

Distributed DAQlink 4



Networked Seismic Recording System

Inexpensive, Flexible, and Expandable

The Distributed DAQlink 4 System is the combination of a standard DAQlink 4 seismograph and internal, high-speed, network extenders. Using inexpensive twisted pair telephone cable, these network extenders will send triggering times to, and receive seismic data from, other DAQlinks. These cable lengths can reach 10,000 ft, or 3 km, in length.

The entire system is connected to a computer which controls the seismograph network and stores the acquired seismic data. This computer can be simultaneously providing Quality Control as the project is acquired. The final data files can be stored in SEG-2, SEG-D, SEG-Y, ASCII or MiniSEED format.

System Features:

Cutting-Edge Performance

- 1 to 24 channels per seismograph node
- High-Speed 24bit ADC – up to 64,000 sps
- Wide Bandwidth – DC to 32 KHz (unfiltered)
- Low Distortion – 0.00006% THD @ 500 sps
- Wide Dynamic Range – >144 dB (system) and >124 dB (measured) @ 500 sps
- Low Noise – <0.15 μ V RMS @ 500 sps

Multiple Time Synchronization Modes

- GPS Clock Discipline for Autonomous Recording
- VHF/UHF Radio for Underground Use
- Or synchronize multiple DAQlink via cable

Multiple Trigger Modes

- Trigger on hammer switch for shot acquisition
- Trigger using GPS time for noise monitoring
- Two trigger circuits available, one for standard and a second for low-voltage inputs

Multiple Data Storage Methods

- 16 Gbytes internal memory card standard
- External mounted, USB-compatible Memory Plug for data backup and transfer
- Ethernet connection for fast data transfers and remote data storage

Built-in Ethernet Network

- Use network to configure seismograph and monitor acquisition
- Compatible with cables, Wi-Fi and Cellular Data
- Internal FTP server for external data access

Built-in Acceptance Testing

- Instrument Tests:
 - Distortion, Cross-feed, CMRR, Impulse & Noise
- Sensor Tests:
 - Resistance, Frequency, Damping, Sensitivity



Distributed DAQlink 4



24 Channel Seismograph

Operation Modes:

Operate as Stand-Alone Seismograph

- Use a sledgehammer and hammer switch
- Small, lightweight unit for small, fast crews

Operate as an Acquisition System

- Use a vibrator and Force 3 controller
- Network a computer to Monitor Acquisition, Quality Control Data, and Store Shot Records

Passive Monitoring

- True Continuous Recording
- Use Cellular Modem for Remote Data Collection
- Works with surface or downhole sensors

Automated Event Detection

- Continuously record and store data
- Use LTA/STA Ratio (Long Term Average over Short Term Average) to detect events
- Includes automatic email notifications as events are located



Distributed DAQlink 4



24 Channels per Node



Vibrators or Impulse Sources

Distributed DAQlink 4 with Built-In Network Extender Features:

- Provides high-speed time break, system status and data transfer
- Uses inexpensive twisted pair telephone cable
- Simple setup and configuration
- Allows seismograph spacing of 10,000 ft, 1.9 miles or 3 kilometers

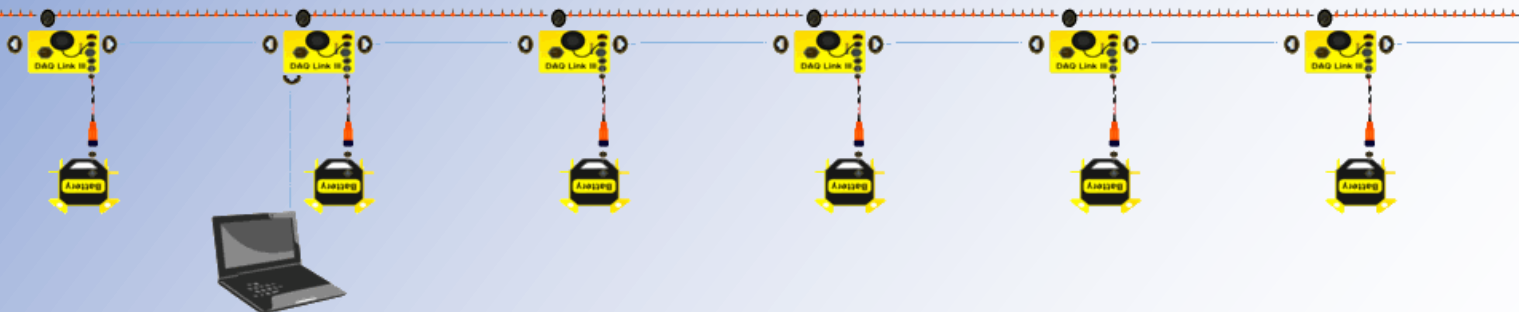
Other DAQlink 4 Connection Options:

