



# GeoSIG

**Bridges**



**Tunnels**



**Power Plants**



**Historical Buildings**



**Dams**



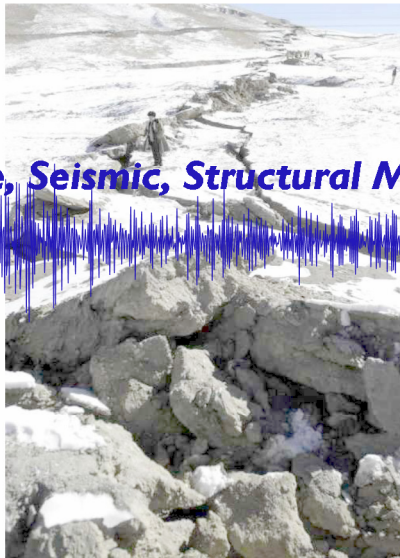
**Important Structures**



**Urban Areas**



**Earthquake, Seismic, Structural Monitoring and Dynamic Measuring Solutions**



Vancouver  
Canada

Liberation Tower  
Kuwait

Ataturk Dam  
Turkey

Hagia Sophia  
Turkey

Maritsa TPP  
Bulgaria

Furka Tunnel  
Switzerland

Oresund Bridge  
Denmark

26 December 2004 Sumatra Earthquake recorded by GeoSIG Strong Motion Instruments in Turkey, 7800 km away  
Courtesy of Kandilli Observatory and Earthquake Research Institute, Istanbul

Rupture of the 14 November 2001  
Kokoxili Earthquake probably near the  
Kunlun Pass, China

# GeoSIG, the Swiss manufacturer of systems and solutions for earthquake, seismic, structural, dynamic and static monitoring and measuring

## Background

GeoSIG Ltd provides superior instruments, state-of-the-art systems and solutions for earthquake, seismic, structural, dynamic and static monitoring and measuring.

Since 1992, having established a permanent and strong position at the top tier of the industry and with significant experience in the development of systems for scientific, industrial and civil engineering applications GeoSIG has thousands of instruments and systems in operation around the world.

Composed of highly dedicated and talented individuals with many years of experience in their fields, GeoSIG has developed a large variety of Strong Motion- and Seismic Recorders, Sensors and Civil Engineering Monitoring Systems and provides high quality instruments and network systems. The principle tenet of GeoSIG is providing measuring solutions to customers' problems and meeting the customers' needs. This tenet is fulfilled by highly versatile products in terms of features, functions, quality and reliability at an optimum price performance ratio.

The design and development of all GeoSIG systems are centred on obtaining the highest possible levels of performance, durability and reliability; qualities which are inherently associated with the words 'Swiss Made'.

To insure continuing leadership, GeoSIG is continuing to place strong emphasis on incorporating the most advanced technologies. To complement its technical capabilities and to attain high levels of quality assurance, GeoSIG has invested extensively in support and infrastructure which has culminated in achieving ISO 9001 accreditation.

## Present Situation

GeoSIG has succeeded in bringing out excellent products and is recognised and well known in the seismic and civil engineering market place. GeoSIG Instruments have been designed from the outset with the future in mind. The open architecture, leading edge digital electronics, and the use of advanced engineering facilities, such as CAE (Computer Aided Engineering), Object Oriented Software Design and VHDL (VHSIC Hardware Description Language) has resulted in a system design with the power and flexibility to perform not only today's but tomorrow's instrumentation and monitoring requirements.

Numerous projects have been successfully completed ranging from single instruments to massive networks in more than 80 countries around the world like Argentina, Armenia, Austria, Belgium, Brazil, Canada, Chile, China, Croatia, Denmark, France, Germany, Greece, Grenada, Hungary, India, Iran, Italy, Kazakhstan, Korea, Lithuania, Mexico, Nepal, Netherlands, Norway, Pakistan, Portugal, Romania, Russia, Slovakia, Slovenia, Spain, Switzerland, Syria, Taiwan, Turkey, United Kingdom, USA, just to name a few.

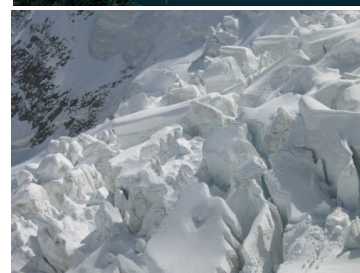
Determined representatives have been assigned in Argentina, Austria, Bangladesh, Brazil, Canada, China, Croatia, Denmark, France, Greece, Hong Kong, India, Iran, Israel, Italy, Korea, Morocco, Pakistan, Panama, Portugal, Romania, Russia, Singapore, Slovakia, Slovenia, Spain, Syria, Taiwan, Turkey, United States. This representative network enables GeoSIG to be present on the entire globe.

