2014 YieldPoint Introduction

Introduction to YieldPoint Solutions

- Andrew Hyett, Founder, Owner & CEO
- References: YieldPoint Clients in the last year
- Digital and Analog instruments
- YieldPoint Instruments
- Unique Features of YieldPoint Extensometers

Dr. Andrew Hyett, Founder, Owner & CEO

Dr. Andrew Hyett
Ph. D. Imperial College, London, UK
Post Doc Queen's University, Kingston, ON
Co-Founder, MDT, Kingston, 1990
Founder & Owner, YieldPoint Inc., 2001

Innovative Digital Geotechnical Instrumentation
Well published expert in rock mechanics and ground anchors behaviour
Working relationships with mines and academia
Frequent peer reviewer

YIELDPOINT CLIENTS

INTRODUCTION TO YIELDPOINT INSTRUMENTS AND MARKETS

Extensometers improve *Safety* and *Productivity* by monitoring the strength and soundness of ground support structures.

SAFETY: Monitoring movements in the rock is paramount as it allows engineers to take remediation measures before risks become tangible.

PRODUCTIVITY: Unexpected groundfalls force evacuations and closures for assessment and remediation. Weeks of production are lost. Any mitigation will lower final costs enormously.

ANALOG INSTRUMENTS

Analog instruments present both complexities and risks that are entirely resolved by digital solutions.

COMPLEXITY WITH ANALOG INSTRUMENTS

- Readings in engineering units must be converted.
- Deployment must be recorded manually and accurately.
- Instruments/loggers/ports connections must be mapped.
- Changes to configuration must be documented accurately.
- Repairs to broken wires must reproduce previous configuration accurately.
- Data streams out of loggers are not identified.
- Instruments cannot be calibrated individually.
- Manual data processing must take place to obtain usable readings.

RISKS WITH ANALOG INSTRUMENTS

- Data rendered useless with any mistake in system deployment/labeling/mapping/repairs.
- Data unreliable if broken wires improperly repaired.
- Small manual errors when downloading will associate data files with wrong instruments.
- No way to identify whether data files are properly addressed.
- Instruments cannot be individually calibrated.
- Instruments cannot be optimized.
- Harsh environments affect data reliability.
- Less reliable data compromises safety.

COMPETITIVE ADVANTAGES FOR YIELDPOINT

- World's only range of digital geotechnical instruments.
- Data processing right at the site of the measurement.
- Readings directly in millimeters. No need for risky manual conversions.
- Individual instruments ID for easy deployment without configuration.
- No need for reconfiguration after changes and repairs to system.
- Data files always associated to each individual instrument ID.
- Instruments individually calibrated in factory for optimized performance.
- Digital data strings very solid for transmission in harsh environments.
- Seamless communications via d-MESH radio telemetry.
- Complete compatibility of readout, data loggers and radios.
- Cloud access via Ethernet and Wifi.

YieldPoint Digital Instruments

Digital Extensometers

Digital Instrumented Cables

Digital Bolt Anchors

Data Loggers

Biaxial Inclinometer

Digital Instrumented Rebar

Digital Ground Movement Monitor

Radio Telemetry Solution

YIELDPOINT INSTRUMENTS

DISPLACEMENT	LOAD	OTHERS
d-GMM	d-REBAR	d-Tilt
d-MICRO	d-ROCKBOLT	FillPoint
d-MPBX	d-CABLE	PullTest Unit
d-EXTO	U-CELL	Moisture Content

One Instrument = One Data String
One Data String = ID + Temperature + 8 readings

YieldPoint Data Management

MANUAL READING	DATA LOGGING	REMOTE ACCESS
Manual Readout	Data Loggers	Wireless Mesh Networks
d-READER	d1LOGGER	d-MESH
	d4LOGGER	Sensors Nodes, Gateways

