

GSR-18 Strong Motion Recorder / GSD-18 Digitiser

Features

- Standard 16 Mbytes Onboard Memory (Optional up to 64 Mbytes)
- Dynamic Range: 111 dB @ 100 SPS
108 dB @ 200 SPS
- RMS Noise: 5 mV @ 100 SPS
7 mV @ 200 SPS
- On-line Diagnostics and Self-Checking System
- LED and LCD Status Indication
- Detailed Analysis Tool with dedicated GeoDAS Data Analysis Package
- Also available only as Digitiser for Seismic Network
- Sets New Standards in Price / Performance for 18 Bit Technology



Outline

The **GSR-18 Strong Motion Recorder** has a dynamic range of 111 dB @ 100 SPS and 108 dB @ 200 SPS. The standard 3 channel system has selectable sampling rates from 100 to 250 SPS.

A variety of sensors can be connected to the GSR-18 offering solutions for applications in miscellaneous fields.

Various network solutions such as independent or interconnected recording networks and local or central recording networks can be configured easily with highly advanced functions such as on-line surveillance, common trigger and time synchronisation. The standard parameter settings and the user-defined configurations can be transferred easily from the PC to the **GSR-18**.

Transferring data to PC while recording is possible and can be done also via modem. Optionally available is the dial-up system which allows the **GSR-18** to call automatically a predefined telephone number after an event has been recorded.

A comprehensive package of advanced, menu-driven 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. **GeoDAS Data Analysis Package** is a dedicated evaluation program especially designed by **GeoSIG** for earthquake and civil engineering data analysis. It contains all necessary functions and performances for detailed evaluation in the frequency domain functions (FFT, Power Spectrum, Response Spectrum). Additional include integration (acceleration-velocity and velocity-displacement), CAV (Cumulated Absolute Velocity), Space (Rotation, Display) and various data filters.

The **GSR-18** is also available as **GSD-18** Digitiser only integrated into **GeoSIG Seismic Network Systems**.

The **GSR-18** is the ideal, compact and most cost effective **18-Bit** approach.

SPECIFICATIONS GSR-18 / GSD-18

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-18** is stored in an internal EEPROM which secures the configuration set-up independent of any backup battery requirements.

Data Analysis

The **GeoDAS** program provides basic time history data evaluation in the field. The **GSR-18** supplies data available 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 in trade 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 with a single bolt mount, easy to install and to level with three levelling screws. The sensors can also be built into the **GSR-18** unit (internal sensors). Also available as a standard option is a current loop interface (0 to 20 mA) for signal transfer over long distances as well as a gain selection to expand the signal range.

AC-63 Force Balance Accelerometer

Frequency Response: DC to 100 Hz
Largest signal: ± 2 g Std. (± 1 , ± 4 g optional)

AC-23 Geophone-based Accelerometer

Frequency Response: 0.2 Hz to 50 Hz
Largest signal: ± 1 g

CMG-5T Güralp™ Accelerometer

Frequency response: DC to 100 Hz
Largest signal: ± 2 g

CMG-40T1 Güralp™ Seismometer

Frequency response: 1 Hz to 80 Hz
Largest signal: ± 10 mm/s

Anti Aliasing Filter

Filter response type: FIR (finite impulse response)
Attenuation: > 110 dB above Nyquist
Filter equation: contact GeoSIG

Digitiser

Type: 4-Channel 22-Bit Sigma-Delta ADC
Dynamic Range: 111 dB RMS @ 100 SPS
108 dB RMS @ 200 SPS
RMS Noise: 5 μ V @ 100 SPS
7 μ V @ 200 SPS
Sampling rates: 100, 200, 250 SPS
per channel
Bandwidth: 40% of sampling rate

Data Recording

Pre-event-Time: 1 to 30 seconds
Post-event-Time: 1 to 100 seconds
Compression factor: 2 (typical)

Triggering

Level Triggering:

Lower band limit: 0.1 Hz (20 dB / decade)
Upper band limit
(Can be turned ON or OFF): 12 Hz (40 dB / decade)
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: 16 Mbytes (standard)
32, 64 Mbytes (expandable)
Recording time: 18 minutes per 2 Mbytes
(@ 3 channels, 200 SPS)

Removable ATA memory card (Optional):

Type: PC Card ATA Memory
(PC compatible without additional software)
Size: 16, 32, 48, 64 Mbytes

Power Supply

Type: Switched power supply
Internal battery: Rechargeable, 12 VDC, 6.5 Ah
Sealed Lead acid battery
Power consumption: 130 mA @ 12 VDC
Autonomy: 2 days
AC voltage: 230 VAC (115 VAC optional)
Internal charger: 230 VAC (115 VAC optional)

Time Base

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

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, 1 for GPS)
Baud rates: 2400, 9600, 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 kg (incl. 6.5 Ah battery)
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)

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-18** warning option provides four independent warning / error outputs (relay contacts) based on user selectable criteria. This option allows configuring the GSR-18 as a seismic switch.

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

GSNet Capabilities

GeoSIG offers various network solutions such as Independent or Interconnected Recording Networks 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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