## Quality

In mid 1997 GeoSIG has been assessed and approved to the quality administration systems, standards and guidelines of BS EN ISO 9001: 1994 and in 2004 assessed and approved to the quality administration systems, standards and guidelines of BS EN ISO 9001: 2000 applying to the design, development, manufacture, supply and servicing of geophysical measuring solutions (QMS Quality Management Systems Limited, Certificate Number: GB2117)

## Staff

GeoSIG Ltd. recognises that the most valuable asset is the combined expertise, experience and talents of its team. Dedication, talent, knowledge and experience have enabled GeoSIG to rapidly grow and develop into one of the principle developers of measuring solutions.



## Mainstream Products

Sensors	Full Scale Range	Bandwidth	Dynamic Range	Axes	Cross Axis Sensitivity	Downhole Version	Dimensions	Weight
<b>Accelerometers</b>								
AC-2x	Jumper selectable: $\pm 0.2, \pm 0.5, \pm 1, \text{ or } \pm 2 \text{ g}$ (optional: $\pm 0.1, \pm 0.25, \pm 0.5, \text{ or } \pm 1 \text{ g}$ )	From : 0.1 Hz (1 pole) To : 100 Hz (1 pole, 200 Hz optional)	> 125 dB	1, 2 or 3	$\pm 1 \%$ typical $\pm 3 \%$ maximum	AC-2x-DH	195 x 112 x 96 mm	2.5 kg
AC-4x	$\pm 2 \text{ g}$ standard (optional: $\pm 0.625, \pm 1, \pm 4 \text{ or } \pm 5 \text{ g}$ )	From : DC To : 100 Hz	90 dB at $\pm 2 \text{ g}$ FS (0.1 to 30 Hz) 97 dB at $\pm 5 \text{ g}$ FS	1, 2 or 3	< 2 % typical	AC-4x-DH	195 x 112 x 96 mm	2 kg
AC-6x	$\pm 2 \text{ g}$ standard (optional: $\pm 0.5, \pm 1, \pm 3 \text{ or } \pm 4 \text{ g}$ )	From : DC To : 100 Hz (50 or 200 Hz optional)	> 120 dB at $\pm 4 \text{ g}$ FS	1, 2 or 3	< 0.2 %	AC-6x-DH	195 x 112 x 96 mm	3 kg
<b>Seismometers</b>								
VE-1x	$\pm 100 \text{ mm/s}$ (optional: $\pm 1, \pm 10 \text{ mm/s}$ )	From : 1 Hz To : 315 Hz	> 96 dB	1, 2 or 3	< 0.1 % of full scale	VE-xx-DH	195 x 112 x 96 mm	2.0 kg
VE-2x	$\pm 100 \text{ mm/s}$ (optional: $\pm 1, \pm 10 \text{ mm/s}$ )	From : 4.5 Hz To : 315 Hz	> 96 dB	1, 2 or 3	< 0.1 % of full scale	VE-xx-DH	195 x 112 x 96 mm	2.0 kg
VE-3x	27.3 V/m/s	From : 4.5 Hz To : 315 Hz	> 96 dB	1, 2 or 3	< 0.1 % of full scale	VE-xx-DH	110 x 80 x 60 mm	1.0 kg
VE-5x	2 x 500 V/m/s (optional: DIN: 2 x 100 V/m/s)	From : 1 Hz To : 80 Hz (-3 dB) DIN : 0.8 to 315 Hz	> 120 dB (1 to 30 Hz)	1, 2 or 3	$\pm 1 \%$ typical $\pm 3 \%$ maximum	VE-xx-DH	195 x 112 x 96 mm	2.5 kg
VE-5x-BB	2 x 500 V/m/s	From : 0.2 Hz To : 160 Hz	> 120 dB	1, 2 or 3	$\pm 1 \%$ typical $\pm 3 \%$ maximum	VE-5x-BB-DH	195 x 112 x 96 mm	2.5 kg

