UG228: Bootloading New Firmware onto an ETRX358USB User's Guide

This document provides step-by-step instructions for bootloading new firmware onto an ETRX358USB.

KEY POINTS

- Explains the installation of the USB driver
- Provides instructions for loading firmware using the Telegesis™ Terminal and the procedure for bootloading.
- Provides instructions for loading firmware using Tera Term

1. Install USB Driver

After you plug in the ETRX358USB stick, the PC will detect and try to install a driver. Cancel the attempt to find a driver on the local PC and install `SiLabs-CDC.inf` manually by browsing to its folder. If you have an EmberZNet stack release installed, the file is in the following path:

```
…\EmberZNetn.n.n-GA\tool\usb-host-drivers
```

The driver can also be pre-installed using an installer provided by Silicon Labs.

2. Load Firmware using Telegesis Terminal

Telegesis Terminal can be downloaded at:

http://www.telegesis.com/download/software-centre/telegesis_terminal_software_for_windows/TelegesisTerminalSetup4.0.2.zip

or any other serial communication tool that supports Xmodem-CRC.

2.1 Procedure for Bootloading

If you choose Telegesis Terminal (V4.0.2), start by clicking [**File**] → [**Open Layout**] (or [**Ctrl-O**]) and select the [**CombinedInterface.xml**] button layout. The buttons shown at the bottom of the screen can be selected after loading the CICIE firmware to verify whether the firmware has been loaded successfully.

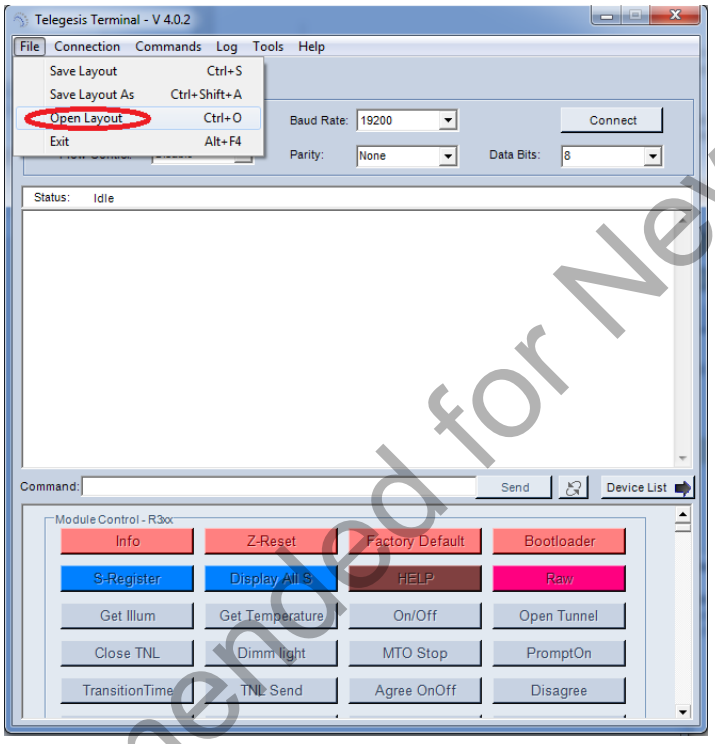


Figure 2.1. Open Layout

Plug in the ETRX358USB. The default values can be used, so baud rate, flow-control, etc., will not need to be changed. Select [**Tools**] → [**Refresh Com Ports**] to find the COM Port assigned to the USB, as shown in the figure below.

