User Manual

ROADRAIN CATM1

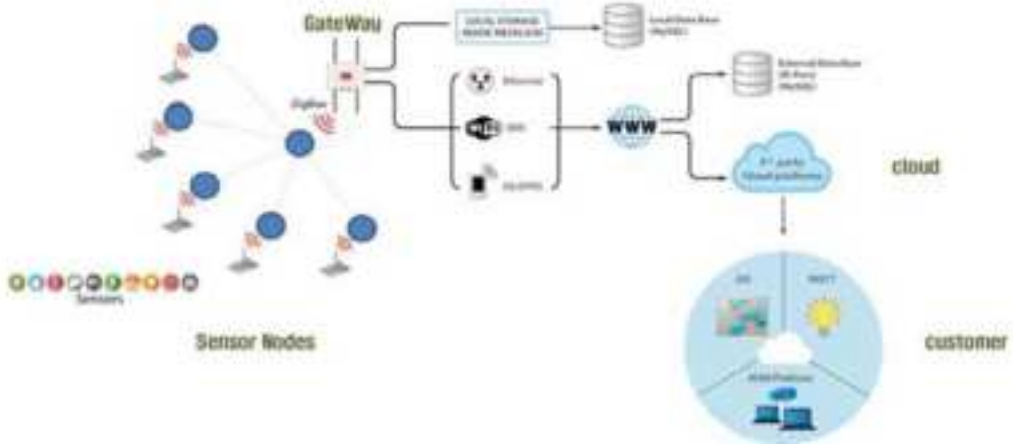
[contents]

[Revision History]

NO.	History	Reason	Date
A	First		01/08/2022

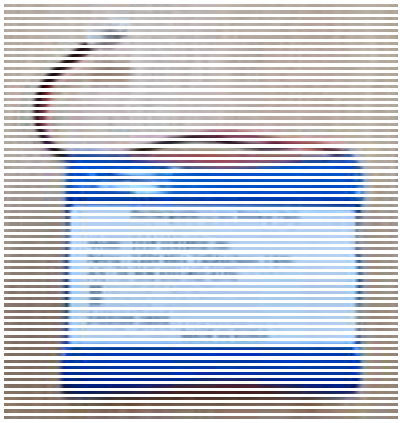
[product info]

This product is a sensor platform that secures IP65 level shielding that can be used outdoors. The sensor can be installed externally and is a sensor that can transmit sensor data measured in real time at a set period through LTE-CATM1 (Band 2/12) and wireless network. It is a sensor node. Supports up to two relays for on/off control of industrial devices (ex, water pump, gate..).
It can be operated with a battery and its capacity is <10,000 mAh, ensuring stable operation for several months to years depending on the data transmission scenario and the sensor used.
Meanwhile, this product can be operated with external power (+5V), so it can be used regardless of the battery in places where a power supply is available.



[Product Components]

[Main box]