Recorders Digitizers	Channels	Dynamic Range or (Least Significant Bit %)	Resolution or (RMS Noise)	Sampling rate / Bandwidth	Pre-event / Post-event	Memory / Capacity	Battery / Autonomy	Dimensions / Weight
<b>Single Units</b>								
GSR-12	3	(0.025 % of full scale)	12 Bit	100, 200, 250 SPS / 40 % of sampling rate	1 to 20 seconds / 1 to 240 seconds	Removable 2 GB	12 VDC, 7.2 Ah / 2 days	280 x 180 x 100 mm / 7.2 kg (incl. battery)
GSR-16	3	(0.0015 % of full scale)	16 Bit	100, 200, 250 SPS / 40 % of sampling rate	1 to 20 seconds / 1 to 240 seconds	Removable 2 GB	12 VDC, 7.2 Ah / 2 days	280 x 180 x 100 mm / 7.2 kg (incl. battery)
GCR-16	3	(0.0015 % of full scale)	16 Bit	200, 400, 800, 1000 SPS / 50, 100, 315 Hz	0.1 to 5 seconds / 0.1 to 60 seconds	Onboard 2 MB	12 VDC, 7.2 Ah / 2 days	280 x 180 x 100 mm / 6.9 kg (incl. battery)
IA-2	3	> 96 dB with AC-4xi > 120 dB with AC-6xi	16 Bit with AC-4xi 18 Bit with AC-6xi	50, 100, 200, 500 SPS 40 % of sampling rate	1 to 100 seconds / 1 to 1000 seconds	Removable 2 GB (expandable to 32 GB)	12 VDC, 7.2 Ah / >1 day	296 x 175 x 140 mm / 296 x 225 x 156 mm (with plate) / 7.3 kg (incl. battery) / 1.3 kg plate
GSR-18 GSD-18	3	111 dB RMS @ 100 SPS 108 dB RMS @ 200 SPS	(5 mV @ 100 SPS) (7 mV @ 200 SPS)	100, 200, 250 SPS / 40 % of sampling rate	1 to 30 seconds / 1 to 240 seconds	Only GSR: Removable 2 GB	12 VDC, 7.2 Ah / 2 days	280 x 180 x 100 mm / 7.2 kg (incl. battery)
GMS-18	3 or 6	> 130 dB @ 200 SPS	20 Bit	3 chn: 50, 100, 200, 500 SPS 6 chn: 50, 100, 200 SPS / 40 % of sampling rate	1 to 100 seconds / 1 to 1000 seconds	Removable 2 GB (expandable to 32 GB)	12 VDC, 7.2 Ah / >1 day	296 x 175 x 140 mm / 296 x 225 x 156 mm (with plate) / 7.3 kg (incl. battery) / 1.3 kg plate
GSR-24 GSD-24	3	132 dB @ 50 SPS 130 dB @ 100 SPS 128 dB @ 200 SPS	21.9 Bit @ 50 SPS 21.6 Bit @ 100 SPS 21.2 Bit @ 200 SPS	50, 100, 200 SPS / 40 % of sampling rate	1 to 132 seconds / 1 to 100 seconds	Only GSR: Removable 2 GB	12 VDC, 7.2 Ah / 2 days	280 x 180 x 100 mm / 7.2 kg (incl. battery)
GMS-24	3 or 6	> 140 dB @ 200 SPS	24 Bit	3 chn: 50, 100, 200, 500 SPS 6 chn: 50, 100, 200 SPS / 40 % of sampling rate	1 to 100 seconds / 1 to 1000 seconds	Removable 2 GB (expandable to 32 GB)	12 VDC, 7.2 Ah / >1 day	296 x 175 x 140 mm / 296 x 225 x 156 mm (with plate) / 7.3 kg (incl. battery) / 1.3 kg plate
<b>Network Recorders</b>								
GMC	Up to 72	> 130 dB @ 200 SPS	24 Bit	50, 100, 200, 500 SPS 40 % of sampling rate	1 to 100 seconds / 1 to 1000 seconds	Removable 2 GB (expandable to 32 GB)	12 VDC, 100 Ah / 1 day	400 x 600 x 366 mm
GNC-CRx	Up to 48 / 3 per RMC Card	(0.025 % of full scale)	12, 16, 18 or 24 Bit	12, 16, 18 Bit: 100, 200, 250 SPS 24 Bit: 50, 100, 200 SPS / 40 % of sampling rate	1 to 30 seconds (120 for 24 Bit) / 1 to 100 seconds	Removable 2 GB per RMC card	12 VDC, 7.2 Ah / 2 days divided by # of RMC cards	up to 24 channels: 600 x 575 x 370 mm / 25 to 48 channels: 600 x 575 x 630 mm / 30 to 50 kg (incl. battery) depending on amount of channels
CR-5	Up to 120 dynamic & > 500 static	(0.003 % of full scale)	16 Bit	50, 100, 200, 500, 1000 SPS / DC to 52 Hz (200 sps) or DC to 264Hz (1000 sps)	1 to 100 seconds / 1 to 100 seconds	Limited by HDD size	12 VDC, 100 Ah / 1 day	max : 1600 x 600 x 620 mm / max : 150 kg
CR-5P	Up to 99 dynamic & > 200 static	(0.003 % of full scale)	18 or 24 Bit	100 and 200 SPS optionally 10, 20, 50, 250 SPS	1 to 1800 seconds / 1 to 1800 seconds	Limited by HDD size	12 VDC 70 to 240 Ah / System and config. depending	Aluminium / Polyethylene max : 550 x 500 x 340 mm / Painted Steel max: 600 x 580 x 370 mm / max : 50 kg

