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State of Health File

The state of health file is a diagnostic information status stream produced by the seismometer and their corresponding data logger known as Maris Interface. The first part of this page concern seismometer .soh files. The first part of this page concern the Maris interface .soh files. The state of health file contains a GPS status message every minute, an environmental measurements message every ten minutes, a GPS synchronization status message every twenty minutes and GPS timing, visibility and position message every hour.

Oceans 3.0 API filter: `dataProductCode=SH`

Oceans 3.0 API filter: `extension=soh`

Guralp Seismometers or GeoSense Short Period Seismometers

The content of these files is parsed to sensors relevant to each type of seismometer.

GPS Status message

o/s: The current offset between the internal clock vs GPS time.

Drift: The difference between current o/s and previous o/s.

Pwm (Pulse Width Modulation): Feedback control parameter.

Manual 3-D: Signifies that enough GPS satellites are visible to obtain a 3D fix. If "No Fix" is displayed, the GPS received has not yet been able to obtain a satisfactory fix.

   Example: *2015 11 5 06:00:00 o/s= 2152 drift= 2036 pwm= 8649 Manual 3D*

Environmental Measurements

 External Supply: Voltage received by seismometer from the power supply.

Temperature: Internal temperature of seismometer.

   Example: *2015 11 5 06:05:00 External supply : 14.1V Temperature 12.62'C*

GPS synchronization

Current Offset: Current offset between internal clock from GPS time in micro seconds. Slow or fast is used to represent if internal clock is ahead or behind GPS time.

Frequency error: Frequency error in Hz.

Mass Position: Displays the current mass positions.

   Example: *2015 11 5 06:30:00 29.2 MicroSec Slow Freq error -74 e-9*

      2015 11 5 06:30:00 Mass Positions   5% -1%-19%

GPS timing, visibility and position

GPS timing: The current time provided by GPS

Satellite visibility: SV#'s, which stands for Space Vehicle Number is a list of all usable satellites. A minimum of four satellites is required to obtain a full 3-D GPS fix.

Seismometer position: Latitude, longitude and height of the seismometer. If position is unavailable, the latitude, longitude and height are shown as below.

   Example: *2015 11 5 06:00:00 GPS Date/Time 05/11/15 06:00:00*

      2015 11 5 06:00:01 Manual 3D SV#'s 1 2 3 4 5 (5)

      2015 11 5 06:00:01 Lat 00'00.0000N Long 000'00.0000E Height   0m

Example .soh files: GEOSENSESEISMO114_20151105T000000.000Z.soh, GURALPBBSEISMO2533_20230126T000000.000Z.soh

Maris Interface Unit

Note that the contents from these SOH files <u>are not parsed</u> at the moment.

Digitizer System information

Host name, label, system type, SEED network and station, site name, firmware version, system reboots, boot time and uptime.

Example:

```
        Host name:  MIN-5A5B
        Host label:  MARIS
        System type:  Minimus
        SEED network:  NV
        SEED station:  ENEF
        Site name:  Endeavour
        Firmware version:  2.0-8282
        System reboots: 30 (since 2021-07-01 21:39:36)
        System boot time: 31.10.2022 02:01:49
        System uptime: 71d 22h 42s
```

Digitizer Environmental Measurements

Temperature (in degrees Celsius) and Relative humidity

Example:

```
         Temperature:  19.795 °C
        Relative humidity:  24.36%
```

Power supply

Input voltage, power over Ethernet voltage

Example:

```
        Input voltage:  31.029 V
        Power over Ethernet voltage:  0.612 V
```

Network configuration

Mode and IPv4 sockets used

Example:

```
        Mode:  Static
        IPv4 sockets used:  12 out of 20
```

GNSS status

Geographical and satellite information (satellite info not relevant due to these being marine deployments)

Example:

```
    Latitude:  48.6493
    Longitude:  -123.4481
    Altitude:  -12.34 m
    Horizontal dilution of precision:
    Last timestamp:  0000-00-00 00:00:00
    Last lock time:  1970-01-01 00:00:00
    Stability:  0%
```

Precision Time Protocol (PTP) Status

PTP state, last PTP timestamp and lock time, PTP stability, Master clock class and accuracy, Master time source, Network path delay, jitter estimate and outliers

```
        PTP state: Phase Locked
        Last PTP timestamp: 2023-01-11 00:02:30Z
        Last PTP lock time: 2022-12-31 14:27:56Z
        PTP stability: 100%
        Master clock class: PRI_REF_PTP
        Master clock accuracy: <1.0us(0x23)
        Master time source: GPS
        Network path delay: 2189.0 us
        Network jitter estimate: +/- 3333 ns
        Network outliers: 7%
```

microSDcards

External slot, Internal slot, Primary card status, backup card

```
        External slot:  Card detected / Card usable / Primary card
        Internal slot:  Card usable / Backup card
        Primary card
                Status:  Recording
                Size:  60686336 KiB
                Used:  58203052 KiB
        Backup card
                Status:  Recording
```

Sensor0 and Sensor1

These sections depend on the number of sensors detected by the Minimus (the digitizer of the Maris Interface Unit), which depends on the amount of sensors that a particular unit is designed to support (e.g. a seismometer only, or a seismometer and a bottom pressure recorder, etc).

Serial number, firmware version, temperature (in degrees Celsius), rotation information (in degrees).

```
Sensor0
        Serial number:
        Firmware version:  6.0
Sensor1
        Serial number:  TR1302
        Firmware version:  5.20
        Temperature:  10.95 °C
        Rotation:  yaw = -32.965°, pitch = 0.175°, roll = 8.800°
```

Example .soh file: To be added once in the archives

Information from manufacturer: https://www.guralp.com/documents/html/MAN-MIN-0001/s5.html

Discussion

To comment on this product, log in and click *Write a Comment* below.