



International Federation of Digital Seismograph Networks

IUGG Montréal, Canada

16 July, 2019

FDSN

Working Group V

Portable Instrumentation
Bruce Beaudoin (Chair)
Wayne Crawford (Vice-Chair)



Agenda

- Acceptance of agenda
- Approve 2017 minutes
- Review of Kobe action items
- Standardized SOH recommendation
- How to document moving stations via time-referenced location and orientation records
 - identification of use cases i.e. stations that move
 - data usage and access
 - Straw man - Ahern
- Other business
- Adjourn



Kobe Action Items

- Action Item 2017.01: Identify a small working group to develop proposal for SOH channels.
Responsible: Beaudoin, Haslinger
Status: Done. Further discussion this meeting
- Action Item 2017.02: Send list out of current methods used by various parks to correct clock drift for feedback.
Responsible: Crawford
Status: No update
- Action Item 2017.03: Put together a small working group to develop a short decimation summary paper. Suggested that it would be useful to engage the ObsPy group.
Responsible: Crawford
Status: No update
- Action Item 2017.04: Send out request for new and updated content for the Web Page (QC tools, stationXML, inventory)
Responsible: Beaudoin
Status: Done



SOH Recommendation: Kobe 2017

Identify a small working group to develop proposal for SOH channels.

Coralie Aubert (SISMOb)

Rick Benson (IRIS DMC)

Maxime Bes de Berc (RESIF)

Jordi Cusi (ICTJA-CSIC)

Irene Molinari (ETHz)

Roman Racine (ETHz)



SOH Recommendation: May 2019

Recommendation for Standardized Data Logger State of Health Reporting FDSN WG-V Version 2019135

Preface

The diversity of instrumentation used in portable broadband deployment presents challenges when monitoring network performance with disparate state-of-health (SOH) available from data loggers. SOH reporting varies from regularly sampled time-series, to on demand reporting, to periodic recording to a text file on local media. These varying reporting methods and inconsistent SOH across data loggers, challenges operators of both real-time and stand-alone (on-site recording only) networks to have a unified approach when assessing network status. By adopting recommended SOH, the FDSN can encourage manufacturers to standardize SOH reporting and simplify network operations.

Currently several manufacturers have either released or are about to release new data loggers. Several of these new data loggers have enhanced SOH reporting, but still there is limited commonality across manufacturers. Below is recommend SOH information that data loggers should report to enhance an operators' ability to troubleshoot network problems.

Recommendation

1. Time series and/or sampled SOH channels (see attached table)

Where appropriate we'd expect these channels to be stored as mseed time series data

Component	State of Health	Time series	sps	On query/power-up
Total system				
	system input voltage	x	0.1	x
	system current	x	0.1	x
Sensor system				
	voltage	x	0.1	x
	current	x	0.1	x
	mass positions	x	0.1	x
	temperature	x	0.1	x
	Sensor tilt	x	0.1	x
	Calibration	x		

Digitizer system				
	voltage	x	0.1	
	internal battery voltage	x	0.1	
	current	x	0.1	
	temperature	x	1	
	humidity	x	1	
	pressure	x	0.1	
	Resets			x
	Reboots			x
	data buffer used			x
	data buffer capacity			x
	memory used			x
	memory capacity			x
	CPU load average			x
	media writes			x
Storage				
	used bytes			x
	available bytes			x
	capacity bytes			x
Telemetry				
	link status			x
	input - cumulative bytes over time window			x
	output - cumulative bytes over time window			x
	buffer used			x
	buffer capacity			x
	packets dropped or tossed by digitizer			x
Timing				
	Clock quality 100% <5μs, 90% < 100μs, 70% < 200μs, 1% decrement for each hour free running	x		
	Number of satellites used			x
	GPS Latitude	x	0.00005	
	GPS Longitude	x	0.00005	
	GPS Elevation	x	0.00005	
	GPS Lock Status	x		
	GPS PLL Status	x		
	GPS Antenna status			x
	Clock phase error	x	1	
	GPS antenna current	x	1	
	GPS time	x		
	GPS module current	x		
	GPS module voltage	x		
	VCO voltage	x	0.1	
	NTP/PTP delay	x	0.1	x
	NTP/PTP offset	x	0.1	x
	NTP/PTP jitter	x	0.1	x

2. Log File (non-time series, e.g. on power-up or on request)

Stored as mseed log channels. All entries time stamped.

2.1. DAS configuration and configuration updates (e.g. sample rate(s), sensor centering threshold values, gain settings, telemetry, etc.)

2.2. Hardware

2.2.1. DAS serial number



SOH Recommendation

Proposed action item: engage WG I to finalize SOH recommendation.



How to document moving stations via time-referenced location and orientation records

- Identification of use cases i.e. stations that move
 - Mermaid
 - Iceberg
 - Ice flow
 - Glacier
- Data usage and access
- Straw man - Ahern