Installation

Step #1 – Configuring your PC for RS-232 Control

If you have a built-in RS-232 connector

1. Proceed to Step #2, it should be properly installed and ready to use.

If you plan on using the USB-to-RS-232 Cable for Windows

1. Unpackage the supplied USB-to-RS-232 and following the instructions. The cable uses the Prolific chipset. A driver disk is supplied should you need to install drivers.

If you plan on using the USB-to-RS-232 Cable for Ubuntu, also applies to Linux

1. This is a very useful page:
    http://blog.mypapit.net/2008/05/how-to-use-usb-serial-port-converter-in-ubuntu.html
2. Plug in the Prolific USB to RS-232 serial adapter
3. Terminal: "dmesg" -- you should see something like this that is near the end

    [349112.120020] usb 4-1: new full speed USB device using uhci_hcd and address 2
    [349112.330207] usb 4-1: configuration #1 chosen from 1 choice

4. Unplug Prolific USB to RS-232 adapter
5. Terminal: "lsusb" -- you should see something like this

    Bus 004 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
    Bus 003 Device 003: ID 046d:c018 Logitech, Inc. Optical Wheel Mouse

Bus 003 Device 002: ID 045e:00db Microsoft Corp. Natural Ergonomic Keyboard 4000 V1.0
Bus 003 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
Bus 002 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
Bus 005 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub

6. Plug in the USB to RS-232 adapter
7. Terminal: "lsusb" -- you should see an additional line like this

    Bus 004 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
    Bus 003 Device 003: ID 046d:c018 Logitech, Inc. Optical Wheel Mouse
    Bus 003 Device 002: ID 045e:00db Microsoft Corp. Natural Ergonomic Keyboard 4000 V1.0
    Bus 003 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
    Bus 002 Device 003: ID 067b:2303 Prolific Technology, Inc. PL2303 Serial Port
    Bus 002 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
    Bus 005 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
    Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub

8. The 067b:2303 before the word Prolific in the above messaging is key for the next step. If it is not this number combination then make note of the number combination and fill it in the next step.
9. Terminal: "sudo modprobe usbserial vendor=0x067b product=0x2303"
10. Terminal: "dmesg" -- you should see something like this

    [349112.120020] usb 4-1: new full speed USB device using uhci_hcd and address 2
    [349112.330207] usb 4-1: configuration #1 chosen from 1 choice
    [349112.488663] usbcore: registered new interface driver usbserial
    [349112.488705] USB Serial support registered for generic
    [349112.488766] usbcore: registered new interface driver usbserial_generic
    [349112.488772] usbserial: USB Serial Driver core
    [349112.498155] USB Serial support registered for pl2303
    [349112.498187] pl2303 4-1:1.0: pl2303 converter detected
    [349112.510161] usb 4-1: pl2303 converter now attached to ttyUSB0
    [349112.510192] usbcore: registered new interface driver pl2303
    [349112.510196] pl2303: Prolific PL2303 USB to serial adaptor driver
    [349133.824053] usb 4-1: USB disconnect, address 2
    [349133.824297] pl2303 ttyUSB0: pl2303 converter now disconnected from ttyUSB0
    [349133.824324] pl2303 4-1:1.0: device disconnected
    [349136.976016] usb 4-2: new full speed USB device using uhci_hcd and address 3
    [349137.126236] usb 4-2: configuration #1 chosen from 1 choice
    [349137.130137] pl2303 4-2:1.0: pl2303 converter detected
    [349137.144232] usb 4-2: pl2303 converter now attached to ttyUSB0
    [349141.264054] usb 4-2: USB disconnect, address 3
    [349141.264290] pl2303 ttyUSB0: pl2303 converter now disconnected from ttyUSB0
    [349141.264315] pl2303 4-2:1.0: device disconnected
    [349152.852020] usb 2-2: new full speed USB device using uhci_hcd and address 2
    [349153.062171] usb 2-2: configuration #1 chosen from 1 choice
    [349153.066027] pl2303 2-2:1.0: pl2303 converter detected

[349153.079158] usb 2-2: pl2303 converter now attached to ttyUSB0
[349388.272054] usb 2-2: USB disconnect, address 2
[349388.272300] pl2303 ttyUSB0: pl2303 converter now disconnected from ttyUSB0
[349388.272325] pl2303 2-2:1.0: device disconnected
[349433.488021] usb 2-2: new full speed USB device using uhci_hcd and address 3
[349433.642174] usb 2-2: configuration #1 chosen from 1 choice
[349433.646023] pl2303 2-2:1.0: pl2303 converter detected
[349433.658155] usb 2-2: pl2303 converter now attached to ttyUSB0

11. As you can see from the messages above, the new serial port device is mapped to /dev/ttyUSB0. You can instruct Ubuntu to load this module automatically by include the following line inside "/etc/modules" file:

"modprobe usbserial vendor=0x067b product=0x2303"

It should look something like this in the file and make sure the command is after the "lp"
/etc/modules: kernel modules to load at boot time.
#
This file contains the names of kernel modules that should be loaded
at boot time, one per line. Lines beginning with "#" are ignored.

lp
modprobe usbserial vendor=0x067b product=0x2303

Step #2 – Get the latest Colt UI from the www.benchforge.com Website in downloads and place it in a covenant location in your PC.