All specifications are subject to change without prior notice.



### AC-2x

The AC-2x Series are based on a standard exploration geophone mass-spring system with electronic correction, which yields a simple thus reliable accelerometer series. The temperature stability and light weight (2.5 kg) of AC-2x is outstanding. Recommended for strong motion earthquake survey & industrial applications requiring high sensitivity, 2x series come with two different uniaxial (AC-21H & 21V), as well as biaxial (AC-22) and triaxial (AC-23) configurations. The sensor full scale is jumper selectable at  $\pm 0.2$ ,  $\pm 0.5$ ,  $\pm 1$  or  $\pm 2$  g along with a frequency response of 0.1 Hz to 50 Hz, optionally 200 Hz. It is also available as a low noise version. Downhole versions are available

### AC-4x

The AC-4x sensor package is a MEMS (Micro Electro-Mechanical Systems) based accelerometer designed for urban and industrial applications regarding Strong-Motion earthquake survey / alarming and vibration monitoring. All these applications require rugged sensors with a minimum of maintenance and a simple method for periodic testing. The DC response allows the sensor to be easily repaired, tilt tested or recalibrated in the field. With the help of the TEST LINE the AC-4x accelerometer can be completely tested assuring proper operation and accurate acceleration measurement. The full scale is  $\pm 2$  g, optionally adjustable to  $\pm 1$ , 4, 5 and 6 g. The frequency response ranges from DC to 100 Hz. Downhole versions are available.



### AC-6x

The AC-6x sensor package is a force balance accelerometer designed for freefield and industrial applications regarding Strong-Motion earthquake survey and vibration monitoring. All these applications require high dynamic, rugged sensors with a minimum of maintenance and a simple method for periodic testing. The DC response allows the sensor to be easily repaired, tilt tested or recalibrated in the field. With the help of the TEST LINE the AC-6x accelerometer can be completely tested assuring proper operation and accurate acceleration measurement. The full scale is  $\pm 2$  g, optionally adjustable to  $\pm 0.5$ , 1 g. The frequency response ranges from DC to 100 Hz or optionally to 50 or 200 Hz. Downhole versions are available.

### VE-1x

The VE-1x series velocity sensors are based on a symmetrical rotating dual coil construction minimising the force on the spring arms. The use of precious metals ensure optimum electrical contact and longer operation life. These velocity sensors operate from a wide range of input voltages and can be used for a variety of civil engineering and general vibration measurement applications. The sealed cast aluminium housing contains a MS style connector or a sealed cable inlet. The housing also incorporates a single bolt mount with three levelling screws. The sensors are further equipped with an impulse test circuit. VE-1x series are offered in two different uniaxial (VE-11-H & VE-11-V) as well as biaxial (VE-12) and triaxial (VE-13) configurations. With a frequency response of 1 to 315 Hz, the scale ranges from  $\pm 1$  mm/s,  $\pm 10$  mm/s and  $\pm 100$  mm/s.



### VE-2x

The VE-2x series velocity sensors are similar to VE-1x series. However, in 2x series the frequency response is between 4.5 to 315 Hz and the scale ranges from  $\pm 10$  mm/s,  $\pm 50$  mm/s and  $\pm 100$  mm/s. These velocity sensors are offered in two different uniaxial (VE-21-H & VE-21-V) as well as biaxial (VE-22) and triaxial (VE-23) configurations.

### VE-3x

The VE Velocity Sensors are engineered for consistent performance over a long lifetime. Advanced computerised testing, manufacturing techniques and quality control are used in the production process to provide both, the uniform parameters and the rugged qualities required in modern velocity sensors. The use of precious metals ensure optimum electrical contact and a long operating life. VE-3x series are offered in two different uniaxial (VE-31-H & VE-31-V) as well as biaxial (VE-32) and triaxial (VE-33) configurations.





