

LoRa tilt & crackmeter



Description

Model **TCL module, LoRa tilt & crackmeter** is dedicated module manufactured as a wireless communication method. It transmits measured data to the gateway and transmits it to a network server via the internet, and can be monitored under various conditions in a real-time monitoring program. This product is **very useful in safety diagnosis sites** and is also the optimal choice for slope sites with small installations.

The **TCL module** is manufactured with a built-in digital 3-axis MEMS tilt sensor. It measures the tilt angles of the structure in the X, Y and Z directions, and connects a model 4335 potentiometric crackmeter to the analog input port of the TCL module to measure the tilt angle of the structure and the size of the crack simultaneously.

Features

- Use of low-power, long-distance LoRa communication (Long Range, LPWAN)
- Use of Low-power design allows up to 5 years without battery replacement
- Up to 6km long-distance communication between sensor module gateways is possible
- Wireless measurement system eliminates the need for long-distance sensor signal wiring
- Free communication fee with LoRa local network configuration
- Structural tilt measurement, crack measurement, and simultaneous tilt and crack measurement are selected available
- Real-time smart monitoring using LoRa web monitoring program (S-Pro)

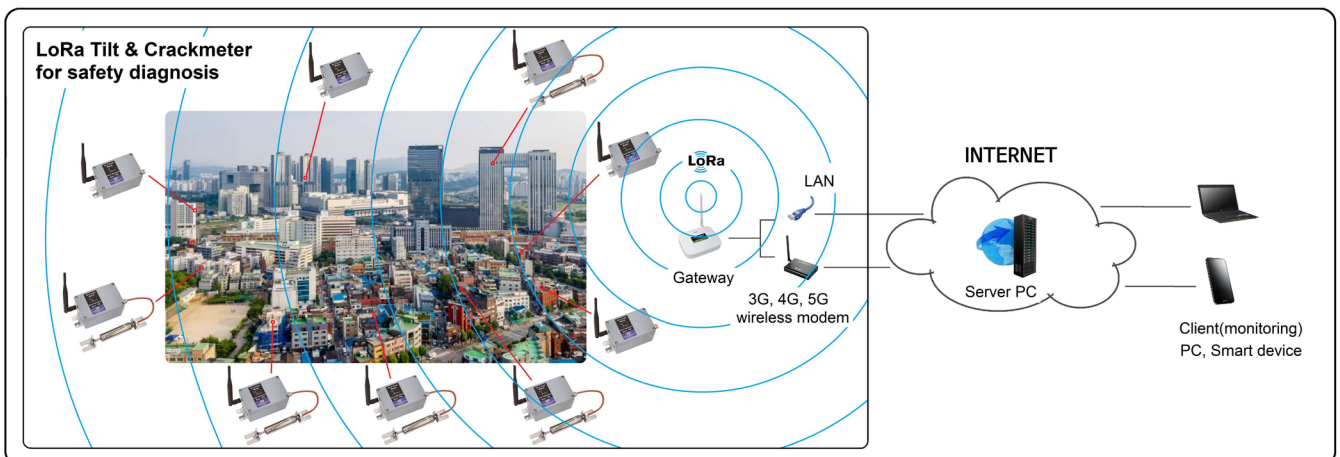
Applications

The **TCL module**, LoRa tilt & crackmeter can be configured as a wireless measurement management system to measure tilt angles and crack progression in construction sites and building structures, enabling real-time monitoring.

- Safety diagnosis sites for building structures
- Slope inclination and crack measurement sites
- Real-time measurement of widely distributed building structures
- Sites that require accurate real-time monitoring
- Sites requiring remote control and unmanned control



[TCL module installation on the wall]



[LoRa tilt & crackmeter system]

LoRa tilt & crackmeter

Specification

Model	Tilt & crackmeter module		
	TCL		
Applied sensor	3-Axis MEMS sensor, Crackmeter (model 4335)		
Applied channel	4 Ch		
Power source	DC 3.6V 19000mA (D-size) Lithium battery (standard)		
Output voltage	DC 5V		
Operating temperature	-20 ~ 70°C		
Use time (1 hour interval reading)	5 Years		
Range (Accuracy)	Tiltmeter	$\pm 10^\circ, \pm 30^\circ, \pm 85^\circ$	($\pm 0.1\%$ FSR)
	Crackmeter	20mm	($\pm 0.5\%$ FSR)
	Temperature sensor	-50 ~ 180°C	($\pm 0.5\%$ FSR)
Resolution	0.0001°, 0.001mm		
Gateway communication method	LoRaWAN local network		
Gateway communication distance	City area : average 1km, Open area : Max. 6km		
Dimensions	125 × 80 × 75mm		
Material	Aluminum case		
Weight	700g		

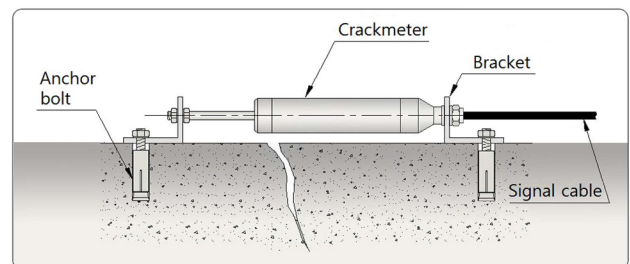
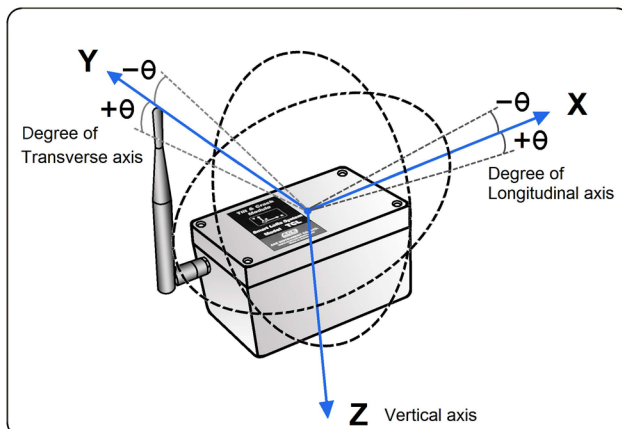
[The gateway is exclusively for RAK's LoRa communication and can be prepared and used by the user]

Description of 3-axis measurement direction

The LoRa tilt can measure angular data along the X, Y and Z axis. With the Z-axis as the reference vertical axis, the measurement direction is the X-axis(longitudinal change) and the Y-axis(transverse change).

Depending on the installation location, the X-axis can be used as vertical axis, allowing measurement of the longitudinal and transverse changes(Y-Z axes and X-Z axes).

The **TCL module should not be installed upside down**; it must be installed in the proper forward direction, as shown in the figure below.



[Model 4335 crackmeter installation]