



LoRaWAN® Ultrasonic Distance & Level Sensor

MacRay LUS X1



Introduction

The MacRay LUS X1 is an industrial-grade LoRaWAN® Ultrasonic Distance & Level Sensor designed for accurate non-contact measurement of distance, liquid level, material level, and object presence across industrial, agricultural, utility, and environmental monitoring applications.

Using advanced ultrasonic sensing technology, the device enables reliable real-time monitoring without physical contact, making it ideal for tanks, reservoirs, silos, waste bins, water systems, chemical storage, and industrial automation environments. The sensor continuously measures level and distance data while securely transmitting information over long-range LoRaWAN® networks.

Features

- Non-Contact Ultrasonic Distance Measurement
- Real-Time Liquid & Material Level Monitoring
- Configurable Sampling & Transmission Intervals
- Industrial-Grade Ultrasonic Sensing Technology
- High-Accuracy Distance & Level Measurement
- Compatible with Public & Private LoRaWAN® Networks & MacTalk Protocol

Key Advantages

- Ideal for Water Tank & Reservoir Monitoring
- Enables Smart Waste Bin Fill-Level Monitoring
- Supports Chemical & Industrial Storage Monitoring
- Enables Remote Monitoring Across Distributed Sites
- Supports Smart City & Utility Infrastructure Projects

Ultrasonic Measurement Specifications

| | |
|----------------------------|-------------------------|
| Sensor Type | Ultrasonic Level Sensor |
| Temperature Range | 3 – 450 cm |
| Blind Zone Distance | 3 cm |
| Accuracy | ±1% of FS |
| Resolution | 0.1 cm |
| Center Frequency | 40 kHz ± 1 kHz |
| Sensing Angle | 60° |
| Protection Rating (Sensor) | IP67 |
| Calibration | Factory Calibrated |

Wireless Specifications

| | |
|--------------------|---|
| Wireless Protocols | LoRaWAN® (v1.0.4), Macnman MacTalk Protocol |
| Antenna | Internal high-efficiency antenna |
| Supported Bands | IN865 / RU864 / EU868 / US915 / AU915 |
| Tx Power | 23 dBm @ 865 MHz |
| Sensitivity | -137 dBm @ 300 bps |
| LoRaWAN® Class | Class A (Default), Configurable to Class C via Maya |
| Device Activation | OTAA |
| Supported LNS | Private LNS ,Chirpstack ,The Things Networks , MQTT, Orbiwise |

Device Management

| | |
|----------------------|--|
| Configuration Method | Via Macnman Maya Android App |
| Local Configuration | BLE-Based Local Configuration |
| Remote Configuration | Over-the-Air Configuration (Downlink Commands) |
| Status LED | X 1 Internal Multi-Color LED |

Device Configuration Parameters

| | |
|------------------------|--|
| Data Reporting Mode | Periodic / Event-based / Hybrid |
| Transmission Interval | Independent uplink interval for optimized power consumption |
| Threshold-Based Alerts | Configurable level threshold for event-triggered transmission |
| Sampling Interval | Configurable data acquisition interval (e.g., 1 min to 24 hours) |

Power & Battery Performance

| | |
|--|--|
| Power Supply | Integrated 8 Ah Lithium Battery |
| Battery Type | Lithium Thionyl Chloride (Li-SOCl ₂) |
| Estimated Battery Life at 25 °C | |
| 5-minute reporting interval | ~1 year |
| 15-minute reporting interval | ~2 years |
| 60-minute reporting interval | ~4+ years |

Physical & Environmental Specifications

Enclosure & Mechanical

| | |
|-------------------|-----------------------|
| Material | Glass Filled Nylon |
| Protection Rating | IP65 |
| Dimensions | 96 mm X 96 mm X 28 mm |
| Weight | ~175 g |

Mounting & Installation

| | |
|-----------------------------|-----------|
| Wall - Mounted Installation | Supported |
| Pole - Mounted Installation | Supported |

Environmental Conditions

| | |
|-----------------------|-------------------------------|
| Operating Temperature | -40°C to +80°C |
| Operating Humidity | 0% to 95% RH (non-condensing) |

Regulatory Certifications & Compliance

| | |
|------------------------|----------------|
| Wireless Certification | WPC |
| Environmental | RoHS compliant |

What's in the Box?

