

Inform@Risk Measurement Node

Versatile Wireless Geotechnical Measurement Node

- Cost-effective, easy to use autonomous measurement nodes for geotechnical monitoring
- Connected by LoRa® wireless network - range up to 15 km, low energy consumption
- Set of basic sensors onboard, including inclination sensor, magnetometer, thermometer and barometer
- High precision 24 bit AD-converter for use with external sensors

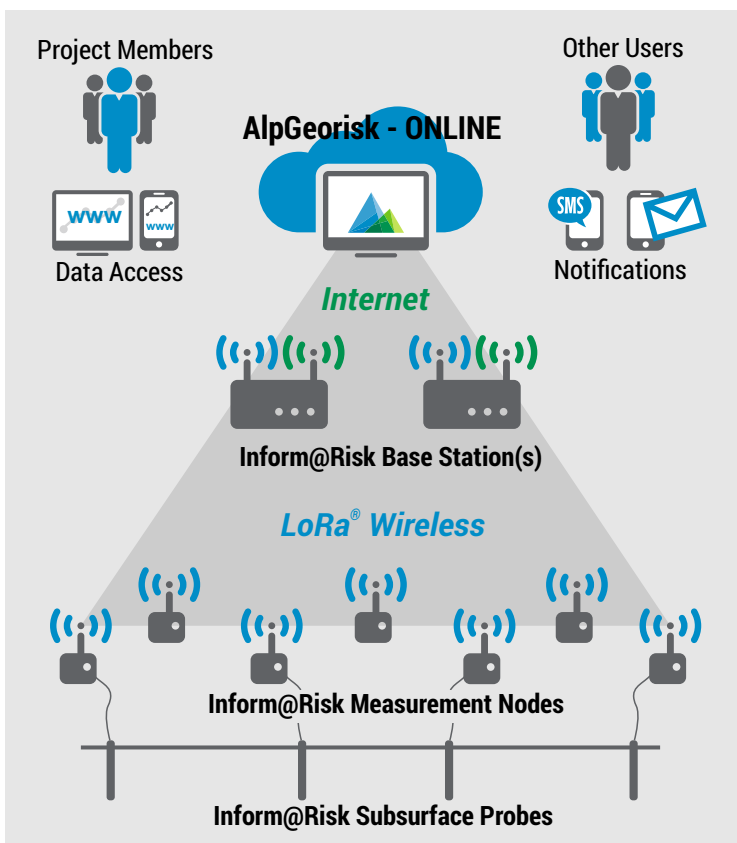


Inform@Risk Measurement Node

Geotechnical measurements e.g. for construction, mining or monitoring of natural hazards are often quite expensive - especially if a high spatial and temporal density of observations is required. The Inform@Risk Monitoring System, which is based on IoT (Internet of Things) technologies and modern manufacturing methods, as eg. 3D printing, provides a versatile cost efficient infrastructure for geotechnical measurements. The System consists of at least one internet connected Inform@Risk Base Station on site, one or multiple Inform@Risk Measurement Nodes and optional Inform@Risk Subsurface Probes, which can be connected to the measurement nodes.

The Inform@Risk Measurement Node is a small, low energy measurement unit which performs measurements and relays the acquired data to the Inform@Risk Base Station using the LoRa® wireless transmission technology, which allows to transmit data over very long distances (up to 15 km). The node has several commonly used sensors as e.g. an inclination sensor, magnetometer, thermometer and barometer onboard and provides several analog and digital interfaces to add more external sensors. This includes the Inform@Risk Subsurface Probes, which are geotechnical sensors specifically designed for low cost borehole installations (see data sheet „Inform@Risk Subsurface Probe“). As the Inform@Risk Measurement Node includes a 24 bit analog to digital converter, most analog sensors typically used in geotechnical applications can be integrated. This includes eg. linear transducers, tilt meters, earth pressure cells, load cells and piezometers. Either conventional AA batteries or a solar panel can be used as power source. In any case the node allows continuous operation for multiple years in most typical use scenarios.

Any data acquired is transmitted to the Inform@Risk Base Stations in range and relayed to the AlpGeorisk-ONLINE data management and visualisation solution (see datasheet „AlpGeorisk-ONLINE“).



Inform@Risk Monitoring System

Technical Details	
Dimensions (without antenna)	130x94x81 mm
Weight	420 g
Enclosure IP class	IP66
Operating voltage	3.3 V (Microprocessor)
Power supply	3.3 – 18 V
Operating temp. range	-25°C to 40°C
LoRa frequency bands	868-915 MHz
Data transmission interval	1 min – 1 day
Analog Inputs	4 (24 bit), 2 (12 bit)
Digital Input/Outputs	Serial, I2C
Temperature measurement range	-40 – 85°C
Temperature measurement	±1°C
Barometer measurement range	300 - 1100 hPa
Barometer measurement accuracy	±1.0 hPa
max. IMU measurement range*	±250°/SEC; ±2g;
max. IMU measurement accuracy*	
HQ inclination sensor (optional)	
Inclination measurement range*	
Inclination measurement accuracy*	

*Range and accuracy can be adapted to the needs of the application.

