

Gateway- GHA

The GHA Gateway is a key component GHA network. Support a continuous data flow for your geotechnical and structural monitoring instrumentation when you need to:

- Cover vast distances.
- Transmit signals through physical barriers.
- Minimize maintenance operations and site visits.
- All this, while allowing massive scale at low deployment and maintenance costs.

The GHA Gateway is an outdoor gateway equipped with an internal antenna and a 4G worldwide module. It can deploy reliable networks, connect high volumes of end-devices and manage millions of bidirectional messages every day.

Leverage the capabilities GHA Gateway in projects where you need to deploy a single-gateway network architecture. Access the data server embedded in the gateway

FEATURES

Supported unlicensed bands: 863-874.4MHz, 902-928MHz, 915-928MHz
Carrier grade casing (IP67) for industrial use.
Antenna for GPS (peak gain=2.6dBi).
Powered by PoE (Injector, switch), both Mode A and Mode B (802.3af specifications). ±48VDC through RJ45 (isolated power). USB Type C
External waterproof connectors (RJ45, USB Type C) eliminating the need to open the casing during installation.
Easy-to-install mounting kit.
USB Type C connector for direct PC connection using USB cable.
Compatible with all GHA Devices.

ADVANTAGES

Suitable for single-gateway projects using Geohazard Advisors Monitoring portal
Cover vast distances. Up to 15 km range in open sight.
High scalability. One gateway can connect and manage hundreds of devices.
Customer support from experts in IoT remote monitoring.
Pioneering company in IoT, more than 25 years experience in geotechnical, structural and geospatial monitoring in the mining, hazard industry.

APPLICATIONS

Civil infrastructure monitoring
Surface and underground mining and tailings dams
Construction works and structural health of surrounding buildings monitoring
Railtrack monitoring, structural health of tunnels and bridges, and georisks monitoring



Technical Specifications

RADIO AND NETWORK

Radio Band	ISM Sub GHz
Sensitivity	Down to -137 dBm (SF11)
Antenna'	Integrated internal antennas GPS, 4G, LoRa (peak gain=2,6dBi)

SUPPORTED UNLICENSED RADIO BANDS

ISM frequencies	Region	Rx	Tx
863-874.4 MHz	EMEA, India	863- 873MHz	863-873MHz
902-928 MHz	North America	902-915MHz	922-928MHz
915-928MHz	APAC, Latin	915-928 MHz	915-928MHz

NETWORK INTERFACES

Ethernet	10/100 Ethernet WAN (RJ45 PoE).
WWAN	Integrated 4G

WWAN

Technologies	Band	Data rate
LTE	Band 1 (2100)	LTE FDD: - Max 150Mbps (DL) - Max 50Mbps (UL)
	Band 2 (1900 PCS)	
	Band 3 (1800+)	
	Band 4 (1700/2100 AWS-1)	
	Band 5 (850)	LTE TDD: - Max 130Mbps (DL) - Max 35Mbps (UL)
	Band 7 (2600)	
	Band 8 (900)	
	Band 12 (700 ac)	
	Band 13 (700 e)	
	Band 18 (800 lower)	
	Band 19 (800 upper)	
	Band 20 (800 DO)	
	Band 25 (1900+)	
Band 26 (850+)		
Band 28 (700 APT)		
Band 38 (TO 2600)		
Band 39 (TO 1900+)		
Band 40 (TO 2300)		
Band 41 (TO 2600+)		
WCDMA	Band 1 (2100)	HSDPA: Max 42Mbps (DL)
	Band 2 (1900 PCS)	

DEVICE INTERFACES MECHANICAL SPECIFICATIONS

Leds	GREEN - power RED - system status
Connector	USB Type E Port
SIM Card	Mini-SIM card slot
Buttons	Multifunction button for On/Off/Reset

MECHANICAL SPECIFICATIONS

Weight	265 x 165 x 100 mm
Size	1.4 kg
Weather protection	IP67
Operating range	-40° to 60°C

SOFTWARE AND FIRMWARE

Firmware	Geohazard Advisors Monitoring portal
Data and network management	Geohazard Advisors Monitoring portal
Configuration/firmware updates	Through web user interface remotely or via local access

NETWORK MONITORING

Local Access	Data collection about network performance for troubleshooting
CWs Level	Real-time availability status (on/off) Uptime Power input Health parameters

POWER REQUIREMENTS NETWORK MONITORING

Power source	PoE' both mode A and mode B (802.3af specifications) 5V through
Mean power consumption'	4.5W'



GHA Pnode

GHA Pnode is a 3-channel wireless logger. It counts with a configurable channel that admits most inputs from analog sensors, a thermistor channel and a pulse counter channel. Its compact design makes it the most cost-effective way to capture data from any environment. You can now easily connect any voltage, current, resistive, transducer such as load cells, strain gauges, pressure cells, pressure sensors, thermometers, flow sensors to your monitoring systems.

