

GSR-24 Seismic Recorder / GSD-24 Seismic Digitiser

Features

- Standard 128 MByte Data Memory (Optional up to 2 GByte)
- 24 Bit Digitiser
- Bandwidth to 80 % of Nyquist
- Highest Dynamic Range
- GPS Time Receiver (Option)
- Continuous Data Stream Output
- On-Line Diagnostics and Self Checking System
- Quick Installation
- Sets New Standard in Price for 24 Bit Technology



Outline

The **GSR-24** Seismic Recorder is a high performance velocity and acceleration acquisition system. In combination with the Radio Telemetry Interface and the acquisition facilities a complete solution is now available on the market for seismic profiling, after shock studies, noise measurements and single station micro seismic networks.

Featuring the latest industrial standard 24 Bit high resolution digitiser the **GSR-24** records signals over **132 dB dynamic range** making it one of the most accurate and flexible portable recorders available on the marketplace. This highest performance allows to acquire micro seismic, broad band and strong motion signals in a single field unit.

The standard **GSR-24** recorder allows **3 signals** from either seismometers, accelerometers or geophones to be acquired using a three component 24 Bit Digitiser, a Control Card, a GPS receiver, a CPU and flash memory. The GSR-24 has a digitiser line output.

A separate **Digitiser GSD-24** is available, which has the same features as the GSR-24, but no memory and therefore no recording facilities.

The line output from the **GSR-24/GSD-24** is available for connection to a radio transmitter. This enables continuous data transmission back to base and at the same time as back up continuous recording.

A comprehensive package of advanced, windows-based analysis software is available. **GeoDAS** is included with the **GSR-18** and can be used on-site for a first impression of the recorded data. **SEISLOG** is included in the Seismic Data Acquisition System consisting of a Laptop or PC and is the base of the recording function for the **GSD-24**. SEISLOG allows also the graphical display of the recorded data.

With the **GeoDAS Data Analysis Package** and **SEISAN**, we provide two dedicated analysis programs for earthquake and civil engineering as well as for seismologist.

The **GSR-24 Seismic Recorder** is the ideal compact and most cost effective **24 Bit** approach.

Specifications GSR-24 / GSD-24

Set-up and Configuration

All the necessary parameter and configuration settings are selectable with the easy-to-use **GeoDAS** Windows program. The configuration of the **GSR-24** is stored in an internal EEPROM which secures the configuration set-up independent of any backup battery requirements.

SEISLOG

The **GSR-24/GSD-24** can be used as a seismic digitiser providing 1 second packaged data for direct recording in a PC running the SEISLOG software from Bergen University.

Data Analysis

The **GeoDAS** program provides basic time history data evaluation in the field. The **GSR-24** supplies data in binary format or as ASCII files. The **GeoDAS Data Analysis Package** covers the requirements of detailed laboratory analysis for most earthquake and civil engineering applications. Any customary evaluation software package can of course be used as well.

Sensor

Various sensors suitable to your application are available. All sensors are housed in a compact case and easy to install and to level.

Güralp CMG-40T-1 1 second Seismometer

Frequency Response: 1 Hz to 80 Hz
Velocity output: 2 x 1000 Vs/m

Güralp CMG-5T Force Balance Accelerometer

Frequency Response: DC to 100 Hz
Acceleration output: +/- 2, 1, 0.5, 0.1 g
Dynamic range for 2 g F.S.: > 140 dB (0.005 to 0.05 Hz)
> 127 dB (3 to 30 Hz)

Anti Aliasing Filter

Filter response type: FIR Brickwall
Attenuation: > 130 dB above Nyquist
Filter equation: contact GeoSIG
Channel to channel skew: Zero

Digitiser

Type: 3-Channel 24-Bit Sigma-Delta ADC

Dynamic Range: 132 dB @ 50 SPS
130 dB @ 100 SPS
128 dB @ 200 SPS

Resolution (peak to peak Noise): 21.9 Bit @ 50 SPS
21.6 Bit @ 100 SPS
21.2 Bit @ 200 SPS

Sampling rates: 50, 100, 200 SPS per channel

Bandwidth: 40 % of sampling rate
Input range: +/- 5 V or +/- 20 V
Type: differential input
Channel to channel isolation: 127 dB

Data Recording

Pre-event-Time: 1 to 132 seconds
Post-event-Time: 1 to 100 seconds

Triggering

Level Triggering:

Lower band limit: Drift compensated
Range: 0.01 to 100 % of full scale

STA/LTA Triggering:

STA-Base: 0.1 to 10 seconds
LTA-Base: 1 to 100 seconds
STA/LTA-Ratio: 1 to 60 dB

On-Board Memory

Memory: 128 MByte Flash Memory,
Recording time: 19 minutes per 2 Mbytes
(@ 3 channels, 200 SPS)

Removable ATA memory card (Optional):

Type: PC Card ATA Memory (PC compatible without additional software)
Size: 128, 256, 512 Mbyte, 1, 2 Gbyte

Power Supply

Type: Switched power supply
Internal battery: Rechargeable, 12 VDC, 6.5 Ah
Sealed Lead acid battery
Power consumption: 175 mA @ 12 VDC
Autonomy: 38 hours
Charger: 90 - 260 VAC External Power Supply

Time Base

Standard clock accuracy: 20 ppm (10 min/year
@ - 10 °C to + 50 °C)
External time interfaces: GPS

Indicators

Green: AC Power LED
Green: Run/Stop LED
Yellow: Event/Memory LED
Red: Warning/Error LED
LCD display: User selectable choice of display Parameters

Communication

Serial ports: 2 (1 for communication / continuous data stream, 1 for GPS)
Baud rates: 2400, 9600, 19200, 38400, 115200
Communication protocol: TG protocol
Protocol securities: Checksum and software handshaking
Communication: PC/RS-232 port or modem
Modem operations: Auto Dial

Environment / Housing

Operational temperature: - 20 °C to + 70 °C
Storage temperature: - 40 °C to + 85 °C
Humidity: 0 to 100 % RH (non condensing)
Type: Aluminium housing
Size: 280 x 180 x 100 mm
Weight: 7.2 kg (incl. 6.5 Ah battery & charger)
Protection: IP65 (NEMA 12)

Housing Options (Large Housing with Handles):

Size: 330 x 230 x 180 mm
Weight: ~10 kg (incl. 6.5 Ah battery)
Protection: IP66 (optionally IP68)

TCP/IP Communication Option

Using a RS-232-TCP/IP device server, **GSR-24** can be seamlessly integrated in a TCP/IP computer network for instrument setup and data acquisition. Doing so each **GSR-24** can be assigned a unique IP Address.

Self Test

Permanently active, self monitoring and user selectable, periodical system test including comprehensive sensor, memory, filter, real time clock, battery level and hardware tests.

Seismic Switch / Warning Unit Option

The **GSR-24** warning option provides four independent warning / error outputs (relay contacts) based on user selectable criteria. This option allows to configure the GSR-24 as a seismic switch.

Alarms: 2 relay contacts
Alarm levels: 0.1 to 100 % of full scale
(User programmable)
Relay Hold-On: 1 to 60 seconds
(User programmable)

GSNet Capabilities

GeoSIG offers various network solutions such as Independent or Interconnected Recording Networks and Local or Central Recording Networks. On-line surveillance, common trigger and time synchronisation are some of the highly advanced functions within the GSNet.

Specifications subject to change

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