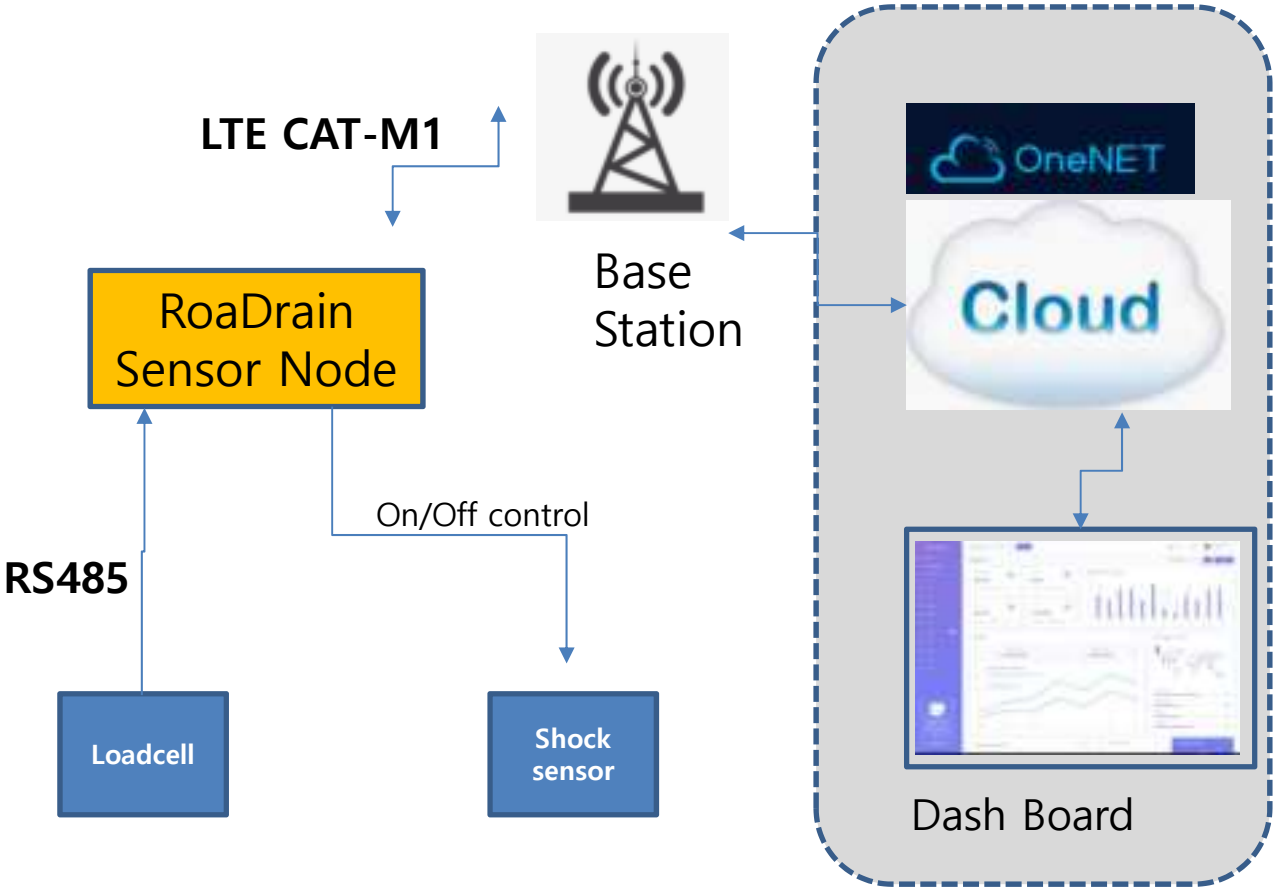


[Battery]

[Sensor Probes(Load Cell,Shock Sensor)

[제품 동작 내용설명]

- This product (RoaDrain CATM1) can measure load and detect rain using a load cell and shock sensor.
- When various environmental substances flowing into drains, etc. are collected during rainy weather, their load can be reported through the cloud. In this case, the communication cycle can be set sufficiently long, and long-term operation (3 to 5 years) is possible through low-power operation in sleep mode. do.
- The above operations are possible through the LTE CAT-M1 communication network..



[Product Specifications]

[RF Frequency : B2[1,850~1,910MHz, 1,930~1,990MHz],
B12[699~716MHz, 729~746MHz]

Unit	CATEGORY	SPEC1	SPEC2
Main Unit	Enclosure	protection	IP65 or compatible
		material	ABS
		Size[WxHxD] ,mm	139.5 x 99.7 x 55
	User Interface	indicator	NONE
		power input	1 x USB type (*외장형 배터리로 필요한 경우에만 사용 함)
		user button	1
	Wireless	Ext. Antenna	< 3.5dBi omni
		communication	LTE-CATM1 (B2/B12)
	battery	capacity	<10,000mAh
		type	Li-ion
		operating time	> 2 year
	weight(kg)	kg	< 0.5kg(TBD)
	size	WxDxH	100mm x 140mm x 50mm
	operating condition	temperature	-20deg ~ +50deg
loadcell I/F	interface	connection	Circular connector
		pin	4-pin
	Electrical	Power	5V
		Signal	RS485
		power consumption	< 0.5W peak(TBD)
Shock I/F	Interface	Connection	2 -pin

[FCC Information]

This device complies with part 15 of the FCC Results. Operation is subject to the following two conditions :

(1) This Device may not cause harmful interface, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

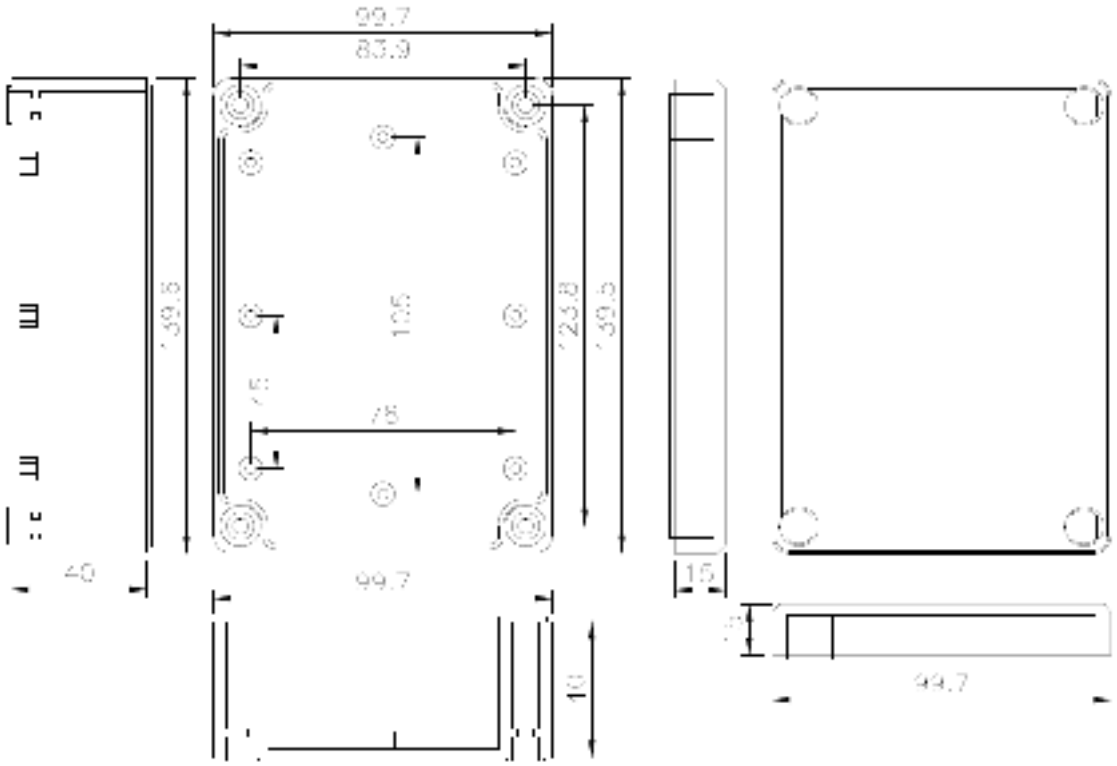
Note: This equipment has been tested and found to comply with the limits for CLASS B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try correct the interference by one or more of the following measures:

1.1. Reorient or relocate the receiving antenna.
1.2. Increase the separation between the equipment and receiver.
1.3. Connect the equipment into an outlet on a circuit different from that to which receiver is connected.
1.4. Consult the dealer or experienced radio/TV technician for help.

WARNING
Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

IMPORTANT NOTE:
FCC RF Radiation Exposure Statement:
This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

[Mechanical Specification]

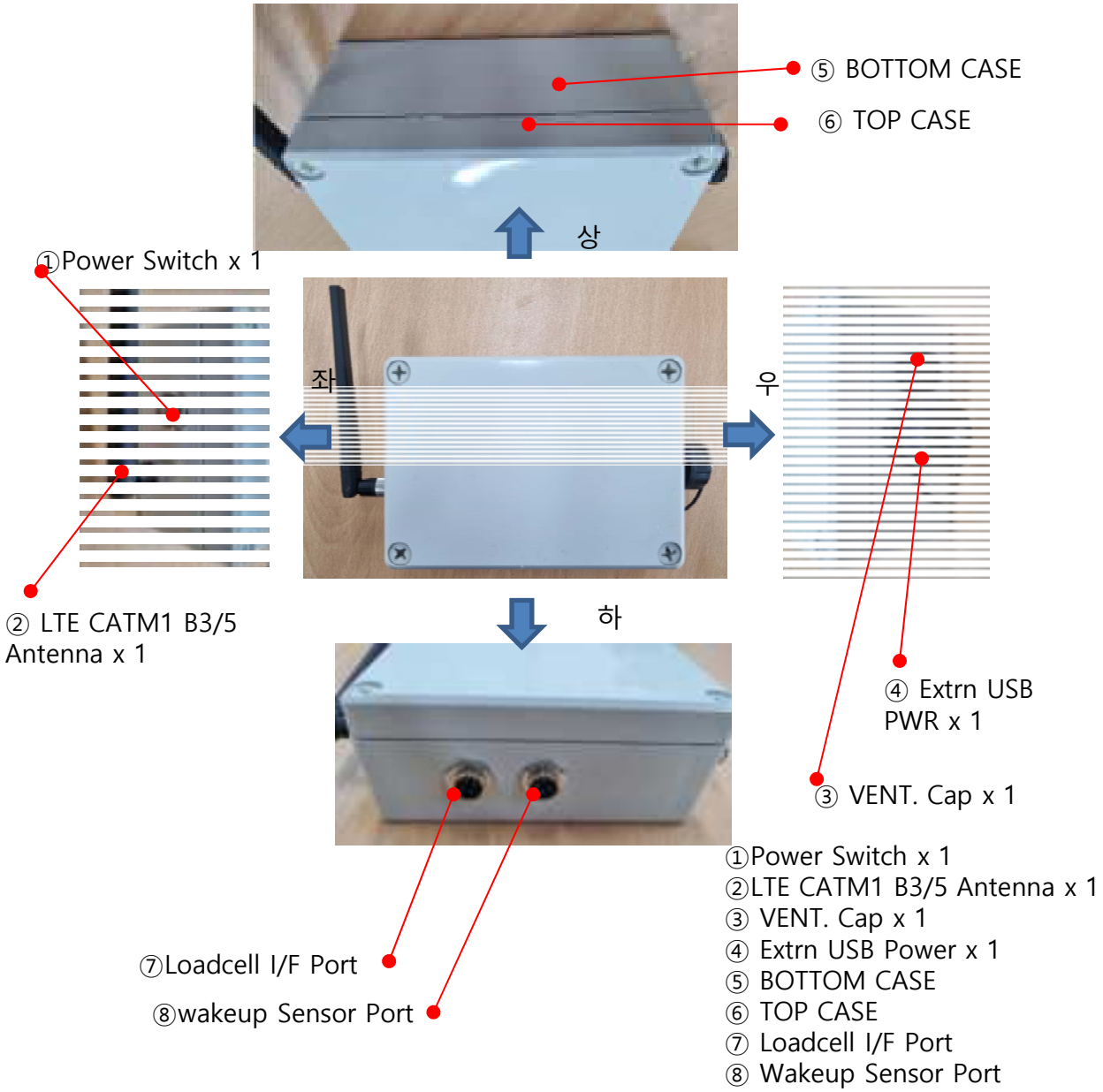


[Tune up information]

mode	Target Power [dBm]	Tolerance [dB]	Max. Allowed Power [dBm]
LTE Band 2	23	+/- 1	24
LTE Band 12	23	+/- 1	24

[installation Guide]

