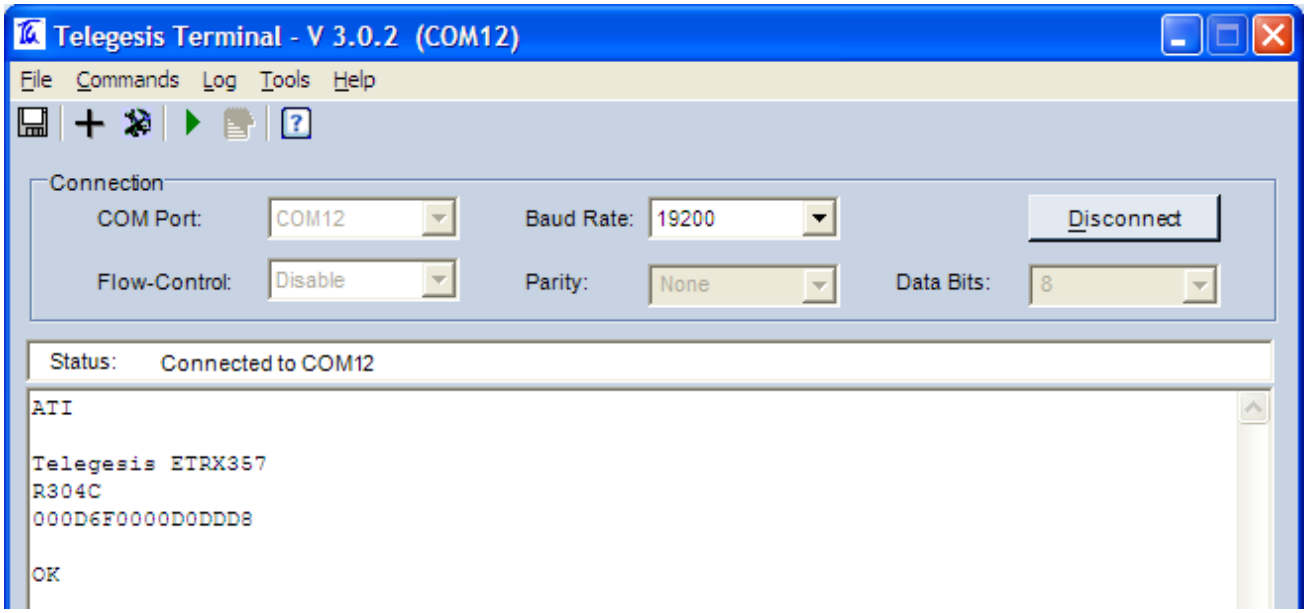


Figure 3. Telegesis Terminal

7.2 Macintosh and Linux drivers

A Virtual Com Port driver kit for Mac and Linux can be obtained by following the link on our website on the *Support → Software download* page.

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/. (Note that this is for information only, and this software was developed with no input whatsoever from Telegesis.)

8 Custom Firmware Development

If you intend to develop custom firmware to go onto the ETRX357USB the InSight toolchain from Ember Corporation is required. This is obtainable from Ember as part of their development kit – www.ember.com The USB stick contains an ETRX357-LRS module based on the Ember EM357 and a USB-to-serial bridge chip. The ETRX357-LRS communicates via its serial port, so the user's firmware must use the UART of Serial Controller 1. The nRTS and nCTS lines are connected to the USB bridge chip. The LED on the USB stick is driven from EM357 pad PA6.

In order to download custom firmware onto the ETRX357, the Ember bootloader can be used or alternatively the ETRX357USB can be directly connected to the Ember InSight Adapter3 for programming and real time debugging.



Figure 4: Connecting the ETRX357USB to the Ember ISA3

9 Ordering Information

Ordering/Product Code	Description
ETRX357USB	Telegesis ZigBee® USB stick based on an ETRX357
ETRX357USB-LRS	Telegesis ZigBee® USB stick based on an ETRX357-LRS
ETRX351-LRS **ETRX357-LRS**	Telegesis ZigBee® Module with Ember ZigBee® Technology: • Based on Ember EM351 or EM357 • Telegesis AT Style Command Interpreter based on • EmberZNet meshing and self-healing ZigBee® PRO stack • Integrated power amplifier as well as low noise amplifier • Integrated 2.4GHz Antenna
ETRX351 **ETRX357**	Telegesis Wireless Mesh Networking Module with Ember ZigBee® Technology: • Based on Ember EM351 or EM357 • Telegesis AT Style Command Interpreter based on • EmberZNet meshing and self-healing ZigBee® PRO stack • Integrated 2.4GHz Antenna
ETRX357DVK	Telegesis Development Kit with: • 3 x ETRX35xDV Development Boards • 3 x USB cables • 2 x ETRX35x on carrier boards • 2 x ETRX35xHR on carrier boards • 2 x ETRX35x-LR on carrier boards • 2 x ETRX35xHR-LR on carrier boards • 1 x ETRX2USB USB stick • 2 x ½-wave antennae • 2 x ¼-wave antennae
Notes: • Customers' PO's must state the Ordering/Product Code. • There is no "blank" version of the ETRX357 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 EM35x. • Please contact Telegesis if you require additional AT style commands or specific integration assistance.	

Table 11. Ordering Information

10 Trademarks

All trademarks, registered trademarks and products names are the sole property of their respective owners.

11 Disclaimer

Product and Company names and logos referenced may either be trademarks or registered trademarks of their respective companies. We reserve the right to make modifications and/or improvements without prior notification. All information is correct at time of issue. Telegesis (UK) Ltd does not convey any license under its patent rights or assume any responsibility for the use of the described product

12 Contact Information

Website: www.telegesis.com
E-mail sales@telegesis.com

Telegesis (UK) Limited
3, Abbey Barn Business Centre
Abbey Barn Lane
High Wycombe
Bucks
HP10 9QQ
UK

Tel: +44 (0)1494 510199
Fax: +44 (0)5603 436999

13 References

Telegesis - www.telegesis.com

Ember - www.ember.com