**VE-5x**

The VE-5x sensor is based on a standard exploration geophone mass-spring system with electronic correction. This type of sensor has remarkable stability against temperature or ageing because of the very simple principle. The VE-53 sensor package is a triaxial velocity sensor designed for field or industrial survey and monitoring applications also including vibration and explosion for civil engineering. Downhole versions are available.

**GSR-12 / GSR-16**

The GSR series are data acquisition systems representing the state of the art technology in earthquake monitoring. As with all the recorders, a variety of trigger conditions can be selected to start data capture onto internal solid state memory or removable PC memory. Data is transferred to the central station using a PC/RS-232 port or a modem.



**GSR-18 / GSD-18**

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 a broad range of applications. The 18 Bit technology brings in a significant dynamic range improvement in combination with the AC series of force balanced sensors. (GSR-18AH is shown in the picture)

**GSR-24 / GSD-24**

The new state of the art GSR-24 Seismic Recorder has a three component 24 Bit high resolution digitiser capable of recording velocity and acceleration signals over 133 dB dynamic range. This high performance allows the acquisition of micro seismic, broad band and strong motion signals in a single field unit. Combined with the Radio Telemetry Interface and the acquisition facilities a complete cost effective solution for seismic profiling, aftershock studies, noise measurements for single station to micro seismic networks is offered. Digitised data stream output may be connected to a radio transmitter enabling continuous data transmission back to base, while triggered recording into an ATA PC compatible flash memory up to 64 MB is possible.



**GMS-18 NetQuakes Recorder**

The GMS-18 is the ground breaking second generation of the GeoSIG Measuring System with extended connectivity, capability and flexibility. It includes an Ethernet connection and optionally a 2.4 GHz Wi-Fi module to insure fast and reliable data transfer. Its design and efficiency makes it the first choice for any application requiring seismic instruments. With its optimized installation, operation and maintenance philosophy, the GMS offers the real possibility to implement such as high density arrays with total operating costs at a small fraction of conventional strong-motion seismograph networks. The instrument's software processes data in real time. Wired or Wireless Interconnected Network options enable the use of several units together in a time and trigger synchronised manner; wireless using the Wi-Fi and Wi-Synch options. GMS is being used in the NetQuakes Project of the USGS.

**GMS-24**

The GMS-24 is the ground breaking second generation of the GeoSIG Measuring Systems with extended connectivity capability and flexibility, now in 24 Bit, reaching a dynamic range of more than 140 dB. The unit is based on the GMS technology developed in close coordination with USGS and deployed in high quantities in North America establishing the NetQuakes system. It includes an Ethernet connection and optionally a 2.4 GHz Wi-Fi module to insure fast and reliable data transfer.



### GCR-16



The GCR series is a Universal Civil Engineering Recorder utilizing the latest modern processor technology to carry out vibration measurements in accordance with DIN4150 part 1 and 2 as well as the Swiss Norm SN64031a. The recorders may be configured with a wide selection of sensors suitable for a range of application. With different configurations of recording parameters it is possible to use the 16 Bit GCR-16 as either a blasting surveillance recorder or as a permanent data recorder for ramming works, mining, tunnel, bridge or traffic surveillance. Data transfer to a PC is also possible via a modem.

### IA-2 Internet Accelerograph

The Internet Accelerograph IA-2 expands the era of its predecessor IA-1. It complements the GeoSIG instrument NetQuakes / GMS in the urban seismic research and engineering, which requires a high spatial density of seismic instruments. For major urban centres several hundred instruments are required. Thus unit costs as well as operating costs are of major concerns.



### GMC Measuring Centre

The instrument is based on the GMS / NetQuake technology and has 100% software compatibility with the GMS instruments. It is the new generation of the GeoSIG Measuring Systems with extended connectivity capability and flexibility..

It includes an Ethernet connection and optionally a 2.4 GHz Wi-Fi module to insure fast and reliable data transfer.

### GNC-CR24 / -CRI8 / -CRI6 / -CRI2

The GNC-CR Central Recording System is a Multichannel Recorder containing several Recorder Module Cards. It can be extended to an almost unlimited number of channels by adding further 12 Bit, 16 Bit or 18 Bit triggered Recorder Module Cards. The Network Center provides on-line surveillance, common trigger, common sampling and time synchronisation (GPS, telephone and radio modem interface are optional). The LCD indication informs continuously about the current status of the Network Center. The PC based software may be AllView or the newly released GeoDAS Windows based software for managing the network, downloading and analysing records.