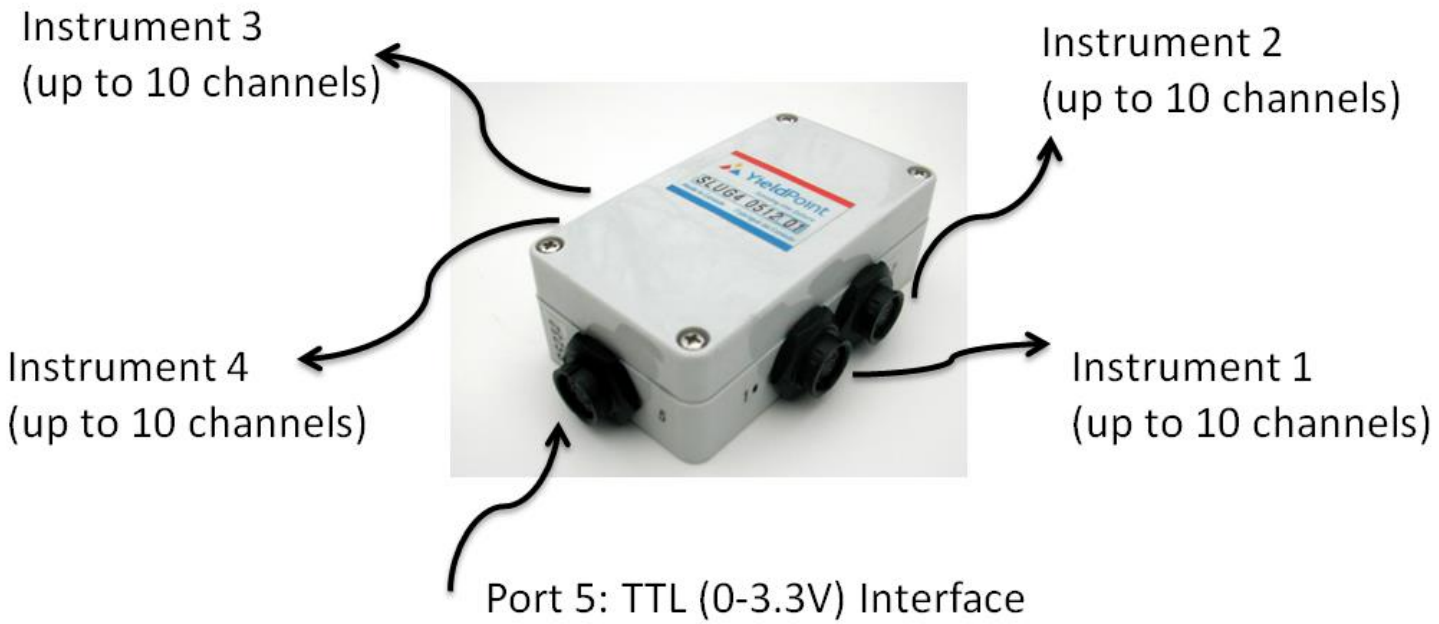
YIELDPOINT READOUT UNIT

The readout unit dREADER provides instant readings of the entire data string coming from any YieldPoint instrument and without any configuration of any kind, not even the need to press on a button.

The LCD Display scrolls through the following:

DATE TIME ID TEMP°C CHANNELS 1, 2,3, 4, 5, 6
2013/11/12 21:04:45 1307-3171004 + 13.6, 22.99mm 20.56mm 20.41mm 18.78mm 17.67mm 15.96mm

