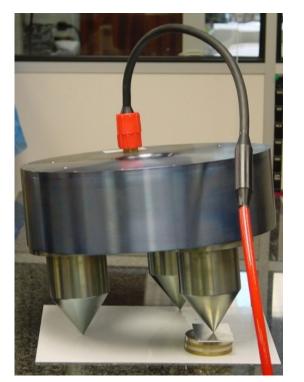
Ocean Bottom Seismometers





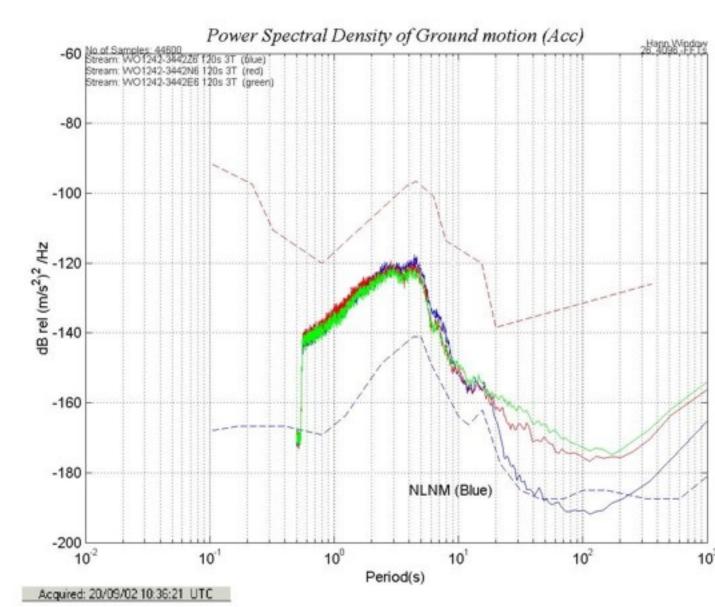


- Packaged options available using any Guralp broadband Sensor
- +/- 30 degrees microprocessor controlled leveling system. (Reduces installation complexity). Alternative packages with +/- 10 degrees levelling options.
- 24bit resolution internal broadband acquisition system
- Low Power < 1.0 Watts includes stable real time clock. (OBS version of CMG-DM24 < 0.65 Watts, Ultra low power CMG-3T conpact < 0.31 Watts)
- Real Time Clock module with exceptional stability (accuracy of <1.8*10⁻⁸) over full temperature range
- Real Time Clock stability <4 * 10⁻⁹ over 0 to 15 degrees Centigrade
- Internal Power Management for operations requiring high current surges such as leveling, Unlocking and centering.
- Autonomous Deployment system and shutdown.
- Storage 8 Gigabytes of FLASH Memory. (Ask GSL for larger Capacities)
- Firewire (IEEE1394) data transfer output port
- TCP/IP protocol interface option (consumes 0.5 WATT extra power)
- Internal 3 axis Magnetometer for Orientation measurement.
- 8 or 16 Low sample rate environmental channels 16-bit, optionally 24-bit.
- Automatic Realtime Clock calibration and synchronisation.
- Disk storage system of 90 Gigabytes available

CMG-3 Broadband Seismometers

Key Features:

- Proven design and track record since 1987
- Frequency responses available from 0.0027 (360s) to 50 Hz (100 Hz high corner
- Output sensitivities available from 2*750V/m/s up to 2*20,000 V/m/s
- Self noise better than -195 dB relative to 1 m²/s⁴/Hz @ 1 Hz
- Self noise Below USGS NLNM from up to 200s to 18Hz (vertical)
- Robust automatic mass locking / unlocking
- Automatic Mass centering
- Ultra low power versions available < 0.31 Watts



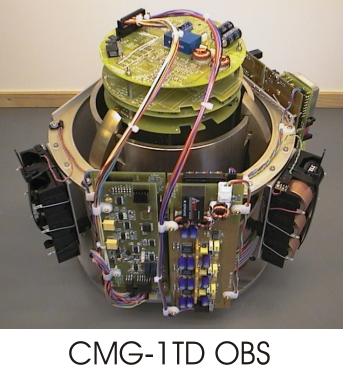
Above plot shows a typical LP background noise plot from a CMG-3TD installation

