xGeo
Digital Geophone

Key Features:

- Rugged aluminum enclosure with IP67 protection
- Can be used as standalone accelerograph or as a digital geophone in a daisy chain SHM system
- High quality AD conversion with 32-bit Delta Sigma resolution
- Embedded 3 channel high sensitive geophone
- User configurable sampling rate
- Ethernet/Wi-Fi/DigiMESH® or GSM communication protocols
- Internal Micro SD card for local storing of the event files
- GPS or RTC time and data synchronization
- Easy installation, wireless or using simple CAT5e cable. Included mounting plate for precise leveling
- POE capability
- Ultra low power consumption
- Wide range of Operating Temperature: -40°C ~ 85°C

Overview

xGeo is a fully digital geophone used for SHM monitoring in Sentry System. It offers an affordable and flexible solution for field/remote acquisition and structural data analysis. xGeo is designed for applications in harsh environments and small places. Size, weight, and cabling are critical design requirements in almost any installation. By taking advantage of the extreme performance and small size, xGeo is able to deliver unprecedented control and acquisition capabilities in a compact, rugged package with extreme industrial certifications and ratings for operation in harsh industrial environments. Temperature ranges of -40° to 55° C (-40° to 131° F) and a variety of international safety, electromagnetic compatibility (EMC), and environmental certifications and ratings are all available with xGeo.

xGeo can be used as standalone accelerograph or as a digital geophone in a daisy chain SHM system. Series of xGeo can be connected in a network using standard CAT5e cable for easy installation. xGeo is embedding high-sensitive tri-axial geophone. The system can be set up to run reliably for days, months, or years without stopping.

Technical Information

Software

Proprietary Digitex Software included with xGeo. Fully compatible with xPlorer hardware and server software, xGeo can work as part of xDAS SHM system. Available Digitex PC software for data acquisition, streaming, data archiving, reporting, etc.

Hardware

xGeo is digital sensor unit with embedded tri-axial high sensitive geophone.

General	
Type	24 or 32-bit ΔΣ
Sampling Rate	200 sps (100, 500,1000)
Filters	Anti-aliasing, Software
Communication	Ethernet, Wi-Fi, GSM
No. of Channels	3 or more per request

Embedded Geophone	
Natural Freq.	4.5Hz
Coil Resistance	375Ω
Moving Mass	11.5g
Scale Factor	28V/m/s
OC Damping	0.6

Power	
Powering	From CAT5e data cable
Input Voltage	12-24 VDC or PoE
Power Cons.	1-2W (w/o sensor)
Sensor Power	Supplied from digitizer

Physical	
Packaging	Rugged aluminum
Protection	IP66/IP67
Weight	700g
Dimensions	130x120x65mm

User Interface
Informational LED
System Configuration Panel
Web Application Panel