YIELDPOINT DATA LOGGER

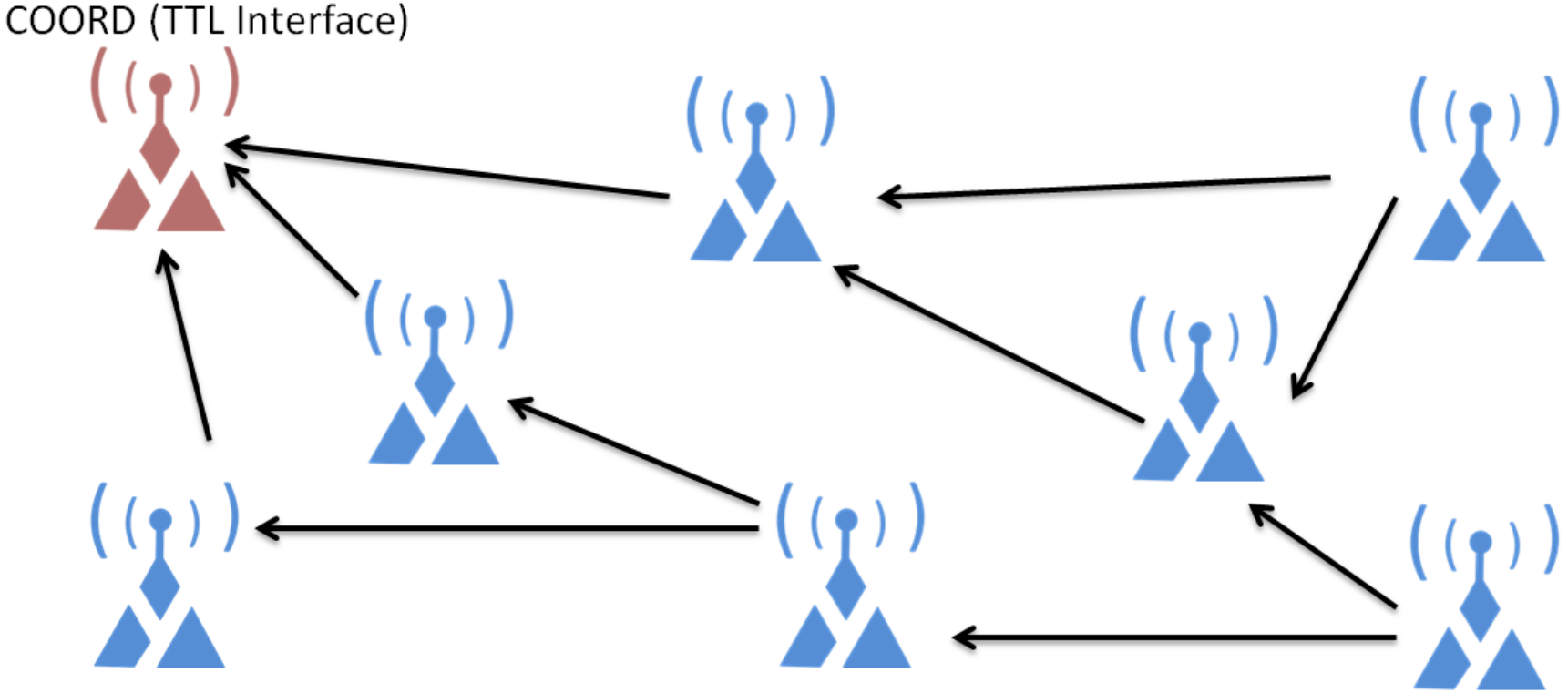


YIELDPOINT TELEMETRY UNIT

Mesh radio (900MHz)

