

The care and feeding of Pythons at the Redmond Zoo.

(Using Micro Python and pyboard with Windows)

Introduction.

Pyboard connects to Windows using a standard micro USB cable. It can operate in four different USB modes and two of them need driver to be installed. Pyboard USB interface works with 32 and 64 bit versions of Windows XP, Vista, 7, 8 and 8.1

Once the drivers are installed you will be able to use REPL mode with a terminal program such as HyperTerminal or Putty and update the version of Micro Python in bootloader mode.

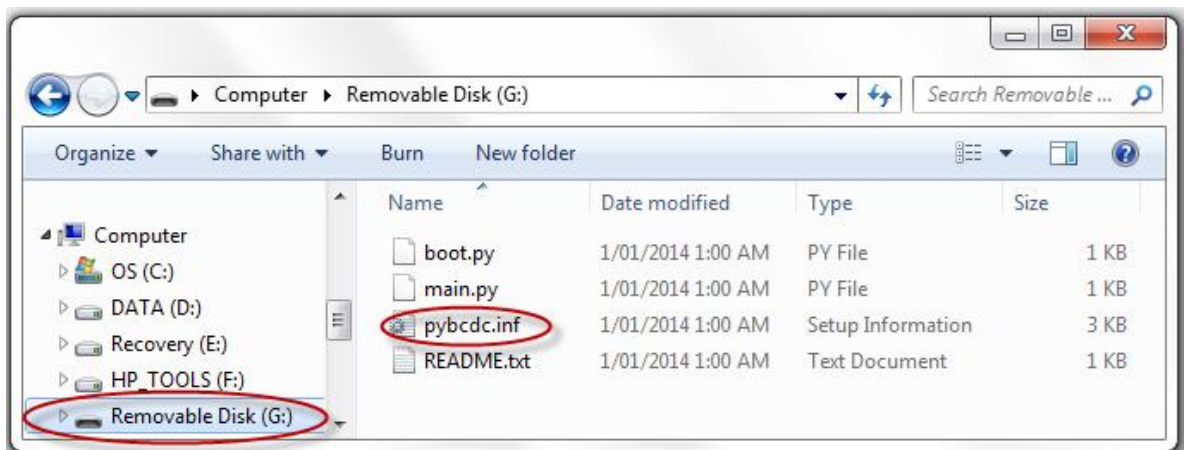
USB drivers.

By default Windows 8 and 8.1 do not allow installation of unsigned drivers. Windows must be booted in a special mode before installing the pyboard driver. Instructions are available from several sites:

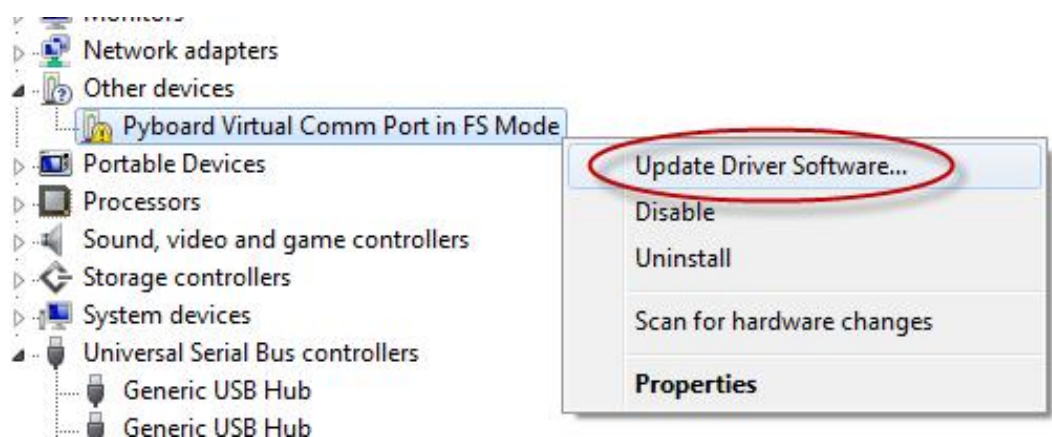
<http://revryl.com/2013/08/06/install-unsigned-drivers/>

<http://www.nextofwindows.com/how-to-install-an-un-signed-3rd-party-driver-in-windows-8/>