Environmental	
Operating Temp.	-40°C to 55°C
Humidity	90% non-condensing

DIGITEX INNOVATIVE SYSTEMS

US Office:
9 Wildwood Trail
Ormond Beach,
FL 32174, USA

Europe Office:
23, Prashka
1000 Skopje
Republic of Macedonia

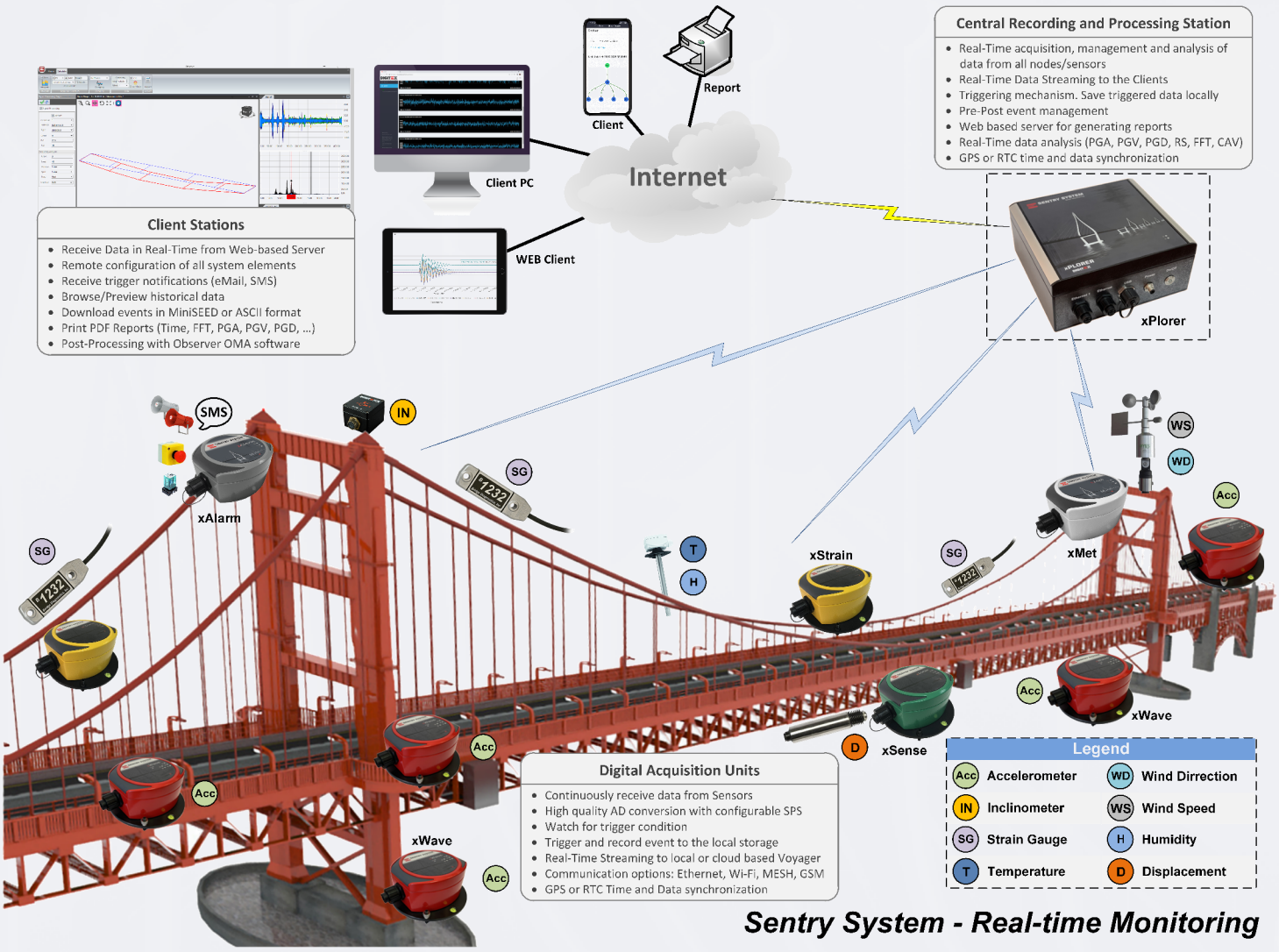
www.digitexsystems.com
+1.386.265.3122
+389.72.213.782
info@digitex.me

Real Time Monitoring System Architecture

The Digitex monitoring system is based on a highly efficient, multithreaded software design that allows the system to acquire data from a large number of xDAS units, monitor and condition this data, and distribute it, in real time, over the Internet to multiple remote locations.

Sensors on the structure continuously send out data to the system. If an event such as an earthquake occurs, pre-assigned thresholds of drift are exceeded in one or multiple locations, thus triggering the recording and analyzing of data (including pre-event memory). Once an event is recorded, the system notifies a list of users (via e-mail) and uploads the event via FTP to another site.

Using the “quick analysis” capability of the Digitex system, various measures of the monitored system’s response can be distributed to multiple locations and displayed in real time. The system can cross correlate data, plotting useful information about the interaction between the dynamic loads on the structure and its modal characteristics. It can be used for a rapid (rough) estimation of the dominant structure mode being observed in the selected time window, as well as an estimator of the corresponding structure damping parameters.



Sentry System - Real-time Monitoring

About Digitex

Digitex is a company specialized in design and development of real time structural health monitoring systems for a variety of industries and applications including: bridges, tall buildings, campuses, windmills, oil rigs and more. Digitex's innovative solution for ambient vibration measurements and quick health assessment of structures is jointly developed and validated with our partners and advisors from the Universities. When properly configured, the Digitex system is capable of measuring and responding to both natural and man-made events such as: earthquakes, wind, explosions and accidental heavy impacts.

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