

Obsidian and Etna2 Differences & New Stuff

Antelope/Kinematics User's Group
5/29-6/1, 2017



Dennis Pumphrey
Manager, Software Engineering
Kinematics, Inc.

Etna2 from 30,000 ft

- 3 component internal EpiSensor
 - Software selectable ranges 1g/2g/4g
- Sampling rates 1-500sps
- 2xUSB ports
- 10/100 Ethernet
- Timing:
 - GNSS
 - PTP Master or Slave



(64.60.212.94)

Obsidian from 30,000 ft

- 4ch with internal EpiSensor or 4-36 external
- Sampling rates 1-5000sps
- 4xUSB ports (3xHost, 1xDevice)
- 10/100 Ethernet
- 3xSerial ports (+Console)
- Internal battery charger
- Timing:
 - GNSS
 - PTP Master or Slave



Etna2 vs Obsidian₁

Feature	Basalt/Granite	Obsidian	Etna2
Channels	4-36	4-36	3
Max SPS	2000	5000	500
Multiple SPS/channel	No limit imposed	No limit imposed	2
Low latency packets	No	Yes	Yes
Sensor type	Internal or 2.5V, 5V, 20V external	Internal or 2.5V, 5V, 20V external	Internal EpiSensor (selectable 1g/2g/4g)
Broadband support	Yes	Yes	No
Regulated sensor power	No	Yes	No
Storage	1xCF	1x4GB, 1x32GB SDHC	1x4GB, 1x32GB SDHC
Battery charger	On board	On board	N/A

Etna2 vs Obsidian₂

Feature	Basalt/Granite	Obsidian	Etna2
Timing	GPS	GNSS w/ SBAS, PTPv2	GNSS w/ SBAS, PTPv2
Network	10 Ethernet	10/100 Ethernet	10/100 Ethernet
USB	1xDevice	1xDevice, 3xHost	1xDevice/Host, 1xHost
Serial ports	3 (+Console)	3 (+Console)	N/A (Console only)
Switched power outputs	2	3	N/A
1PPS I/O	N/A	3	N/A
DFS port	Optional*	1	N/A
Relays	N/A	N/A	2

Etna2 vs Obsidian₃

Feature	Basalt/Granite	Obsidian	Etna2
KMI ORB server	Yes	Yes	Yes
RockToSLink	Yes	Yes	Yes
RockToEW	Yes	Yes	Yes
Data formats	MiniSEED, ASCII, EVT, SAC, COSMOS, MSM, Matlab, SEISAN, SUDS, BCSIMS, SEISLOG	MiniSEED, ASCII, EVT, SAC, COSMOS, MSM, Matlab, SEISAN, SUDS, BCSIMS, SEISLOG	MiniSEED, ASCII, EVT
Customer extensible	Yes	Yes	No
Rockhound	Full license	Full license	Limited functionality

New Features in

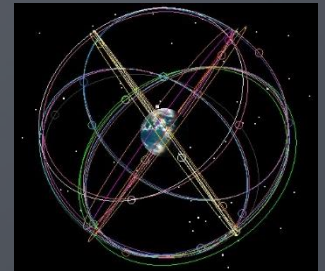
Linux Updates 3.4 (Obsidian), 1.3 (Etna2), Rockhound v3.14.2

The features I will review here apply to both the
Obsidian and the Etna2

WHAT'S NEW

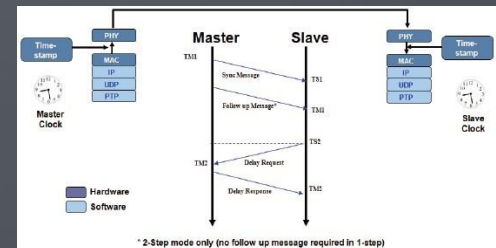
Timing₁

- Timing:
 - GNSS: Up to two of GPS, GLONAS, GALILEO or BEIDOU
 - SBAS (ground based augmentation)
 - Timing generally stabilizes < 200 nanoseconds to UTC

