



LoRaWAN® Soil pH Sensor

MacSync LSS X4

LoRaWAN® soil pH sensor for real-time soil acidity monitoring with long-range wireless connectivity and precision agriculture intelligence.



Introduction

The MacSync LSS X4 is an industrial-grade LoRaWAN® Soil pH Sensor designed for continuous real-time monitoring of soil pH levels across smart agriculture, greenhouse, irrigation, plantation, horticulture, and precision farming applications. Built for harsh outdoor agricultural environments, the sensor enables farmers and agricultural teams to monitor soil acidity and alkalinity conditions remotely using long-range LoRaWAN® connectivity.

With rugged IP68 sensor construction, ultra-low power architecture, configurable threshold alerts, BLE-based configuration, and compatibility with public and private LoRaWAN® networks, the MacSync LSS X4 delivers scalable wireless soil intelligence for fertilizer optimization, crop health monitoring, irrigation management, and data-driven agricultural operations.

Features

- Real-Time Soil pH Monitoring
- High Stability Soil Acidity Measurement
- Fast Sensor Response Characteristics
- Corrosion-Resistant Agricultural Probe Design
- Configurable Threshold-Based pH Alerts
- Compatible with Public & Private LoRaWAN® Networks & Macman MacTalk Protocol
- Rugged IP68 Waterproof Soil Probe

Key Advantages

- Helps Maintain Optimal Soil Conditions for Crop Growth
- Supports Precision Fertilizer & Nutrient Management
- Improves Crop Productivity & Soil Health Monitoring
- Enables Better Irrigation & Soil Treatment Decisions
- Reduces Manual Soil Testing & Field Inspection Requirements

pH Sensor Measurement Specifications

Range	3 – 9 pH
Accuracy	±0.3 pH
Resolution	0.01 pH
Response Time (T90)	< 15 Second
Operating Temperature	-20°C to +60°C
Operating Humidity	5% ~ 95% RH
Long-term Stability	≤5%/year

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 Network , 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	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 pH Thresholds for Event-Triggered Transmission
Sampling Interval	Configurable data acquisition interval (e.g., 1 min to 24 hours)

Power & Battery Performance

Power Supply	Integrated Battery - 19,000 mAh
Battery Type	Lithium Thionyl Chloride (Li-SOCl ₂)
Estimated Battery Life at 25 °C	
5-minute reporting interval	~2 years
15-minute reporting interval	~4 years
60-minute reporting interval	~6+ years

Physical & Environmental Specifications

Enclosure & Mechanical

Material	Glass Filled Nylon
Protection Rating	IP65
Dimensions	152 mm X 62 mm X 43 mm (Without Sensor Probe)
Weight	~175 g

Mounting & Installation

Wall - Mounted Installation	Supported , With Clip
Pole - Mounted Installation	Supported , Without Clip

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?

- MacSync LSS X4 Sensor
- Mounting Clip
- User Manual
- Warranty Card
- IP68 Cable Extender *
- Mounting Screws
- Power Adapters *