Besides the Network Extender option, seismograph networks can be constructed using the 100Base-T network

- Cable Solution - 100 meters maximum between network switches
- WiFi solution - typical line of sight or 1 Km with 900 MHz units (distance depends on environment)
- Cellular Data Modem Solution - Connect each DAQlink 4, or the entire DAQlink 4 system, to a cellular data modem and download data from anywhere via the Internet



**Standard DAQlink 4 Seismograph
with standard top-mounted connectors**



The entire system controlled from a central location.

Distributed DAQlink 4

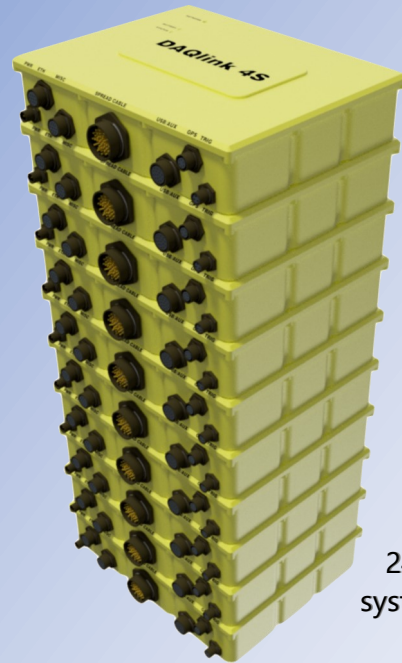


2D or 3D Acquisition

Distributed DAQlink 4 Trigger Options:

- Cabled solution - wired trigger signal is connected to each DAQlink unit
- VHF Radio solution - Wireless Trigger box is connected to each unit - Trigger signal is sent via VHF radio
- GPS solution - if all DAQlink units have GPS synchronization, then the triggering will be synchronized via the GPS time. Only one DAQlink needs to be wired to the trigger signal. The other DAQlinks will start at correct GPS time via Ethernet commands from the Vscope software.
- Trigger Storage - with the DAQlinks continuously recording with GPS synchronization, store the GPS trigger times at the Source Points and Post process Shot Records.

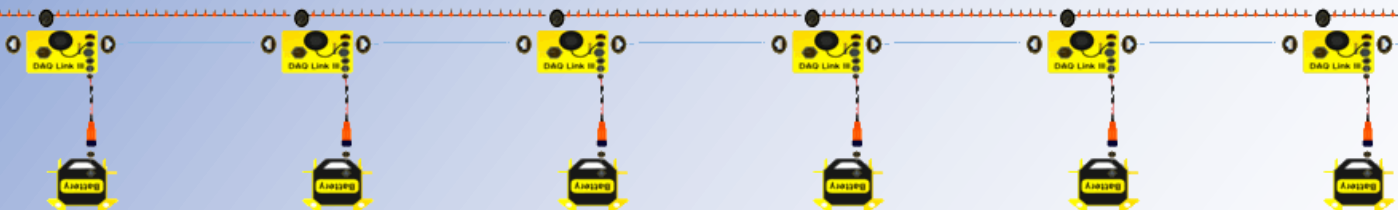
MegaDAQ - Multiple DAQlink 4 Seismographs in a single chassis



240 channel system shown

MegaDAQ (DAQlink 4S seismograph)

- All connectors have been relocated to the side of the case, enabling DAQlinks to be stacked.
- With the connectors centralized, cable runs are shorter and easier to maintain.
- With the seismograph modules in a central location, they can be networked for real-time data.
- MegaDAQ configurations utilize a single GPS module for consistent timing.
- The MegaDAQ configuration packs the largest number of channels into the minimum amount of space.



