User Manual
Wireless IoT Radar Level
SA365RL

ISTEC

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1 About this manual

This manual is an instruction manual for the SA365RL, a wireless IoT radar level meter.
You should read this manual and understand its contents before installing, operating, and inspecting the level meter.
Install this meter in an environment that meets the waterproof and explosion- proof ratings of this product.
We are not responsible if an accident occurs when the product is installed in an environment that requires a higher level than the waterproof or explosion- proof rating of this product.
This manual uses the following symbols for the important matters.

Symbols used

Warning	Products can be damaged if you don't comply with this.
Caution	Measurements may be inaccurate if you don't comply with this.
Notification	Suggest solutions when special problems or unusual matters occur.

Contact us

IS Technologies Co.,Ltd

Continuously improve user convenience and product performance and quality, we would like to collect user opinions on products and instruction manuals.
If you have any questions, please contact us at any time using the contact information listed on the cover.

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2 Product Description

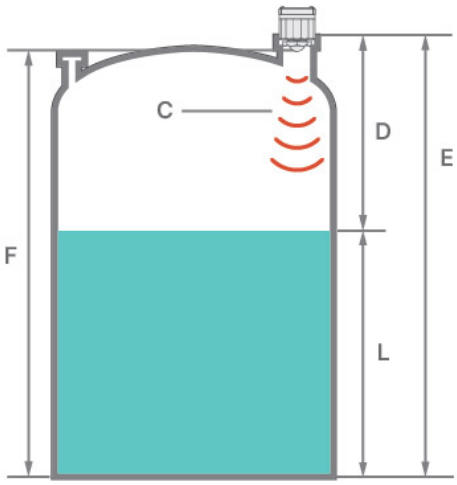
Principle of Measurement

The SA365RL is a radar level meter that calculates distance by measuring the time it takes for a radar wave transmitted from a sensor to bounce off the surface of the object being measured.
The measured value is converted to a current value for interfacing with external instruments.

! Measures

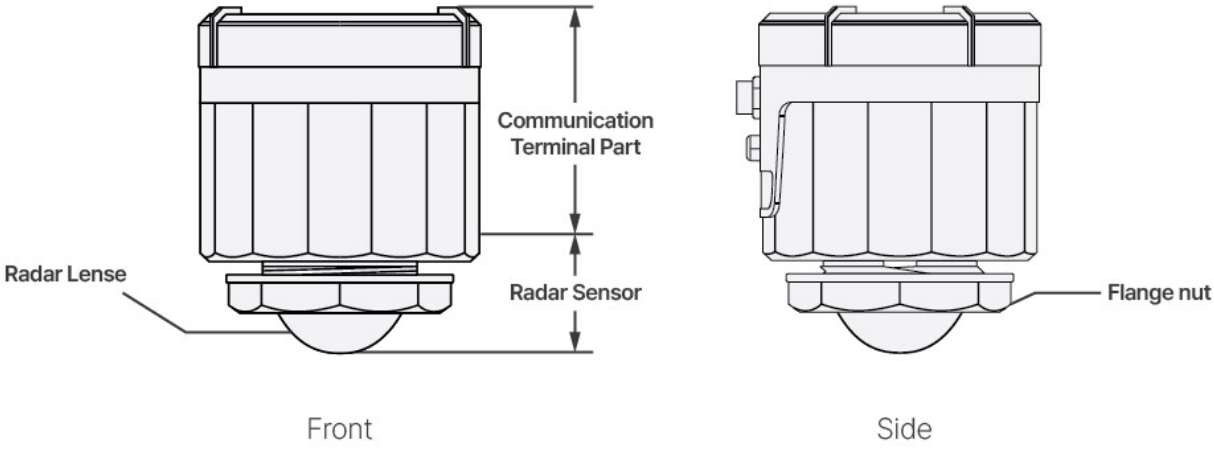
$$D = (C * T) / 2$$
$$L(Level)=E-D$$

- **C: speed of light**
- **D: Distance from sensor to surface**
- **L: Height of the object**
- **F: Distance from sensor to floor**
- **E: Distance of empty tank**