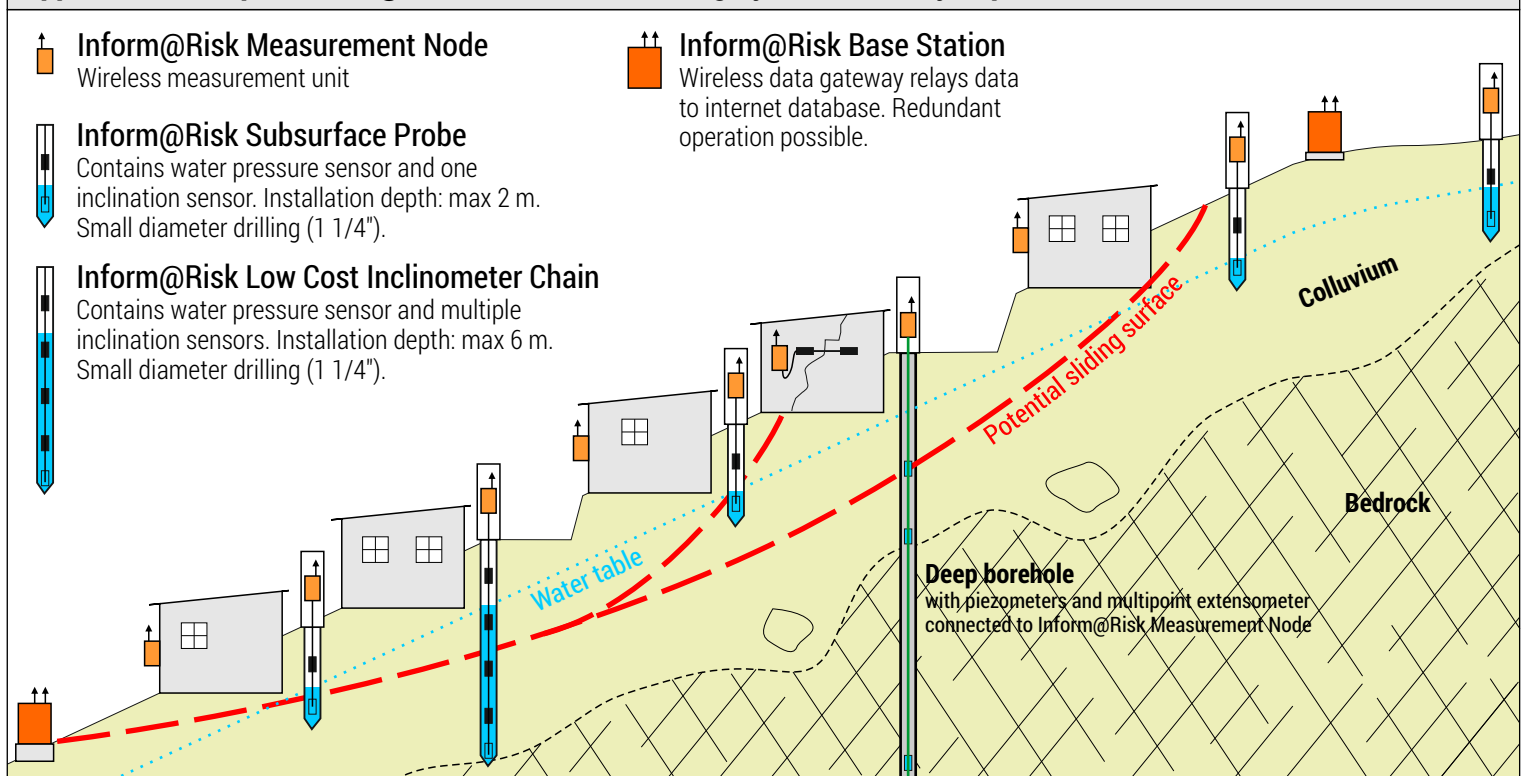
The Inform@Risk Measurement Node is based on the Arduino microprocessor board MKR 1310 and the Inform@Risk Sensor PCB. The Sensor PCB and the related programming have been developed as open source. For more details please visit:

www.informrisk.alpgeorisk.com



Inform@Risk Measurement Node

Application Example: Inform@Risk Landslide Monitoring System in Densely Populated Area



Inform (@) Risk
hacia un territorio más seguro

The Inform@Risk Monitoring System has been developed in the Inform@Risk research project, which was funded by the German Federal Ministry of Education and Research.

www.bmbf-client.de/projekte/informrisk

 Federal Ministry of Education and Research

 **AlpGeorisk**

AlpGeorisk

Natural Hazard Management • Geotechnical Measuring Systems • Measurement Data Management

Einsteinstraße 10, D-85716 Unterschleißheim

Tel: +49 (0) 163-2513112 • Website: www.alpgeorisk.de • Email: mail@alpgeorisk.de