- Compact version of CMG-3T • Reduced height < 11.5 inches from bottom of feet to top of handle (< 291 mm)
- Weight less than 11.5 Kg • Upgraded electronics using
- low profile surface mount Enhanced robust locking
- mechanisum Low profile OBS version



INTEGRATION DEVELOPMENTS AND THE COMPLETE PRODUCT LINE OF GURALP SEISMIC

OBS & OBH



Autonomous auto



CMG-3ESPD Compact OBS. 24-bit ADC. +/- 10 degrees leveling Titanium housing

CMG-1TD OBH Designed for 8000m deep Borehole

Sensors designed for low noise sites. Suitable for vault and portable applications. Background noise levels below USGS NLNM from >30 seconds to 10 Hz (minimum)

Weak Motion



CMG-6TD





— 2 Gb FLASH + IEEE1394

—— 3 ch 24-bit ADC



INSTRUMENTATION

PAULY, Bruce, Digital Technology Associates, and PEARCE, Nathan, Guralp Systems Ltd.



Medium Motion

Sensors designed for medium noise sites. Suitable for rapid and temporary installations. e.g local and regional networks & volcano monitoring. Background noise levels below USGS

NLNM from 10 seconds to 5 Hz

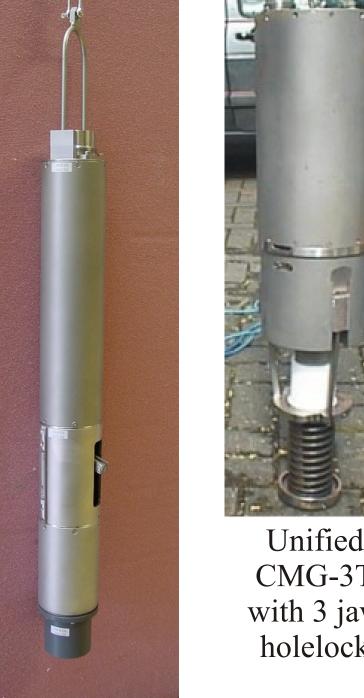




Borehole







CMG-3T with 3 jaw

fluxgate magnetometer

Strong Motion

Sensors designed for strong motion studies Suitable for vault and portable applications. Dynamic range in excess of 145 dB. Clip levels from \pm 0.1g to \pm 4g Triaxial and single uniaxial versions available





