**V102**

The GPS is a Hemisphere v102. In addition to position, this GPS also tells us the orientation (we refer to this as heading).

The IR20 is a pyrgeometer manufactured by Hukseflux. It measures broadband infrared (longwave) radiation. A black mirror silicon dome covers a thermopile (thermocouples in series). When the top of the thermopile is a different temperature than the bottom of the thermopile, a voltage is created. This voltage is measured and is calibrated to Wm-2. A pyrgeometer is designed so that the thermopile shaded from sunlight and affected only by infrared radiation. The thermopile is either warming or cooling relative to the target. Usually, for an upward-facing instrument, the thermopile cools to space (the sky temperature is cold). This cooling is large when the sky is clear and near 0 when it is very cloudy. The thermopile voltage is measured by the logger as well as the temperature of the instrument body. These values are used to derive the longwave flux. Two IR20s are installed on each ASFS station, one facing up (measuring incoming radiation emitted by atmospheric gases and cloud, termed “downwelling longwave” LWD) and one facing down (measuring outgoing radiation emitted from the surface termed or “upwelling longwave” LWU). The IR20s have a small internal heater and are mounted inside of a ventilator. The heat and ventilation are meant to mitigate ice formation and to help maintain a homogeneous temperature across the instrument.

**Turning the system on/off:**

Connect/disconnect power source.

Fused 12 VDC

**Communications & Settings:**

 RS232 unpolled

 19200, 8, N, 1

**Variables:**

 Variables are reported in the “slow” data table file. The calibration coefficients are hard-coded into the logger program and so raw thermopile voltage (mV), raw thermistor resistance (Ohms) and calibrated fluxes (Wm-2) are recorded.

**Post Processing:**

* TBD

**Daily Data Checks:**

* Make sure data is coming in.

**ASFS Visit Checks:**

* Make sure mounting and cables are secure.

**Things to consider:**

* Note that when we use the term “heading”, we are referring to orientation; i.e., the direction the station is pointing, which may differ from its movement, which is the track.
* More information on NMEA protocol and GPS messages is provided with the manual.