

Table of content:

1. **GeoSIG announces Jean Poirier resignation**
2. **GeoSIG introduces 24 bit Accelerograph**
3. **GeoSIG introduces CR-4 Central Recorder for monitoring Civil Engineered Structures.**
4. **Portable CR-4 shipped**
5. **CR-4 selected for monitoring one of the worlds largest bridges**
6. **Network solutions key in Dam Instrumentation**
7. **GBV installed base continues to grow**
8. **Frequently Asked Questions (FAQ) on selection of seismic recorders full scale range**

GeoSIG announces Jean Poirier Resignation



Jean Poirier

Johannes Grob

Jean Poirier announced his resignation as President of GeoSIG Ltd. to the management board effective 31 December 2000. SIG SA and GeoSys AG merged in January 1999 forming the company GeoSIG Ltd. The idea of merging the two companies was created by Jean based on his years of experience in this market and the shared belief that significant efficiencies would be realized with combined and focused effort from Switzerland.

As President of GeoSIG Ltd. Jean lead the successful merge by the implementation "Change Management" principals. Through his training and coaching the two companies became a single strong and powerful Swiss company fully committed to the geophysical market.

Now, after realizing his vision in the forming of GeoSIG and with the new organization structure operating effectively, he is looking for new challenges. Jean plans to use his marketing experience in the Swiss geotechnical market to build up a new activity. Since the static and the dynamic field monitoring and recording overlap continues to grow collaborations between Jean Poirier and GeoSIG Ltd. are foreseen.

GeoSIG thanks Jean for his creative ideas, support and leadership during the important phase. Please join us in wishing Jean and his wife Lamis the best of health and continued success on the challenging new projects.

GeoSIG introduces 24 bit Accelerograph, GSR-24



First deliveries are planned in early 2001 for GeoSIG's new 24 bit digital recorder and digitiser option.

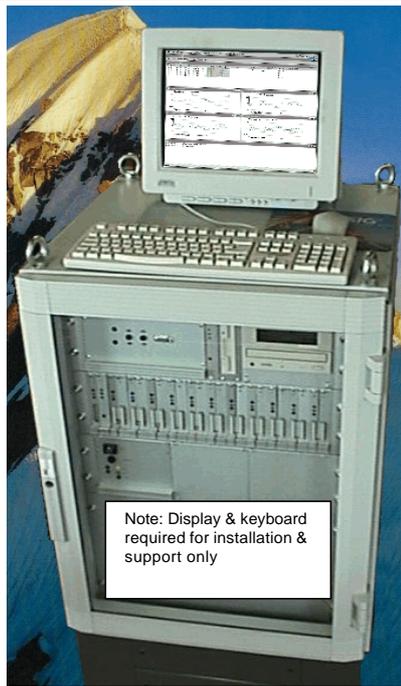
GSR-24 Features

- **Standard 8 Mbytes Data Memory 1.3 Hr (Optional up to 64 Mbytes 10 + Hr)**
- **24 Bit Digitiser, based on a proven seismic 24-Bit Sigma-Delta ADC**
- **Bandwidth to 80 % of Nyquist**
- **Highest Dynamic Range (records signals over 132 dB)**
- **GPS Time Receiver (Option)**
- **On-Line Diagnostics and Self Checking System**
- **Quick Installation with proven AllView software**
- **Sets New Standard in size and price for 24 Bit technology**

GeoSIG introduces a new PC-based central recorder Model CR-4 for monitoring Civil Engineered structures

CR-4 Features

- PC based central recording system
- Up to 120 dynamic & > 500 static channels
- 16 bit resolution, one 24 bit Delta-Sigma converter per channel, with gain selection
- 20-1000 Hz sample rate
- Alarm Relays, 1 global, 5 individual
- Power autonomy >24 hours
- Rugged industrial packaged Std.
- Galvanic isolation & surge protected
- GPS synchronized recording available
- Real-time display of dynamic channels
- Large capacity data storage options
- On-Line surveillance, diagnostics, self checking and Reporting system



Note: Display & keyboard required for installation & support only

As a member of the A.T.I. team GeoSIG has completed the installation of 20 CR-4 structural monitoring systems for the Italian Servizio Sismico Nazionale (SSN) organization. Participating on the team with GeoSIG was CND, performing equipment installation and META Consulting, performing modeling and numerical analysis.

Christoph Kuendig, GeoSIG, Managing Director reported that since introduction in 1999 GeoSIG has installed a number of permanent CR-4 Central Recording systems. The SSN installations are perhaps the most important because of the quantity of CR-4 units as well as the large numbers of accelerometers. The CR-4 Central recording system advances the state of the art in

PC based structural monitoring and allows the 20 structures located North of Roma to be monitored from SSN headquarters in Roma via modem connection.