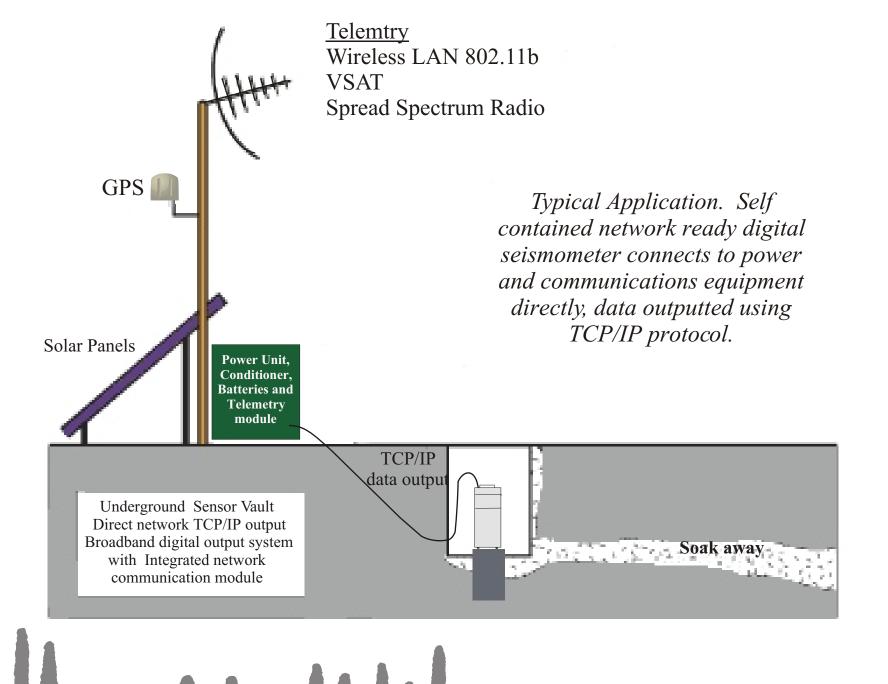


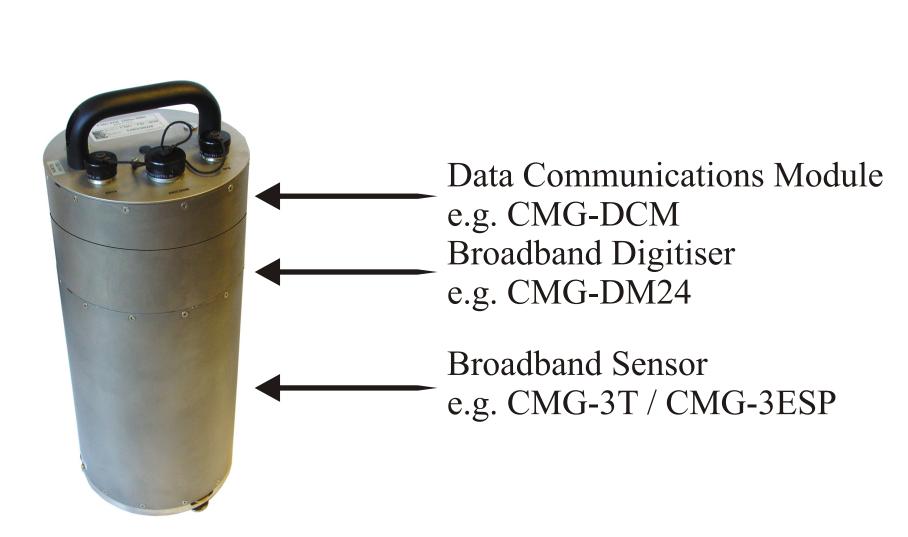
CMG-5U

CMG-5T

CMG-5TD

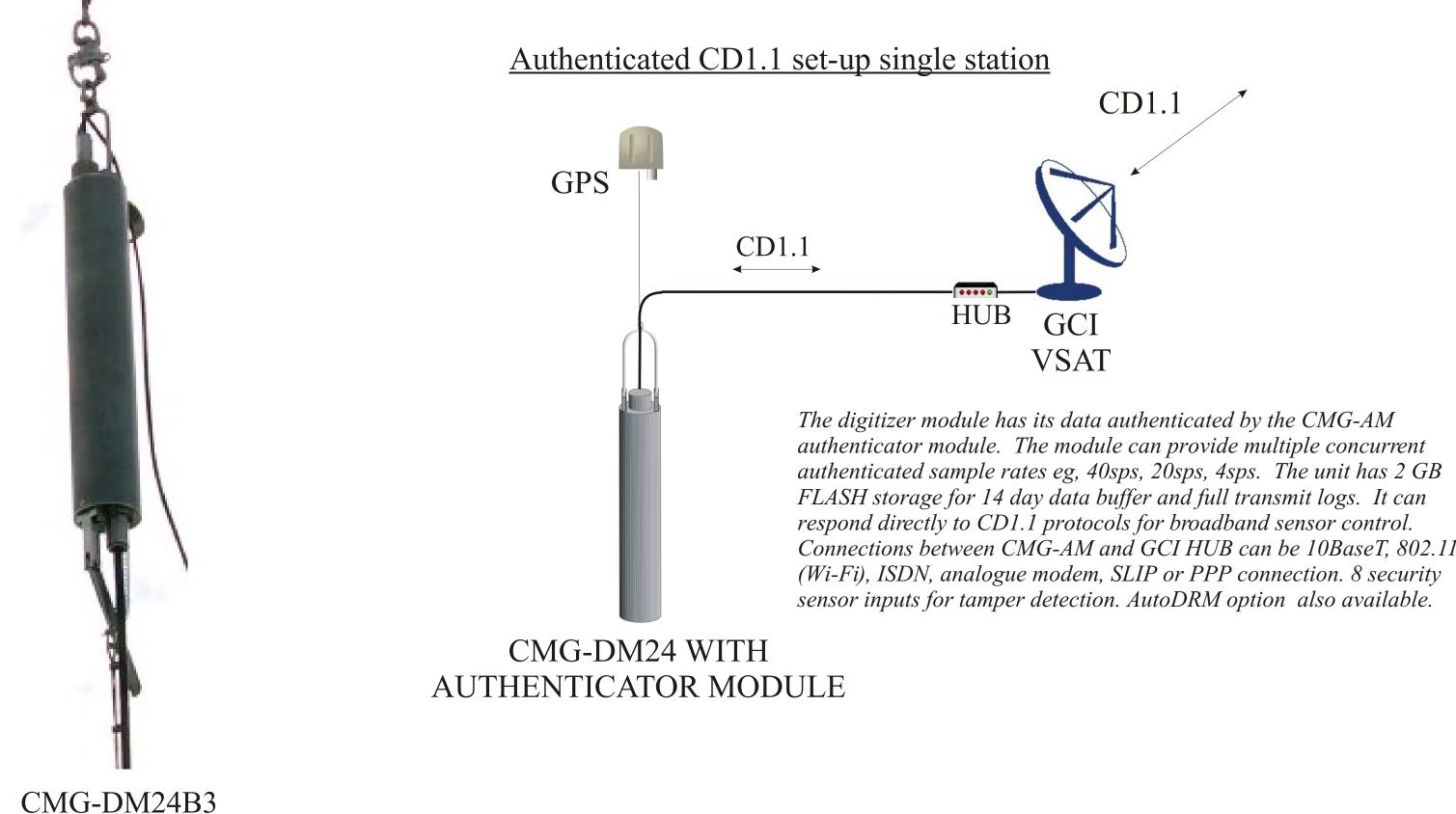
Digital Output and Network Ready Broadband Seismometers





