Multifunctional Ultrasonic Distance Sensor

EM400-MUD



EM400-MUD is a multifunctional ultrasonic distance sensor designed to detect small-range areas and small blind spots. It features switchable pre-set modes for different applications. EM400-MUD is also equipped with a 3-axis accelerometer and temperature sensor to detect device status. With high protection IP rating and waterproof enclosure, EM400-MUD can withstand harsh environments and operate up to 10 years using two 9000 mAh batteries.

Milesight offers LoRaWAN® version and NB-IoT/Cat.M version to meet different communication needs. The LoRaWAN® version can be integrated with Milesight LoRaWAN® gateway and Milesight IoT Cloud solution, enabling remote and visual management of all sensor data. The NB-IoT/Cat.M version not only supports multiple application modes to compatible with IoT platforms, but also is equipped with GNSS for tracking and security purposes.

EM400-MUD is specifically designed for medium or large trash bins and parking lot.

◆ Features

Shared Values

- 3-450 cm wide detection range with small blind zone
- Equipped with NTC temperature sensor for the detection and alarm of trash burning
- Built-in 3-axis accelerometer sensor to monitor device tilt status
- Damp-proof coating inside and IP67 waterproof enclosure for outdoor applications
- Two built-in 9000 mAh replaceable batteries that work for up to 10 years without replacement

- Equipped with NFC for one touch configuration, support card emulation mode

LoRaWAN® Version Only

- Equipped with three pre-set modes for different applications: standard mode, bin mode, Parking lot mode
- Ultra-wide-distance wireless transmission up to line of sight of 15 km
- Function well with standard LoRaWAN® gateways and network servers
- Compatible with Milesight IoT Cloud for remote management

NB-IoT/Cat.M Version Only

- Equipped with two pre-set modes for different applications: standard mode, bin mode
- Equipped with GNSS positioning for tracking
- Support cumulative number report function for power saving
- Support multiple network protocols to be compatible with IoT platforms

◆ Specifications

Wireless Transmission	
LoRaWAN® Version	
Frequency	CN470/IN865/RU864/EU868/US915/AU915/KR920/AS923-1&2&3&4
Tx Power	16 dBm (868 MHz)/20 dBm (915MHz)/19 dBm (470MHz)
Sensitivity	-137dBm @300bps
Mode	OTAA/ABP Class A
NB-IoT/Cat M Version	
Cellular Band	Cat M1: B1/B2/B3/B4/B5/B8/B12/B13/B18/B19/B20/B25/B26/B27/B28/ B66/B85 Cat NB2: B1/B2/B3/B4/B5/B8/ B12/B13/B18/B19/B20/B25/B28/ B66/B71/B85
SIM Slot	1 (Micro SIM-3FF), 1.8V
Application Mode	TCP/UDP/MQTT/AWS
Measurement	
Distance	
Detection Range	3 ~ 450 cm
Detection Accuracy	± (1+0.3%*S) cm, S=distance (-15°C ~ 60°C)
Detection Resolution	1 mm