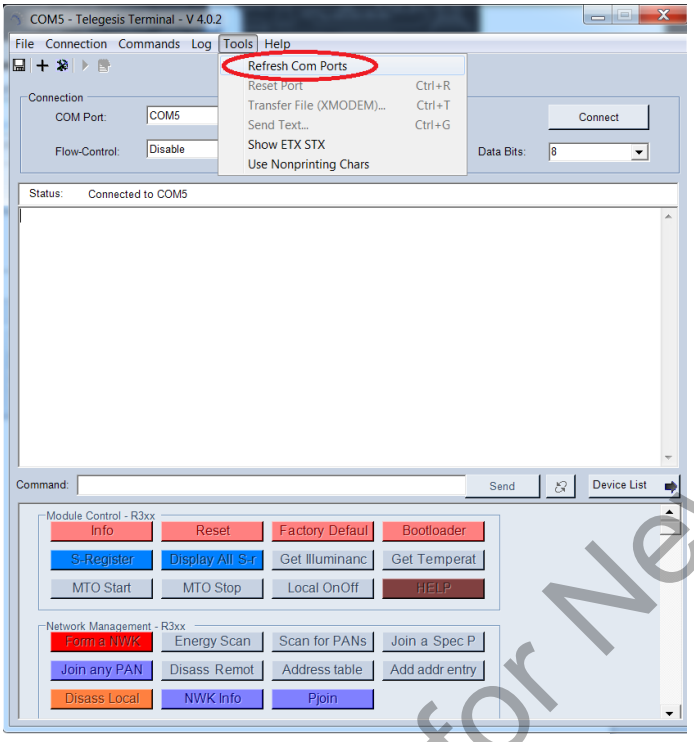


Figure 2.2. Refresh COM Ports

Select the COM port and click the [**Connect**] button, as shown in the figure below.

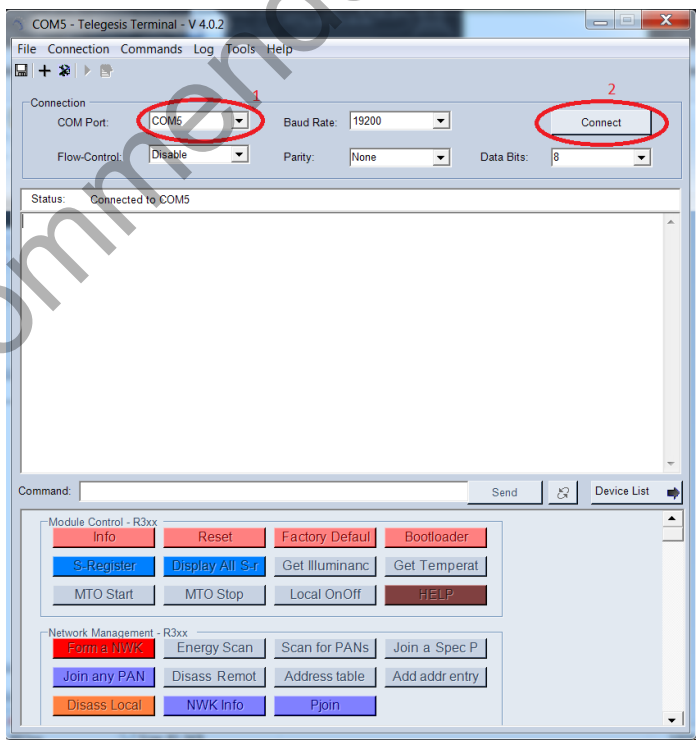


Figure 2.3. Connect

Press [**Enter**] on the PC keyboard. If the ETRX358USB has only the bootloader and no application file, Telegesis Terminal will show the bootloader menu, as shown below:

