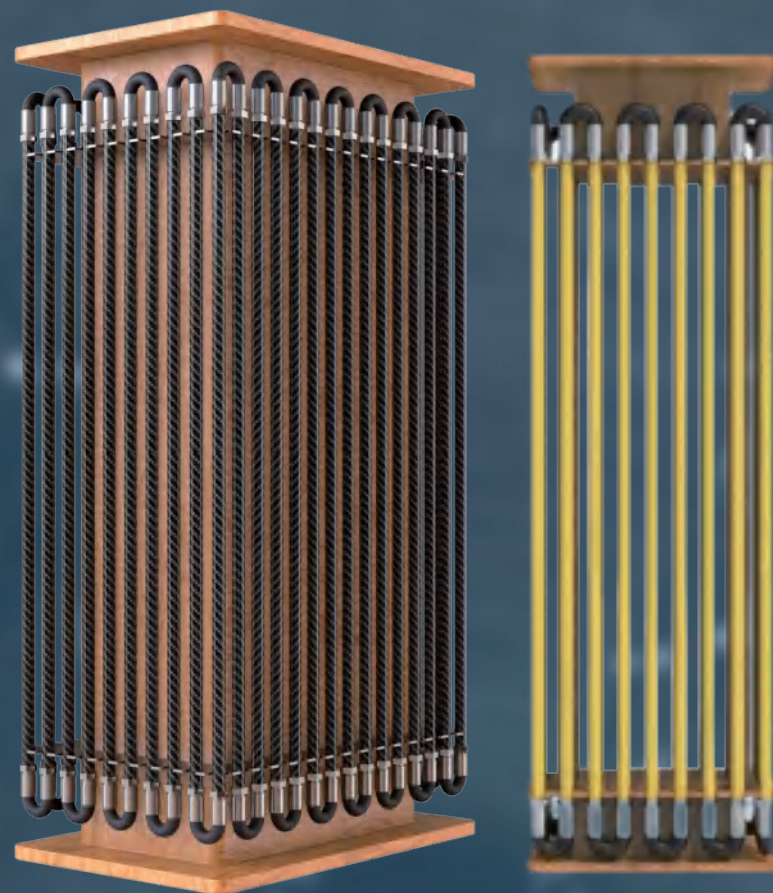


HUASI ARRAY FLEXIBLE INCLINOMETER-AFIC



Model: AFIC-500, AFIC-1000
AFIL-500, AFIL-1000

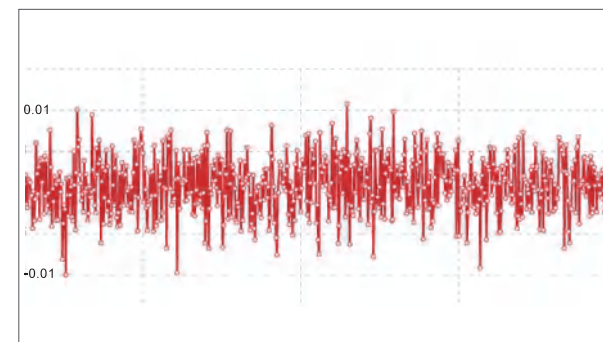
AFIC/AFIL array flexible inclinometer is an automatic monitoring system released by HUASI. It consists of sensor chain, data logger and cloud software. The sensor chain can be installed in vertical, horizontal and circular, which means that the chain can monitor hole horizontal displacement, bridge settlement and tunnel convergence.

With Linux operation system inside, C2000 logger can calibrate the raw data and output final results directly. Users needn't install any calibration software. Integrated with 4G module, C2000 supports 4G SIM cards of all suppliers in the world. C2000 supports TCP, FTP, SFTP transmission protocols and can work with any third-part software.