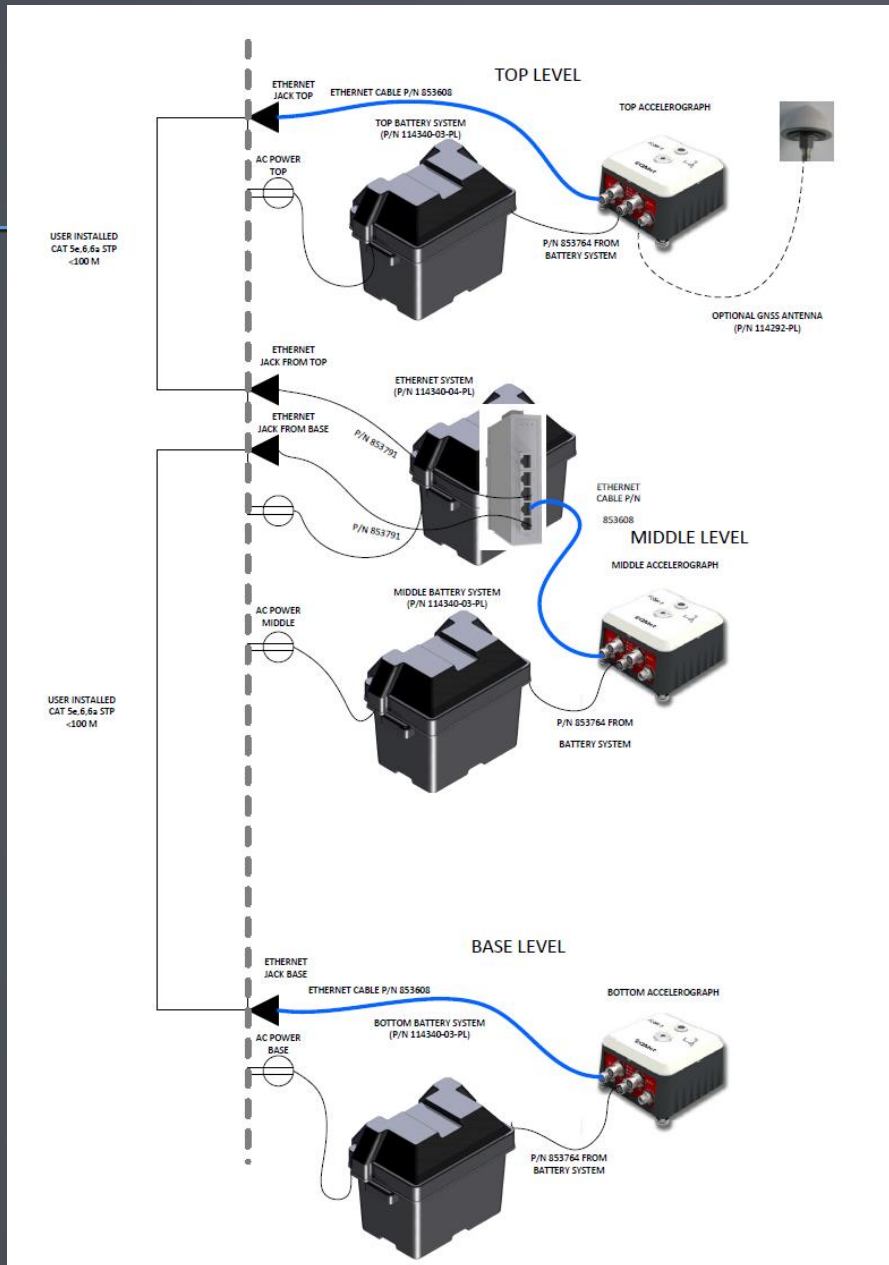


Timing₂

- Hardware based* PTPv2 to share accurate timing over a LAN. Can act as PTP Slave or Master
 - Use a commercial PTP server or a digitizer as master
 - Slaves will follow the master even if the master loses time source
 - PTP compliant networking hardware is preferred, but often not required
 - Timing is similar to that from GNSS



