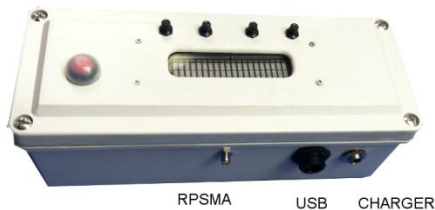




# BASESTATION-1

## OVERVIEW

- RPSMA: RP-SMA socket for connection to external antenna (default is 3dBi Rubber duck antenna)
- USB: USB Serial port connection to host computer (default 9600, N, 8, 1)
- CHARGER: Connect to charger to charge internal battery.



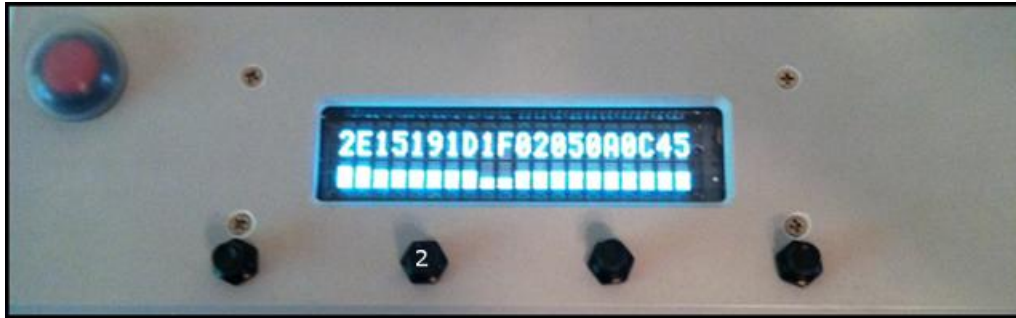
NOTE: Basestation-1 has an internal break sensor intrusion detector, opening receiver box voids warranty.

## POSITION



Power on the unit, by default position is shown. Pressing button (1) will show position in Decimal degrees. When 3D lock is established, the altitude is shown (in Feet) and alternates between an airplane icon and Ft symbol. When 3D lock is lost, the characters "-----" are shown.

# SATELLITES



Pressing button (2) displays the Satellites available to the remote receiver as well as their relative signal strength (using a 2 column bar-graph to depict a 1-10 value). Two digits are used for each Satellite and the SVN is shown in hexadecimal above the signal strength indication (to constrain SVN numbers to 2 columns). Currently active US satellites are listed below:

Basestation-1 DEC2HEX (SVN)	Satellite PRN/SVN	Plane	Freq. Std # Block		Launch Date	Last Clock Swap (or Set Healthy)	Other Info
3F	01/63	D2	Cs3	IIF-2	16 July 2011		
3D	02/61	D1	Rb1	IIR	06 November 2004	27 April 2008	
21	03/33	C2	Cs4	IIA	27 March 1996	01 January 2007	
22	04/34	D4	Rb1	IIA	26 October 1993	14 September 1998	
32	05/50	E3	Rb1	IIR-M8	17 August 2009	27 August 2009	
24	06/36	C5	Rb1	IIA	10 March 1994	19 March 2004	
30	07/48	A4	Rb3	IIR-M6	15 March 2008	24 March 2008	
26	08/38	A3	Cs4	IIA	06 November 1997	16 November 2009	
27	09/39	A1	Cs4	IIA	26 June 1993	24 December 2005	
28	10/40	E3	Cs3	IIA	17 July 1996	25 March 2008	
2E	11/46	D2 (F)	Rb1	IIR	07 October 1999	21 December 1999	
3A	12/58	B4	Rb3	IIR-M3	17 November 2006	13 December 2006	
2B	13/43	F3	Rb1	IIR	23 July 1997	26 September 1997	
29	14/41	F1	Rb1	IIR	10 November 2000	15 November 2000	
37	15/55	F2	Rb3	IIR-M4	17 October 2007	31 October 2007	
38	16/56	B1	Rb3	IIR	29 January 2003	18 February 2003	
35	17/53	C4	Rb3	IIR-M1	25 September 2005	16 December 2005	
36	18/54	E4	Rb1	IIR	30 January 2001	07 February 2001	
3B	19/59	C3	Rb3	IIR	20 March 2004	05 April 2004	
33	20/51	E1	Rb1	IIR	10 May 2000	17 May 2000	
2D	21/45	D3	Rb3	IIR	31 March 2003	11 April 2003	
2F	22/47	E2	Rb3	IIR	21 December 2003	12 January 2004	
3C	23/60	F4	Rb2	IIR	23 June 2004	09 July 2004	