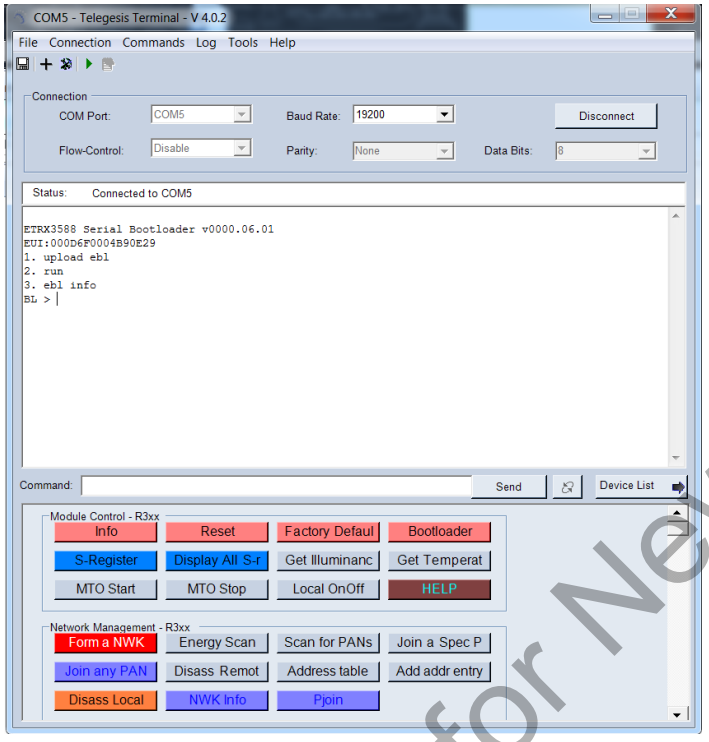


Figure 2.4. Telegesis: Only Bootloader, No Application File

Note the first line indicates the bootloader version (for example, 6.01, 6.02, 6.03, or 6.06, etc.), as it affects the following procedure.

Otherwise, if there is already an application file, see 2.2 Additional Notes below.

Pressing [**1**] initiates the upload of the new firmware and a number of 'C' characters will indicate that the ETRX358USB is ready to receive data. Within 60 seconds, select [**Tools**] →[**Transfer File**], and browse for the new firmware file. (Tip: Select [**Tools**] →[**Transfer File**] or [**Ctrl-T**] before pressing [**1**]. Navigate to the ebl file, and cancel the transfer window. When you press [**1**] and [**Ctrl-T**] the form will already be completed.)

Firmware files for the ETRX358USB will be in the .ebl format. After checking that the protocol is set to XMODEM (128 bytes), press the [**Send**] button and the new firmware will be downloaded, as shown in Figure 2.5 Transfer File on page 5. On Telegesis Terminal this step may hang after completion, in which case you have to terminate Telegesis Terminal from the Windows Task Manager and start again.

Note: When the USB goes into bootload mode, the LED on USB will remain on. When the USB is receiving an image (ebl) file, the LED will blink until the ebl file transmission is completed.

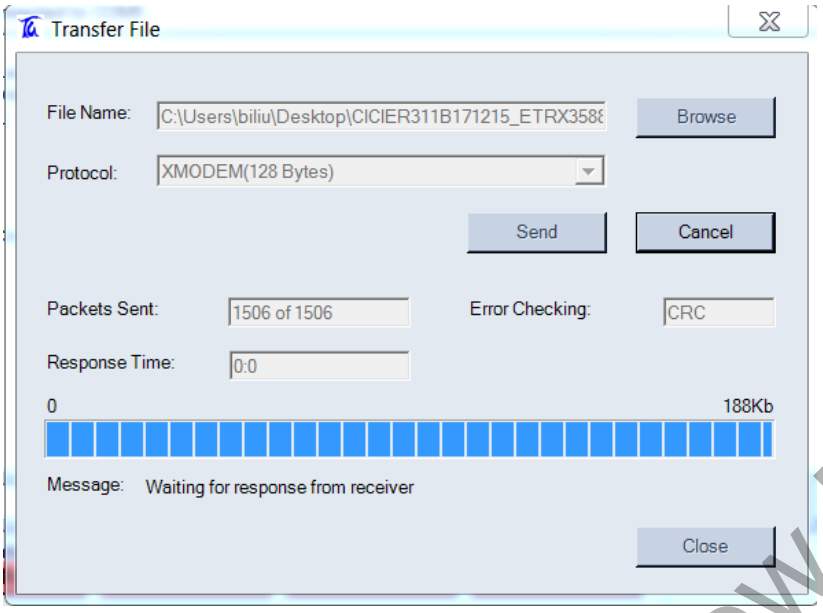


Figure 2.5. Transfer File

When the transfer has been successfully completed, close the Telegesis Terminal (as there is a known issue in Telegesis Terminal at present, sometimes you have to force closure using the Windows Task Manager). Then, re-open Telegesis Terminal.

Note: Sometimes the COM Port number can be changed to a new one. Check the Windows Device Manager to find the COM Port that connects to the Silabs CDC serial port.

Press [**Enter**] again in order to return to the bootloader menu (shown in Figure 2.4 Telegesis: Only Bootloader, No Application File on page 4) and option [**2**] to run the downloaded application software. After selecting option [**2**], you may have to refresh the COM ports list again to find the COM port which is connected to the USB stick. To do that, you need to click the [**Disconnect**] button on Telegesis Terminal, then click [**Tools**] → [**Refresh Com Ports**]. After the COM Port shows up, click the [**Connect**] button then [**Info**] button. The response (as shown in the figure below) will contain the firmware version number CICIE R311 and build number for example B120416, which means the firmware file has been successfully uploaded onto the ETRX358USB. Other binaries will give a different response.