PRODUCT FEATURES OF AFIC

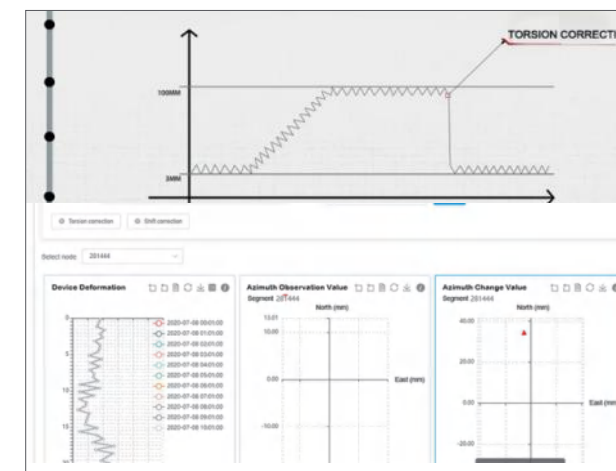
Temperature Compensation, Stable Data

The AFIC adopts MEMS micro-electro mechanical system which perfectly eliminates the inter-axis system errors by high integration. It adopts temperature compensation mode to eliminate temperature drift during $-40^{\circ} \sim 60^{\circ}$, ensuring the stability of data collected by AFIC. The data fluctuates only 0.01mm in experimental environment.



Torsion Algorithm, Deviation Correction

AFIC adopts professional torsion correction mode, which can correct the deformation value led by torsion, ensuring accuracy and stability of measuring data.



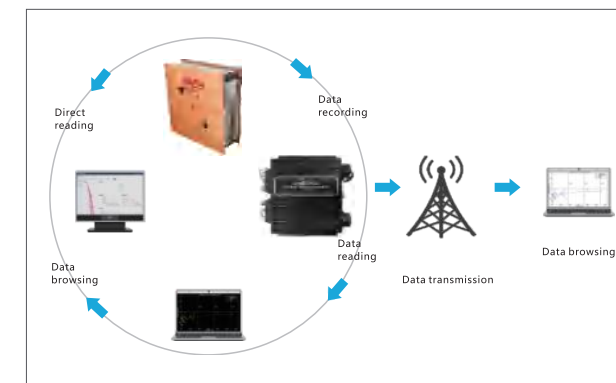
Sectional Assembly, Easy Installation

AFIC adopts innovative sectional assembly design that makes users can freely assemble and install AFIC according to the depth of boreholes. The flexible AFIC can be rapidly deployed in vertical, horizontal and convergence monitoring applications.



Automatic Data Transmission, Real-time Analysis

AFIC adopts 4G network to collect and transmit data. Once installed and powered on, the data can be automatically transmitted to the cloud platform. The frequency of data collection and transmission is up to 1 time/second. Users can check the data in the cloud platform in real time.



PRODUCT DRAWING OF AFIC

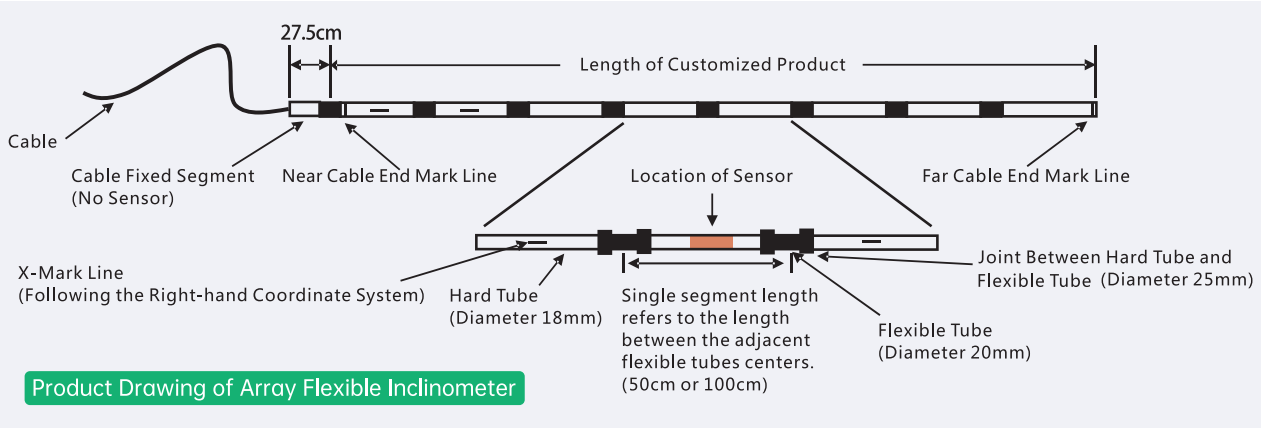
The standard single segment length of AFIC has 2 specifications: 0.5m/segment and 1m/segment.