18	24/24	D5	Cs4	IIA	03 July 1991	07 September 2000	
3E	25/62	B2	Rb1	IIF-1	28 May 2010	27 August 2010	Clock swap, 12 July 2010, from Cs3 to Rb1...
	---						
1A	26/26	F5	Rb1	IIA	07 July 1992	10 March 1998	
1B	27/27	A6	Cs4	IIA	09 September 1992	20 May 2005	Decommissioned 10 August 2011...
2C	28/44	B3	Rb2	IIR	16 July 2000	10 August 2000	
39	29/57	C1	Rb3	IIR-M5	20 December 2007	02 January 2008	
23	30/35	B5	RB1	IIA	---	16 August 2011	Re-set healthy... note NANU 2011061...
	---						
34	31/52	A2	Rb3	IIR-M2	25 September 2006	12 October 2006	
17	32/23	E5	Rb2	IIA	26 November 1990	26 February 2008	Old PRN23/SVN23... Reinstated on 27 June 2007... note NANU 2007081...
	---						
	---						
					UFN - until further notice		
					NET - No Earlier Than		
					TBD - To Be Determined		

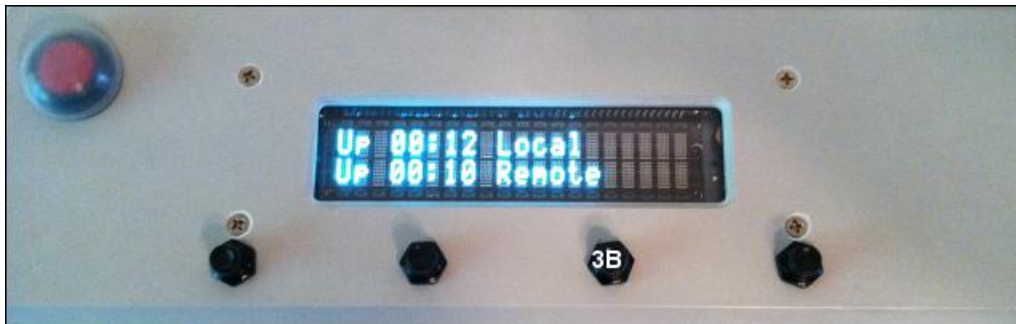
The list is updated and maintained by the NGA GPS Division, <http://earth-info.nga.mil/GandG/sathml/satinfo2.html>. WAAS, EGNOS, MSAS, GAGAN, or GLONASS transponders bit in the above list may be used and contribute to the position fix.

### TEMPERATURE (LOCAL/REMOTE)



Local and remote temperature is displayed in Fahrenheit and Celcius when button 3 is pressed once.

### SYSTEM UPTIME



System uptime in HH:MM format is displayed when button 3 is pressed a second time.

### BATTERY (LOCAL/REMOTE)



Local and remote battery voltage and current consumption is shown when button 4 is pressed once.

### POWER (LOCAL/REMOTE)



Power consumption and battery resistance is shown when button 4 is pressed twice.

### LOW BATTERY (6V AND BELOW)



When battery voltage drops to 6V and below, the base-station needs to be charged.

### USB SERIAL PORT SETUP

Basestation-1 includes an FT232R USB to serial adapter for local console; by default this UART provides NMEA data to the host computer. When connecting to the USB Host computer from Windows allow it to automatically check for updates to correctly install the FTD232 USB to Serial driver.

