12 Turning the Instrument On and Off

The Sap Flow Meter has an internal 4.2V 960 mAh DC Lithium Polymer battery that is used to operate the instrument. The internal battery must be trickle charged from an external power source (such as a Solar Panel) for long term field deployment. The Sap Flow Meter can be turned on manually by pressing the power button or automatically by connecting an external 12V DC power supply. This includes a USB cable connected to a PC.

NOTE 27: The SFM1 can also be charged directly from any computer's USB port.

12.1 Turn the SFM1 On

The SFM1 has a physical power switch located inside the USB communication access port. To access this switch remove the communications access port bung by unscrewing the bung.

NOTE 28 the bung consists of two parts (a) the bung which is the knurled large portion and (b) the smaller Gore-Tex cap. You must unscrew the whole bung by turning the larger knurled portion of the bung otherwise you will not gain full access to the communications port.

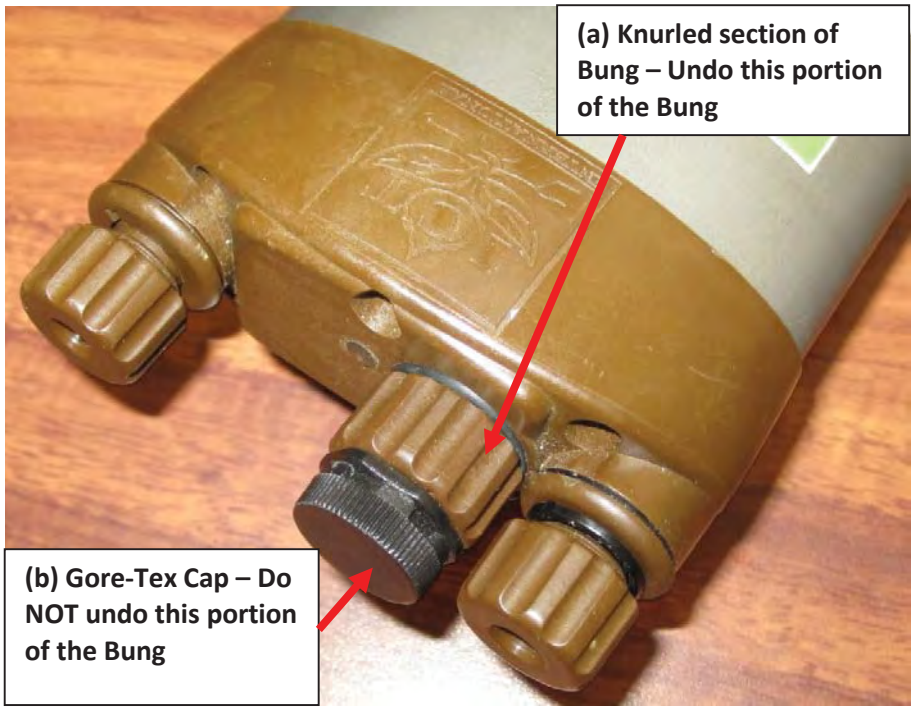

Photo 14: The Power switch is located below the knurled bung.

The power switch is located above the USB port. It is a small rectangular grey button.

NOTE 29: In most cases the user should be able to use their finger to reach inside the communications access port. The point of the finger can rest gently on the USB port allowing the fingernail to rock forward and depress the switch. VERY LITTLE force is required to depress the power switch. If you find this technique difficult you can use a small flat blade screw driver or tweezers supplied by ICT to gently depress the switch.

To turn the SFM1 on, press and hold the switch for approx 1 second. When the instrument is turned on the **Green** LED (visible through the light tube, adjacent to the communication port) will flash rapidly for a few seconds during start up. The LED will remain **Green** for approx 10 to 15 seconds before turning off. Once the SFM1 has started the **Green** light will flash momentarily once every 10 seconds to indicate it is powered on.

