

## Brief Introduction

As the developing of urbanization and the limit of city space, the city buildings are gradually constructed higher and higher, the deep foundation pit system decides the success or failure of whole project. Underground water level data gathering is one of the most important monitoring of the whole foundation pit construction; our IoT based wireless foundation pit water level sensors will collect the water level values twenty hours each day and update it to the cloud monitoring website regularly, and finally form visualization graphic.

### Main Features:

- Low power
- Wireless telecommunication,
- Regular data upload,
- Regular self-inspection,
- Simple and fast installation,
- Built-in NB-IOT communication module,
- Built-in replaceable Lithium battery,
- Battery voltage monitoring,
- AC power input free,
- No cable connection,
- 304 Stainless steel case (Data transmitter)



# Comparison

## Conventional Wired Version:

The conventional water level monitoring system mostly includes a main data collector and several wired water level nodes as photos below. The data collector should be in the construction site and needs the AC power input, there will be many wire slots on the ground that are easily damaged and require extra labor cost.



## NB-IOT Wireless Version:

Underground data collector, no cable on the ground, independent each sensor.



## Technical Parameters

	Parameters	Remark
Range	0~20 meters	20 meters extension cable
Accuracy	10mm	
Size	Sensor node: Φ26mmX105mm Transmitter: Φ62mm*210mm	Suit to install in the 50mm diameter water level tube
Case Material	304 Stainless steel	
Ingress Degree	IP68	
Protocol	485	
Telecommunication	NB-IOT network (B3/B5/B8)	
Antenna	Built-in	

Item		Parameters
<i>Battery</i>	Nominal voltage	3.6V DC
	Minimum work voltage	2.8V DC
	Capacity	19000mAH
Power	Sleep Current	≤15uA
	Maximum Power	≤2W @3.6V
	Durability	≥6 months
Self-Inspection	Interval	Pre-set
	Voltage	Ragne:2.8-3.6V, ±0.2V
Alarm	Pre-set	1-10 times, no-stop till manual termination

## Environment

Work Temperature (℃)	-10℃~60℃
Storage Temperature (℃)	-10℃~70℃
Humidity	5%~100%
Air Pressure (kPa)	63.0~ 106.0 (<4000m)

## Performance and Safety

Telecommunication Response Time	<10s
Average Lifespan	≥15000 hours
False Alarm Ratio	≤0.1%
Alarm Failure Ratio	≤0.1%
EMC	Comply with IEC 61000-4-2、3、4、5
Isolation Resistance (Normal condition)	≥100MΩ
Isolation Resistance (Wet and Hot)	≥2MΩ
Leakage Current	<5mA

## Appearance



Sensor node



data Transmitter

# Installation Instruction

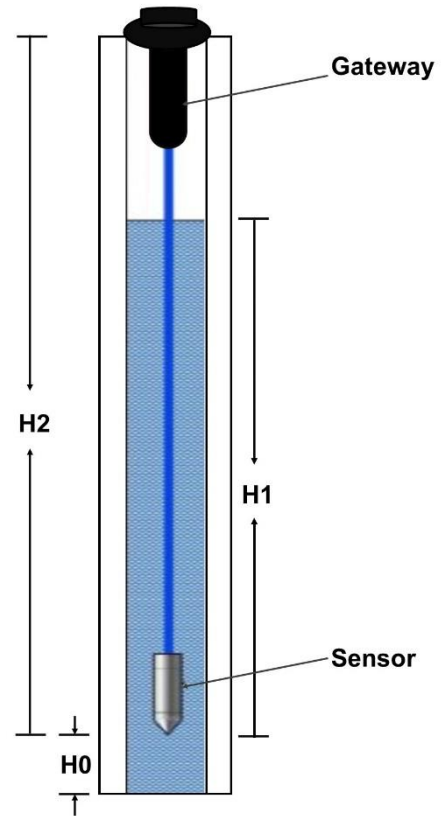
## Steps:

Step 1. Drop the sensor node and cable to the bottom along the monitoring hole,

Step 2. Connect the sensor node cable and the data transmitter,

Step 3. Put the transmitter in the central of the monitoring hole,

Step 4. Open the monitoring page and check if the sensor is online to identify if the whole device is working normally.



## Caution:

The hole for the transmitter should be wider than the upper water tube, the diameter of transmitter installation hole should be wider than 60mm, and the top of the transmitter should be 20mm lower than the ground to avoid the direct vehicle crush.

## Application Diagram

Actual water level  $H = H_0 + H_1$

$H_0$  is the installation height of the sensor node

$H_1$  is the height detected by the water pressure sensor, it is calculated by the water pressure but not direct measuring.