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ETRX3DVK Development Kit
# Quick-Start Guide

Your ETRX3DVK contains:

- 3 x ETRX35xDV Development Boards
- 3 x USB cables
- 2 x ETRX35x on carrier boards
- 2 x ETRX35xHR on carrier boards
- 2 x ETRX35x-LRS on carrier boards
- 2 x ETRX35xHR-LRS on carrier boards
- 1 x ETRX3USB USB stick
- 2 x ½-wave antennae
- 2 x ¼-wave antennae

The ETRX3DVK Development Kit has been designed to allow quick evaluation and prototyping using the ETRX3 wireless mesh networking modules. The Long Range modules will allow you to test their greater outdoor range and within-building penetration.

Before you start, go to our Support Software Download page at www.silabs.com/telegesissoftware and download the ETRX3USB drivers and the Telegesis Terminal software (the ETRX357 Development Board uses the ETRX3USB drivers). Install them on your computer. Also, we recommend you to go to www.silabs.com/telegesisdocuments and get the AT Command Manual, the ETRX357 Development Kit Manual and the ETRX3USB Product Manual.

1 Connecting your Development Kit Board

After you have installed the USB drivers, connect a Development Kit Board to the computer and load the drivers as prompted, then repeat for the USB stick. Then right-click on "My Computer", select "Manage" and "Device Manager".
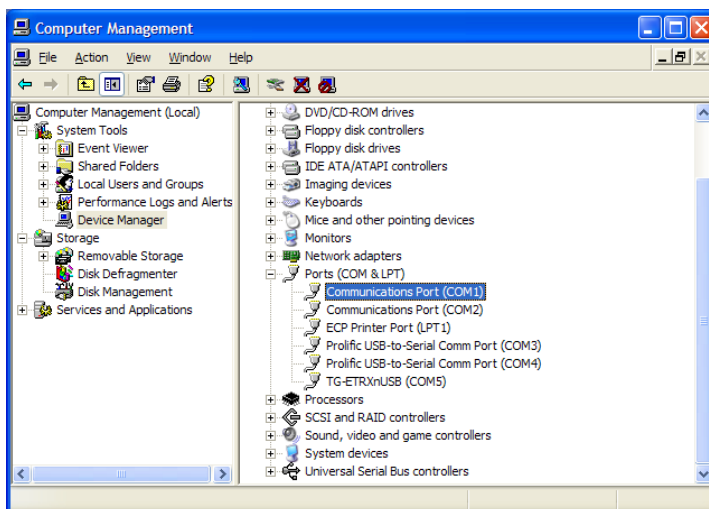
Under "Ports" you will see your Telegesis USB device(s); note the COM port number that it is attached to (here, COM5). Now you can close the Device Manager. Each board that you plug in will appear as a different COM port.

2 Application Software

If you do not wish to use the Telegesis Terminal Application program, the command line of the ETRX357 can be accessed using any terminal software program such as HyperTerminal® or PuTTY. Simply set up HyperTerminal to connect to the appropriate com port at 19200bps, Data bits - 8, Parity - none, Stop bits - 1, Flow Control – none (ETRX357 factory default).

However the Telegesis Terminal Application Software program allows enhanced functionality especially suited to the ETRX357 modules. The AT-Style commands

can be issued by clicking on customisable 'Command' buttons and all of the 64-bit serial numbers which are reporting in are listed in a separate window. This means you will not need to input any of the 64-bit serial numbers.

For instructions on how to use the AT Commands read the AT Command Manual-check your firmware version with the "ATI" command and ensure you have the correct manual. There is also introductory material in the development kit manual.

After installing the Telegesis Terminal Application program a single command button will appear. Use File -> Open Layout to select the correct set of buttons for firmware R2xx based on EmberZnet2.x or R3xx based on EmberZnet3.x. In order to use the Telegesis Terminal software, select the correct COM port and the connection parameters (ETRX357 default 19200, 8 bits, no parity, no flow control) and press the "Connect" button. These settings are automatically retained each time the software is re-started.

To get started quickly, power up one node connected to the PC and type **AT** followed by **<enter>**. If the communication to the module is working the module will prompt **OK**, if not check power and serial connections and make sure you have connected to the correct COM port.

3 Network Set-up with Telegesis AT commands

To start a PAN network issue the **AT+EN** command, or alternatively press the '**Establish PAN**' button. The local unit will now scan all available 16 channels and establish a PAN with a random PAN ID on the quietest one. This may take up to 16 seconds and leads to the node becoming the network's coordinator. When successful the module will prompt '**JPAN:cc,PPPP**'[1], where cc is the channel number and PPPP is the PAN ID of the newly created PAN.

If you get an error message instead it is likely that the module was already part of a PAN, so you need to issue the **AT+DASSL** command or press the '**Disas Local**' button to leave the PAN before going back to starting a new one. In order to find the network status simply issue the **AT+N** command or press the '**NWK Info**' button.

Once the network is established remote nodes can be powered up ready to join in. If you have serial access to remote nodes simply issue the **AT+JN** command or press the '**Join any PAN**' button to join the newly established PAN. If you don't have serial access to the remote nodes (such as when Development Boards are battery-powered with no USB cable) you just need to wait for them to join the network automatically.

By default all nodes (except coordinators) are set up to check once every minute whether any neighbours on the same PAN are present, or whether they are

orphaned. If no neighbours have been found after a couple of minutes, the unit will leave the (deserted) PAN and try to join into a new one once every minute.

