GMS

GeoSIG Measuring System
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Thank you
Introduction

GeoSIG Measuring System, GMS

- Visual Indicators
- Wireless Sync Antenna
- Connectors
- Base Plate
- Possible Lock
- Handle
- WiFi Antenna
Major Features

GeoSIG Measuring System, GMS

- Internet Enabled, Wireless Ready, Multifunctional 24 Bit Measuring System
- Latest Technology with Linux based Operating System
- On Board Processing and Evaluation Capabilities
- Timing via NTP (Network Time Protocol), GPS or 433 MHz Wi-Synch
- Enhanced Connectivity Options for GSM, GPRS, Satellite, Radio Telemetry or Landline Modem, Wired/Wireless Network
- Ring Buffer Continuous Recording
- Data Stream Output, Network Triggering
- Rugged, Water Resistant Cast Aluminum Housing
- Levelling Base Plate for easy installation and Replacement
GMS Evolution: GeoSIG Dense Networks Experience

IA-1: Pacific Div. of the Geological Survey of Canada (GSC)
GBV-316: University of Bergen, Institute of Solid Earth Physics
CR-4: Servizio Sismico Nazionale (SSN), Italy
GSS-xx: Kandilli Observatory and Earthquake Research Institute (KOERI), Turkey

Figure 1. Locations of more than 100 IA-1 Stations at British Columbia, Canada

Figure 2. Seismic Observatory of Structures with more than 1000 Acceleration Axes, Servizio Sismico Nazionale (SSN), Italy

Figure 3. Locations of 100 Earthquake Rapid Response Stations, Turkey

Figure 4. Proposed Locations of 300 Digital Strong Motion Instruments, National Strong Motion Instrumentation Network, India
GMS Evolution: GeoSIG Hardware Experience

GeoSIG IA-1
Internet Accelerograph
Linux based, Internet enabled, Time sync from internet, extended field experience of array.

GeoSIG GSR-16 / 18 / 24, GSR-05
Seismic / Strong Motion Recorder
Long term operation, experiences, Linux based with custom made platform.

GeoSIG AC-43 / 63 / 73
Mechanical or MEMS accelerometer
High performance accelerometer, optimum noise, low cost, specific housing

WiFi ENABLED

GMS
GeoSIG Measuring System GMS
Mechanical Design

Innovative Cover

Innovative Battery Compartment

Innovative Housing Shape

Innovative Baseplate

Innovative Internal Sections
Application – Communication

Data Center

Check Server: every 5 min
Upload SOH: every 15 min
Upload Events: immediately
Upload Ringbuffer: every 1 h

All intervals can be customized

WiFi

Internet

Provider

Provider

Provider

10001

10002

10003

10005

Analog landline

GPRS

GeoSIG Measuring System (GMS), 29.11.2010
What to do in case...

... Data Center is down or

... A Configuration with a wrong Server address has been sent?
If there is no connection for 24 h to the Main Server
→ Instrument checks Backup Server (Configured in Bootloader)
If there is no connection to the Backup Server too
→ Instrument checks Recovery Server (Hard coded)

No Data will be uploaded to Backup or Recovery Server
To recover of instrument/configuration only
Creation of Shakemaps

- Created with the measured data from the stations
- Improved by Epicenter Data from USGS Public Server
- Further improved by Shakemap from USGS Public Server
Innovation – Structural Health Monitoring

- Wireless Time Synchronisation and Data Communication
- No cabling between the Stations: Very fast Installation Time
- For permanent and temporary Installations
- Network Triggering
- Automatic Event Report creation
- Data Upload over LAN, WiFi, GPRS or Analog Landline
- Ring Buffer Continuous Recording

- 230 VAC
- Analog Landline
- GPRS
- LAN / WiFi
- Internet to Data Center
- Building monitored

- Wireless 433 MHz Synchronisation
  - Time Synchronisation
  - Source: NTP or GPS

(Wireless) Ethernet Link (LAN/ WLAN):
- Data Transfer to Master
- Firmware / Config Upgrades
- Network Trigger

GeoSIG Measuring System (GMS), 29.11.2010
Tests: Qualification at USGS

Rotate and Set Angle

Test Stage

Bearings

Temperature Chamber
ANSS-Recommended Low-Gain Accelerometer Noise Analysis
Digitiser GMS-18, Main Board Serial Number 121'192; Test Date 12.11.2009
(Unsmoothed; File 'RBF 123456 20091112 110438 Shortcut 50SPS 10VFS.txt')
Test Results: Noise of Internal Sensor

ANSS-Recommended Low-Gain Accelerometer Noise Analysis
Sensor Model AC-63i, GMS Serial Number 100344; Test Date 09.12.2009
(Unsmoothed; File 'RBF 100344 20091209 004729.txt')

Per-bin rms Acceleration (cm/s^2)sqrt(1/Hz)

Frequency (Hz)
Tests: Qualification at USGS

The GMS-18 successfully passed the intensive USGS Testing and up to now more than 300 instruments have been purchased by USGS.

David Oppenheimer, Chief of the northern california seismographic network, USGS:

Instruments were never tested that much before.

“The instruments were extensively tested and we didn’t accept them until they met all the performance specs.”
# Tests: EMC Test

## TEST CERTIFICATE

**Product:** GeoSIG Measuring System (GMS)

**Trade mark:** GeoSIG Ltd.

**Type:** GMS

**Manufacturer:** GeoSIG Ltd.

**Hersteller:** Europa Business Center

**Test results:** Ref. No.: EMCKP1325.1A

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A sample of this product was tested and found to be in conformity with the following harmonized standards:

*Ein Exemplar dieses Produktes wurde getestet und die Übereinstimmung mit den folgenden harmonisierten Normen festgestellt.*

- EN 61000-6-4: 2007
- IEC 61000-6-4: 2006
- EN 61000-6-2: 2005
- IEC 61000-6-2: 2005

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Zurich, 18. February 2009

EMC-TESTCENTER ZURICH AG

Max Hunziker
General Manager Technics

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Certificate No.: EMCKP1325.1A
Questions?

For further Information:
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Thank you...