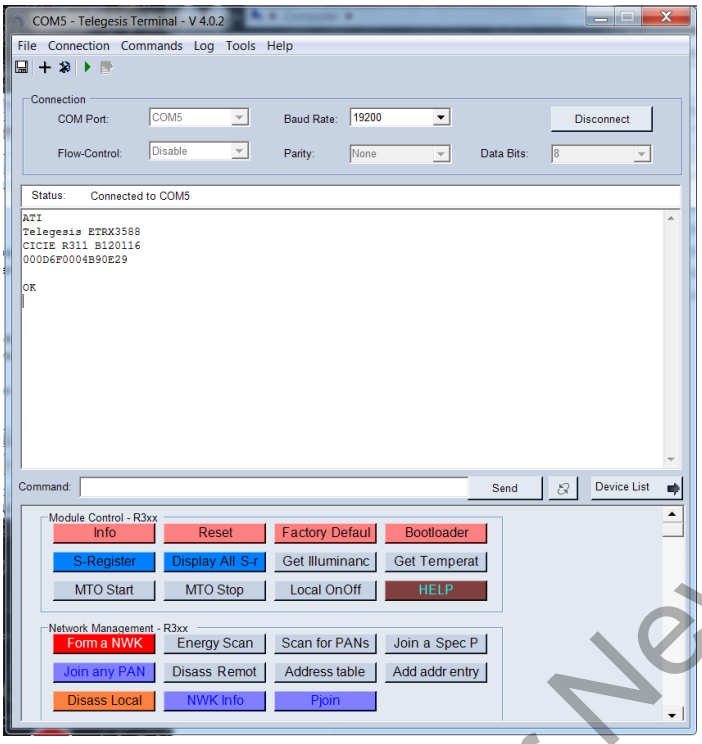


Figure 2.6. Telegesis: Successful Firmware Upload

2.2 Additional Notes

To upgrade the CICIE firmware on an ETRX358USB which already has CICIE firmware, use the [**Bootloader**] button, as shown in the following figure.

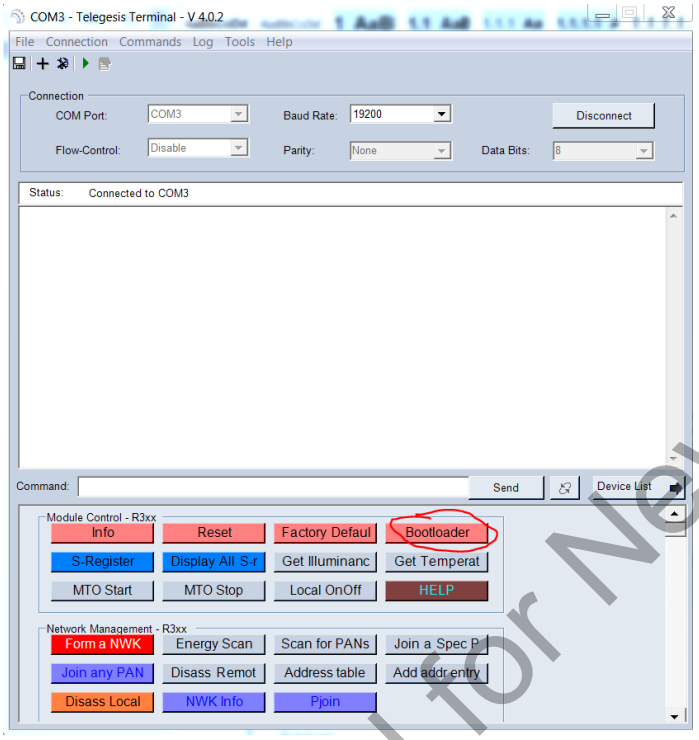


Figure 2.7. Upgrading CICIE Firmware

Alternatively, you can manually input the `AT+BLOAD<CR>` command.

Then the LED on the USB will be ON, which means the USB has started the bootloader.