GeoSIG Technical Director, Lukas Gätzi said: "The CR-4 system measures and records the response of the instrumented structure to natural and induced vibrations." The 20 systems consisted of the following:

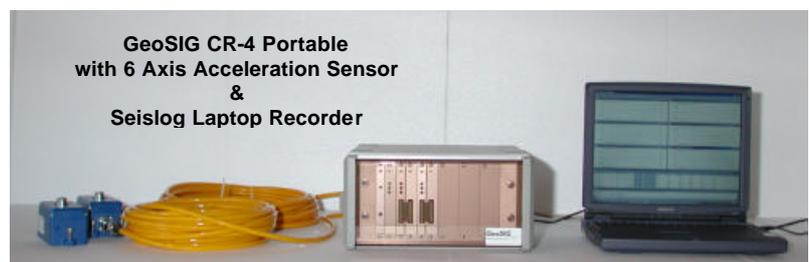
Structure Type	Structure Type Quantity	Accelerometers			LVDT
		3X	2X	1X	
Reinforced Cement Regular	8	9	23	25	1
Reinforced Cement Non-regular	5	15	38	45	2
Masonry	4	3	8	34	1
Historical	1	1	3	17	0
Bridge or Viaduct*)	2	12	10	8	0
Total	20	40	82	129	4
Total Sensor Channels		120	164	129	4

*)

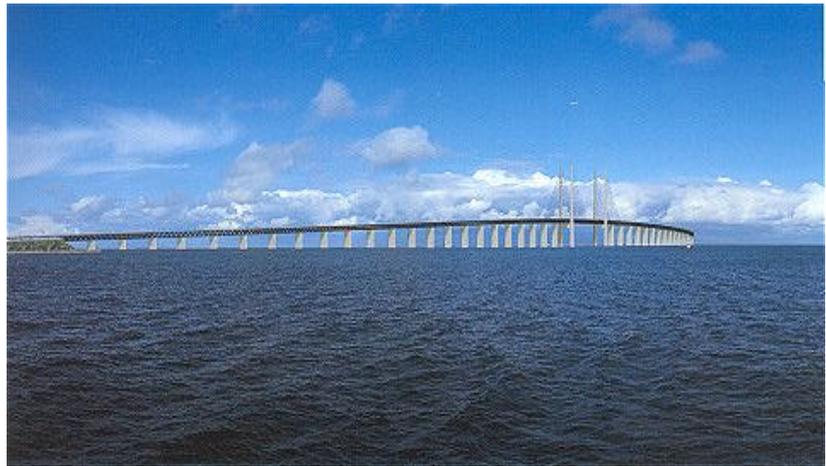
The CR-4 Central recording systems for the bridge and viaduct were installed in GeoSIG's optional waterproof enclosures to provide proper protection from the weather. The PC recording systems operate without local intervention automatically alarming central if there is an equipment fault or event recorded and performing a system check every 6 hours. The central PC system is equipped with 2 modems one for receiving information automatically transmitted by the recorders and one used to download triggered events and talk to the individual recorder from central.

Portable CR-4 shipped to CERN European Laboratory for Particle Physics

Ask your GeoSIG sales representative or contact us direct to receive a CR-4 leaflet and portable recorder technical description.



CR-4 PC based Central Recorder installed on Denmark's Oresund Bridge to monitor and record acceleration, strain weather, and temperature.



CR-4 central recording system is installed in the optional weather-proof housing



Remote Acquisition System with cover removed

Sensor Type	Sensor Qty	Channels	
		Static	Dynamic
Thermocouples	4	4	
Accelerometers (triaxial)	22	66	66
Strain gauges (4 channels)	3	12	12
Strain gauges (4 channels)	2	7	7
Meteorological (4 channels)	2	8	
Total	33	97	85

One of the largest bridges in the world was instrumented by GeoSIG in Y2K. The PC based CR-4 continuous monitoring and recording system supports dynamic monitoring accelerometers at 200 samples per second and static sensors such as thermocouples, strain gauges and a meteorological station. Because of the long cable lengths engineers specified GeoSIG's standard Remote Acquisition System with waterproof enclosure that allows the A/D converters to be located close to the sensors and the digital signals sent to the central recorder over RS-485 network cables.

