Ultrasonic Distance Sensor

EM400-UDL

◆ Introduction

EM400-UDL is a non-contact ultrasonic distance sensor designed for liquid level distance measurement. It features multiple selective probes with varying detecting ranges to meet diverse requirements. With high protection IP rating and waterproof enclosure, EM400-UDL can withstand harsh environments, and it can work up to 10 years with 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-UDL can be used in outdoor applications such as water level measurement in static or slow-flowing water bodies, monitoring fill level of water tanks, etc.

◆ Features

Shared Values

- Selective probes vary from 25 to 1000 cm for multiple applications
- Two built-in 9000 mAh replaceable batteries that work for up to 10 years without replacement
- Equipped with NTC temperature sensor for the detection and alarm of burning
- Built-in 3-axis accelerometer sensor to monitor device tilt status
- Damp-proof coating inside and IP67 waterproof enclosure for outdoor applications
- Equipped with NFC for one touch configuration, support card emulation mode

LoRaWAN® Version Only

- 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 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		
Model	**Standard Version**	**Pro Version**
Range	C050: 25 ~ 500 cm C100: 25 ~ 1000 cm	W050: 30 ~ 500 cm W100: 50 ~ 1000 cm
Accuracy	± (1+0.3%*S) cm, S=distance (- 15°C ~ 60°C)[1]	±1% FS (- 30°C ~ 65°C)
Resolution	1 mm	
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)	
Advanced Features	Cumulative Report (NB Version Only), Calibration, Threshold Alarm, Tilt & Distance Switch	
Physical Characteristics		
Power Supply	2 x 9000 mAh ER26500 Li-SOCL$_2$ Batteries	
Battery Life[2]	**LoRaWAN® Version**: > 10 years (10-min Interval, 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)[3]	
Operating Temperature	- 30°C ~ 70°C	
Relative Humidity	≤95% (Non-condensing)	
Ingress Protection	IP67	
Dimension	118 × 65 × 80 mm	
Housing	ABS + PC (UL94 V0)	

Color	Black gray (C050/C100), Gray (W050/W100)
Weight	C050&C100: 252.7g (Batteries included) W050&W100: 246.6g (Batteries included)
Installation	On the Flat Surfaces with Screws
Approvals	
Regulatory	CE, FCC
Environmental	RoHS

[1]This accuracy is applicable to the measuring range of 25~800cm.

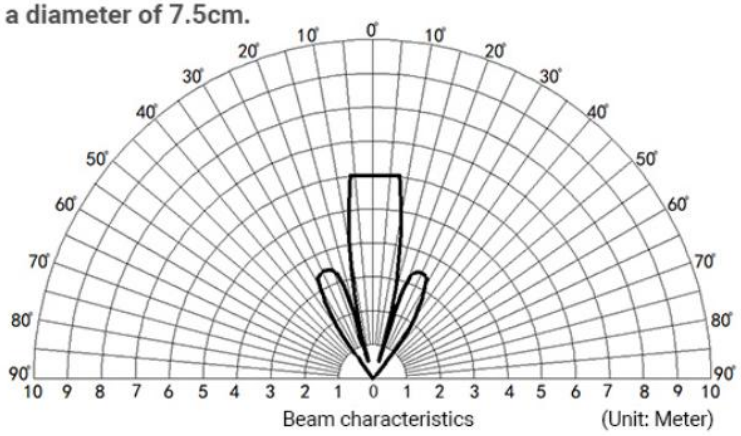
[2]Tested under laboratory conditions and for guideline purposes only.

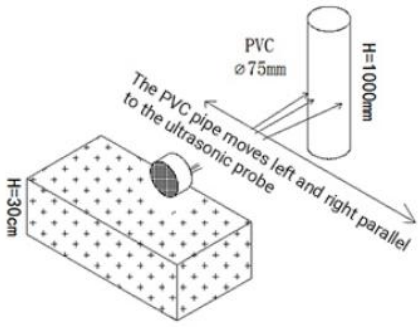
[3] PSM is required for SIM card and will be impacted by cellular base station signals.

◆ Beam Pattern

C050:

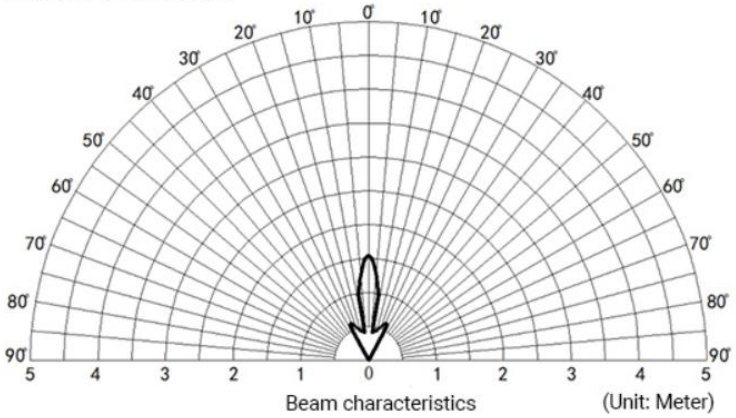
(1) The tested object is a white cylindrical tube made of PVC material, with a height of 100cm and a diameter of 7.5cm.