1. If the USB is with bootloader version 6.01, 6.02, or 6.03, click the [**Disconnect**] button (twice if the first time gets a rejection) and [**Refresh Com Ports**] to find the COM port (it may be a newly assigned COM Port). Then click the [**Connect**] button and use [**Enter (<CR>)**] on the PC keyboard to get access to the bootloader menu. Then follow the procedure in the previous section, starting just after Figure 2.4 Telegesis: Only Bootloader, No Application File on page 4.

   If the COM port still cannot be found after following the above instructions, open the Windows Device Manager. Then find the COM Port and click [**Disable**]. After that, select [**Enable**].
2. If the USB is with bootloader version 6.06 or higher, select the [**Disconnect**] button to close the COM port promptly (within 1 second) after issuing the `AT+BLOAD` command or issuing [**2**] to run firmware. If you do not close the connect COM port, the COM port may be lost. In this case, you would need to open the Windows Device Manager. Then find the COM Port and click [**Disable**]. After that, select [**Enable**].

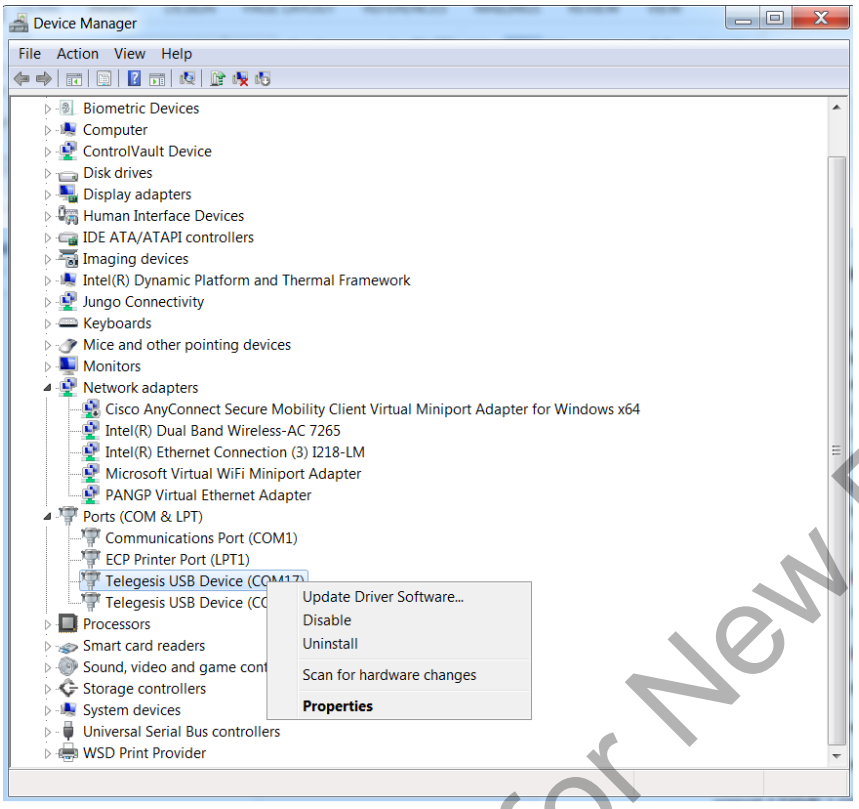


Figure 2.8. Windows Device Manager

3. Load Firmware using Tera Term

If you choose Tera Term (V4.89), you can start by clicking [**File**] → [**New Connection**] (or [**Alt+n**]) and select Serial Port, as shown in the figure below.

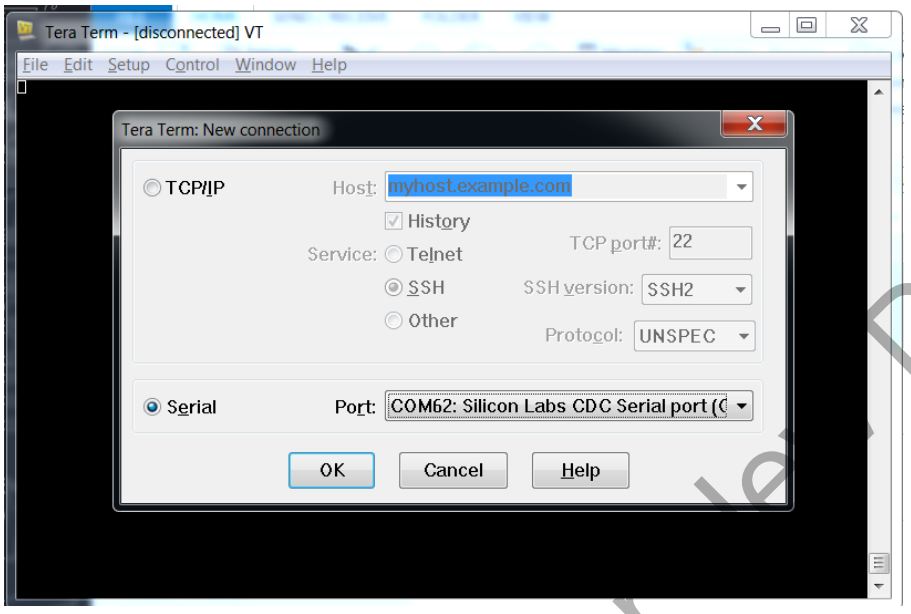


Figure 3.1. Selecting Serial Port

Then press [**Enter**] on the PC keyboard. If the ETRX358USB has only the bootloader and no application file, Tera Term will show the bootloader menu, as follows:

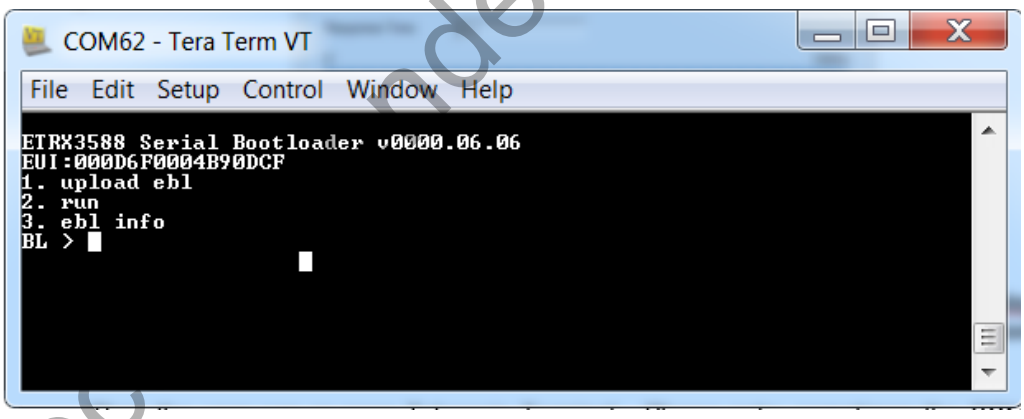


Figure 3.2. Tera Term: Only the Bootloader, No Application File

Pressing [**1**] initiates the upload of the new firmware and a number of [**C**] characters will indicate that the ETRX358USB is ready to receive data, as shown in the next figure. Within 60 seconds, select [**File**] → [**Transfer**] → [**XMODEM**] → [**Send**], and browse for the new firmware file.

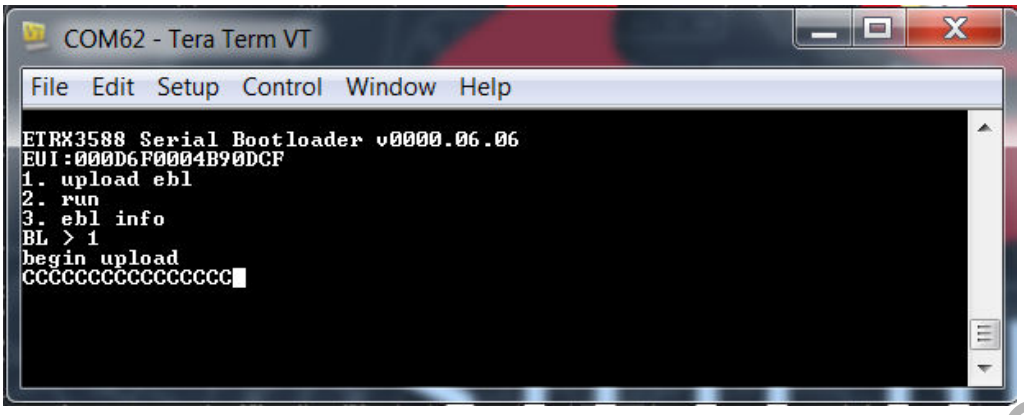


Figure 3.3. Initiate Upload, Set to Receive Data

Firmware files for the ETRX358USB will be in the .ebl format. After checking that the protocol is set to XMODEM (128 bytes), press the [**Send**] button and the new firmware will be downloaded.

