

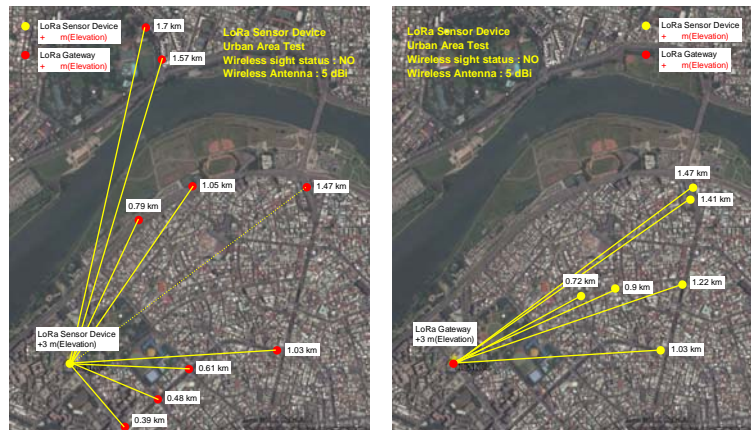
# KENKUL-LoRa Sensor Networks

## KENKUL-LoRa

LoRa wireless sensor network system Combination : LoRa Sensor Device , LoRa-Gateway and Software ◦ LoRa Sensor Device supply sensor's working power, and provide multiple signal input, active push data to LoRa-Gateway, the host computer can using LoRa-Gateway with interface such as RS232/485 or USB port connecting with LoRa Sensor Device easily ◦

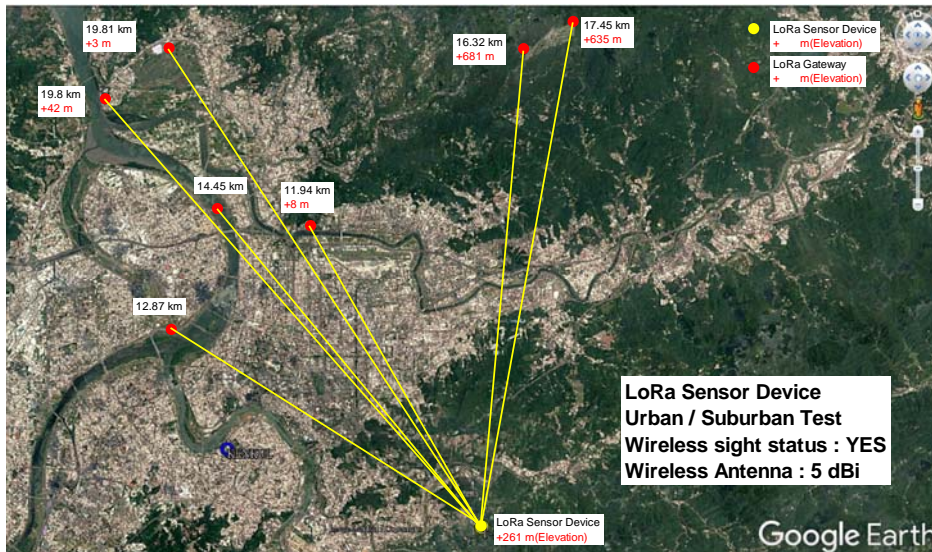
## Application

- Geotechnical / Environmental Industry
- Home automation
- Agriculture
- Construction / Bridge
- Danger zone measurement
- Discard area measurement



## Kenkul LoRa Network Topologies

KENKUL LoRa use star network support up to 15 km (LOS) for wireless measurement.