- MacRay Model
- Mounting Clip
- User Manual
- Warranty Card
- IP68 Cable Extender *
- Mounting Screws
- Power Adapters *

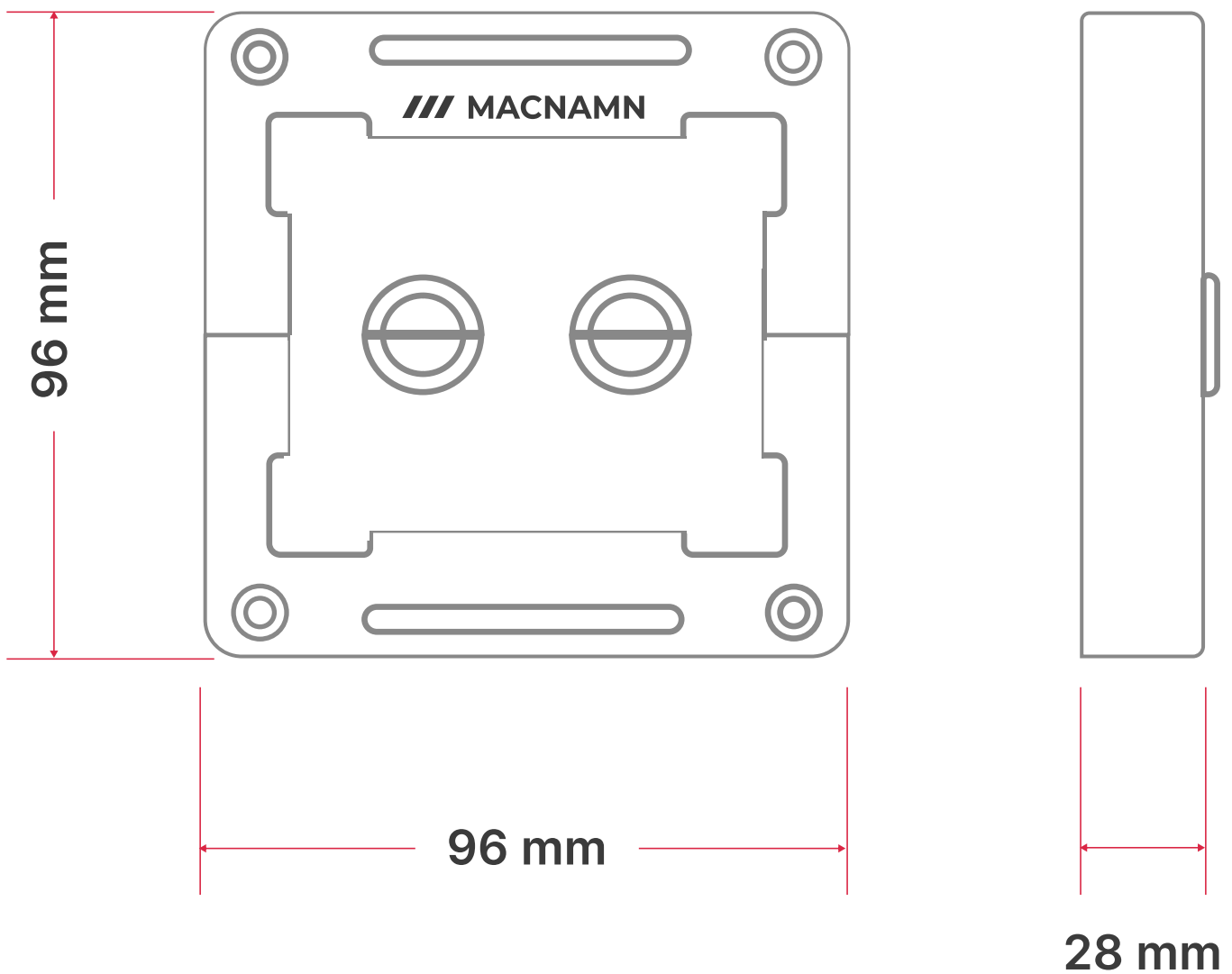
Models & Ordering Information

| Variant Name | Power Source |
|------------------|---------------------------------|
| MacRay LUS X1 PO | External Power (9–36 V DC) |
| MacRay LUS X1 BO | Integrated 8 Ah Lithium Battery |

Notes

- Power operated models are only available with external probe option
- (*) Marked accessories must be purchased separately

Device Dimensions






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