**Interface Definitions:**

| | |
|---|---|
| system_to_outside_matlab_display<br><br>satellite_map<br><br>location_pin | • Satellite map showing current location ±10m accuracy within 30 seconds<br>• Remaining system 'on-time' within 5%<br>• Analog readings from inputs |
| system_to_outside_buzzer | • Tone between 100Hz and 10kHz<br>• Volume between 40dB and 80dB |
| outside_to_system_dcpwr | • 9 - 12V<br>• 2A Peak |
| outside_to_system_gps | • 3.3 - 5V<br>• 20mA Nominal Current |
| dcpower_to_sense | • 3.3 - 5V<br>• 500mA Peak Current |
| outside_temp_to_sense | • -9.5 to -10.5°C<br>• 84.5 to 85.5°C |
| sense_temp_to_beta | • 0.2 - 4.5V<br>• Within 5% or 0.1V of real values, whichever is larger |
| dcpower_beta_to_buzzer | • 3.3 - 5V<br>• 200mA Peak |
| dcpower_to_beta | • 5.25V Maximum<br>• 4.4V Minimum<br>• 500mA Peak Current |
| beta_to_alpha | • LoRa Communication Protocol<br>• 915MHz<br>• At least mile range |
| alpha_to_beta | • LoRa Communication Protocol<br>• 915MHz<br>• At least  mile range |
| dcpower_to_alpha | • 3.3V - 5V Nominal Voltage via Micro Type B USB Port<br>• 10mA - 500mA Minimum to Maximum Current |
| alpha_to_matlab | • USB Serial Communication<br>• 3.3V - 5V Nominal Voltage via Micro Type B USB Port<br>• 10mA - 500mA Minimum to Maximum Current |

| | |
|---|---|
| led_indicator | • This signal will light up both leds on the PCB when the when the battery status is at optimal capacity<br>• When battery drops below 5 percent second LED will turn off |
| analog_1 | • This will be an input signal that will be from 4.2 volts to 0 volts. This will interface will be used for reading higher level voltages. |
| analog_2 | • This will be an input signal that will be from 4.2 volts to 0 volts. This signal will be used for reading any sensor data, mainly used for hot swapping. |