1 Radio Node + 1 Logger + 4 Instruments = 1 Telemetry Unit

YIELDPOINT TELEMETRY NETWORK

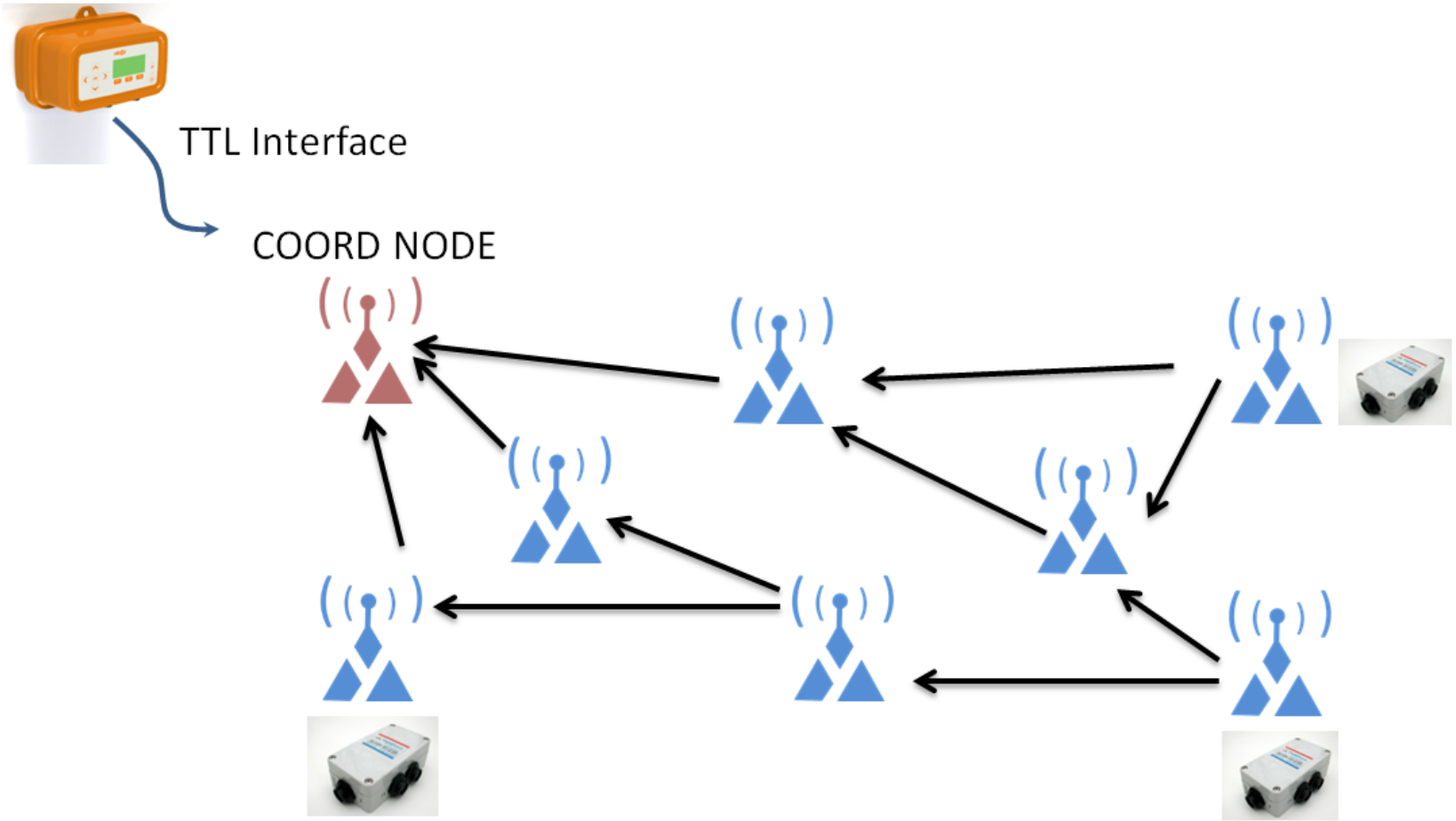


Multiple Radio Nodes = 1 Telemetry Mesh Network including 1 Coordinator

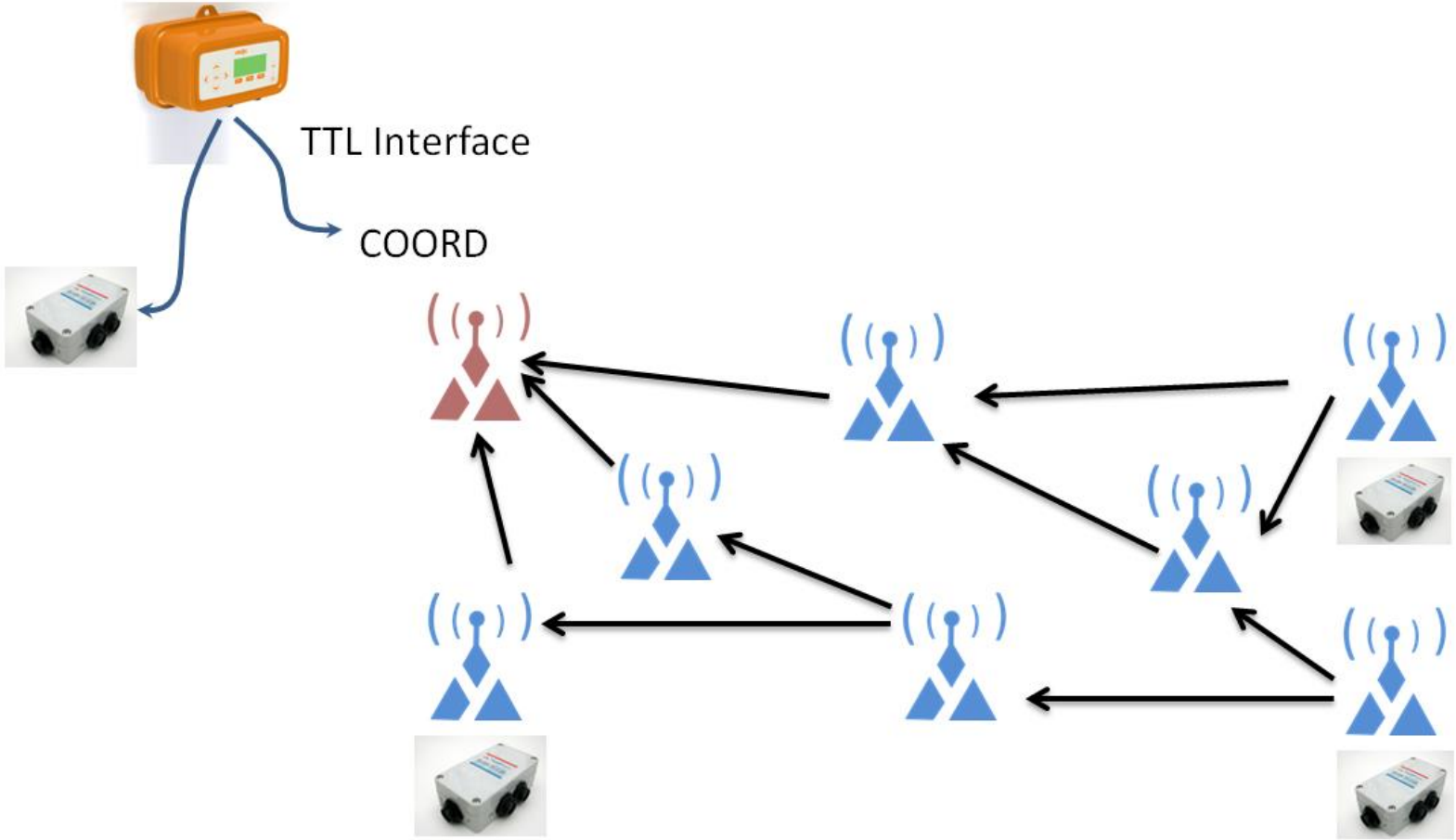
CONNECTIONS TO A WIFI/ETHERNET GATEWAY

Option 1: 2 DATA LOGGERS TO GATEWAY