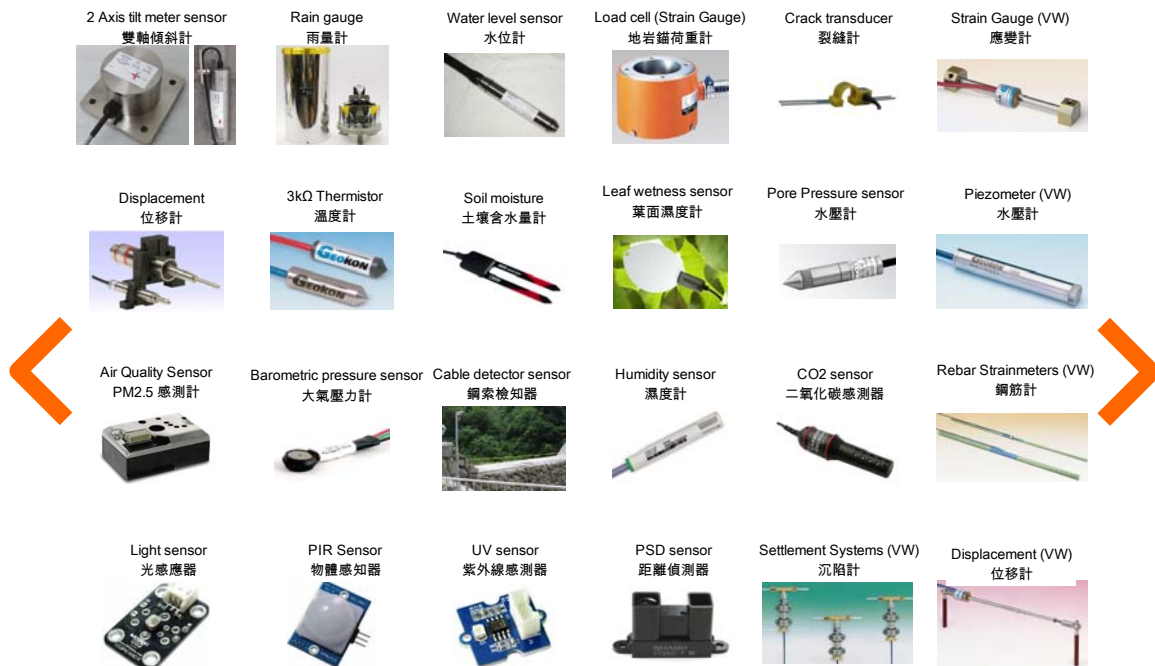


## Feature

- Low cost
- Low power consumption
- High resolution A/D
- Multiple signal input
- Multiple functions configurable
- Long life internal battery (Option)
- Long distance and high penetrating transmission



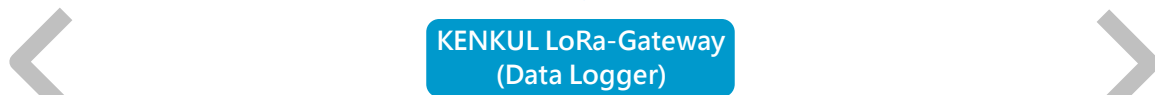
## KENKUL LoRa System Structure



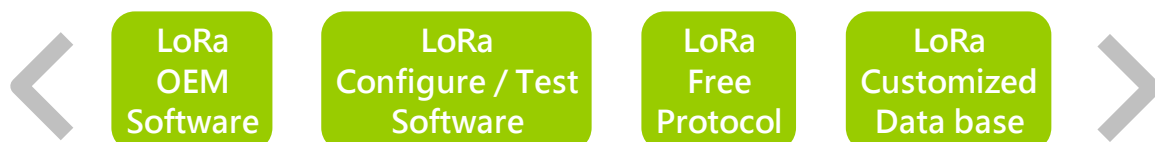
+/-5VDC / Full Bridge Strain Gauge / Rain Gauge / 3K Thermistor  
DC LVDT Sensor / Vibrating Wire Sensor Signal Input



Active Push Data  
15 km(LOS)Transmission / Star Network



Passive  
Data Transmission



## KENKUL LoRa-AI(Analog Input) Specification

### Analog sensor Input

Number of channels	2 differential channels
Input ranges	±5 V
ADC resolution	0.0001 VDC
ADC accuracy	16 Bit

### Rain gauge sensor Input

Number of channel	1 channel
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### Thermistor sensor Input

Number of channel	1 channel (2 wires)
Temperature range	3K Thermistor

### Sensor power support

Voltage Output Maximum (100 mA)	5.0 VDC
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### Wireless characteristics

Chipset	Semtech SX 1276
RF data rate	250 kbit/s
Frequency band	902 ~ 928 MHz
Channels	27
TX Power	2/4/6/8/10/12/14/16dBm,20dBm
Antenna (Standard)	2 dBi
Transmission Range (LOS)	Up to 15 km

### Internal battery power

Type	3.3V LiFePO4 3200mAh
Voltage range	3.0 ~ 3.6 V

### Power consumption

Idel	20uA@3.3 VDC(Support with 10mA sensor)
Work	<20mA@3.3 VDC(Support with 10mA sensor)

### Battery life

1 min sample interval(with Sensor)	Up to 2 month (1 x 3.3V 3200mAH LiFePO4 Battery)
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### External power charge

USB	5 V
Solar power	5 V (Max. 6.5 V Input)

### Physical characteristics

Dimensions (Not include Antenna)	118 x 40 x 140 mm
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## LENKUL LoRa-SG(Strain Gauge Input) Specification

**Coming soon...**



## KENKUL LoRa-VW(Vibrating Wire Input) Specification

**Coming soon...**



## KENKUL LoRa-Gateway (Data logger) Specification

### Wireless characteristics

Chipset	Semtech SX 1276
RF data rate	250 kbit/s
Frequency band	902 ~ 928 MHz
Channels	27
TX Power	20dBm
Wireless sensitivity	-144 dBm

### USB,RS-232/485 Serial Port

Baud rate (Default)	9600 bps
Data bits	8
Stop bits	1
Parity	None

### Handle memory

Max. handle LoRa Sensor Device	48
Active push data	No

### Datalogger

Full 48 LoRa Sensor Device Storage Capacity(Arrays)	16000
Real Time Clock	Yes

### Power requirements

Power supply	9 to 35 V
Idel	36mA@12 VDC
Work	40mA@12 VDC

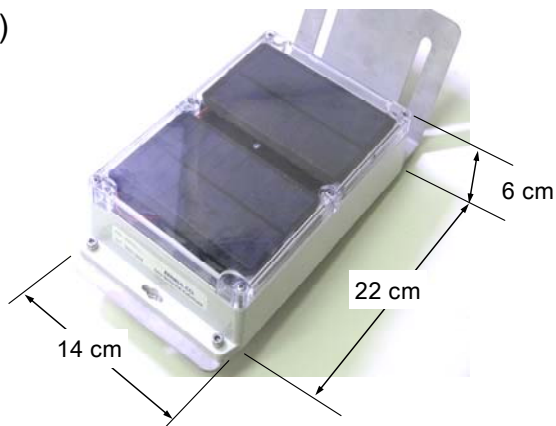
### Physical characteristics

Dimensions (Not include Antenna)	148 x 30 x 110 mm
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### **KENKUL LoRa Outdoor option accessory**

IP65 BOX with 5V(600mA)Solar panel kits(include stainless mount, WSN module space inside)