The hard tube part of each segment is processed by high-strength carbon fiber material and the joints are connected by high-strength flexible tube, whose tensile strength is up to 550KGF. The first segment of AFIC is equipped with a cable fixed segment which is not equipped with any sensor. Both the near-cable end and far-cable end have mark lines.

There is X-axis mark line in every hard tube of AFIC segment to indicate the X-axis direction.



- Length of cable fixed segment(without sensors) 27.5cm
- Length of AFIC with sensors length between near-cable end mark line and far-cable end mark line
- Total length of AFIC length of cable fixed segment(without sensor) + length of AFIC with sensors
- Near-cable end the segment connecting to the cable.
- Far-cable end the segment far away from the cable.
- Length of single segment the length between the adjacent flexible tube centers.
- Diameter of hard tube 18mm
- Diameter of flexible tube 20mm
- Maximum diameter of joint 25mm



SPECIFICATIONS

	AFIC	AFIL
Operation Mode	MEMS acceleration	
Installation	Vertical, horizontal, Curve	Vertical
Angle Resolution	$\pm 0.00067^{\circ}(\pm 2.412'')$	$\pm 0.0023^{\circ}(\pm 8.28'')$
Displacement Resolution	0.005mm/0.5m, 0.01mm/m	0.02mm/0.5m, 0.04mm/m
Deformation accuracy	0.005mm/0.5m for best accuracy (65% confidence) 0.036mm/0.5m for stable accuracy (99.8% confidence) 0.01mm/m for best accuracy (65% confidence) 0.07mm/m for stable accuracy (99.8% confidence)	0.02mm/0.5m for best accyracy (65% confidence) 0.2mm/0.5m for stable accyracy (99.8% confidence) 0.04mm/m for best accuracy (65% confidence) 0.4mm/m for stable accuracy (99.8% confidence)
System accuracy	$\pm 0.5\text{mm}(32\text{m})$	$\pm 2\text{mm}(32\text{m})$
24h stability	$\pm 0.002^{\circ}$ (0.0006%F.S.) (0.017mm/0.5m, 0.035mm/m)	$\pm 0.012^{\circ}$ (0.003%F.S.) (0.1mm/0.5m, 0.2mm/m)
Temperature accuracy	$\pm 0.2^{\circ}\text{C}$	$\pm 1.8^{\circ}\text{C}$
Interval for data collection	Maximum 1 second	Maximum 1 minutes
Material	Carbon Fiber	Resin material
Power soumption	DC 12V, 3.2mA for each node	
Maximum tensile	550KGF	
Water proof	under water 200meters (2MPa)	
Operation temperature	-40°C to $+60^{\circ}\text{C}$	
Diameter	25mm without node connector, 29mm with node connector	
Magnetic Interference	No interference	
Electric Interference	No interference	
Node Length	500mm and 1000mm (other length need customized producing)	
Maximum ange of joint band	180°	
Weight	0.6kg/m	
comunication cable	5meter in standard	
Segement Length	1m,2m,5m,10m,20m in standard (other length need customized producing)	

Angle resolution: The minimum angle output by a MEMS sensor does not represent its stable accuracy.
Displacement Resolution: Calculated from Angle resolution, Different segment lengths result in different values.
Displacement Accuracy: The stable accuracy is the real precision in project
24h stability: Put segment in lab for 24 hour collection, Data fluctuation range
System accuracy: For a 32m length system, the accumulate accuracy we get

INTEGRATED DATA COLLECTOR HS-C2000

AFIC adopts the integrated data collector HS-C2000 to collect, convert, storage and upload data. It integrated into data converter, data recorder and data transmitter. C2000 has built-in global 4G network module which supports all the phone network providers. The calibration file is integrated in C2000, so C2000 will calibrate the raw data and send back XYZ coordinates, which helps to greatly improve efficiency of data processing. With the specific extension module HS-AEM, C2000 can import multiple AFIC's monitoring data. If clients use their own software, C2000 can directly send .CSV file to clients' FTP.