The Pnode logger is capable of transmitting data via long-range radio to a GHA gateway connected to the Internet up to 10 km/ 6.2mi away. One gateway can also support dozens of loggers in the same network, depending on the reporting period, through a star or tree network topology.

In terms of energy consumption, GHA loggers are autonomous battery-powered devices with C-size batteries that can last up to 17 years with minimal to zero maintenance required. The analog data logger is IP68 certified and tested from -40C to +80C.

FEATURES

1 configurable analog channel + 1 thermistor + 1 pulse counter
Input types for configurable channel: Full Weathstone bridge Ratiometric and potentiometers Single-ended voltage
Robust, small and IP68 grade weather-proof box.
Long battery life (>17 years @1h sampling rate).
Internal temperature collected and transmitted (accuracy: 2 °C).
Process measurements: pressure, temperature, displacement, weighing.

ADVANTAGES

Allows you to wirelessly connect to a wide catalog of industrial and geotechnical sensors with analog interface. Suitable for unattended, large scale projects
Cost-effective solution for wireless data collection.
Very low maintenance equipment due to its robustness and low power consumption
Pioneering company in IoT, more than 25 years experience in geotechnical, structural and geospatial monitoring in the mining, hazard industry.

APPLICATIONS

Ground anchors surveillance.
Measurement of axial forces in struts.
Load measurement in bearings and piles
Crackmeters, single point extensometers and utility monitoring points.
Displacement in deck, joints, heavy-lifting, underpinning.
Pressure: level sensors, Jacking.
Water monitoring: water meter, rain gauges.



Technical Specifications

GENERAL

Channels	3 channels
Input type	Channel 1: Configurable Channel 2: Thermistor Channel 3: Pulse Counter
Reporting Period	Selectable from: 30 s, 2, 5, 10, 15, 30 min, 2, 4, 6, 12, 24 h
Time synchronization discipline by radio	Better than ± 30 seconds
Battery type	2 x 3.6V C-Size user-replaceable, high energy density batteries
Interfaces	Internal mini USB
Power Output	5 V DC (up to 50 mA)
Warmuptime	Configurable (60 s MAX)

CHANNEL 1: CONFIGURABLE

Input type	Selectable from full Wheatstone bridge, potentiometer or single-ended voltage
Voltage Excitation	0-5 VDC up to 50 mA.
FULL WHEATSTONE BRIDGE	
Measuring range	± 7.8 mV/V
Accuracy	0.13 % FS far -40° to 80° C 0.14% FS far -10° to 50° C
RATIOMETRIC AND POTENTIOMETER SIGNALS	
Input range	0-5 VDC (0-1 V/V)
Accuracy	0.1 % FS
SINGLE_ENDED VOLTAGE	
Input range	0-5 VDC
Accuracy	0.6 % FS

CHANNEL 2: THERMISTOR

Input type	Thermistor
Measuring range	0 to 2 M Ω
Accuracy	0.04 $^{\circ}$ C (0.03 % FS) for 3K Ω at 25 $^{\circ}$ C 0.9 $^{\circ}$ C (0.7 % FS) for 50K Ω at 25 $^{\circ}$ C

CHANNEL 3: PULSE COUNTER

Input type	Potential free (dry contact) and open collector pulses
Pulse Count	0 to 4 294 967 295 pulses
Pulse Rate	0 to 50 Hz
Accuracy	± 1 Pulse

MECHANICAL

Box dimensions (WxLxH)	113x80x60 mm
Overall dimensions	0 to 4 294 967 295 pulses
Weight (excluding batteries)	240g
Box material	Polycarbonate
Weather protection	IP68





GHA rain-gauge

This rain gauge provides a catchment area of 200cm² and a tip measurement of 0.1 mm as specification. The sensor is manufactured predominantly from moulded thermoplastic components for long and reliable operation.

The sensor can either be mounted on a pole or on a flat surface and offers a built-in bullseye level and levelling screws for precise adjustment in the field.

Meets precision requirement of 0.1mm/tip

Benefits and Features

Catchment area of 200 cm² and measurement resolution of 0.1 mm meet the recommendations

Magnetic reed switch (N.O.), rating 24VAC/DC 500mA

Accuracy - 2% up to 25 mm/hr 3% up to 50 mm/hr

Technical Description

The design uses a proven tipping bucket mechanism for simple and effective rainfall measurement. The bucket geometry and material are specially selected for maximum water release, thereby reducing contamination and errors. Catchment area of 200 cm² and measurement resolution of 0.1 mm meet the recommendations. Levelling screws and bullseye level are built in for easy and precise adjustment in the field. Measured precipitation is discharged

through a collection tube for verification of total rainfall. This unheated version, is ideal for use in moderate climates and a heated is also available for operation in cold temperatures. To discourage birds from perching on the funnel rim, accessory bird wire assembly may be attached to the gauge. Supplied with 6m cable, additional cable available if required.