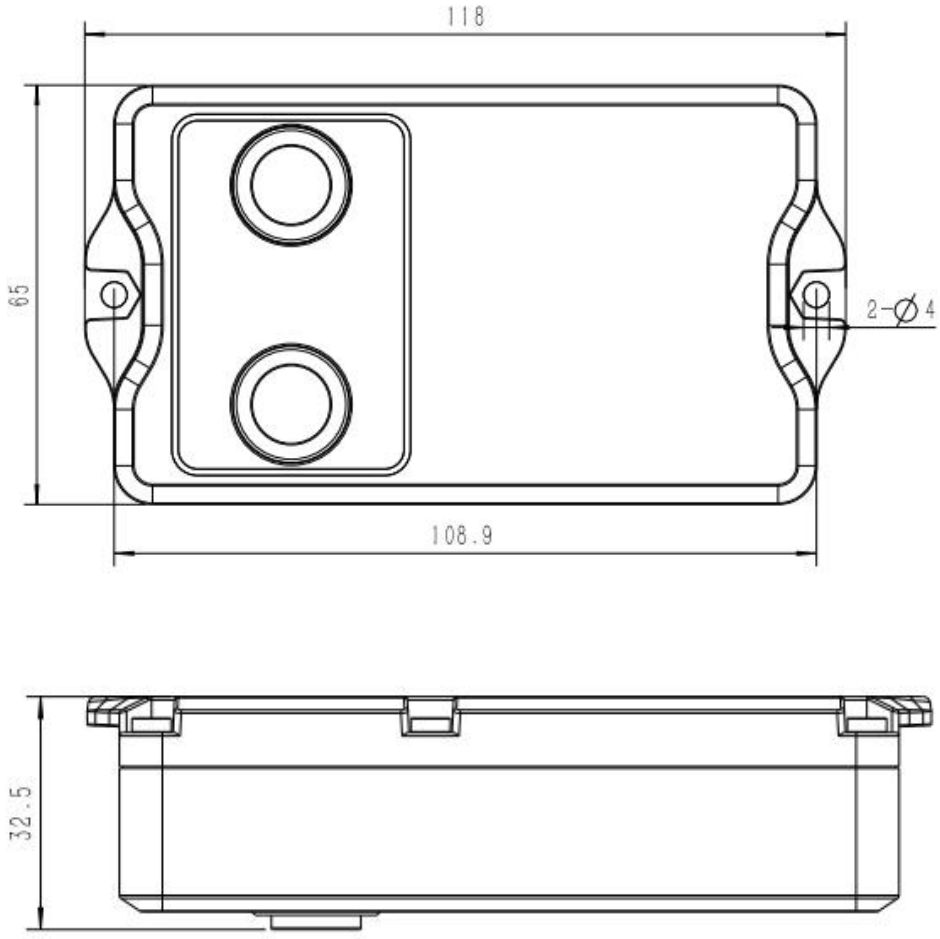
Beam Angle	60°
Device Position	
Status	Normal/Tilt
Temperature	
Range	-40 ~ 125°C
Resolution	0.1°C
GNSS Positioning (NB-IoT/Cat M Version Only)	
Parameters	Longitude/Latitude
Resolution	0.000001
Others	
LED	1 × LED Indicator (Internal)
Button	1 × Power/Reset Button (Internal)
Software	
Power On & Off	NFC, Power Button (Internal)
Configuration	Mobile App (via NFC), Downlink
Advanced Features	Cumulative Report (NB Version), Calibration, Threshold Alarm, Tilt & Distance Switch
Physical Characteristics	
Power Supply	2 x 9000 mAh ER26500 Li-$SOCl_2$ Batteries
Battery Life[1]	**LoRaWAN® Version:** Standard mode: > 10 years (10 min interval, 25°C) Bin mode: > 10 years (20 min interval, 25°C) Parking lot mode: 5 years (12 triggers per day, 25°C) **NB-IoT/Cat.M Version:** TCP/UDP—Around 10 Years, MQTT/AWS—Around 5 Years (4 Times Report per Day, per Report Includes 12 Packages with 30-min Collection Interval, 25°C)[2]
Operating Temperature	- 30°C ~ 70°C
Relative Humidity	≤95% (non-condensing)
Ingress Protection	IP67
Dimension	118 × 65 × 32.5 mm
Housing & Color	ABS + PC (UL94 V0), Black gray

Weight	181.4g (Batteries included)
Installation	On the Flat Surfaces with Screws
Approvals	
Regulatory	CE, FCC
Environmental	RoHS

[1] Tested under laboratory conditions and for guideline purposes only.

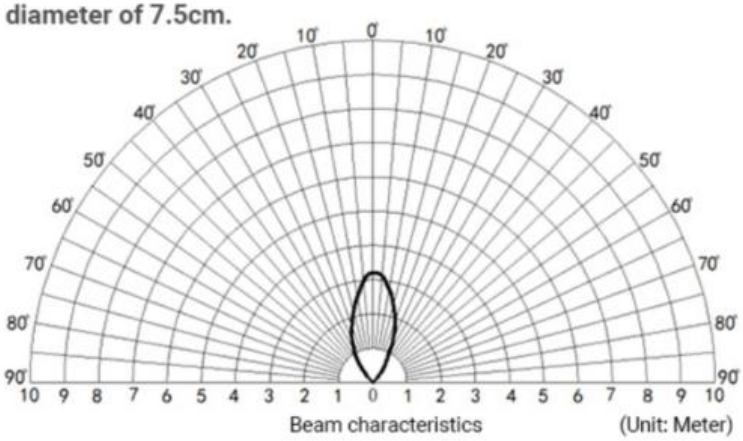
[2] PSM is required for SIM card and will be impacted by cellular base station signals.

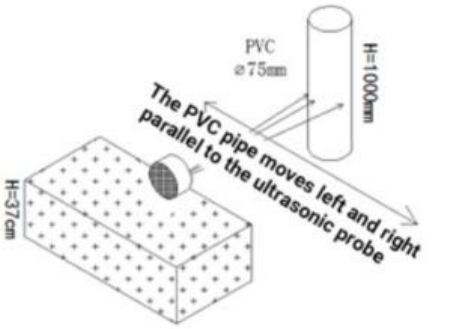
◆ Dimensions (mm)



◆ Beam Pattern

(1) The tested object is a white cylindrical tube made of PVC material, with a height of 100cm and a diameter of 7.5cm.





(2) The tested object is a corrugated box perpendicular to the 0° central axis, with a length * width of 60cm*50cm.