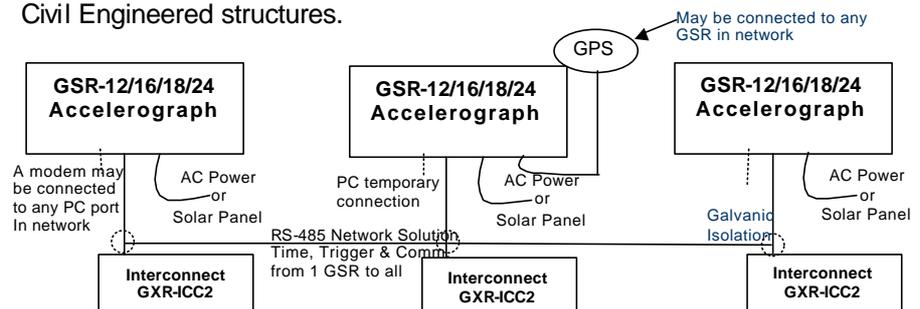
The operator may view the digitized sensor signals in near real-time on the systems laptop computer and will receive alarms if the operator set thresholds are exceeded. A permanent recording is made of all events exceeding the operator set threshold for later review, printing and analysis. The system automatically conducts a functional test every 6 hours and will alarm if a system function error is detected. A large 24-hour ring buffer allows continuous recording.

The rugged modular industrial packaging design provides flexibility in adapting the required dynamic and static sensors to meet the needs of the largest structure. PC based recording provides the flexibility of the PC with such features as large file capacity, communication tools, multi tasking, networking, 24-hour ring buffers and CD R/W capability allowing the contents of the ring buffer to be saved. These are features not typically found in micro controller based recorders.

Network solutions key to Dam Instrumentation

Contact your local GeoSIG representative or GeoSIG main office for more information on this RS-485 network solution.

GeoSIG offers a unique and powerful network solution for dams and large Civil Engineered structures.



GBV installed base continues to grow



GBV Features

- **Internal Velocity Sensor (Geophone)**
- **Standard 8 Mbytes Data Memory (Optional up to 64 Mbytes)**
- **On-line Diagnostics and Self Checking System**
- **Available also as DIGITISER only**
- **Detailed Analysis Tool with dedicated evaluation software package CloseView**
- **SEISLOG and SEISAN compatible**
- **1 or 3 Channels**
- **16 Bit / 96 dB dynamic range**

The GBV has been selected by a number of universities and institutes for seismic monitoring and recording. The principal reasons for the purchases are the price, performance and size of the GBV. In some cases the purchase is to upgrade the network of old film recorders. In other cases the purchase is for new radio linked continuous recording networks. Recent deliveries went to the following countries:

Mexico, UNAM & CICESE, 7
Albania, Seismological Institute, 7
Jamaica, University of West Indies, 6
Norway, NORSAR, 10
Venezuela, Universidad of Cumana, 5

Frequently Asked Questions

What is the best Full Scale Range?

There are two views to consider (assuming a GSR-18 recorder). The easiness to explain and understand from an operation point of view is a recorder having sensor with +/- 1 or +/- 2 g full scale range. The reason is that the sensor operation can be easily demonstrated, understood and the performance validated with a simple instrument 90° tilt test that will record and display a +/- 1 g time history record in either case.

Will I get good measurement results with a +/-1 or +/-2 g accelerometer?

Yes, with a +/- 1 or +/- 2 g full scale range all practical vibrations can be measured with good resolution as long as the largest expected signal will not exceed the +/- 1 or +/- 2 g full scale range and the smallest vibration signal you want to detect is about $1/50'000 = 0.000'020$ g, e.g. 20 micro-g.

But what if I need to detect lower vibration levels?

Certainly this is possible to select a sensor having a full-scale range smaller than one g-range. The smallest one you can select is +/- 0.1 g. Compared to a +/- 1 g full scale this instrument is 10 times more sensitive measuring vibration 10 times smaller, e.g. you have about 2 micro-g as the lowest practically measurable signal. It must be mentioned, that a +/- 0.1 g sensor is a very delicate. Leveling must be precise due to the high sensitivity.



The answers have been provided by GeoSIG Engineering Director Lukas Gätzi

I hope this brief explanation will help you make the proper sensor full-scale selection. We are available to assist you in making the proper full-scale selection if you provide some information about the work you would like to execute. Please let us know the frequency range, the maximum amplitude and the lowest signal you want to measure. As general rule a +/- 1 g sensor is with a GSR-18 never a poor choice.

We would like to take this opportunity to announce that our annual winter holiday will be from the 23th of December to the 7th of January 2001.

**GeoSIG Ltd. - Kanalstrasse 11 - 8152 Glattbrugg - Switzerland
Tel.: +41 1 810 21 50 - Fax: +41 1 810 23 50 - Email: info@geosig.ch - www.geosig.ch**