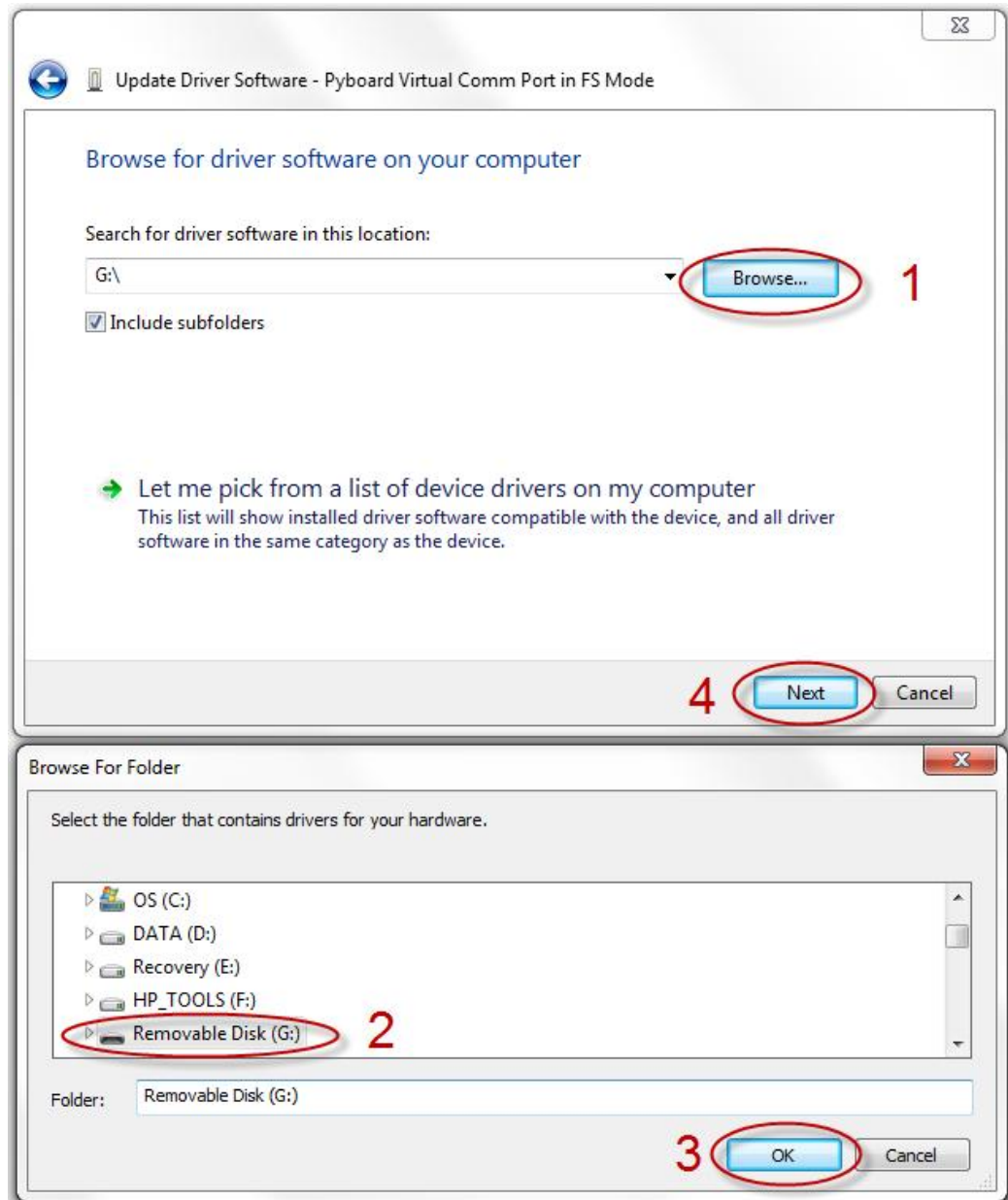
1. MSC. Mass Storage Class. The flash memory on pyboard appears as removable disk drive the same way as a USB thumb drive. No driver installation is required. Plug in pyboard, open Windows Explorer and find the drive. Note the drive letter. It should show the following files:



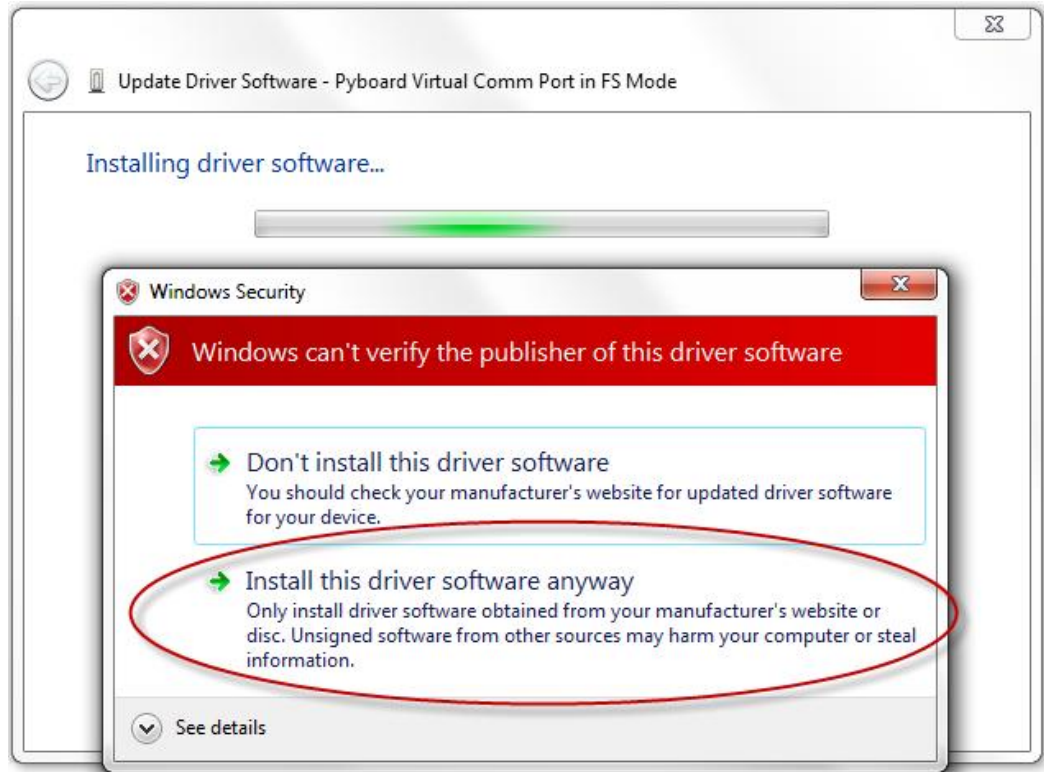
2. CDC. Communications Device Class.
 - a. You may see a message pop up saying that a driver was not successfully installed.
 - b. Open Control Panel. Right click on Pyboard and select "Update Driver Software".



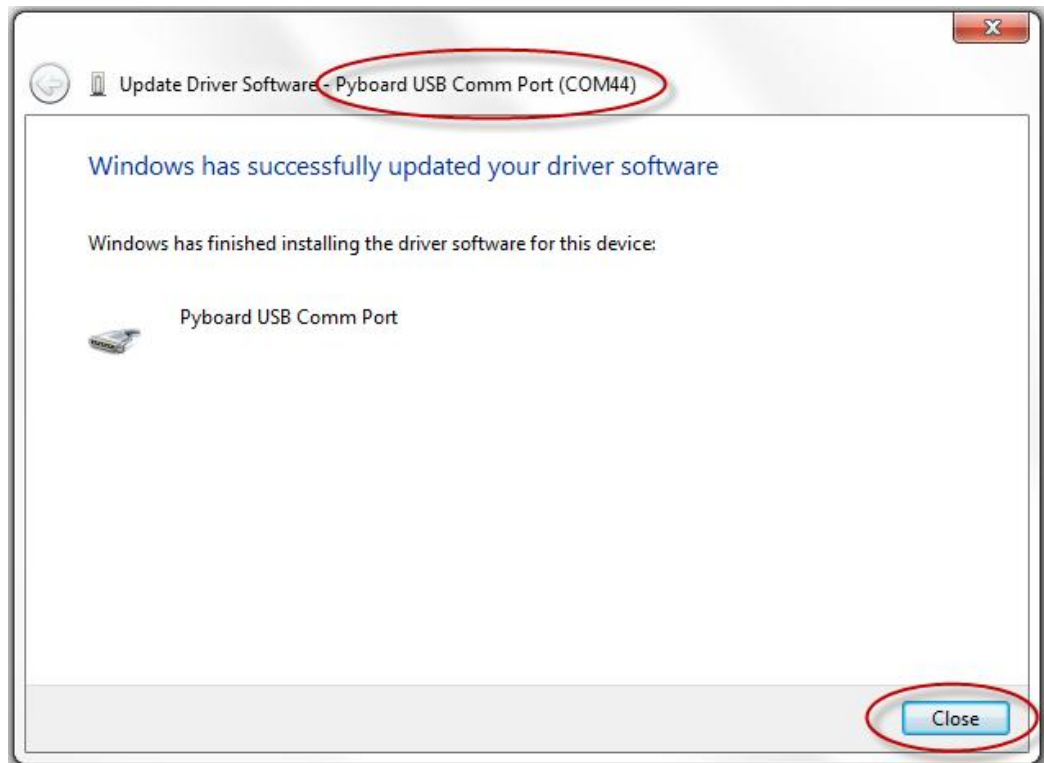
- c. Select "Browse for driver software on your computer" and select the drive letter found above.