Example



Low Latency₁

- >1sps data can be delivered as 0.1 second packets
 - Support is protocol dependent (new API)
 - Etna2 and Obsidian performance similar



Low Latency₂

- Oldest sample latency is packet length, plus group delay, plus ~20ms
 - This is when the data is in the ring buffer ready for delivery
 - Example: Etna2 causal filter @ 200sps: 100ms + 33ms + ~20ms: Typically between 140ms and 160ms
 - This means average latency of 90-110ms

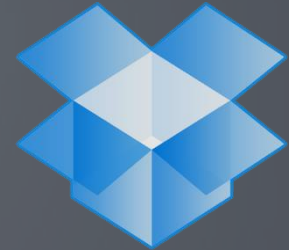
USB Support

- Host port(s), device port
- Device supports "virtual" COM port
- Thumb drives for data offload (VFAT or EXT3)
 - Momentary connection: NO COMMANDS!
 - Left connected: Offloads once per hour
 - Optionally password protected
- Can be used for firmware updates
- Multitech USB cellular, Wi-Fi devices



Upload Using Dropbox

- Simple and slick. Makes upload to multiple destinations easy
- See App Note 78
- Use Dropbox to create an app access token
- Any new files created under /data uploaded to unit specific folders



Security Enhancements

- Many recent Linux security updates
- OpenVPN
- Changes to default netfilter rules
- "stealth mode" closes all ports except ssh, vpn
- But surprisingly...



Login “nag”

```
Etna2-COM5
Debian GNU/Linux 8 Etna2 tty00

Etna2 login: root
Password:
Last login: Thu Mar  9 22:42:21 UTC 2017 on tty00
Linux Etna2 3.12.59-kmi-AM335x-PD15.1.1 #217 SMP PREEMPT Wed Oct 12 09:35:03 PDT
 2016 armv7l

Root partition  : 50% used.
Boot partition  : 11% used.
SysRW partition : 31% used.
Data partition  :  1% used.

#####
WARNING !!!

This system is NOT SECURE because the factory
root password has not been changed.

All default passwords on the system should be
changed, including the following:

User accounts: root, admin, and client.
Rockhound console (port 9900).
Web server.

Refer to the manual or contact support@kmi.com
for more information.

#####

root@Etna2:~#
```


New Web Server

The Obsidian and Etna2 have a new web server based on Tomcat (rather than the previous “DP” based server). It supports:

- Operation with fewer Java applets*
- Has a fully functional mobile device mode
- Is a bit “snappier” in operation



New Web Server₂

7:18 AM 97%

64.60.212.94

KMI , SN: 8

Overview

Status	
Triggered:	No
Event Count:	19
Total Events:	19
Last Trigger Time:	N/A
Last Event Time:	N/A
Timing Locked Since:	2017/05/01 17:37:53 GMT
GNSS Position:	34.150120N -118.101019E 241m

7:19 AM 97%

64.60.212.94

Status ▾

- Overview
- WaveForm Viewer
- State Of Health
- Logout

Layout ▾

Files ▾

Triggering ▾

Tools ▾

Top

Copyright 2016, Kinometrics Inc.

Java Applets

And speaking about Java Applets...

They're still useful for the Waveform Viewer, but -

- Unsupported in Chrome & Opera
- Supported until 2018 in Firefox 'ESR'
- Supported in Internet Explorer, but not Edge

We are working on a replacement Waveform Viewer interface that will be 'Applet-Free'.

Resources

- support@kmi.com
- wiki.kmi.com
 - visitor, worldcup
- unitdata.kmi.com
 - Instrument and sensor data sheets



Kinematics Datasheet Request Form

Product Type:

Serial Number 1:

Serial Number 2:

Serial Number 3:

E-mail Address: