

USB Weather Board v1 USB/Bluetooth Serial Interface

1 Overview

The USB Weather Board is fitted with a SCP1000 barometric pressure sensor and a SHT15 humidity sensor and delivers pressure, humidity and temperature readings over USB. There is also the option of adding a BlueSMiRF to the unit allowing a Bluetooth compatible computer to receive pressure, humidity and temperature readings wirelessly.

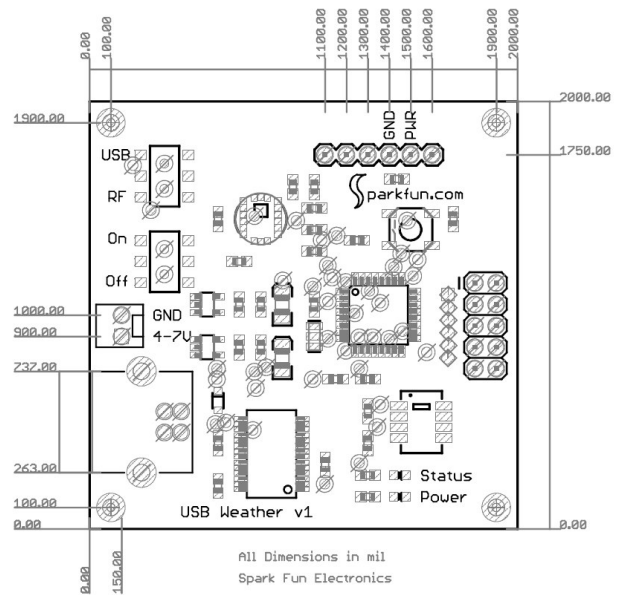
Serial output is a single visible ASCII string at 9600bps.

2 Specifications

Electrical specifications are as follows:

- USB (5V)
- Separate 4-7V header (**Warning:** Exceeding the 7V limit can cause board failure)
- Approximately 35mA when active

3 Operation



The USB Weather Board is relatively straight forward in operation. The unit can be powered through USB or a separate 4-7V header with an on/off switch for easy power on/off.

Data transfer is available over two mediums, USB or Bluetooth, the latter being an add-on (more on Bluetooth further on).

The FTDI USB to UART IC is used for communication through the USB port. The latest drivers for this IC can be found from the FTDI driver page.

Once the board is connected via USB, data can be acquired via any terminal program (i.e. HyperTerminal). Terminal configuration should be

USB Weather Board v1

9600-8-N-1.

An empty footprint can be seen on the Weather Board which can be utilized for Bluetooth communication. The footprint was designed specifically for our BlueSMiRF device which allows for wireless communication to any Bluetooth enabled computer (for more information please see the BlueSMiRF link). The footprint is labeled with GND and PWR pins so be sure to line the BlueSMiRF GND and PWR pins to match the footprint. A female header can be attached which would allow the BlueSMiRF to be easily attached/detached from the board.

There is a separate switch which determines which communication is being used, USB or RF (Bluetooth). Please ensure that if you are using either USB or Bluetooth that the switch is in the appropriate position (See schematic for more information).

3.1 Sensors

The SHT15 Humidity Sensor and SCP1000 Pressure Sensor have the following specifications:

- Absolute barometric pressure accurate within +/-150 Pascal
- Relative humidity accurate within +/-2%
- Temperature accurate within +/-0.3 degrees C
- Serial output 9600bps 8-N-1
- Measurement rate of 1Hz

More information regarding the sensors can be found on their datasheets.

4. Links

SHT15 Humidity Sensor Datasheet:

http://www.sensirion.com/en/pdf/product_information/Data_Sheet_humidity_sensor_SHT1x_SHT7x_E.pdf

SCP1000 Pressure Sensor Datasheet:

<http://www.sparkfun.com/datasheets/Components/SCP1000-D01.pdf>

BlueSMiRF:

http://www.sparkfun.com/commerce/product_info.php?products_id=582

FTDI Driver Page:

<http://www.ftdichip.com/FTDrivers.htm>

3.2 Output Format

Once active your terminal program should be receiving a serial output as a single visible ASCII string at 9600bps.

Below is an example output from the Weather Board.

```
#21.81,081.28,026.5,079.70,083534,000001$  
#21.81,081.33,026.5,079.70,083527,000002$
```

Every second a new set of readings is seen. There are 6 cells of data separated by commas.

Cell 1 (21.81) is the Humidity reading.

Cell 2 (081.28) is current temperature in Fahrenheit from the SHT15 sensor

Cell 3 (026.5) is current temperature in Celsius from SCP1000 sensor

Cell 4 (79.70) is a temperature in Fahrenheit converted from the SCP1000 Celsius reading.

Cell 5 (083534) is barometric Pressure in Pascal.

Cell 6 (000001) is a counter and should increase by 1 every reading.