- d. Windows will search the pyboard flash drive and find and install pybcd.inf. pybcd.inf is unsigned, ie it has not been verified by Microsoft and Windows will show a warning. Pybcd does not contain any drivers, it just links pyboard to existing Windows drivers, so it is safe to ignore this warning.



- e. Once the driver installs note the COM port number.



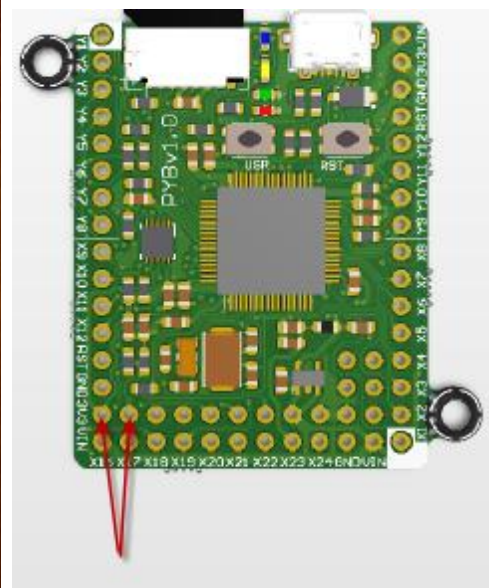
- f. You can also find the port number later from control panel.



3. HID. Human Interface Device. This mode allows pyboard to emulate a mouse or keyboard. No driver installation is required. HID mode is not enabled by default but can be enabled by editing boot.py.
4. DFU. Device Firmware Upgrade. This allows the pyboard flash drive to be reprogrammed with a new version of Micro Python.
 - a. Link the BOOT pin to 3.3V and connect the pyboard USB or press RST if it is already connected. The pyboard executes a special DFU program from ROM (read only memory) inside the STM32 MCU. This makes pyboard unbrickable because it can always start in DFU mode and allow Micro Python to be replaced if it is broken. The official boot mode link is available from any stationery store. The link position is different for pybv3 and pybv10.