Complete TCP/IP output network ready digital seismometer.

Broadband Borehole Seismometers



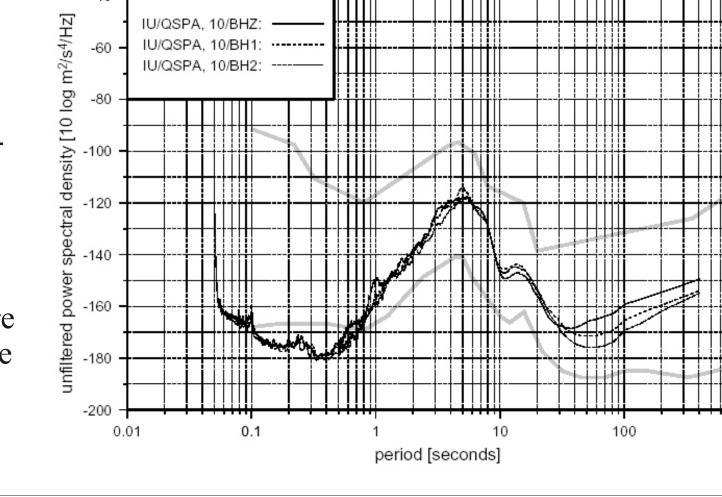
A new IRIS GSN station, known by its 4-letter station code QSPA, is located at the new South Pole Remote Earth Science Observatory (SPRESO).

3 Channel Slimline

Borehole Digitiser

Amongst several instruments installed at this location is a CMG-3TB which is at a depth of 900 feet The plot opposite shows the high frequency ground motion data

(provided by ASL) from the CMG-3TB the horizontal noise levels are essentially the same as the vertical noise level - below the low noise model from 1.7 to 10 Hz. All three components are 5 to 10 db below the low noise model in the 2.5 Hz portion of the



Strong Motion

Guralp Systems manufactures complete strong motion systems. These systems can be stand alone sites as part of a regional strong motion network or as complete modal analysis systems for structural monitoring and engineering implementations, e.g dams, bridges etc.

The plots below show an event recorded on the CMG-5TD from Alaska (data provided by University of Alaska Fairbanks). The plots of the M7.9 earthquake recorded at site CARLO (67 km from the epicenter). The acceleration time histories and corresponding Fourier and response spectra (5% damping) are also shown. The maximum horizontal PGAs at CARLO is

GSL also provides ART Strong motion Analysis and Research Tool for working with SCREAM and the CMG-5TD. All standard formats including UFF are supported.

M7.9 Denali Fault Earthquake record

Station ID: GURALP S/N 5595 Channel 2: = V 2002 11 03 2212

Station ID: GURALP S/N 5595 Channel 3: = E-W 2002 11 03 2212



4g > 145dB accelerometer, 24-bit digitizer with flash memory, baseplate for fixing and UPS with TCP/IP serial server communications

