**Geodetic Module Real-Time Streaming Formats**

**Accelerations and Meteorological Data**

Scripps Orbit and Permanent Array Center (SOPAC)

Contact: Mindy Squibb (msquibb@ucsd.edu)

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This document describes the formats of two types of real-time streams that are output from the SIO Geodetic Module: Meteorological (MT) and Accelerometer (AC). The initial section of the header is the same for each type, but the expansion area contains type-specific terms following the initial section.

Note that:

1. Checksum is XOR for each 2 byte value in the header and data block following the total message length value in the header.
2. Data is BigEndian
3. Default sample rates are:

Accelerations: 100 Hz

GPS: 1 – 5 Hz

Meteorological: 10 sec

*Header Block*

|  |  |  |  |
| --- | --- | --- | --- |
| Term | Num bytes | Type | value/comment |
| Sync | 2 | Hex | Hex bytes equal to ACAB |
| Checksum | 2 | Int |  |
| Total Message length | 2 | Int |  |
| Data type | 2 | Char | AC or A4/MT/GP/SH for Acceleration, Meteorological, GPS and State of Health datatypes |
| GPSweek | 2 | Int | Weeks since 00:00:00 UTC 6 January 1980 |
| GPSmillisecs | 4 | int | Milliseconds since the beginning of the week |
| Site ID | 8 | Char | Null terminated string |
| Header expansion area length | 1 | Int |  |
| For Accelerometers |  |  |  |
| Header version | 1 | Int |  |
| Multiplier | 4 | Int | That was used for conversion made from counts to values in datablock |
| Divider | 4 | Int | “ |
| Sample rate | 2 | Int | In hundredths of a sec |
| Number of channels | 1 | Int | 3 for multiplexed acc |
| Format code | 1 | Int | 1 = mm/s/s multiplexed (accel) |
| Maximum value | 2 | Int | 2048 |
| Number of samples | 2 | Int | Currently 100 for accel; 1 for met |
|  |  |  |  |
| For Meteorological |  |  |  |
| Header version | 1 | Int | 2 |
| Number of samples | 2 | Int | 1 |
|  |  |  |  |

*Data block*

|  |  |  |  |
| --- | --- | --- | --- |
| For Accelerometer | Repeated number of samples |  |  |
| Z (vertical) | 2/4 | Int | See format code above for units  2 bytes for AC, 4 for A4 |
| NS (north-south) | 2/4 | Int | “ |
| EW (east-west) | 2/4 | Int | “ |
|  |  |  |  |
| For Meteorological |  |  |  |
| String from sensor | Variable length (~65 bytes | Char | SOPAC uses Ta, Ua, Pa |

Notes:

2013-03-28 – changed channel order from NS-EW-Z to Z-NS-EW

Meteorological raw format from sensor, e.g.:

0R0,Dm=163D,Sm=0.2M,Ta=22.7C,Ua=49.4P, Pa=1.0110B,Rc=0.00M,Hc=0.0M

  Dm = wind direction average (degrees)

                        Sm = wind speed average (meter/second)

                        Ta = temperature (Celsius)

                        Ua = relative humidity (%RH)

                        Pa = pressure (bar)

                        Rc = rain accumulation (mm)

                        Hc = hail accumulation (hits/cm2h)

We will only be reporting Ta, Ua and Pa in the data block (at least for now)