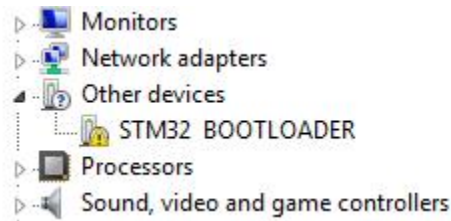


pybv3

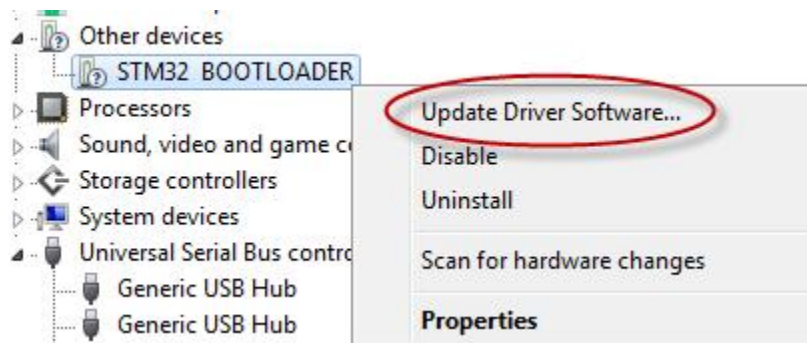


pybv10

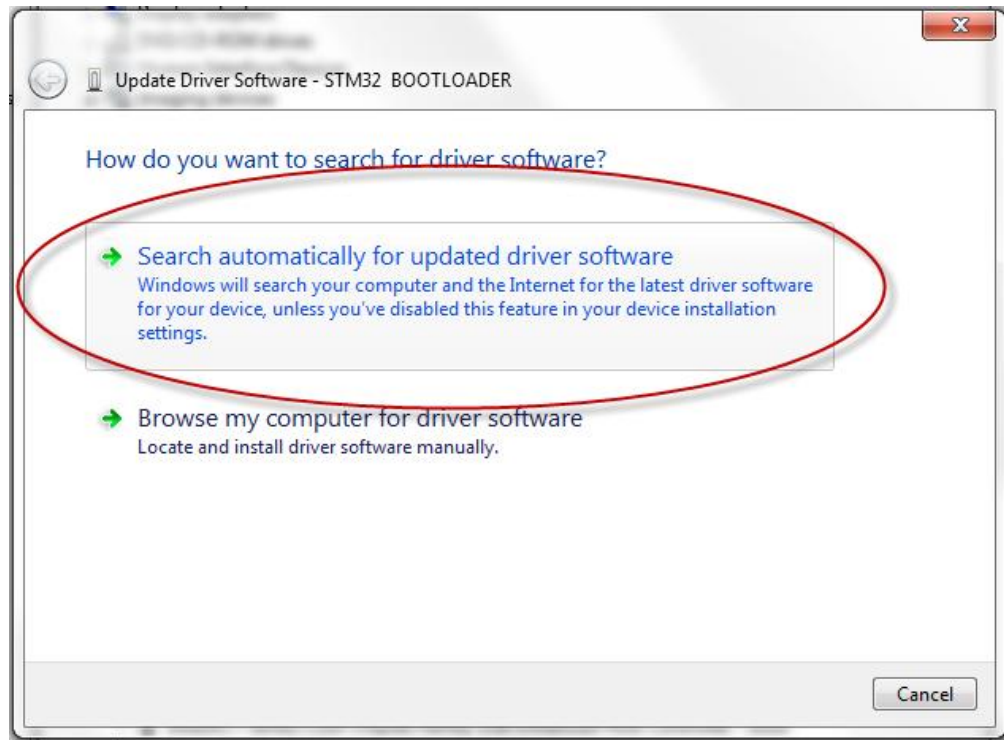
- c. The first time you connect pyboard in DFU mode Windows will try to install the DFU driver. Until the driver is installed pyboard will appear with a warning in Device manager.



- d. The DFU driver provided by ST Microelectronics is signed and available from Windows Update. It should install automatically. If the driver installs automatically you can click on the “device found” balloon and watch the progress. If not manually install it from Device Manager.



- e. Select “Search automatically...”



- f. Driver search requires an internet connection and will take several minutes. Do not proceed until the driver is installed and the DFU device changes in Device Manager.

- g. Once the DFU driver has installed the pyboard may be hidden in Device Manager. Expand "Universal Serial Bus controllers" to see it.



Your computer is now ready for use with pyboard.

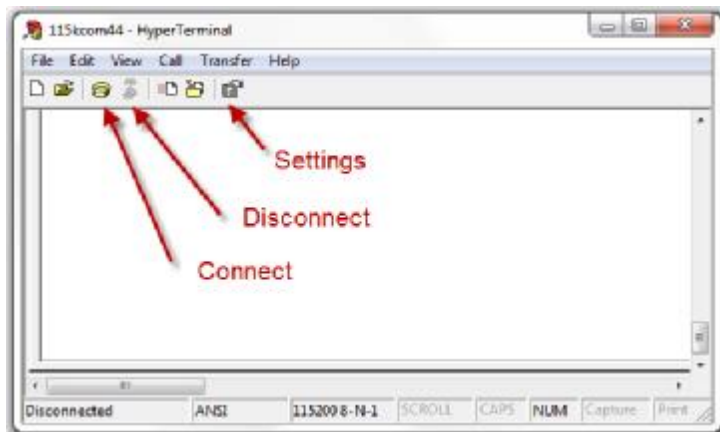
Using REPL with a terminal program.