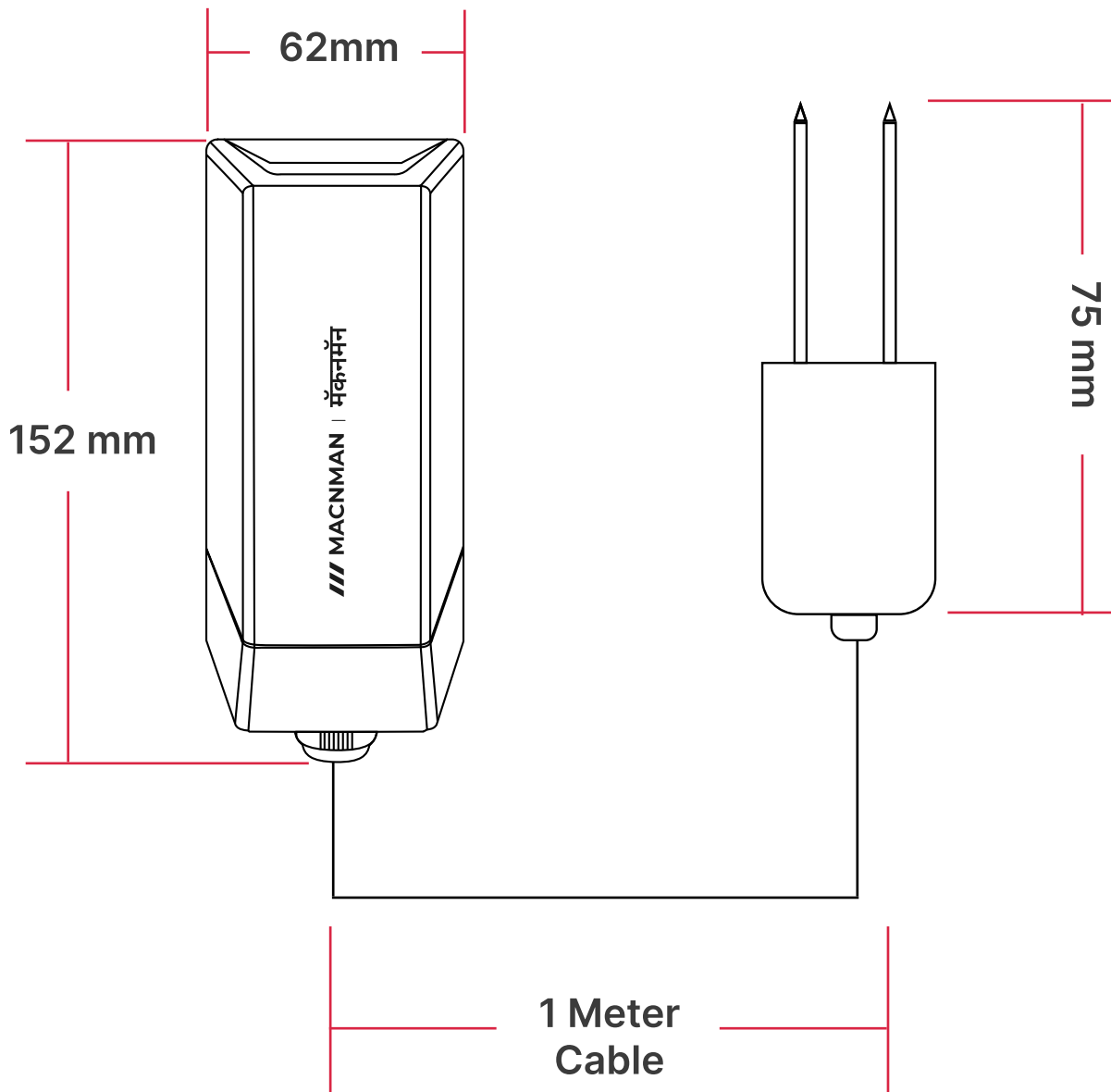
Models & Ordering Information

Variant Name	Power Source	SKU
MacSync LSS X4 BO	Integrated Battery - 19,000 mAh	838
MacSync LSS X4 SO	20 W Solar Panel with 8000 mAh Battery	839

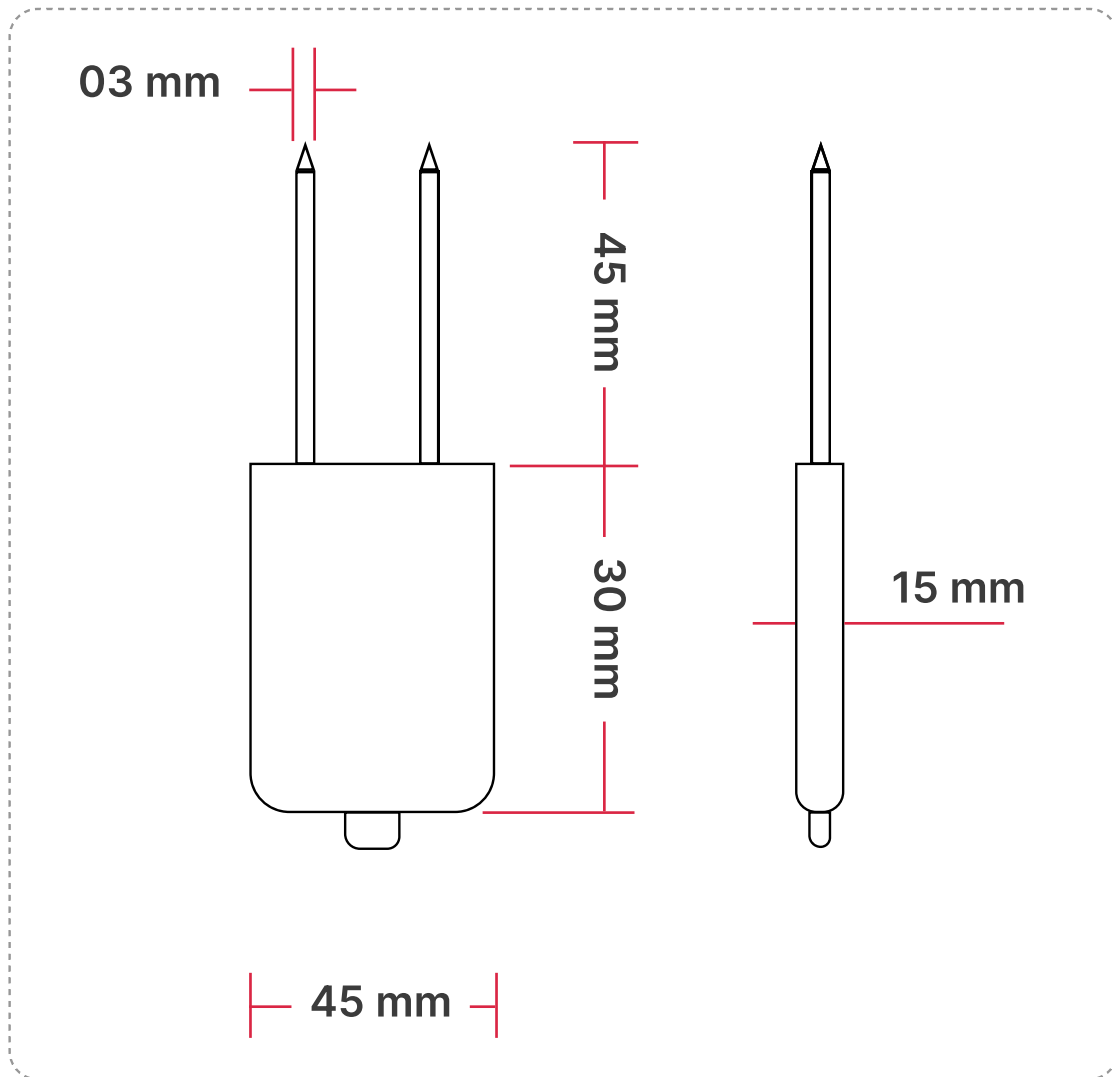
Notes

- Power-operated variants require external DC power input & external sensor probe
- (*) Marked accessories must be purchased separately

Device Dimensions



Device Dimensions






Sensor Probe

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के अवसर के लिए धन्यवाद भवतः सेवायाः अवसरस्य कृते धन्यवादः तमारी सेवा करवानी

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