### SMS Seismic Monitoring System

The SMS is a Strong Motion Multichannel Digital Recorder System. Accelerometer packages are placed in remote locations and are connected to recorder through shielded cables. Recorder, Control Module and Processing Computer are rack mounted in a cabinet. By monitoring continuously the sensors, it detects seismic events, generates associated alarms and automatically processes the recorded data. Also it performs periodical test of the system.

### SAS Seismic Alarm System

The SAS, Seismic Alarm System, is a Strong Motion Digital Seismic Switch System. Accelerometer packages are placed in remote locations and are connected to Seismic Switch through shielded cables. The Switch Module could be rack mounted in a cabinet or use an individual housing, wall or floor mounted for single switch application. By monitoring continuously the sensors, it detects seismic events, generates associated alarms and could also record the event as evidence for the alarm. Also it performs periodical test of the system.



### CR-5 Computer Based Structural Monitoring System

The CR-5 was developed out of years of experience in monitoring civil engineered structures such as dams, nuclear power plants, pipelines, tunnels, bridges, tall buildings and unique structures all over the world. This modern multichannel central recording monitoring system provides engineers with a valuable tool to fully understand and analyse the dynamics of structures in the operating environment. With a CR-5 system the dynamics affecting the structure including but not limited to acceleration, velocity, displacement, temperature, current, wind speed, wind direction, stress and pressure may be monitored and recorded. Upto 120 dynamic & > 500 static channels can be monitored at 16 bit resolution and sampling rates ranging from 20 to 1000 SPS.



**CR-5P Seismic, Earthquake and Structural Monitoring System**

CR-5P is made up of several operational modules in standard 19" rack drawers that can be brought together in several different configurations. It is so versatile that it can be used for any kind of application in any deployment topology. Creating, configuring and operating multichannel recording networks was never so easy. 16 to 24 Bit resolution options, LAN/WAN/WLAN operation possibilities, Internet datastreaming possibility, Hard Disk recording, accurate time synchronisation optionally based on GPS, SMS/GSM/Email/Hardware Alarm options are just a few of the available functionalities.

**AS-1x Seismic Switch**

The AS-12 provides a complete earthquake monitoring system including accelerometer sensor, digital threshold detection circuitry for two independent switch levels, output relays, and backup battery powered AC charger. The AS-12 is housed in a rugged, industrial rated enclosure with internal terminal block connections for AC power and seismic switch relay contacts. The AS-12 is suited for accurate monitoring of earthquake shaking with relay contact closure at two different acceleration levels for warning and/or alarm functions. Factory "Pre-set" Alarm Low/High set-points include 0.15 g / 0.30 g or may be set by the user from a 0.002g to 2.0g range using GeoDAS software provided.

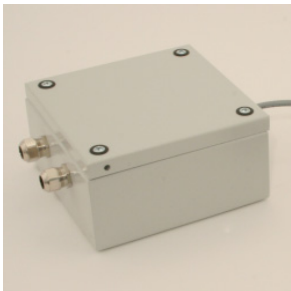


**SSW-43 Seismic Switch**

SSW-43 is an advanced technology seismic switch, including a triaxial MEMS accelerometer and a powerful 16 Bit 80 MHz industrial CPU. The MEMS accelerometer acquires the vibration signals with a 100 Hz sampling rate. The CPU filters this signal with digital low pass filter to minimize non-earthquake signal which is typically above 20 Hz.

**GST-43 Seismic Streamer**

GST-43 is an advanced technology instrument streaming the acquired seismic data, including a triaxial MEMS accelerometer and a powerful 16 Bit 80 MHz industrial CPU. The MEMS accelerometer acquires the vibration signals with a 100 Hz sampling rate. The CPU filters this signal with digital low pass filter to minimize non-earthquake signal which is typically above 20 Hz.



**Interconnection**

When interconnection is involved, more options are available in terms of connections, data flow, accessibility, and cost.

Several recorders with internal or external sensors are placed on site and are interconnected with one cable while galvanically isolated from each other. For convenient cabling external junction boxes are used. The interconnection between the stations can be carried out in ring, star, or net topology. Distances between the stations can be as much as 1 km. This is a favourable and cost effective solution for many applications.