#### LINUX

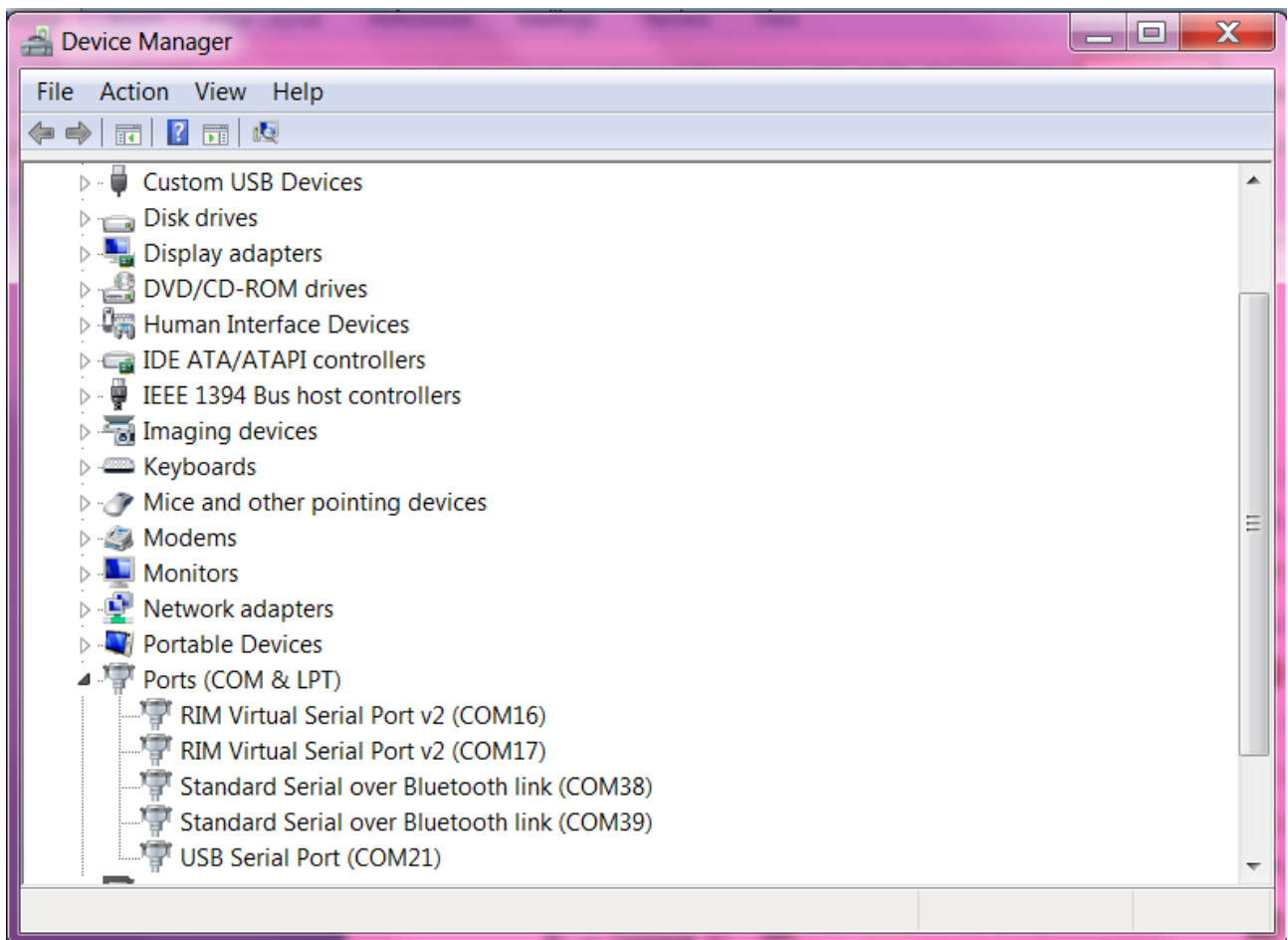
Use minicom, the device will enumerate as /dev/ttyUSB0. Use **dmesg** to see what device name the kernel has assigned.

## APPLE

Get a good GUI terminal emulator like ZOC from EmTec or if you know what you are doing, just install minicom. The FTDI driver is pretty universal and will show up on your system as a new serial device. If not, download the driver from FTDIchip.com or look on the CD.

