**Apogee SI-4H1-SS IRT**

The IRT is an infrared thermometer. It measures brightness temperature averaged over the 8-14 μm band. The full-angle FOV is 64º and thus at a height of 2 m, the diameter of the area of the surface it measures is approximately 4 m (~ 13 m2 area).

**Turning the system on/off:**

Connect/disconnect power source.

Fused 1A 12 VDC.

**Communications & Settings:**

The IRT is connected directly to 12 VDC power and to the data logger control channel C3. Refer to the wiring diagram for details.

The IRT measurements are collected using a polled digital protocol, SDI-12. The only setting that needs to be applied to the sensor configuration is its SDI-12 address, which is 2 (the default address is 0). The device can be contacted using the SDI-12 mode of the LoggerNet terminal emulator on channel C3. The same settings are used on each ASFS and the tower.

**Variables:**

Two variables are reported in the “slow” data table file, the body temperature (apogee\_body\_T) and the target temperature (apogee\_targ\_T), both in C and both average and standard deviation of 12 samples taken every minute.

**Heater:**

The instrument is unheated.

**Post Processing:**

The IRT assumes an emissivity of 1. A correction will need to be applied in post-processing to convert the brightness temperature to surface skin thermodynamic temperature. Refer to the instrument manual for details. Note that Tbackground (from the manual) can be imprecisely estimated using LWD, with the imprecision arising from the fact that the pyrgeometer is broadband while the IRT is narrowband. This error will be smallest (and the reflected IR the largest) under cloudy conditions.

**Daily Data Checks:**

* Check that reasonable values (i.e., within a couple degrees of the air temperature) are being reported.
* If the instrument is iced it is likely that apogee\_targ\_T and apogee\_body\_T (i.e., target and body temperatures) will be very similar, though similarity does not necessarily indicate that the instrument is iced.

**ASFS Visit Checks:**

* Inspect the instrument lens for ice or other residue (such as salt). Ice can be cleaned with ethanol. The manual suggests that alcohol cannot be used to clean salt residue (recommends dilute acid, such as vinegar), but it is common to use ethanol on radiometers and that is what we have, so do what you can.
* Level is not very important. Just make sure it’s pointing at the ground and if it is not level, pointing away from the ASFS structure is best.

**Things to consider:**

* It is not as important to avoid disturbing the surface in the IRT FOV as it is with the SR30 or SR50A.
* Make sure the green lens cap is off!
* The instrument came with some swaps and cleaning instructions, which are at the Polarstern.
* If you are in the FOV, the instrument will “see” you and will measure warmer a warmer target temperature.