**GXR-GPS Receiver**

The GXR-GPS is a state of the art GPS receiver module which employs GARMIN GPS-18 that is a complete GPS receiver and embedded antenna designed for a broad spectrum of system applications. The GPS-18 tracks up to twelve satellites at a time with low power consumption. Its far-reaching capability meets the sensitivity requirements of seismic applications. The GXR-GPS is housed in a water-resistant case and designed to withstand rugged operating conditions. The host system may communicate with the GXR-GPS via a dedicated, compatible, bi-directional communication channel. Internal memory backup allows the GXR-GPS to retain critical data such as satellite orbital parameters, last position, date, and time.



### GXR-GPRS Modem

The GXR-GPRS Modem is a simple, but powerful tool for wireless connection of GeoSIG instruments via the RS-232 port to the Internet, thus to any remote computer.



### GXR-GSM Modem

The TC35i Terminal is a Dual-Band device which has been specially designed for voice and fax communication and applications transmitting a low volume of data. The wireless communications unit is protected by robust industrial housing that also features a series of standard connectors and a SIM cardholder.

### TEL-WLx.xX Wireless LAN Telemetry

GeoSIG's TEL-WLx.xX Wireless LAN Communication System offers versatility and ease of use in a variety of locations and applications. TEL-WLx.xX allows combining an unlimited number of field stations to one single network, which feature easy data acquisition and maintenance. The authorized user has access to the data from every node inside the network. Every wireless module operates either in point to point or point to multipoint mode, selectable by software and by remote. In point to point mode wireless connections up to 100 km are possible. If the distance is shorter the wireless module can be set as a base station, which can connect to 8 other wireless modules.



### GS-SOLE Solar Equipment

GeoSIG assist customers in engineering solutions for providing power autonomy when line power is not available. A complete kit of equipment for implementing a solar panel and charging solution for the strong motion or seismic stations. GeoSIG engineers size the solar panes required based on the location and power consumption of the instruments being powered. The kit includes over voltage protection, charger regulation, mounting pole, battery(s) sized to the power autonomy needed and cabling.

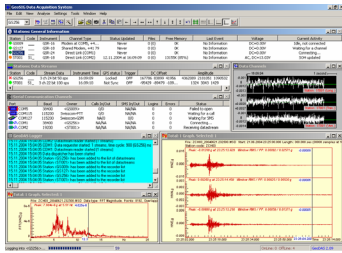
### DH-TUBE Downhole Tube for AC/VE-xxDH Sensors

Aluminum inclinometer casing (tube) is a special grooved tubing, generally installed within a drill-hole, used in conjunction with a wheeled sensor probe system to determine sub-surface ground dynamic movements. The casing is supplied in section of 3 meters and coupling element will be used to assemble the whole casing at installation time. The sensor is guided by a set of wheels mounted below it. The wheels are guided by the grooves inside the inclinometer casing all along its length. Before introduction into the casing, the sensor is orientated relative to the casing.



### GSK-166 Uniaxial Linear Shaking Table

The GSK-166 is an innovative uniaxial linear shaking table, which is based on an industrial high accuracy linear displacement driver, providing a large force driving capacity over a large displacement. Due to the strong axial magneto-guidance, even large or unbalanced loads can be tested. The ingenious design of the GSK-166 enables swapping the table from horizontal to vertical operation within minutes. GeoDAS software controls the GSK-166 via its scripting capability, which provides full control over the generated motion while the shake table driver executes the required dynamic displacement within the table displacement limits. Almost every imaginable waveform is possible, such as recorded earthquakes, sine-sweeps or synthetic signals. This allows a large variety of different applications. Field calibration of sensors or seismic qualification of stand-alone recorders can now be done in-house.

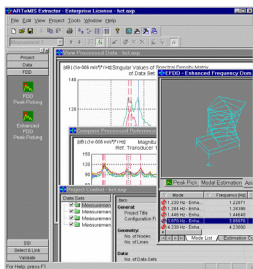
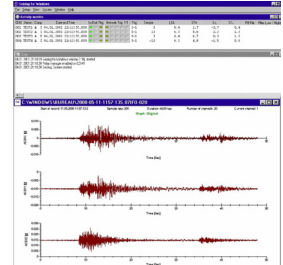


### GeoDAS GeoSIG Data Acquisition System

GeoDAS is a graphical MS Windows application running under Windows 9x/NT/2000, providing a software interface between users and GeoSIG recorders GSR/GCR/GBV/GT and a upgrade for DOS based AllView. In addition to instrument set-up and control GeoDAS provides users with powerful analysis tools for civil engineering and analysis of recorded seismic data. GeoDAS supports data exchange between recorders and PC in interactive and automatic mode, performing preliminary data analysis of every event that is downloaded from the recorder according to predefined set of conditions. After analysis of event GeoDAS can perform several actions including alerts, reconfiguration of hardware, forwarding event data for further analysis, storage, etc.