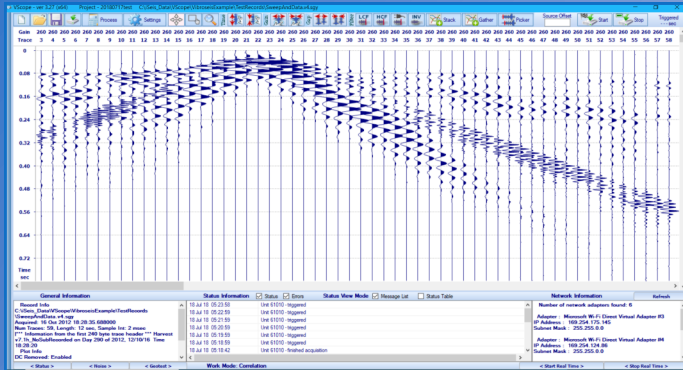
Distributed DAQlink 4 Seismograph System



Distributed DAQlink 4



Includes Vscope 3 Software



Functions:

Configures DAQlink 4 for Acquisition
Monitors Seismograph Operation
Offloads and Evaluates Data

Features:

Data Display
Analysis – Amplitude & Phase Spectra
RMS Noise and Signal Graphs

Expansion:

For larger systems, DAQlink 4 seismographs are compatible with the full line of iSeis Sigma Field Software, including Source Link & Sigma Observer

Standard DAQlink 4 Seismograph Specifications

Electrical	
A/D	24 bit sigma delta converter
Anti-Alias Filters	85% of Nyquist frequency
Low Cut Filter	User Selectable: 0.001 to 120 Hz
Filter Type	Linear or Minimum Phase
Sample Rates	125 to 64,000 sps
User Selectable PreAmp Gains	x1 (0 dB), x4 (12 dB) & x16 (24 dB)
Maximum Input Voltage	6 Volts @ x1 gain & peak-to-peak
Bandwidth	DC to 32 kHz (unfiltered)
Input Impedance	100k Ohms
Clock Sync	GPS Disciplined or VHF Radio Link
Power Supply	10 to 28 VDC
Power Usage*	Typically 0.13 watts per channel
Trigger Delays	Pre-Trigger 30 / Post-Trigger 100 secs
Performance @ 500sps	
Trigger Accuracy	$\pm 1 \mu s$
Dynamic Range	> 144dB (system) / > 124dB (measured)
% THD	0.00006 %
Crosstalk	Better than -125 dB
CMRR	Better than 100 dB
Noise Floor	< 0.15 μV RMS @ 500sps & x16 gain

Physical (per DAQlink unit)	
Number Channels	24
Temperature	-40°C to +85°C
Humidity	0 to 100%
Size*	11.0" x 9.7" x 2.2" (280 x 246 x 56 mm)
Weight*	4.4 lbs. (2.0 kg)
Data Storage (Internal 16GB CF)	120 hours continuous (24 channels @ 500 sps)
Data Storage (on Computer)	Unlimited - Depends on computer
Data Storage (External)	Unlimited - USB Compatible, & Can be changed during acquisition
Data Format	SEG-2 (*.sg2), SEG-D (*.sgd), SEG-Y (*.sgy), ASCII (*.csv) & MiniSEED
LEDs	Network, Status, Battery
Connectors	
Computer Network	10-pin Weatherproof
GPS	6-pin Weatherproof
Trigger	3-pin Weatherproof
Power	2-pin Weatherproof
Auxiliary Data	14-pin Weatherproof
USB Memory	19-pin Weatherproof
Seismic Data	55-pin Weatherproof
Network Backbone**	10-pin Weatherproof (2 ports)



* Standard 24 channel DAQlink 4 (without Network)

** Distributed DAQlink 4 (with Network Extenders)

