SEMEX ENGCON

menhir
Add an expert to your team
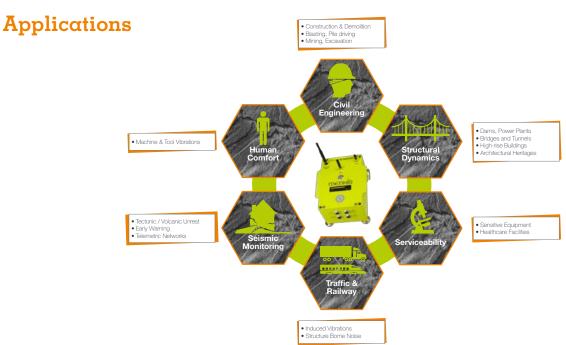
Smart Vibration Monitoring Solution

MENHIR is a high performance and versatile platform for civil engineering, structural dynamics and seismic monitoring applications requiring easy-to-use but highly reliable instrumentation solutions.

Applications

- Construction & Demolition
- Blasting, Pile driving
- Mining, Excavation

Civil Engineering

Structural Dynamics
- Dams, Power Plants
- Bridges and Tunnels
- High-rise Buildings
- Architectural Heritages

- Machine & Tool Vibrations

Human Comfort

Serviceability
- Sensitive Equipment
- Healthcare Facilities

- Tectonic / Volcanic Unrest
- Early Warning
- Telemetric Networks

Seismic Monitoring

Traffic & Railway

- Induced Vibrations
- Structure Borne Noise

Benefits

MENHIR provides outstanding measurement performance.

MENHIR has a very intuitive user interface for quick deployment, remote access and configuration.

MENHIR comes in a very compact but robust form factor for easy deployment even in harsh environments. It can be configured in modern IoT-compliant network topologies using both wired and wireless communication channels.

MENHIR is best deployed along with the SEDRIX cloud application for powerful data management, analysis and visualization. In addition, tailored expert report generation in compliance with a large and growing suite of applicable standards and regulations is available.
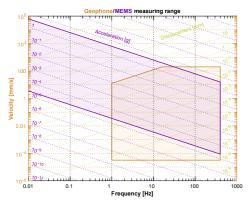
Get in touch

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Certified to
DIN EN ISO 9001:2015

ISO 9001

Technical Details

Product specifications and data are subject to change without prior notice!

Sensor Options

Technology	Geophone (Velocity)	MEMS (Acceleration)
Measuring Range (selectable)	± 200 mm/s ± 12.5 mm/s	± 4g ± 2g ± 1g
Topology	Tri-axial, orthogonally oriented	

Geophone/MEMS measuring range

Data Processing

Compliance	Data processing in compliance with **DIN-45669:2020-06** and:
	D: DIN-4150-2/3
	CH: VSS 40 312
	A: ÖN S9012/20
	F: Circulaire '86
	UK: BS EN ISO 8041/4866
	NL: SBR-A/B
	I: UNI 9614
	Other regulations upon request
Acquisition	3 independent channels with high dynamic range (140 dB RMS @ 400 sps)
Sample Rates	100, 200, 400, 500, 800, 1000, 2000 sps GPS/NTP disciplined
Event Trigger	Multiple, simultaneously applicable trigger criteria for event recording (cf. Real-Time Processing), Common network trigger and Cloud trigger
Alerting	Multi-level alerting (SMS, Email) to dedicated stakeholders Relay output (e.g. Beacon) Common network alerting Health status alerting
Real-Time Processing	Vibration data and attribute analysis: Configurable data filter, peak values, RMS, 1/3-octave band spectra, dominant frequencies, VDV, Secondary airborne noise, etc.
Data Recording & Storage	Both, triggered event and continuous vibration profile recording SDHC card 16 GB (default), others on request
Export Format	Compressed (lossless) MKA CSV SEEDLink/miniSEED

Interfaces

On/Off	Push Button with LED, LCD-Display
Sensor Bus	RS-485 (isolated)
Relay	Power Relay (normally open), 2A
GNSS	GPS optional
SIM-Card	SIM-Card slot for cellular operation

Connectivity

LAN	Ethernet 10/100Base-TX, IEEE 1588 compliant
Cellular (M2M)	4G, fallback to 3G/2G
WLAN (short range)	802.11 b/g/n Wi-Fi Transceiver Access Point and Client mode
Sub-1 GHz (long range)	863-870 MHz SD band with up to 1 km line of sight (LoS)

Communication

Secure Content Delivery Options	TLS/SSL to SmartDataCenter cloud server Transfer to proprietary FTP server Local download
Remote Access	Secured access through SmartDataCenter cloud or VPN
Local access	WLAN access to internal Web-based UI

Power

Supply Voltage	4.5…17 VDC unregulated
Protection	Reverse voltage, over/under voltage Self resettable fuse Power supply isolated from signal ground
Autonomy	> 72 h Internal Li-Ion battery with charge control
Consumption	< 1.5 W

Physical

Mounting	3 adjustable feet with bubble level
Housing	Coated aluminium
Dimensions	200 mm x 140 mm x 108 mm
Weight	4.5 kg

Environmental

Temperature Range	Operating: - 30°C to 60°C Storage: - 40°C to 75°C
Humidity	0 to 100% RH (non-condensing)
Enclosure rating	IP65 (IP67 optional)

Certification & Conformity

Electrical Safety	In compliance with DIN EN 61010-1
EMC	In compliance with DIN EN 61326-1
Conformity	CE

Attachment Options

MENHIR can be extended with further attachments, such as external sensors (surface and downhole versions) and optical/acoustical alarm beacons.

Surface Sensor

Topology	Bi-/Tri-axial	Uni-axial
Mounting	3 adjustable feet with bubble level	
Housing	Coated aluminium, IP65	
Diameter/Height	100 mm / 75 mm	89 mm / 70 mm
Weight	1.8 kg	1.0 kg
Cable Length	3 m (default)	5 m (default)

Downhole Sensor

Mounting	Tri-axial (recoverable)	Uni-axial (vertical)
Housing	Stainless steel, IP68	Aluminium, IP67
Diameter/Height	70 mm / 220 mm	45 mm / (100+95) mm
Weight	3.5 kg	0.7 kg

Submersible Sensor

Topology	Tri-axial
Mounting	3 adjustable feet with bubble level
Housing	Seawater resistant, IP68
Diameter/Height	200 mm (mounting plate) / 90 mm
Weight	5 kg

Opto-Acoustical Alarm Beacon

Connectivity	MENHIR Relay Output	Wireless 433 MHz
Power Supply	MENHIR (4.5…17 VDC)	Transmitter: MENHIR Receiver: 12..24 VDC or 85..260 VAC

Anti-Theft Lock Kit

Wall Brackets

MENHIR	
External Sensor	

Carrying Case

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Monitoring Solution

MENHIR is the flexible edge system of SEMEX-EngCon's complete vibration monitoring solution.

The cloud-based **SEDIRX** application is ideal for unconstrained and highly secured remote access to all connected **MENHIR** devices and **MENHIR** networks. Analysis and visualization of acquired data in compliance with applicable standards allow for fast conclusion of the vibration impact. Report templates provide automatic generation of tailored reports to dedicated stakeholders.

TLS

TLS

TLS

SEDRIX

https://domain.sedrix.com

Data Retrieval / Analysis / Visualization
Remote Access / Project Management
Automatic Report Generation

M2M
4G/3G/2G

Sub-1 GHz
Long range

Wi-Fi
Short Range

SMS
Email

Alarm
Beacon

Wi-Fi

On Site
Access

Certified to
DIN EN ISO 9001:2015

ISO 9001