The pyboard REPL prompt can be accessed with HyperTerminal, Putty or any other serial terminal program.

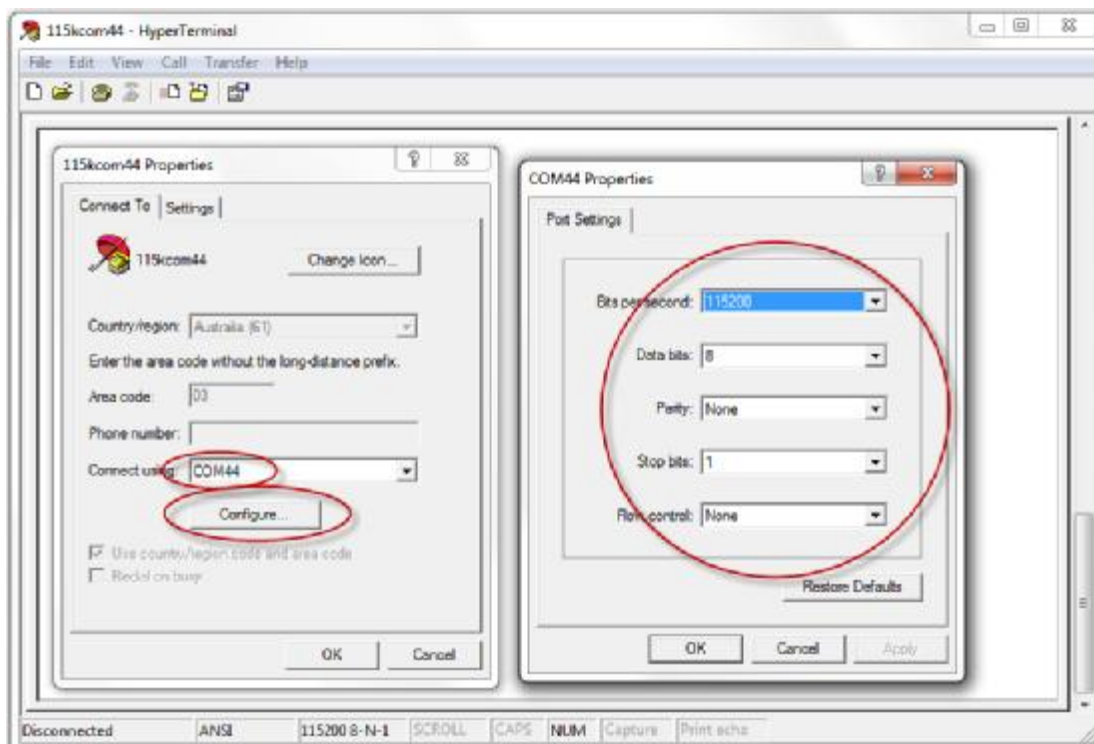
The terminal must be configured for the COM port identified during driver installation and 115kbaud, 8bit, no parity, 1 stop bit (115k, 8, N, 1).

HyperTerminal.

HyperTerminal is installed with Windows XP. HyperTerminal Private Edition is available for trial or purchase for use with newer versions of Windows.

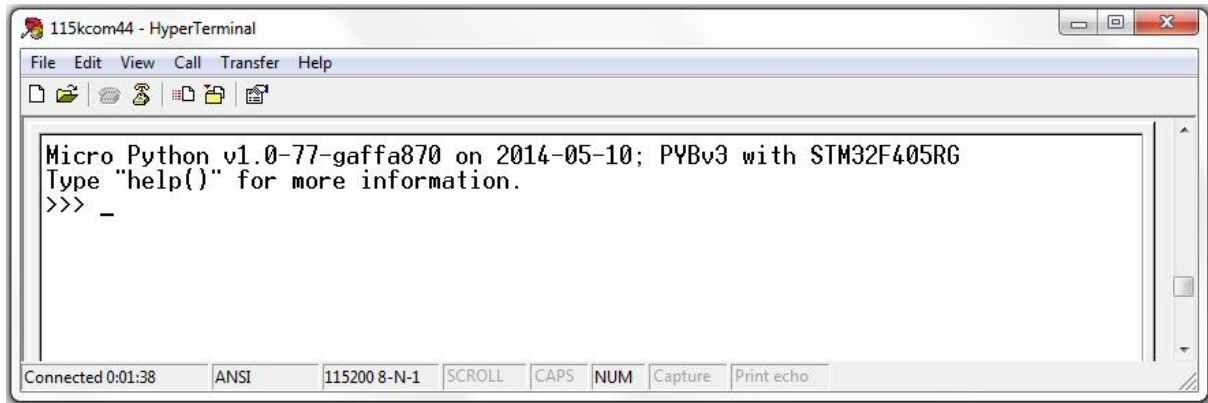


HyperTerminal must be disconnected before altering settings.