Step #3 - Running the Colt UI

Windows
1. Insure that you have .Net 2.0 or later on your machine. If not, install it now.
2. Also, insure your USB-to-RS-232 cable is plugged into your PC if you are using one.
3. Double click the ColtSynthesizer.exe and it should launch

Ubuntu/Linux
1. Terminal: cd to the location of the ColtSynthesizer.exe
2. Also, insure your USB-to-RS-232 cable is plugged into your PC if you are using one.
3. Terminal: "mono ColtSynthesizer.exe"
4. If you get a series of error messages with the following content: .....Could not load file or assembly 'System.Windows.Forms'...... chances are you are missing the following library, execute the following command and repeat step 3.
5. Terminal: "sudo apt-get install libmono-winforms2.0-cil"

Step #4 – setting up the Serial Port

1. For a first time install, you will be asked to set the Serial Port because one was not assigned. Go to the Serial Setup men under Tools and set the appropriate serial port that is connected to your Colt.
2. Click OK when done.

Step #5 – Connect your RS-232 cable to Colt

Step #6 – Connect the included AC Power Adapter to Colt

1. The Power LED should be on.
2. You should see all other LEDs momentarily turn on then off.
3. The Heart Beat LED should continuously flash on and off.

Step #7 – RS-232 Interface check

1. Click on the System Tab.
2. Click on the Refresh Version Info button and observe the RS-232 interface LED flash for each click of the Refresh Version Info button.
3. Plus you should see the Revision fields in the System Tab update. Having this confirms that the RS-232 has two way connection with Colt.
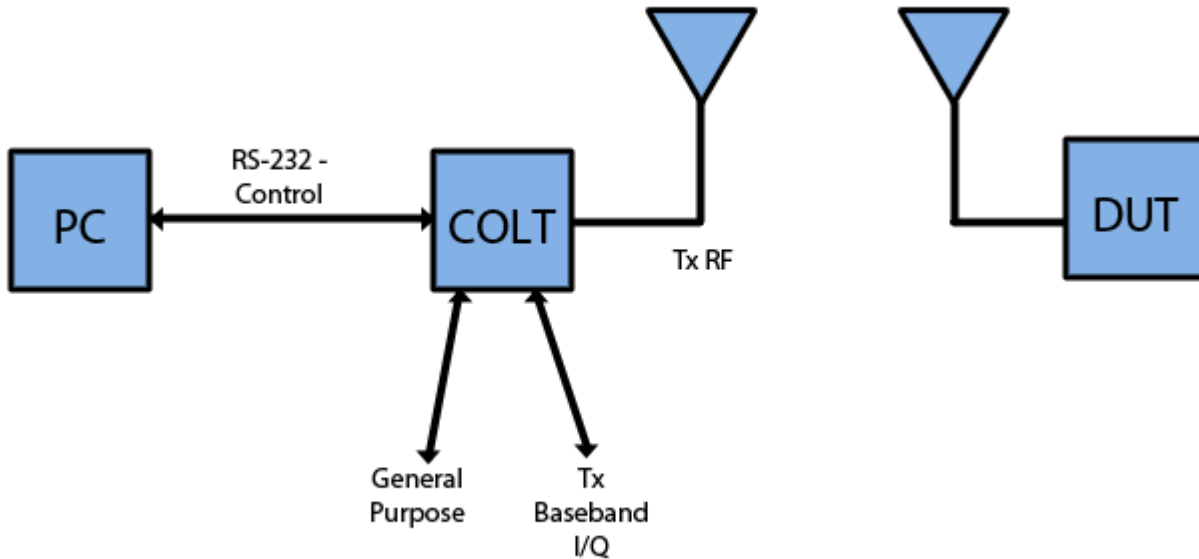
Step #8 – RF check

1. Click on the System Tab.
2. Click the "CW Test" button.
3. Set the desired Channel Frequency from the pull down tab. This will produce a CW (continuous wave) at the desired RF frequency. You can view the RF signal on a spectrum.
4. Also, the Radar Active LED will be on.
5. Click the Off button when finish.

Step #9 – Congratulations, you are done with the install and the quick check-out and are ready to use your Colt!!

Colt is Benchforge's first product. It is a 5-6 Ghz Signal Synthesizer which generates all FCC and other country UNII/DFS radar signals. Its intended use is for developers and for pre-certification say in certification labs. It breaks the paradigm of what can be done with inexpensive yet band specific signal synthesizers.

Colt has implemented the FCC radar signal types contained in FCC-06-096A1 in a small self contained box. The box is controlled over RS-232 and has a simple but powerful User Interface that allows the user to set up for a test of their DUT or to run a series of 30 trails and record the results of each for logging purposes.

See the following block diagram for an example use of Colt. In the PC is connected to Colt. Colt works with either RS-232-RS232 cable or USB-RS-232. You can optionally order Colt with a USB-RS-232 cable should you require one. Colt is powered from an AC-DC transformer provided with Colt. A normal polarity SMA antenna can be directly connected to Colt or you could directly wire Colt to your DUT. This example shows Colt with the antenna connected which is supplied with Colt. If wireless the DUT should have an antenna as well.

We offer two convenient interfaces for test interfaces. One is the I/Q baseband output of Colt. This is available using two BNC connectors on the front panel of Colt. The other is available via a straight pin header on the backpanel of Colt. In it we supply two useful debug outputs which is 1) beginning of the burst (HWSTAT[0]) and 2) when each burst is sent (HWSTAT[1]. Both are 3.3 V logic level signals. HWSTAT[4:7] have dual use because they drive the front 3 LEDs of the front panel LED. Presently HWSTAT[4] is the Heart Beat LED, HWSTAT[5] is the RS232 ACTIVE LED and HWSTAT[6] is the RADAR ACTIVE LED. Keep in mind however that the RADAR ACTIVE is not actual Tx time but persistence has been added so that the LED is visually seen. Some radar pulses are sent faster than the eye can perceive it thus the reason for adding persistence.

Note on the backpanel there is RS232-OUTPUT. It is not presently used but is reserved for future use.