Antenna Cable Assembly

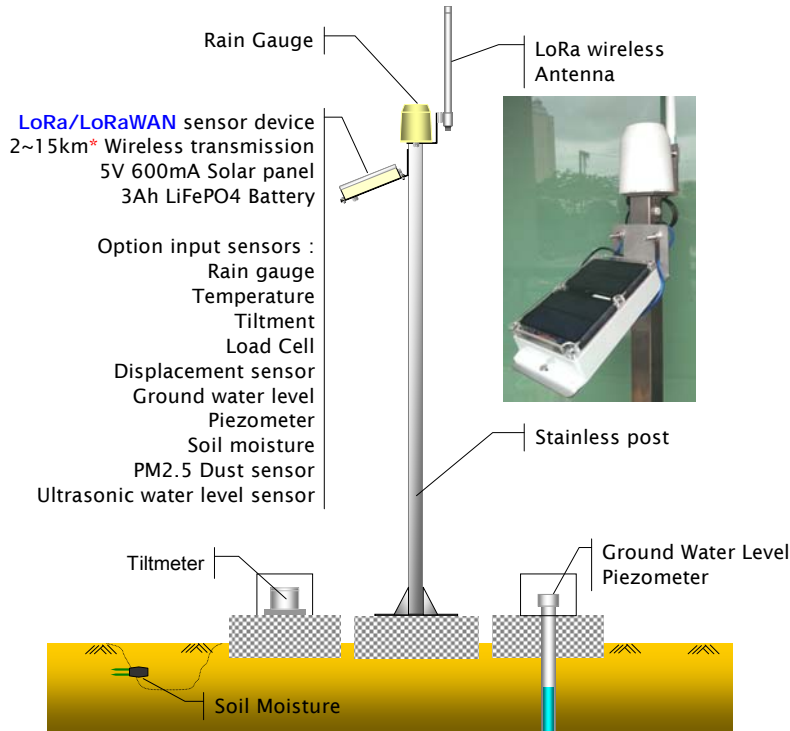


Directional Antenna



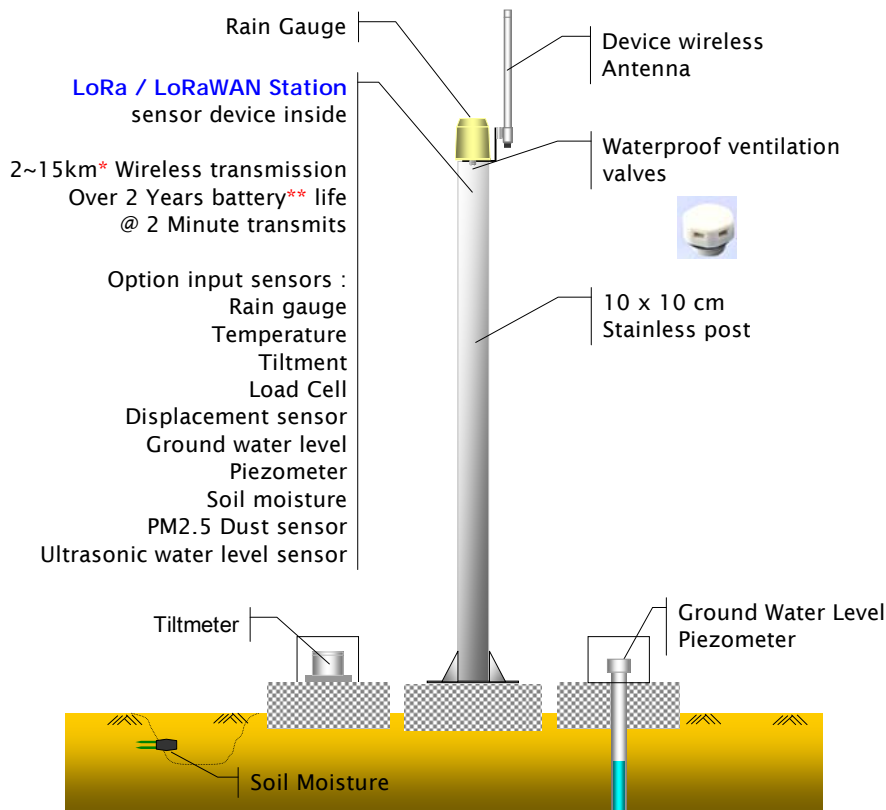
## KENKUL LoRa Sensor Device (Station)

IP65 BOX with 5V(600mA)Solar panel kits(include stainless mount)



\* [Wireless transmission base on LoRa/LoRaWAN Gateway between sensor device LOS status](#)

Battery kits(option high capacity battery)



\* [Wireless transmission base on LoRa/LoRaWAN Gateway between sensor device LOS status](#)

\*\* [Option high capacity battery for use](#)