### SEISLOG, SEISAN and SEISNET

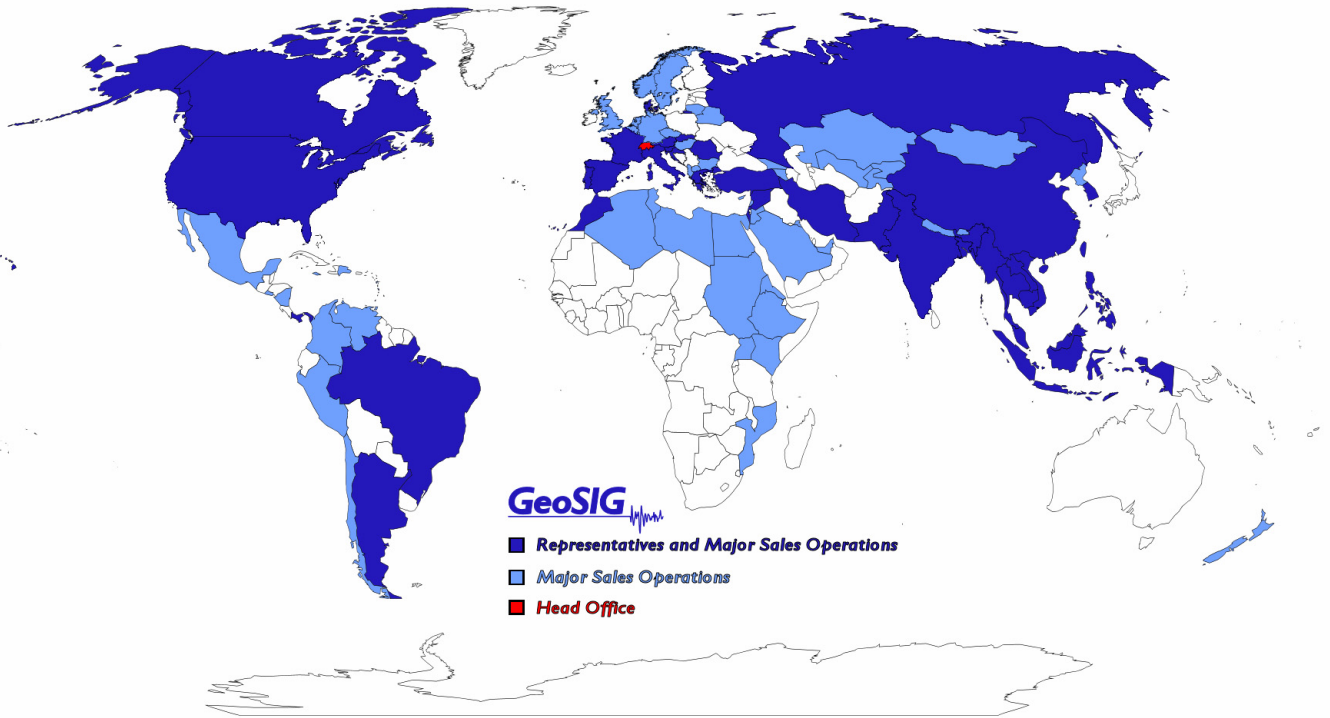
Bergen University has developed three software tools for handling and analysis of data, for which GeoSIG products have been optimised. SEISLOG is an advanced all-purpose seismic data acquisition system for recording up to 64 channels in real time with 24 Bit resolution. SEISAN, is the world's most comprehensive seismic data analysis package, and incorporates a powerful database. SEISNET is used to collect data from local or regional networks with different types of data format. Stations of the type SEISLOG and IRIS/GSN are supported. This combination gives a complete and comprehensive data analysis and handling package.



### ARTeMIS

ARTeMIS Extractor allows easy determination of the dynamic characteristics (natural frequencies, associated mode shapes and damping) of structures excited by ambient sources. Determination and/or monitoring of the dynamic characteristics, also referred to as "modal parameters" is especially important when trying to validate a structure's finite element model or when monitoring a structure's health. ARTeMIS Extractor, is developed by Structural Vibration Solutions ApS, Aalborg, Denmark, for which GeoSIG is a reseller.





GeoSIG Ltd. Worldwide Representatives and Major Sales Operations

**GeoSIG Ltd**

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