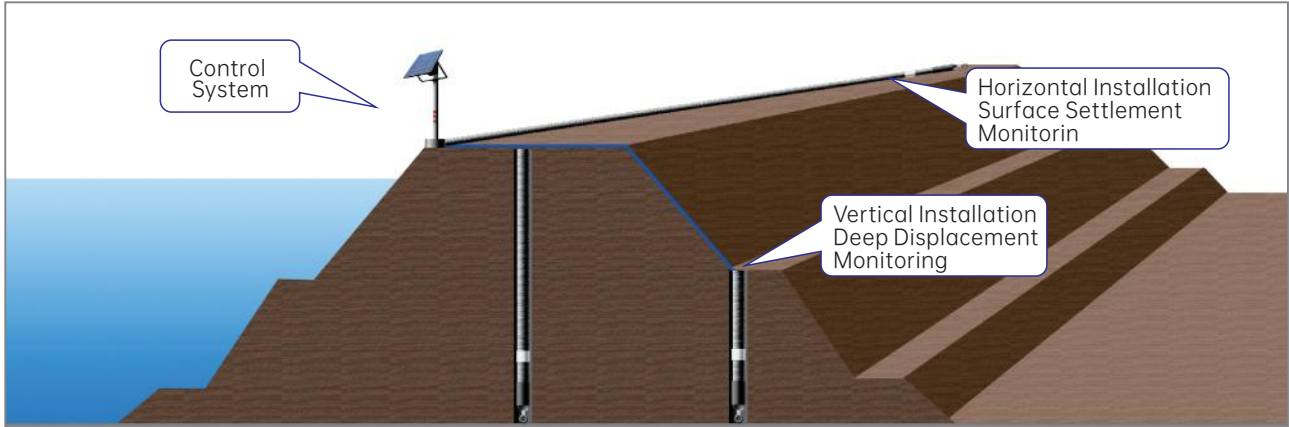


SPECIFICATIONS

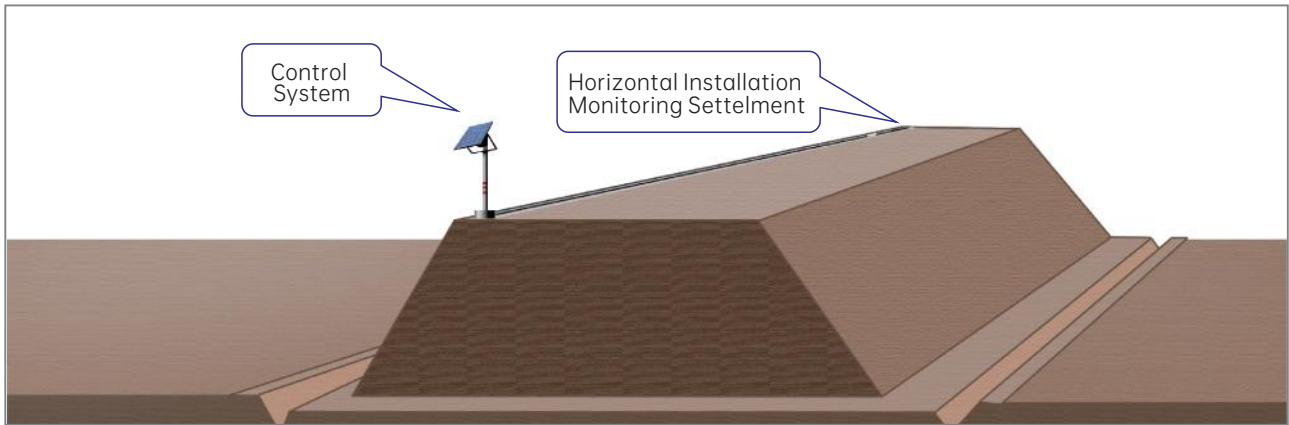
Technical Parameter	HS-C2000
Power Consumption	DC12V 180mA(Dormant state DC12V 1mA)
RAM	16GB
System	Linux
Network	4G netcom(compatible with 3G,2G)
Power Supply	DC9-36V
Port	4G, 2-pin for Power, 5-pin for Device, 9-pin for RS232, RS485 AND Ethenet, Type C for USB, SIM card slot
Daily Timing Error	≤0.5s/day(Cloud platform corrects time every morning)
Status Display	LED
Operating Humidity	≤95%(@40℃)
Operating Temperature	-40℃~85℃

APPLICATION SCENARIOS

Monitoring



Subgrade Settlement Monitoring



Tunnel Convergence and Settlement Monitoring