Note: When the USB goes into bootload mode, the LED on USB will remain on. When the USB is receiving an image (ebl) file, the LED will blink until the ebl file transmission is completed.

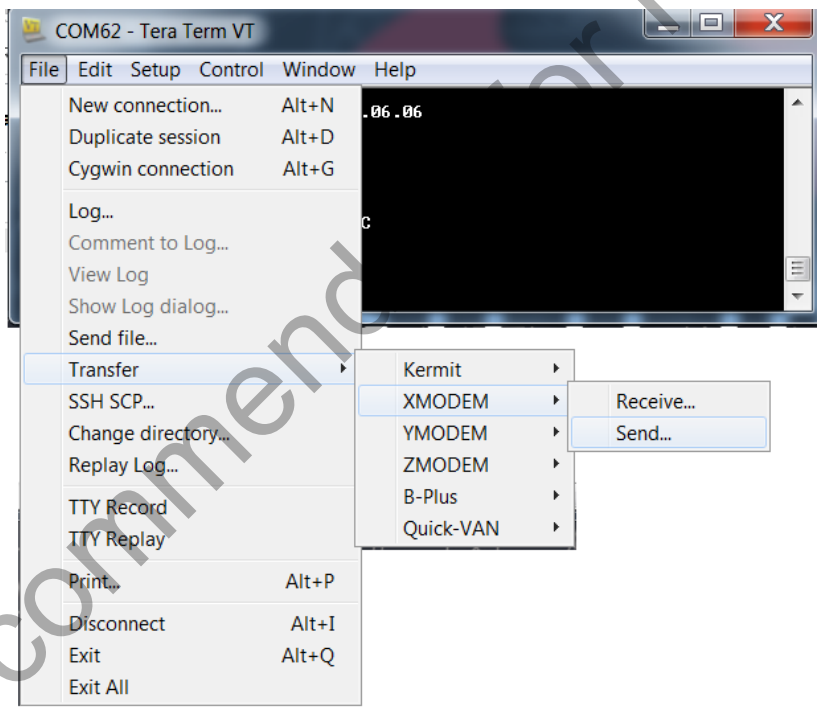


Figure 3.4. Transfer Files

Press [**Enter**], and Tera Term will show the bootloader menu again. After issuing [**2**], the ETRX358USB will run the newly loaded firmware. Type `ATI<CR>` to check the response, and verify whether you have successfully bootloaded the new firmware.

If the ETRX358USB has CICIE application file, pressing [**Enter**] will not trigger any response. You can try the `ATI` command. If you get a response, it will look like the example below:

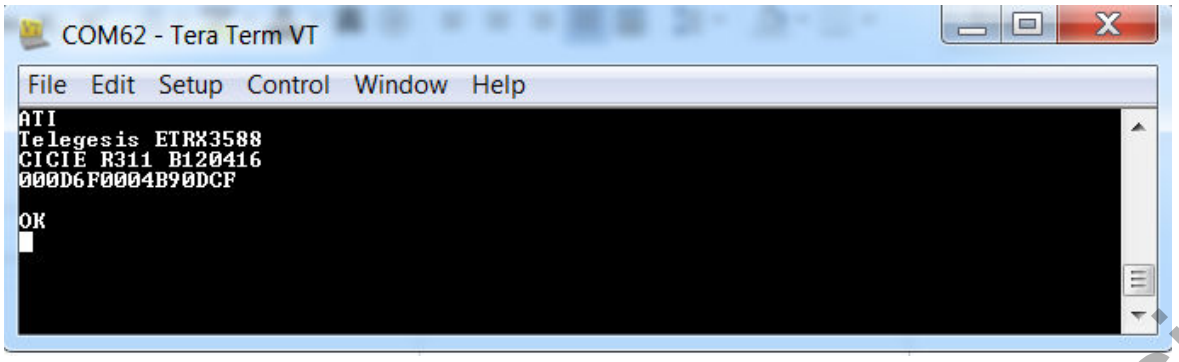
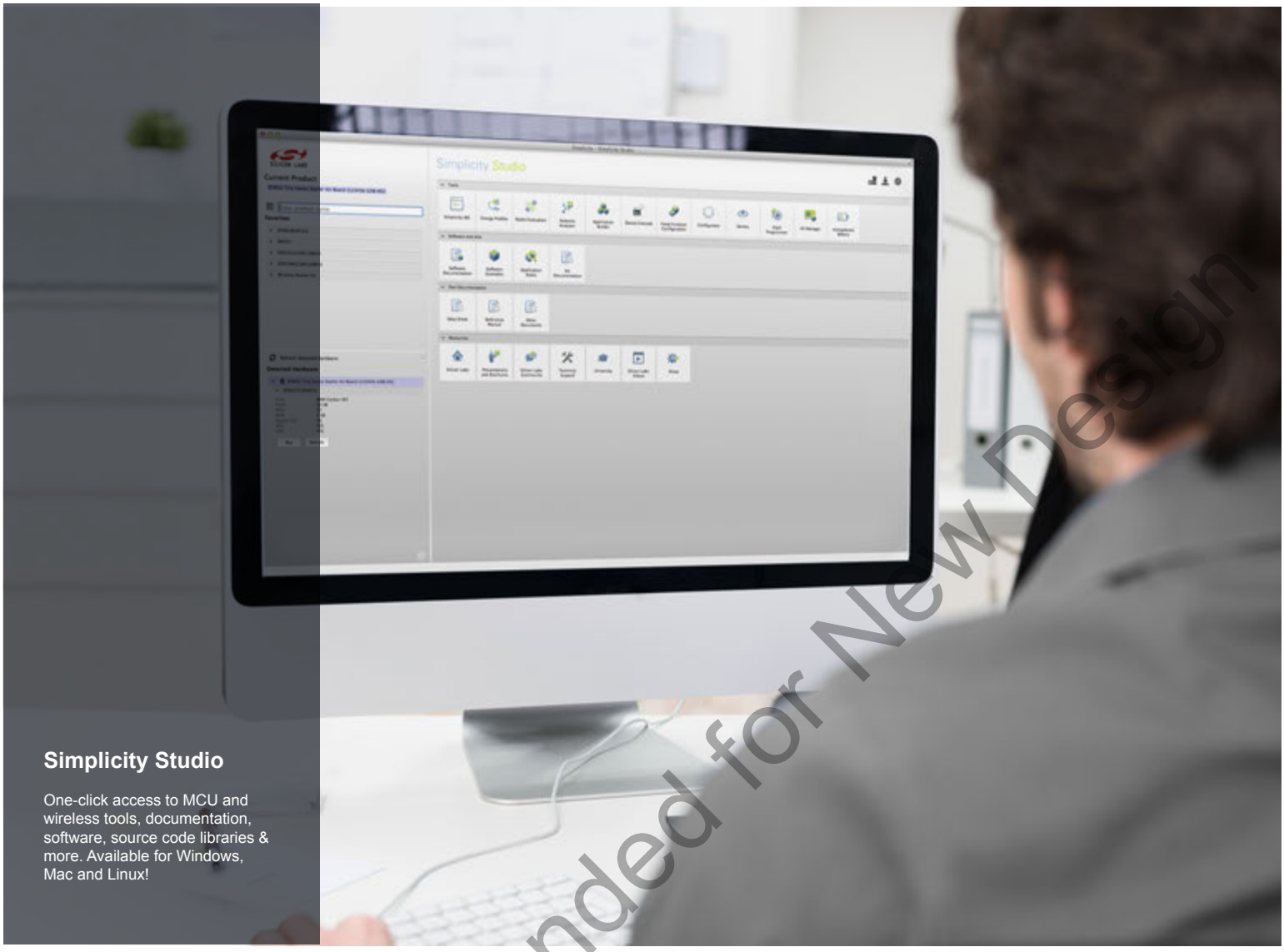


Figure 3.5. Tera Term: Successful Firmware Upload

To bootload new application firmware, you need to apply the `AT+BLOAD<CR>` command. Then, follow the steps from Figure 3.2 Tera Term: Only the Bootloader, No Application File on page 9, onward.



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