Option 2: MESH NETWORK TO GATEWAY

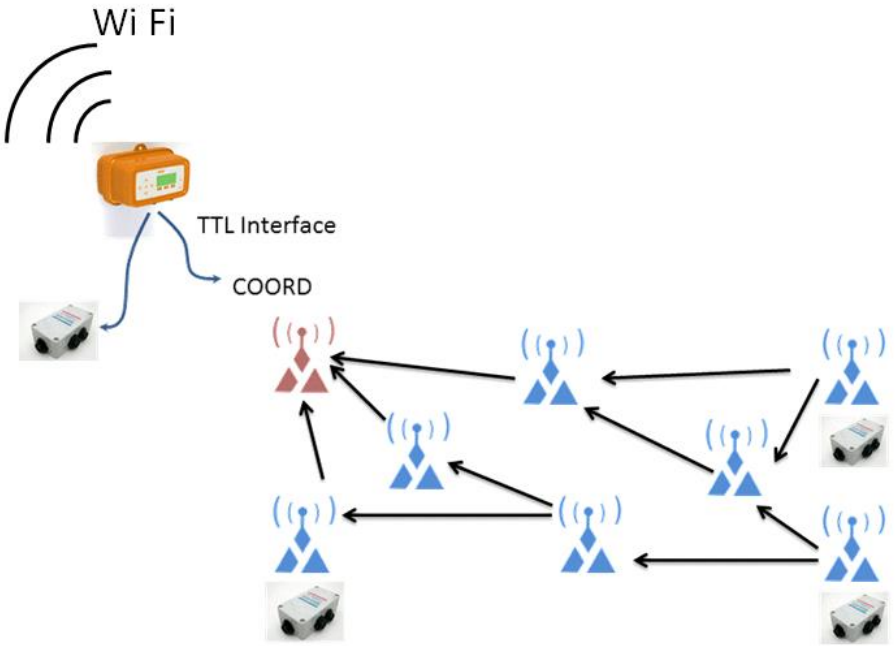


Option 3: MESH NETWORK + LOGGER TO GATEWAY



COMPLETE CLOUD SOLUTION

Transparent: WiFi, Ethernet, Fiber



dMESH TELEMETRY IN BLASTING ZONES

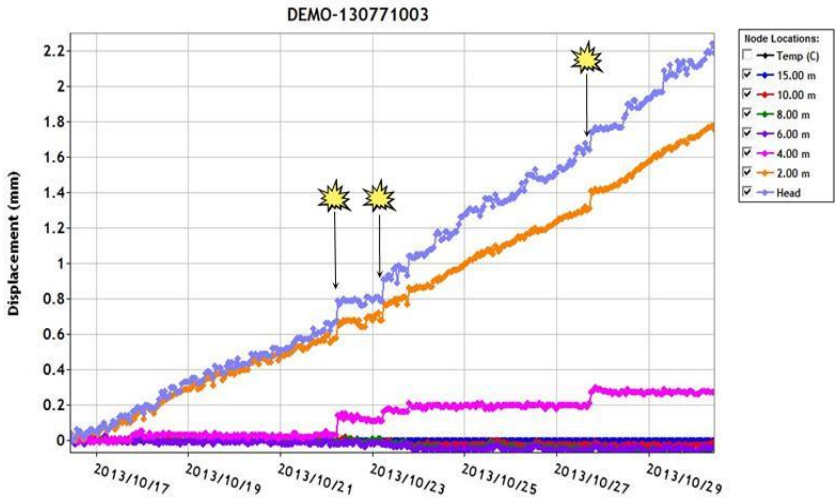
Radio telemetry and logging components can be placed in