Configuration settings.

Once configured press Connect to talk to pyboard.



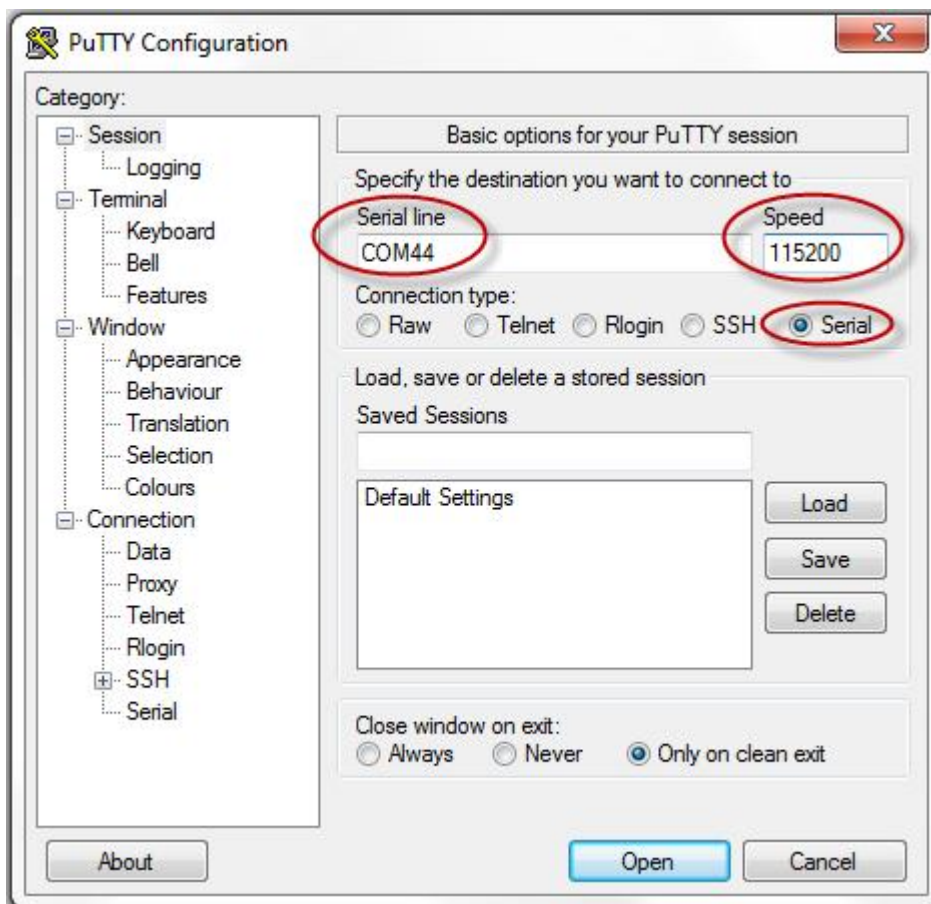
The Micro Python REPL prompt.

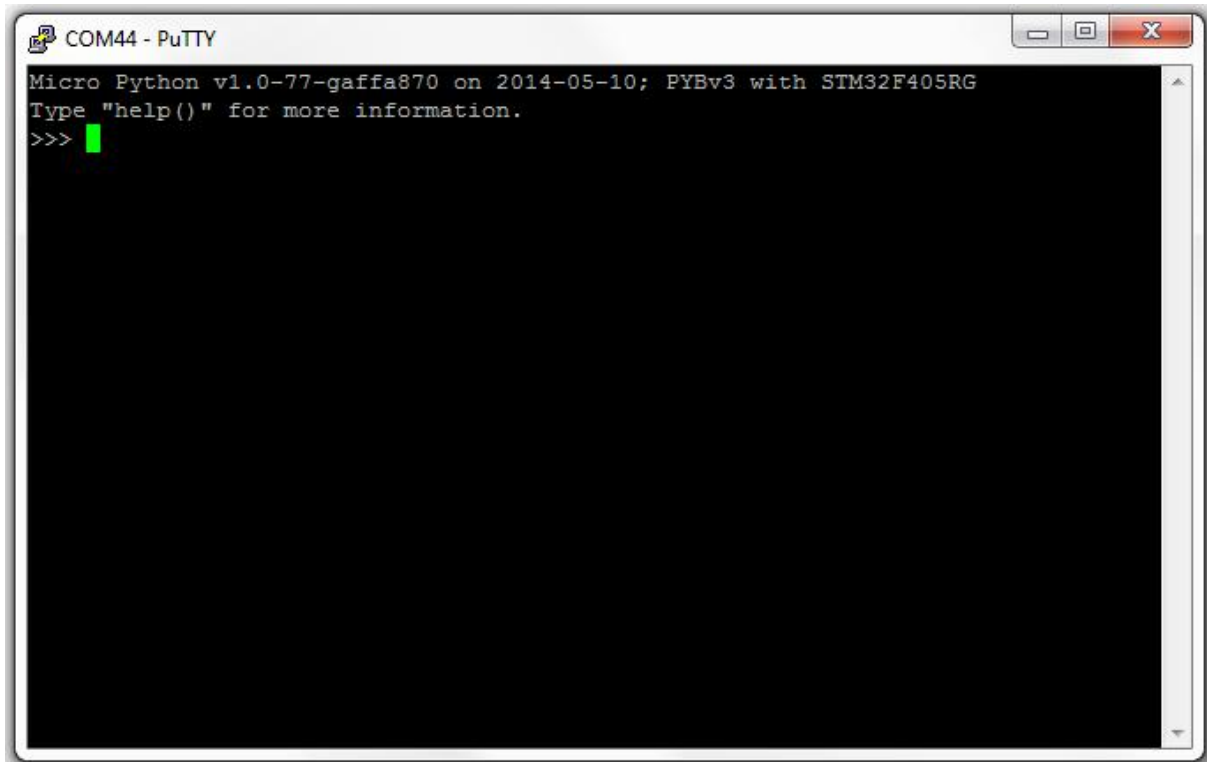
If you reset the pyboard the COM port will be temporarily lost. HyperTerminal will not recover. Make sure you Disconnect before reset and Connect after pyboard restarts.

Putty.

Putty.exe is a free terminal program. Download it from the link at <http://www.putty.org/>

Configure it as follows using the COM port identified during driver installation.



A screenshot of a PuTTY terminal window titled "COM44 - PuTTY". The window shows the Micro Python REPL prompt. The text displayed is: "Micro Python v1.0-77-gaffa870 on 2014-05-10; PYBv3 with STM32F405RG", "Type 'help()' for more information.", and the prompt ">>>" with a green cursor. The terminal background is black, and the text is white. The window has standard Windows-style window controls (minimize, maximize, close) in the top right corner.

```
COM44 - PuTTY
Micro Python v1.0-77-gaffa870 on 2014-05-10; PYBv3 with STM32F405RG
Type "help()" for more information.
>>>
```

The Micro Python REPL prompt.

If you reset the pyboard the COM port will be temporarily lost. Putty will not recover. Make sure you exit before reset and restart Putty after pyboard restarts.

Using DFU to upgrade Micro Python.

There is an open source DFU program available for reprogramming MCU flash memory however you may find it easier to use DfuSe, the GUI version from ST Microelectronics which supports the STM32 family.

Download DfuSe from:

http://www.st.com/web/en/catalog/tools/FM147/CL1794/SC961/SS1533/PF257916?s_searchtype=keyword

The documentation is out of date, but DfuSe is easy to use for reprogramming without the documentation.

Install the 32 or 64 bit version to match your OS. Check your version at (My) Computer / Properties.

Download the latest Micro Python pyboard dfu image from <http://micropython.org/download/>

Install a BOOT to 3.3V jumper on pyboard and connect to USB.

Start "DfuSe Demonstration", Choose the Micro Python DFU file to load and Upgrade your board.

Close DfuSE, remove the boot jumper and press reset.

Depending on the Micro Python version you upgrade to you may need to restore the flash file system to get the latest boot.py and pyboard.inf. See the Micro Python tutorial "Safe mode and factory reset".