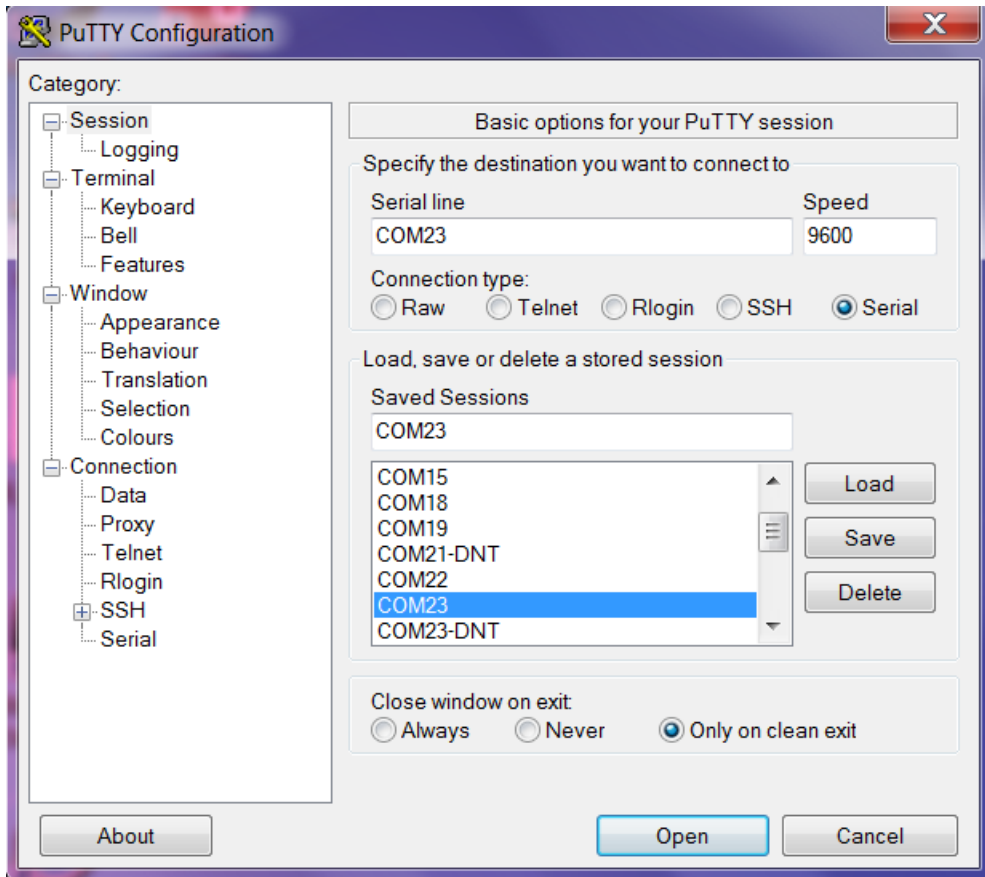
## MICROSOFT PC

For Windows, use any terminal emulation program you have installed (e.g. Hyperterminal), or use Putty (located on the CD). Find the COM port by going to Device Manager and looking under the COM ports to find the name of the COM port to connect to.

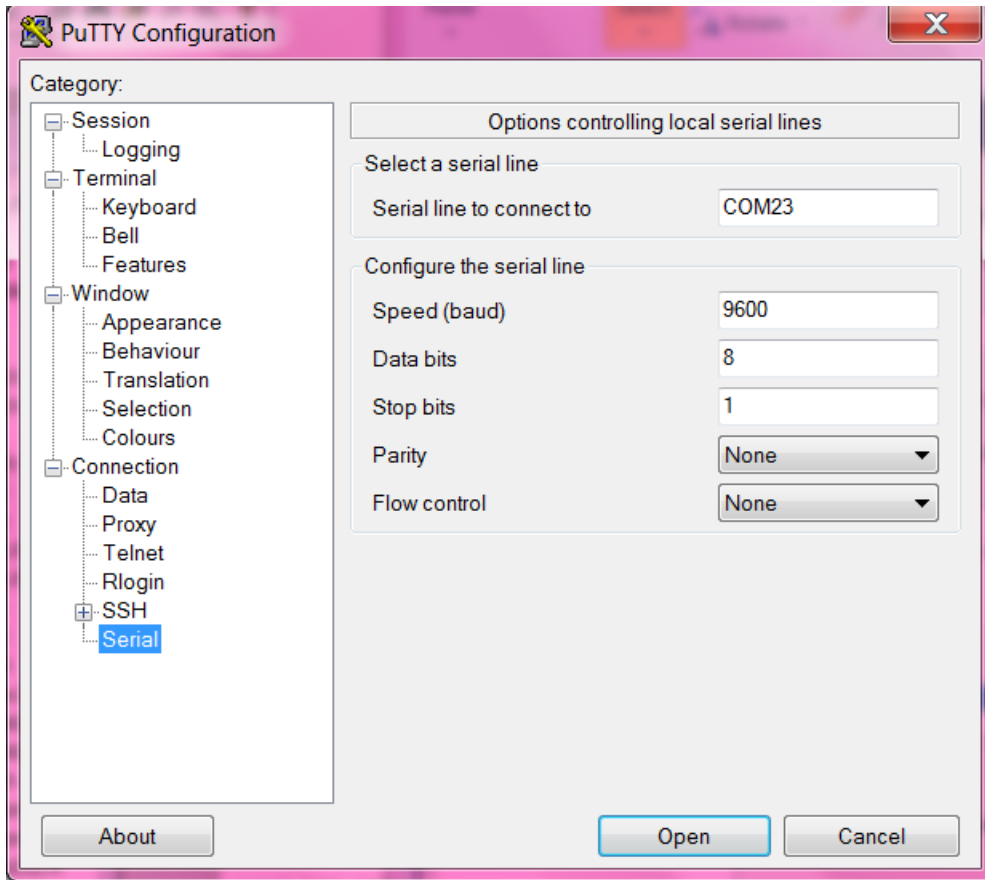


COM21 above shows the USB Serial port device.

Launch Putty, you will want to type the NAME of the Com-Port (e.g. COM23) into “serial line”, “9600” into speed, and type the name of the COM-Port (e.g. COM23) into the “Saved Sessions Field”. Press “Save”.

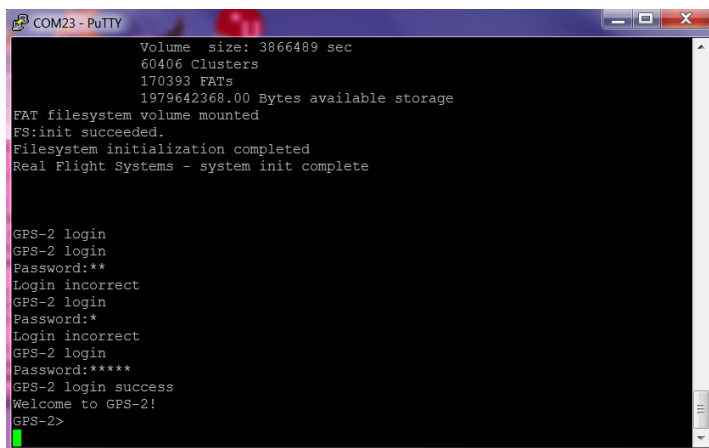


Next, click on the Serial item on the list to the left titled “Category”



Confirm flow control off and 8,1,N serial settings. Keep in mind that if you use a new USB port on Windows, you may have to go through this process again (a well endowed desktop system may support dozens of USB ports). When satisfied with the new connection profile click on “Session” (under Category) to return to the previous menu. Press “Save”, then press “Open”.

Now, the next time you run Putty you may load the configuration and just press “Open”.



Reboot the Base-Station. When the Base-station boots, you will see a message on the console asking for input, ignore it (do not hit enter).

Boot your Telemetry module (GPS1, GPS2). Now your transmitter should be outputting standard NMEA sentences and you may use your favorite GPS tracking system of choice. Many are available, the example below uses TopoGraphic ExpertGPS which is included on your CD-ROM. Type "x" to exit GPS mode.

#### EXPERTGPS SYSTEM TRACKING (WINDOWS)

- Launch Topografix ExpertGPS (Included on CD-ROM), you may also visit <http://www.topografix.com/> for updated versions of ExpertGPS.
- Edit->Preferences, select Serial port (note the unselected Serial port will differ on each system):

Tracking	<input type="text" value="NMEA - GPS Active"/>
Serial Port	<input type="text"/>
Baud Rate	<input type="text" value="9600 Baud"/>

Choose the GPS protocol to use for tracking the GPS position on a moving map.

- Tracking->Enable GPS Tracking

Wait until the device shows up in the Window and your altitude meter is operational (and clock) to be valid before proceeding with operations. The Blue LED on your Telemetry module will glow solid with 3D Lock, check either with ExpertGPS or visually (for solid Blue LED) before commencing operations.

ExpertGPS will show the GPS clock ticking when the GPS receiver is receiving from one satellite. When the altitude window is showing the altitude (slightly bouncing around), you will have 4-satellite lock and be able to report altitude in real-time – the vehicles is ready for flight.

#### BOOT GPS-ONE/GPS-TWO AND CONNECTING FROM A PC

When you have your PC Terminal emulator console up, power up your GPS-ONE or GPS-TWO module, you will see text messages for system initialization like below. When prompted for a password, you type rfs1 and press enter. You will be presented with the remote command line interface (CLI).

## Quick Start – GPS Tracking Only

From the GPS1 or GPS2 command line interface type:

```
GPS2> gps
```

```
$GPGGA .....
```

Exit Terminal application, launch ExpertGPS

NOTE: if your GPS1/GPS2 is already jumpered for gps mode (default), then the step above may be omitted.



WARNING: All liability waived. Rocketry is an inherently dangerous undertaking. Make your choices and take personal responsibility for the outcome of your endeavors, protect your privilege to fly rockets by not making the headlines or becoming a statistic.