protective steel enclosures in blasting areas. It has been proven that radio communications will continue to be effective and precious data never obtained before can be collected that will show the impact of blasts on the rock stability.

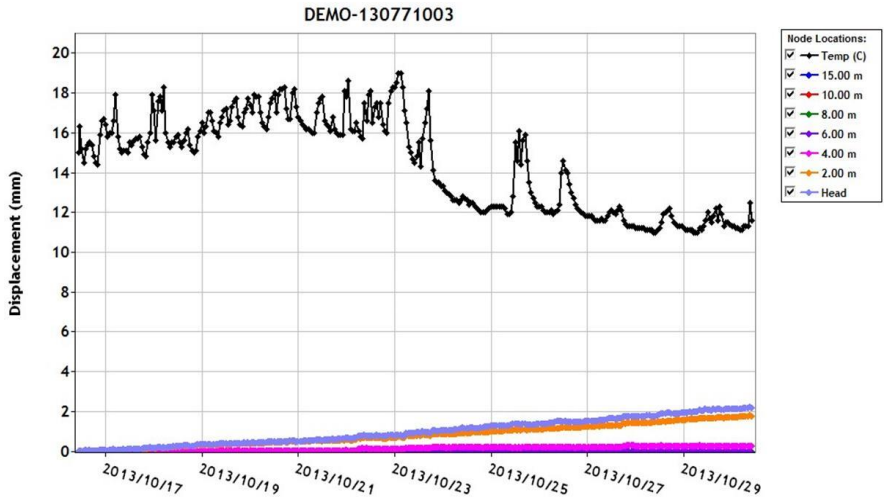
FORMAT OF d6EXTO EXTENSOMETER DATA FILES