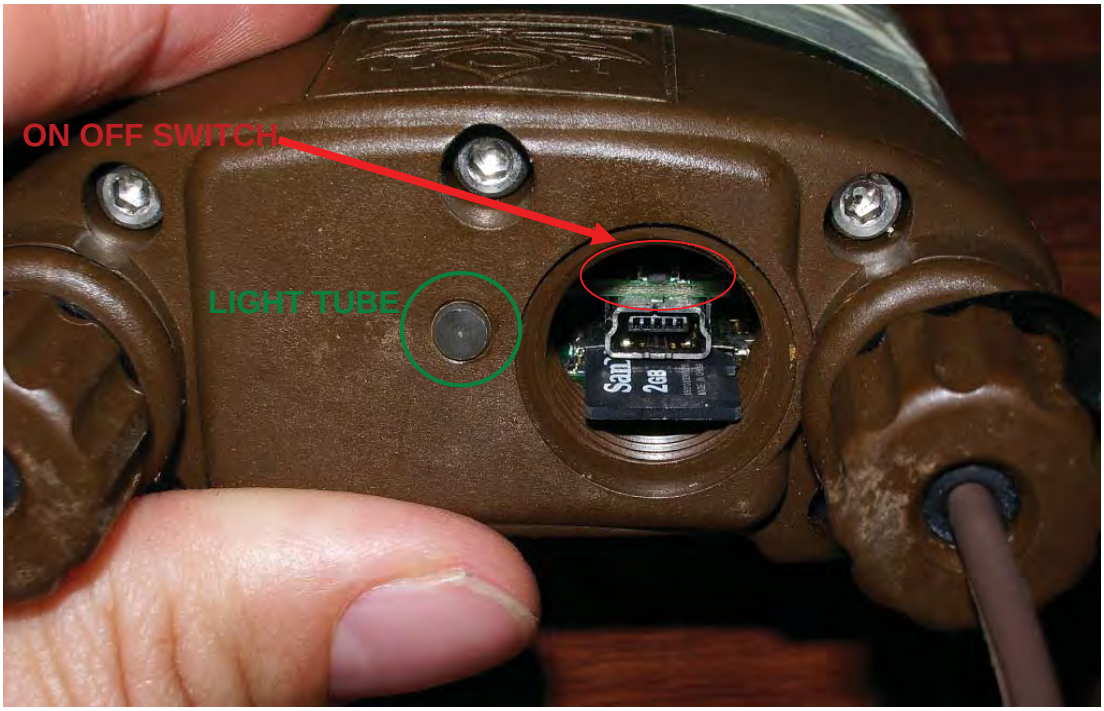

Photo 15 SFM1 Power Switch

NOTE 30: The SFM1 can also be automatically powered up by connecting it to a 12V DC power supply. This can either be in the form of a 12V DC mains power plug pack, a solar panel, solar panel & 12V battery direct to the instrument or through a shared power distribution system in which a large solar panel and battery provide power through a distributed (wired) network to any or all instruments connected, see Powering – Charging the Instrument

12.2 Turn the SFM1 OFF

The SFM1 DOES NOT turn off automatically. If external power is disconnected from the instrument it will continue to operate from, and discharge the internal battery. It **MUST** be turned **OFF** manually. This can be done by using the power switch. To turn the device off press and hold the power switch for approx. 3 seconds. The LED will flash alternately **Red** then **Green** for a few seconds before stopping and all lights are extinguished.

The SFM1 can also be turned off via the GUI software. From the Menu Bar select "Power Down SFM". The LED will flash alternately **Red** then **Green** for a few seconds before stopping and all lights are extinguished. The Instrument will turn off. Confirmation of this is positively reinforced by the software automatically disconnecting. No further current will be drawn from the internal battery. The Instrument is now ready for transport or storage.

Figure 13: The SFM software Menu Bar provides a function to Power Down the SFM.

NOTE 31: Whilst the SFM1 is connected to external 12V power it cannot be turned off either by using the manual power switch or the software function. Pressing and holding the power switch will just display a Green LED. Using the software will display the warning "External Power Connected" and the software will not automatically disconnect.

Figure 14: User Advice Message to alert the user that the SFM1 cannot power down as external power is still connected.