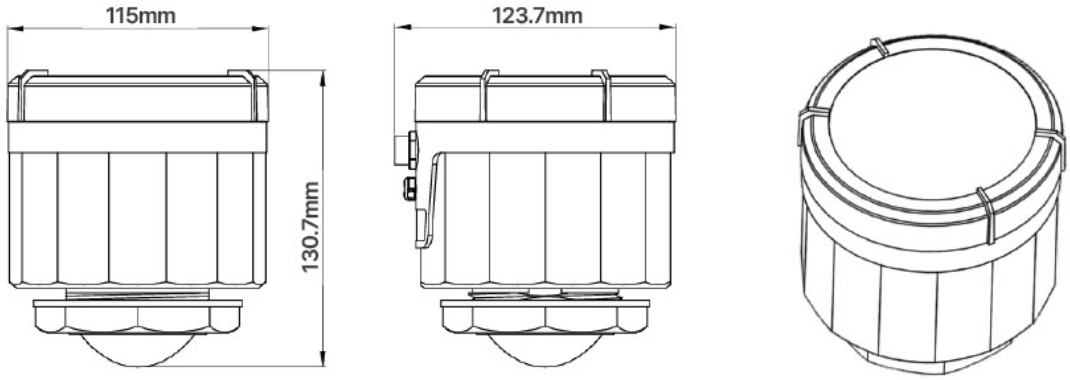


The sensor emits radar waves and receives reflected waves. The level meter calculates and displays measurements by taking into account other factors such as the speed of light and the time it takes for the sensor to emit a radar wave and receive a reflected wave.

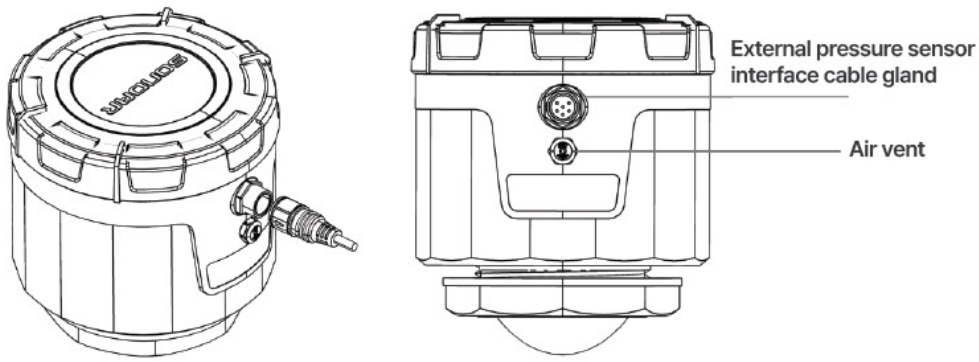
Configuration



Exterior

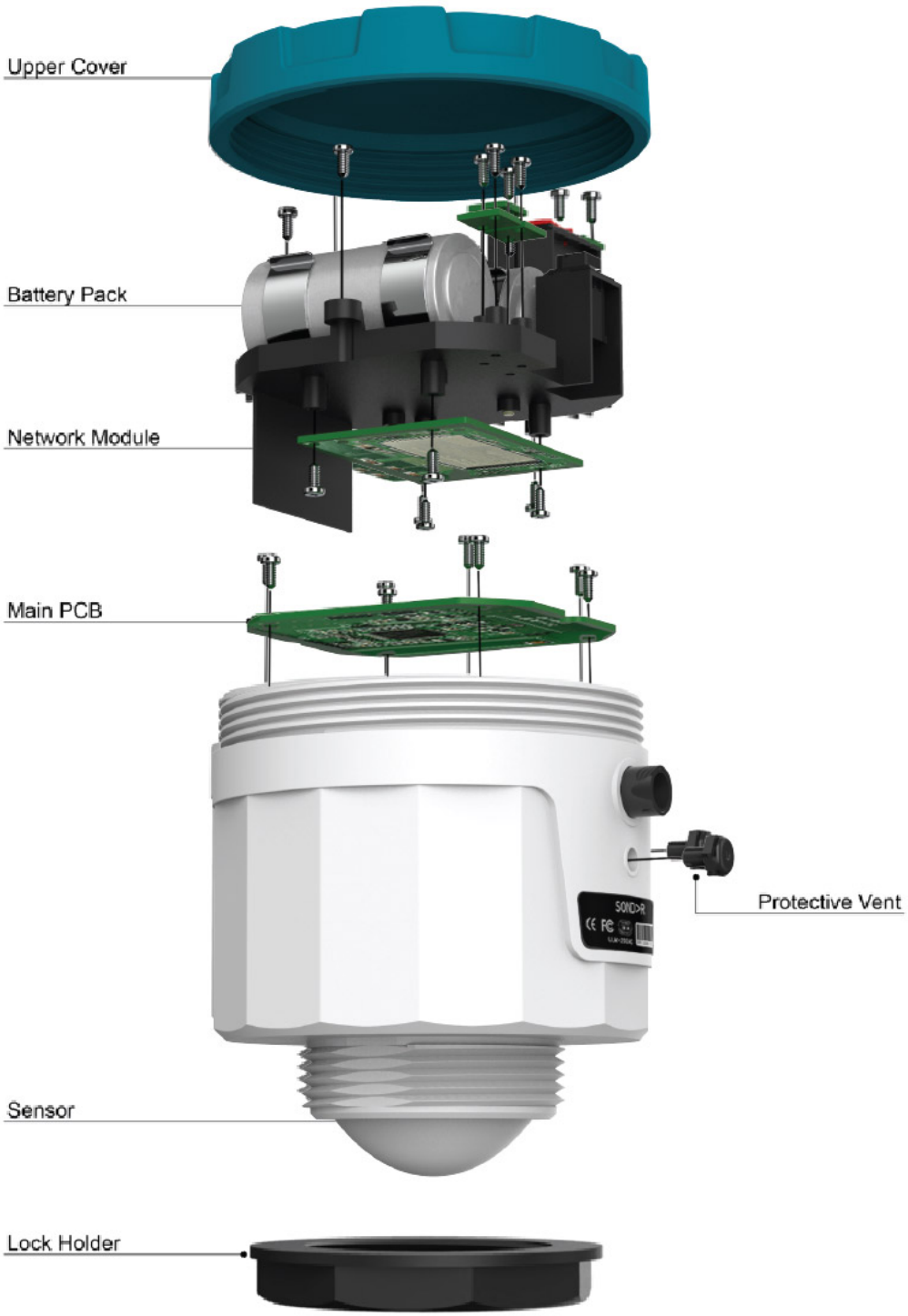


Dimensions



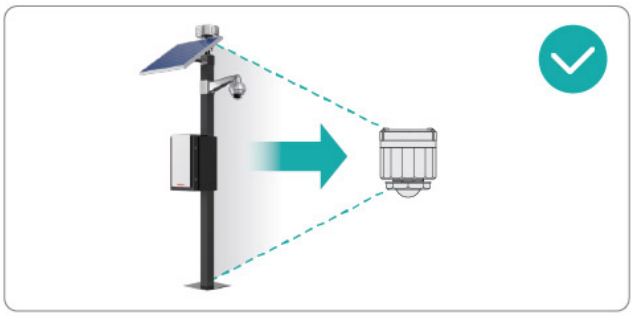
Components

Assembly

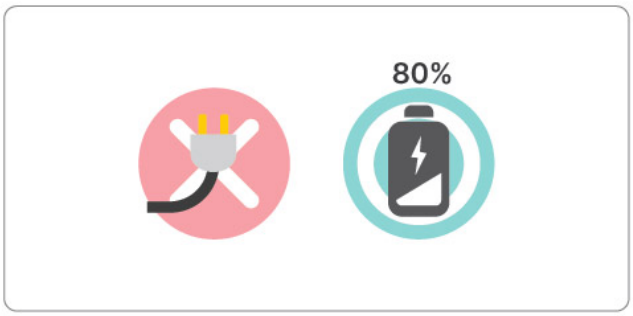


Internal components

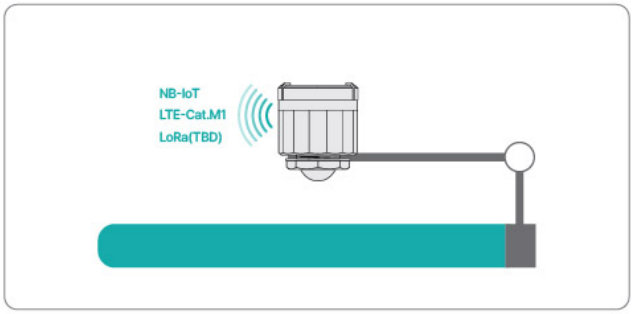
Features



Easy to install due to its compact size.
All-in-One (Sensor & RTU & Battery)

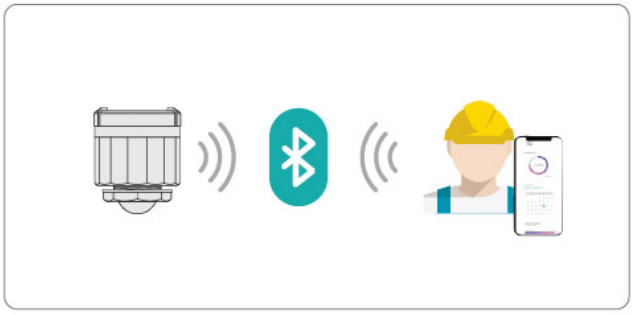


Built-in battery & Easy to replace
Battery level check function (%)

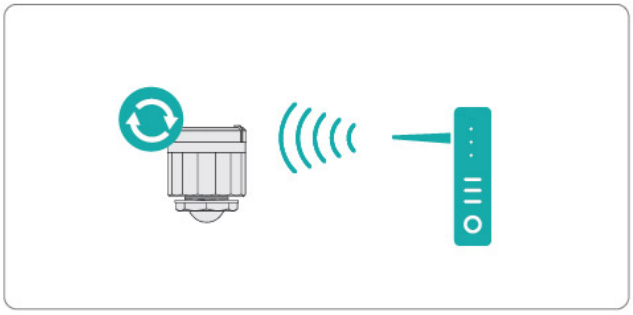


Wireless communication network
[NB-IoT / LTE- Cat.M1 / LoRa(TBD)]

Data collection and transmission
according to the set intervals



Remote setting and inquiry possible via Bluetooth



Remote firmware update(TBD)

3 Specifications

Model		SA365RL Wireless IoT Level Meter
Measurement type		Radar
Measuring range		0.2m ~ 20m
Beam angle		10°
Lens method		Dome type
Frequency		60.5GHz
Accuracy		0.5%
Resolution		1mm
Operating temperature		-30°C to 70°C
Storage temperature		-30°C to 80°C
Communication		NB-IoT / Cat.M1 / LoRa(TBD)
Protection level		IP68
built-in board		RCB, RSB
Battery		2 x D 3.6V 19Ah Lithium Battery
Size (L * W * H)		115 * 130.7 * 123.7 (mm)
Function	Data storage	480EA
	Remote control	Measurement / transmission cycle change, Reset
	BLE	Level setting, monitoring
Certification		

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules.
These limits are designed to provide reasonable protection against harmful interference in a residential installation. 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 to correct the interference by one or more of the following measures:

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

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device should be installed and operated with minimum 20 cm between the radiator and your body.

4 Installation

General instruction

Before installation, please refer to the specifications
to ensure that this product is suitable for the installation environment

General precautions during installation are as follows:

(1) Remove obstacles between the radar sensor and the measurement object.

(2) Keep a distance from the inner wall of the tank or other structures so as not to interfere with the progress of the radar wave.

(3) Avoid places where strong electromagnetic waves, severe noise and vibration occur

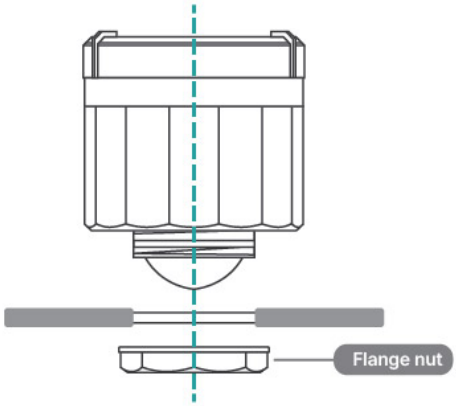
(4) Make sure the level meter is perpendicular to the measurement object .

(5) Ensure that the highest water level does not fall within the dead zone.

The installation environment is unusual or you have difficulty selecting an installation location, please contact us.

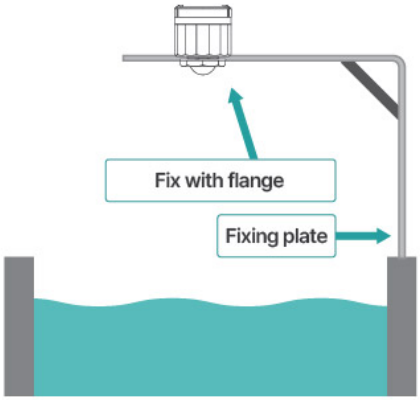
Installation examples

There are three main installation versions.

A. Use separate bracket	This method is primarily used when installing with existing structures in open areas. SA365RL flange nuts are supplied with the product. 

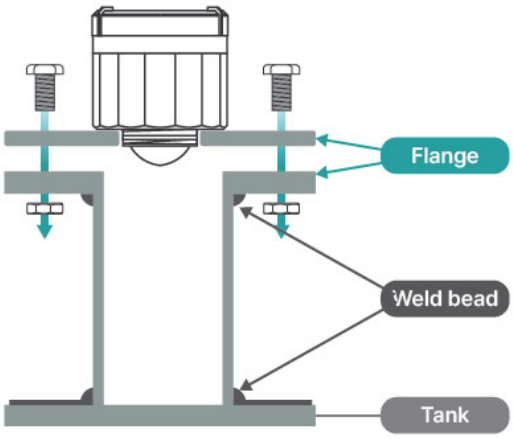
B. Connect with fixing plate

This method is primarily used when installing in water supply, sewer, and drain



C. Connect with nozzle

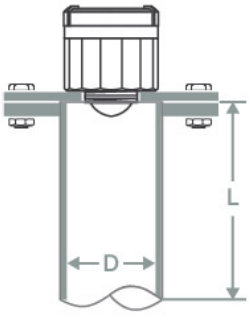
This method is primarily used when installing in closed spaces such as tanks.



Select the flange that matches the nozzle.
A flange made of PVC is recommended and the recommended nozzle sizes are as follows:

Recommended length for each internal diameter of the nozzle (mm).

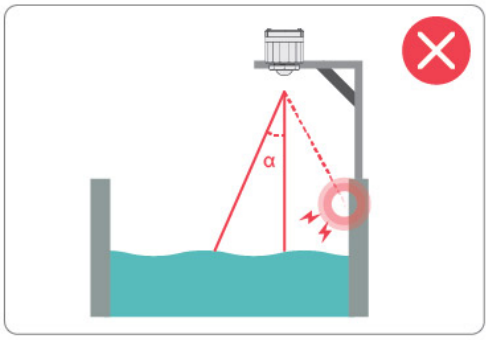
Diameter	Length
80	234
100	290
150	430
200	570



The table above shows the maximum length based on the internal diameter of the nozzle, and the internal diameter and length do not necessarily have to be proportional. When the internal diameter is 80, the length should preferably be less than 234mm.

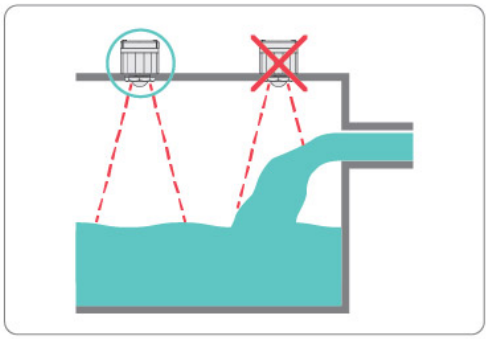
General instruction

Precautions during installation are as follows:



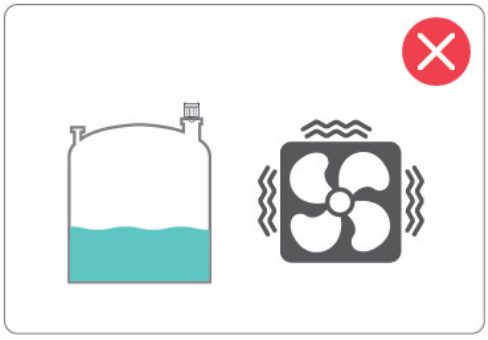
Remove obstacles and ensure clear path for radar wave.

- The installation location should be a place where no other equipment or fixtures cross the path of the radar signals.
- Consider the radar wave radiation angle to prevent the radar wave from reaching the inner wall. Install at a sufficient distance.



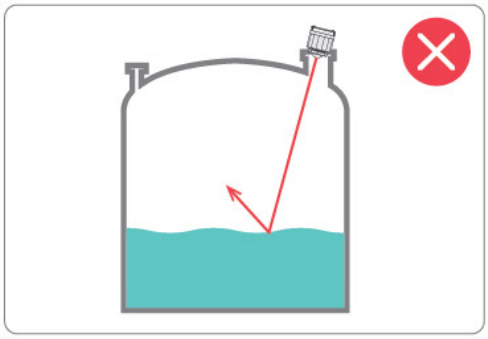
Do not install in or above the filling stream.

Make sure that you detect the medium surface, not the inflowing product.



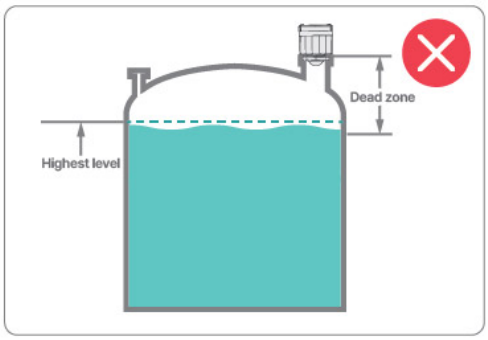
Avoid external interference.

Install it at a sufficient distance from devices generating severe noise, strong electromagnetic waves, vibration, such as motors, pumps, or air nozzles.



Install the level meter perpendicular to the measurement object.

When measuring powder or sediment, consider the slope of the object to be measured.



Consider the dead zone.

The highest water level does not exceed the dead zone. If unavoidable, the level meter can be moved and installed using a pipe.

※ **Dead zone** refers to a distance that cannot be measured.
※ When connected to a pressure sensor, the level in the dead zone can be measured (pressure sensor is optional)

Thank you.

From. IS Technologies Co.,Ltd

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