DATE	TIME	INSTRUMENT ID	TEMP°c	CHANNELS 1, 2,3, 4, 5, 6
2013/11/12	21:04:45	1307-31,71,004	+ 13.6	22.99, 20.56, 20.41, 18.78, 17.67, 15.96,
2013/11/12	22:00:14	1307-31,71,004	+ 13.6	22.99, 20.56, 20.41, 18.78, 17.67, 15.96,
2013/11/12	23:00:14	1307-31,71,004	+ 13.6	22.99, 20.56, 20.41, 18.78, 17.67, 15.96,
2013/11/13	00:00:13	1307-31,71,004	+ 13.6	22.99, 20.56, 20.41, 18.79, 17.67, 15.96,
2013/11/13	01:00:14	1307-31,71,004	+ 13.6	22.99, 20.56, 20.41, 18.79, 17.67, 15.96,
2013/11/13	02:00:14	1307-31,71,004	+ 13.6	22.99, 20.56, 20.41, 18.78, 17.67, 15.96,
2013/11/13	03:00:13	1307-31,71,004	+ 13.6	22.99, 20.56, 20.41, 18.79, 17.67, 15.96,
2013/11/13	04:00:14	1307-31,71,004	+ 13.6	22.99, 20.56, 20.41, 18.79, 17.67, 15.96,
2013/11/13	05:00:14	1307-31,71,004	+ 13.6	22.99, 20.56, 20.41, 18.79, 17.67, 15.96,
2013/11/13	06:00:14	1307-31,71,004	+ 13.6	22.99, 20.56, 20.41, 18.79, 17.67, 15.97,
2013/11/13	07:00:14	1307-31,71,004	+ 13.6	22.99, 20.56, 20.41, 18.79, 17.67, 15.96,
2013/11/13	08:00:14	1307-31,71,004	+ 13.6	22.99, 20.56, 20.41, 18.79, 17.67, 15.96,
2013/11/13	09:00:14	1307-31,71,004	+ 13.6	22.99, 20.56, 20.41, 18.79, 17.67, 15.97,
2013/11/13	10:00:13	1307-31,71,004	+ 13.6	22.99, 20.56, 20.41, 18.79, 17.67, 15.97,
2013/11/13	11:00:14	1307-31,71,004	+ 13.6	22.99, 20.58, 20.41, 18.79, 17.67, 15.97,
2013/11/13	12:00:13	1307-31,71,004	+ 13.6	22.99, 20.56, 20.41, 18.79, 17.67, 15.97,
2013/11/13	13:00:14	1307-31,71,004	+ 13.6	23.01, 20.58, 20.41, 18.79, 17.67, 15.97,
2013/11/13	14:00:14	1307-31,71,004	+ 13.6	23.01, 20.58, 20.41, 18.79, 17.68, 15.97,
2013/11/13	15:00:13	1307-31,71,004	+ 13.6	23.01, 20.58, 20.43, 18.79, 17.68, 15.97,

Data is presented from the readout unit, the data loggers and the dMESH telemetry in a very safe, clear format. Date and time stamped, it associates an instrument ID to the temperature reading and the channels of displacement for each anchor point. This data can be exported to Excel for further processing and graphing and presented in reports.

Graphing using Minescope™





Very clear graphical data using Minescope software gives the ability to immediately analyze and report on the information contained in the data. Blasting events can be identified. Data can be viewed relative to time and relative to depth in the borehole.