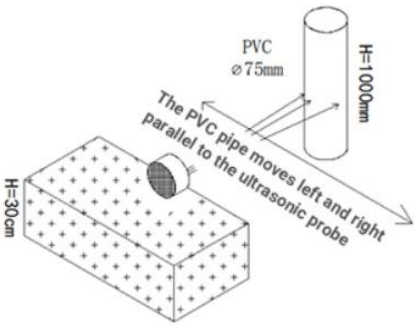




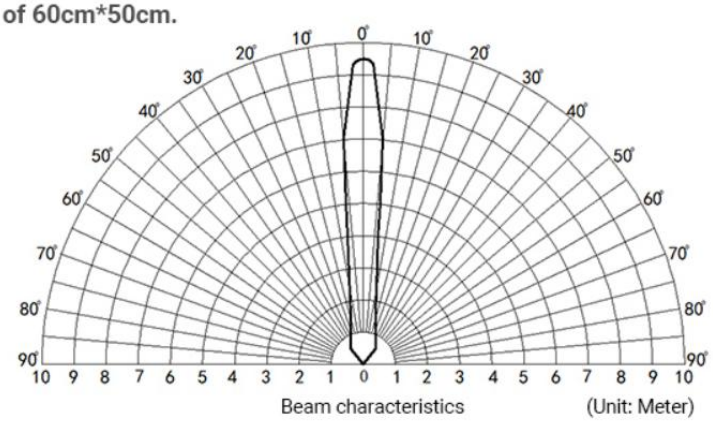
C100:

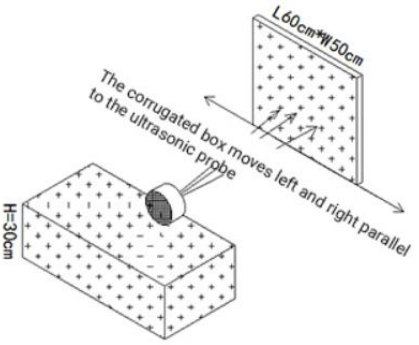
(1) The tested object is a white cylindrical tube made of PVC material, with a height of 100cm and a diameter of 7.5cm.



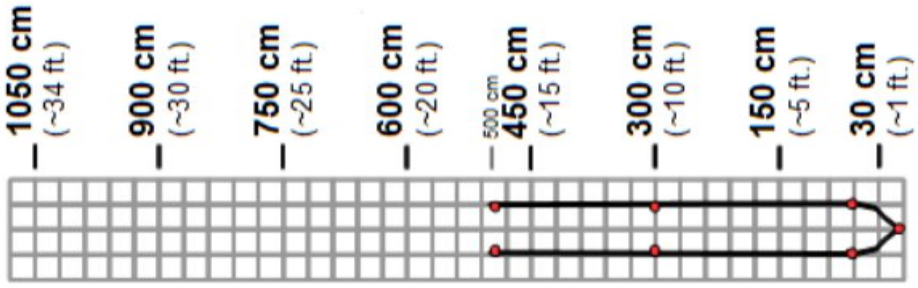


(2) The tested object is a corrugated box perpendicular to the 0° central axis, with a length * width of 60cm*50cm.



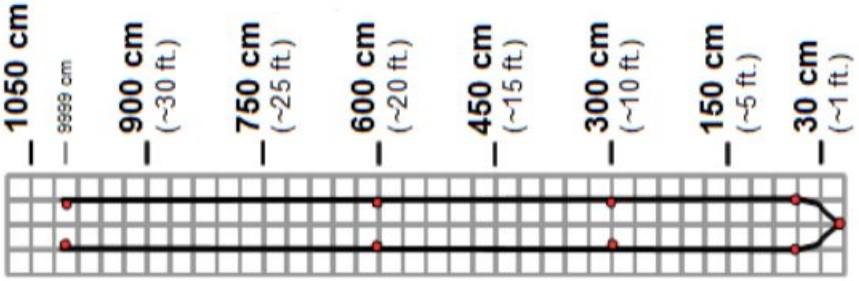


W050:



Typical beam pattern for 30cm target move left and right with the board parallel to the sensor face.

W100:



Typical beam pattern for 30cm target move left and right with the board parallel to the sensor face.

◆ Dimensions (mm)