— DATASHEET —

GATEWAY FOR WIRELESS NODES AND SENSORS

MODEL EWG-01

OVERVIEW

Encardio-rite model EWG-01 gateway is used as a main networking hardware, which uploads all the gathered sensor data to the Encardio-rite cloud server or a third party server. The gateway enabled wireless mesh network used as a whole system, has an advantage of reliable data transfer over long distances, without any delay.

With the real-time data collected from wireless sensors connected to the nodes and gateway, the authorities can know about the slightest of change taking place in the project. This allows one to take timely decisions, increase safety, reduce project delays and be more cost effective.

FEATURES

- Provides reliable and high resolution readings with long term stability
- Innovative wireless mesh-based data collection protocol that provides seamless connectivity in large sites and tunnels
- Easy to install and monitor hard to access sites and tunnels remotely
- Unlimited battery life when powered by direct power supply.
- Wireless data transfer over long distances
- Able to store readings internally when internet connectivity is not available

APPLICATION

- Critical applications where real time monitoring and early warning is required in order to protect life and valuable assets.
- Large civil engineering projects
- Dams, barrage, mines, tunneling, structural, landslide, bridge monitoring
- Deformation of embankment, retaining wall monitoring

DESCRIPTION

A gateway is a network node used for communication which connects different nodes with different transmission protocols altogether. Gateways serve as an exit point for a mesh network, as all the sensor readings must pass through or communicate with the gateway prior to being routed on cloud server.

WIRELESS MESH NETWORK

The geotechnical sensors are interfaced with the long range, low power wireless mesh network that allows the sensors to send recorded data to the Gateway with over 99% reliability. The Gateway then uploads all the collected sensor data to the central/cloud server.

The innovative wireless mesh-based data collection network provides seamless connectivity in large sites and tunnels. The system is low-power and consists of long-range wireless radios that provide a range of up to 15 km in each hop of the mesh network.

A cloud-hosted data management and configuration software is used to manage the network. The configuration is done with an easy to use smartphone application that comes free with the system.

The application provides step-by-step instructions and displays whether the radio signals or battery strength is good enough.

The database management system allows analysis and visualization of the sensor data collected from project site/installation locations.

GATEWAY

Reaches directly

Reaches via other nodes / relay nodes

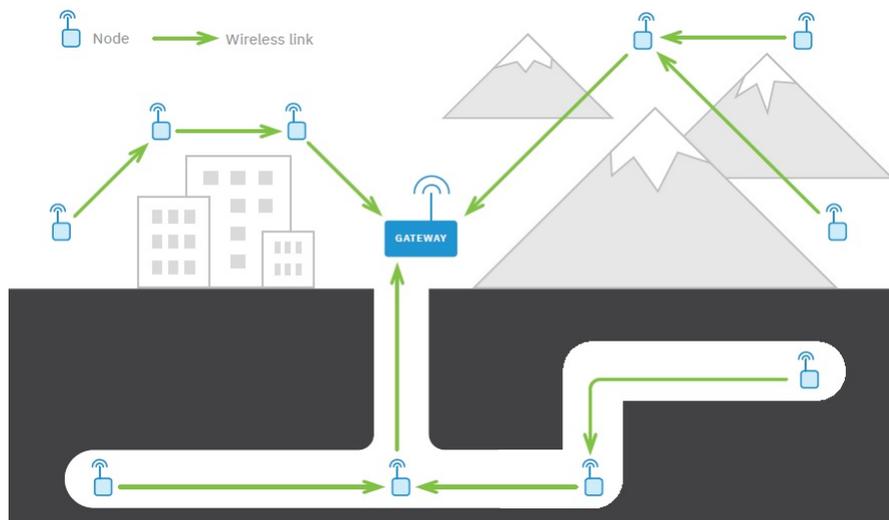NODES   NODES
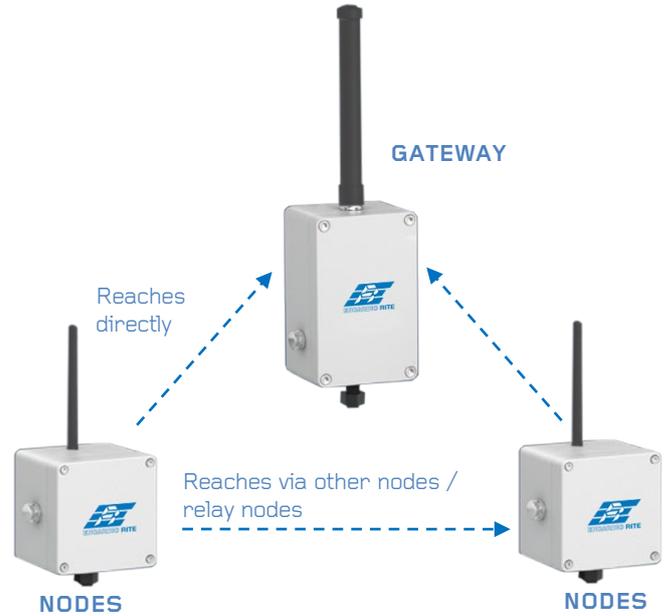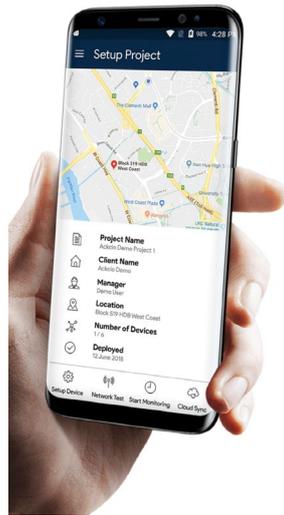
The data is accessible 24 x 7 to all the related authorities. The system can generate automatic reports and provide automated alerts over SMS or email for any reading crossing the pre-defined alert levels.

When different sensors are used at a site, our mesh network ensures that data from all the tilt meters are transferred without any delay. The beauty of mesh network is that even if a tilt meter cannot reach the gateway directly, it can still send its data to the gateway via other nodes in the network. The mesh network allows all sensors to talk to each other, thus allowing them to relay other sensor data to the gateway.

The system automatically mitigates well-known wireless problems like signal blockages and interference, allowing the sensors to reliably send their data to the gateway every time.

Every single radio transmission in the system is secured using AES-128 encryption to maximize security of the sensor data gathered by the system.

Node   Wireless link

GATEWAY

SPECIFICATIONS

Nodes per Gateway	Up to 150
Storage	Industrial grade micro SD Card with 16-32 GB

Interfaces

USB Device Port	USB 2.0 full speed (Micro B connector) 5V
Network interfaces	Integrated 3G Modem & Antenna (HSDPA, EDGE, GPRS) quad band Ethernet over USB 2.0
GPS	GNSS High Sensitivity GPS module (excluding antenna)

Radio Frequency

Transmission distance	Up to 15 km (line of sight) Up to 4 km (cities, urban)
Radio bands	Sub-1 GHz band – complies with unlicensed ISM band specifications in most countries
Link data speed	625 bps – 2.5 kbps variable bitrate
Data security	AES128 Encrypted end to end data

System Power Requirements

Power supply	12 V DC @ 2 A nominal, Solar panel
Internal non-rechargeable batteries	1 D-Cell Li-SOCl2 3.6V Nominal Voltage as Backup power
Typical current drain	200 mA typical operating current
Battery Operating time	Backup battery will support standby mode (RF only) for 6 weeks

Environmental Specifications

Operating temperature	-20° to 60°C
Storage temperature	0° to 40°C
Protection	IP66