pizzi instruments

Inclinometer Chain – AFI

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Geotechnical and Structural Monitoring Instruments and Systems

Inclinometer Chain – AFI

Description

We are pleased to present our Array Flexible Inclinometer system, a solution that stands out for its technical performance and cost-effectiveness, making it fully competitive with the most recognized systems currently available on the international market.

Developed using cutting-edge hardware and software technologies, this system enables high-precision monitoring across a wide range of applications in the geological, geotechnical, and structural fields.

It is particularly well-suited for automated, real-time monitoring of deformations in structures such as tunnels, bridges, dams, mines, landslides, and excavations.

Our inclinometer chain is designed for easy installation, as it is typically delivered pre-assembled. For relatively short installations, the chain is shipped in a fully assembled state, requiring only insertion into the guide tube on site. For longer installations, we offer a modular configuration: the chain is divided into pre-connected sections referred to as "sectors" each consisting of multiple In-Place Inclinometer (IPI) elements. These sectors can be easily connected together using waterproof connectors, forming a continuous loop. A single gateway is capable of managing up to 125 IPI elements, ensuring both scalability and simplicity in deployment.

Applications

The AFI is a highly integrated and adaptable system, designed for easy installation at any angle and in a wide range of environments. It supports both vertical and horizontal configurations, ensuring maximum flexibility in the field. Its versatility makes it ideal for monitoring geological hazards and structural behavior in dams, tunnels (including convergence), bridges, railways, and a variety of other construction projects.

Features and benefits

Exceptional Quality and Performance.

- Fully automated: Real-time monitoring, continuous operation, and high reliability.
- Equipped with MEMS sensors and a highly efficient algorithm, the inclinometer in the flexible chain delivers accurate results with a precision of 0.5 mm per 35 m.
- Angle resolution: ±1″.
- Deformation resolution: Ranges from 0.05 mm to 500 mm.

The AFI system utilizes 4G connectivity, enabling real-time transmission of deformation data every second.

- User-friendly platform: Access real-time data via a web browser.
- Customizable alarm thresholds can be set, and users will receive email notifications when thresholds are exceeded.

Measuring principle

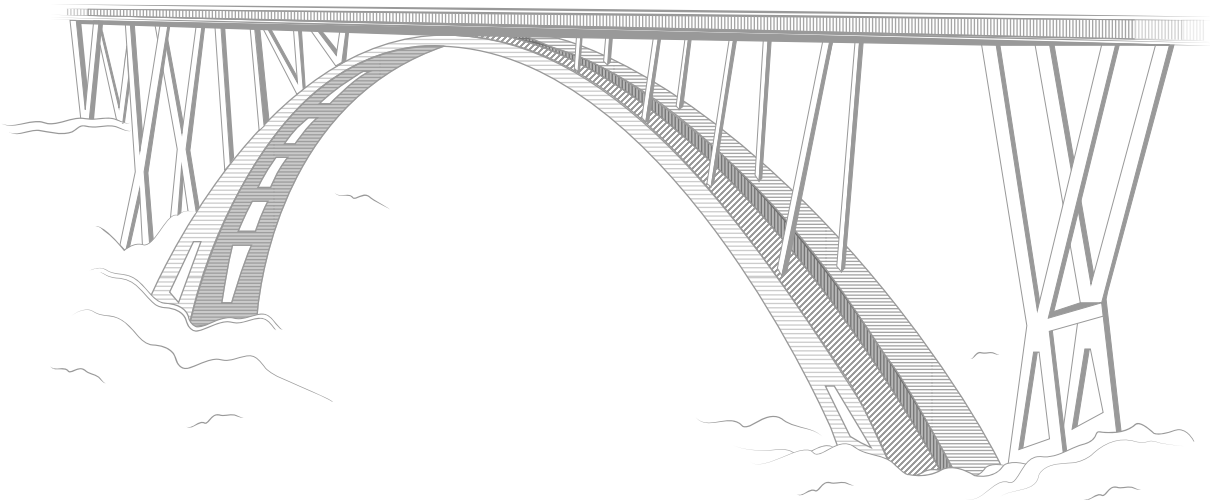
The AFI inclinometer is seamlessly controlled and managed by the integrated HS-C2000 gateway, which is responsible for collecting, converting, storing, and uploading data. This all-in-one unit combines the converter, recorder, and data transmitter into a single device. The C2000 is equipped with an integrated 4G global network module, ensuring compatibility with all major telecom providers. The calibration file is embedded within the C2000, enabling it to automatically calibrate raw data and provide accurate XYZ coordinates. This significantly enhances the efficiency of data processing. For expanded monitoring capabilities, the HS-AEM extension module allows the C2000 to import additional AFI monitoring data. Furthermore, if the customer uses their own software, the C2000 can directly send .CSV files to the customer's FTP server for seamless integration.

Technical characteristics

Sensor type	MEMS acceleration mode
Measuring direction	Three directions (x,y,z)
Measuring angle	0-360°
Angular resolution	±0,0003°(±1,08"") (±0,000005 rad)
Linear resolution	0,005mm/500mm
System stability	±0,5mm (32m)
System accuracy	±0,002° (0,0006%F.S.) (0,02mm/500mm)
Anti-torsion accuracy	±1°
Temperature measurement accuracy	±0,2°C
Temperature recording	In real time for each segment
Acquisition frequency	1sec
Power consumption	DC12V 3,2mA for each segment
Mechanical tension	Up to 550Kg
Holding	200m water column
Working temperature	-40°C +60°C (Humidity 95%)
Diameter	18mm main body; 25mm diameter max.
Magnetic interference	Absent
Electrical interference	Absent
Deformation value	Real time
Element length	0,3m/0,5m/1m/ for each segment
Total length	According to request
Maximum bending angle	180°
Weight	0,6kg/m (AFI in carbon fibre) 1kg (ADMV, in acciaio inox)
Signal transmission cable	10m standard (can be varied upon request)
Cable length without sensor	27cm

The Company

For over 40 years, we have been producing precision instruments and monitoring of large structures sold worldwide.
Accuracy in design, efficiency in implementation, reliability in operation; these are the prerogatives that every large structure must have and that Structural Monitoring Systems must guarantee.



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