- Names of Main Parts of the Product



①Power Switch x 1
②LTE CATM1 B3/5 Antenna x 1
③ VENT. Cap x 1
④ Extrn USB Power x 1
⑤ BOTTOM CASE
⑥ TOP CASE
⑦ Loadcell I/F Port
⑧ Wakeup Sensor Port

[Installation and Operation Guide]

- **How to install/operate the product**

- **Secure the main body to a support stand at the location where the product is to be installed.**
- **Install the product so that its “up” direction is toward the sky to ensure wireless characteristics as much as possible, and avoid installing objects that may interfere with radio waves on top of the product.**
- **Sensor probes are buried or installed in the desired location.**
- **Turn on the product's power switch.**
- **Check whether the device is properly registered and data is updated through management software such as cloud application or dashboard. (Expected to take about 10 minutes**)

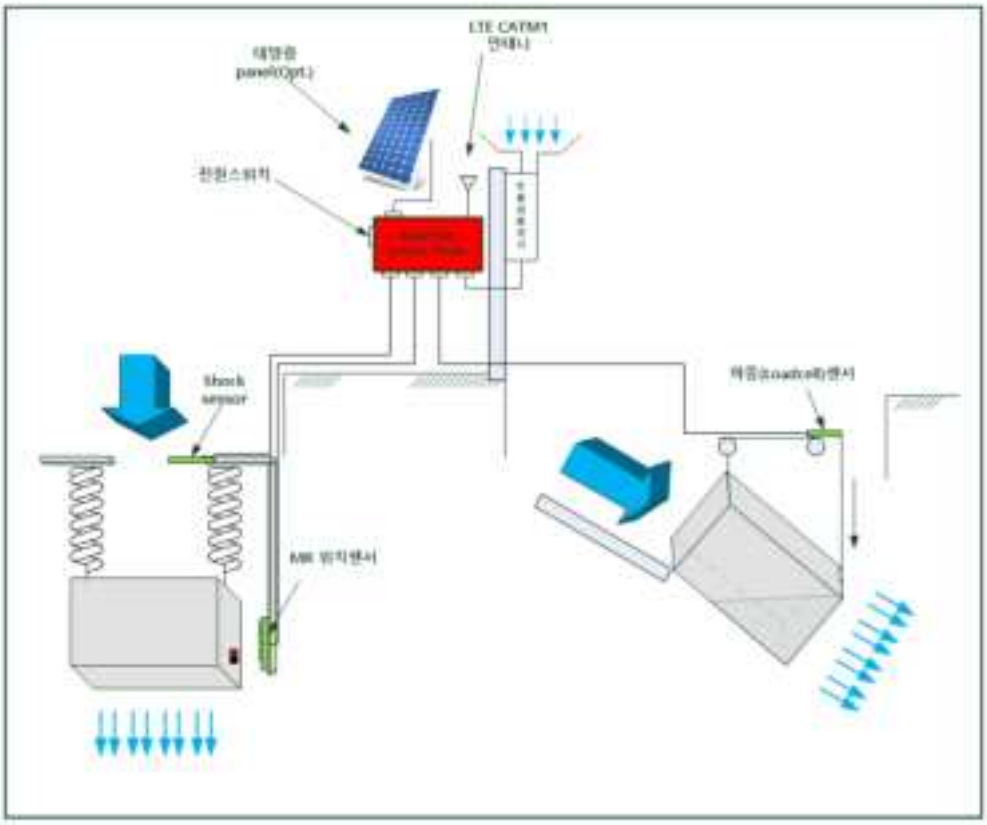
- **caution**

- **Even when moving or replacing an installed product, it is absolutely prohibited to forcibly pull the cable of the sensor probe while it is buried, as applying excessive force can cause damage to the sensor probe.**

- **If work is necessary to replace the sensor probe due to a problem or change the position between probes, turn off the power switch of the product and proceed with work. After work is completed, reapply the power.**.

[Installation and Operation Guide]

- Product installation application examples



What to measure

- Vertical non-point pollution sediment load detection
- Application target Road/river non-point pollutant deposition detection, Smart Highway etc