This initial network setup can take a few minutes, especially with no serial access to remote nodes, but once the network is set up it will remain set even after power cycles.

New nodes joining will cause a prompt 'NEWNODE: <EUI64>'[1] on the remote side, where <EUI64> is the unique 64-bit identifier of the device joining in, and display the JPAN message locally as described above.

To learn more about setting up and maintaining a PAN please refer to the AT Command Dictionary.

4 Configuring Buttons for your set-up

After setting up the network, press the button labelled '**Configure**' which will issue a command to scan the network causing all the nodes in the network to report in. You will see that on discovery of a remote device its serial number is added to the device list window. In addition to this, the configure functionality will build additional buttons to play a tune on a remote board ('**Ident Node x**').

By looking at the actual commands behind these new buttons it is quite easy to understand how the AT-Command interface operates. Also you can easily discover the principle of mesh networking: simply move a Development Board out of range and then add a Development Board between the local node and the one which is out of range and you will find that the network has healed the broken link and all three nodes are accessible again.

With a Development Board and a USB stick you can send messages between two PCs using the Broadcast or Unicast buttons and by experimenting with those buttons you will quickly get an understanding on how to integrate the ETRX357 into your application.

The Telegesis Terminal Application also allows you to create custom command buttons for your individual application, just click on **Commands / Add command button…**
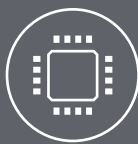
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[1] R3xx firmware will also report Extended Pan ID and module's short address
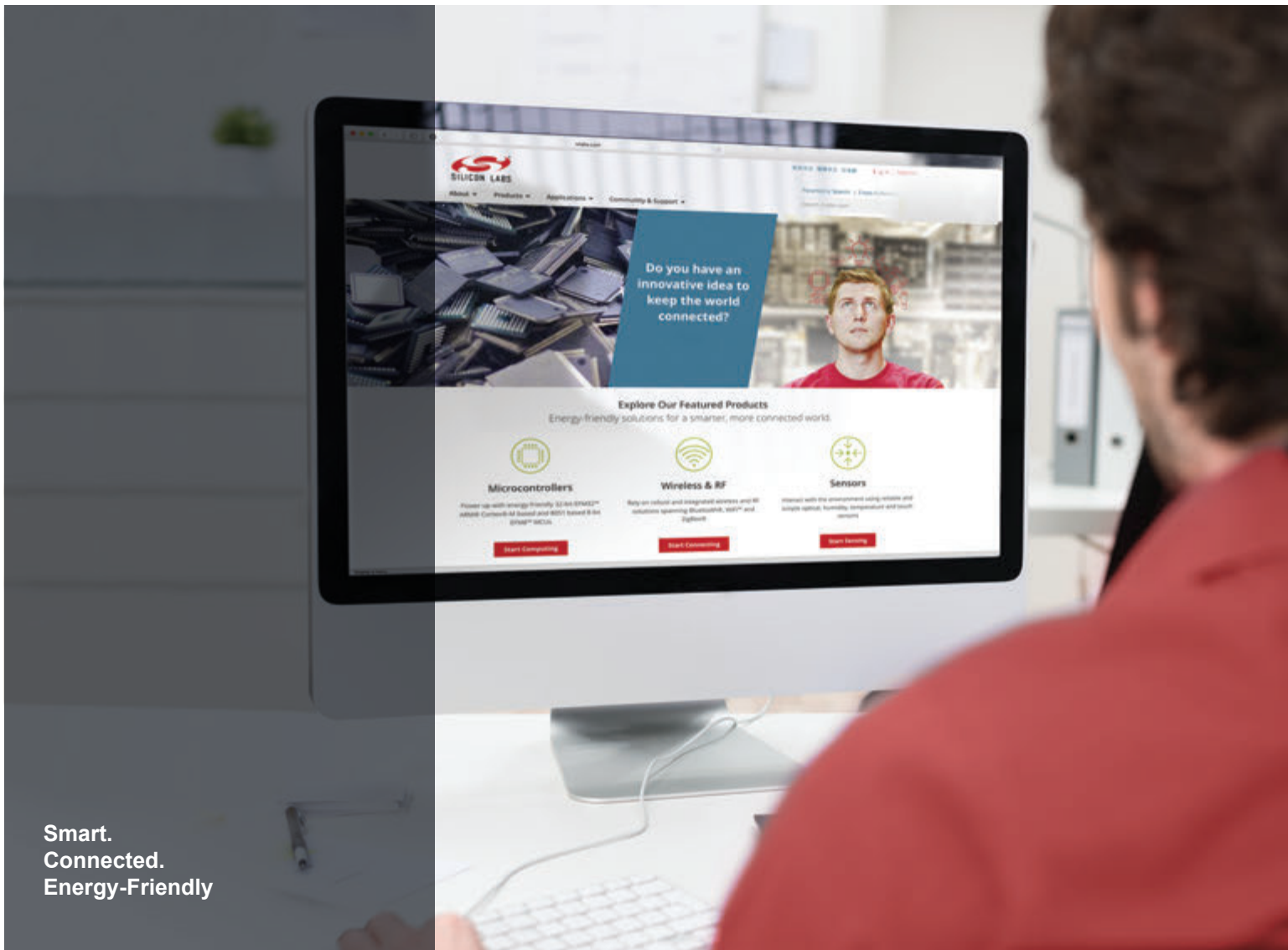
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