



LoRaWAN® 7-in-1 Multi-Parameter Soil Sensor

MacSync LSS X5



Introduction

The MacSync LSS X5 is an industrial-grade LoRaWAN® 7-in-1 Soil Sensor designed for continuous real-time monitoring of critical soil parameters including soil moisture, soil temperature, electrical conductivity (EC), pH, and soil nutrients across smart agriculture, greenhouse, irrigation, plantation, and precision farming applications. Built for harsh outdoor environments, the sensor enables farmers and agricultural teams to remotely monitor soil conditions and optimize crop performance using long-range LoRaWAN® connectivity.

With rugged IP-rated construction, ultra-low power architecture, configurable threshold alerts, BLE-based configuration, and compatibility with public and private LoRaWAN® networks, the MacSync LSS X5 delivers scalable wireless soil intelligence for data-driven agriculture, irrigation optimization, and smart farming infrastructure.

Features

- 7-in-1 Real-Time Soil Parameter Monitoring
- Simultaneous Monitoring of Moisture, Temperature, EC, pH & NPK
- Industrial-Grade Soil Probe for Outdoor Deployments
- High-Stability Soil EC & Nutrient Measurement
- Precision Agriculture Ready Sensor Architecture
- LoRaWAN® & Macnman MacTalk Protocol Support (Device to Device Communication)
- Stable Performance in Industrial & Outdoor Environments

Key Advantages

- Enables Precision Irrigation Based on Real-Time Soil Conditions
- Supports Fertilizer Optimization Using NPK & EC Analytics
- Ideal for Greenhouses, Open Farms & Polyhouse Deployments
- Reduces Manual Soil Testing & Field Inspection Requirements
- Ideal for High-Value Crops & Controlled Farming Environments

Soil Sensor Measurement

	Range	Accuracy	Resolution	Repeatability
Temperature	-45°C to +115°C	±0.5°C	0.1°C	±0.2°C
Moisture	0% – 100% RH	±5%	0.1% RH	±1% RH
pH	3 – 9 pH	±0.3 pH	0.1 pH	±0.1 pH
NPK	0 – 1999 mg/kg	±2% F.S	1 mg/kg	±1% F.S
EC	0 – 10000 µS/cm	±3% F.S	10 µS/cm	±1% F.S

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)
Cloud-Based	Configuration via Macnman IoT platform *
Status LED	1 x 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 parameter 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 , Optional Solar Panel
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	~7+ years

Physical & Environmental Specifications

Enclosure & Mechanical

Material	Glass Filled Nylon
Protection Rating	IP 65
Dimensions	152 mm X 62 mm X 43 mm (Without Sensor Probe)
Weight	~175 g

Mounting & Installation

Wall-mounted installation	Yes , With Clip
Pole - mounted installation	Yes , 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 X5 Sensor
- Mounting Clip
- User Manual
- Warranty Card
- IP68 Cable Extender *
- Mounting Screws
- Power Adapters *

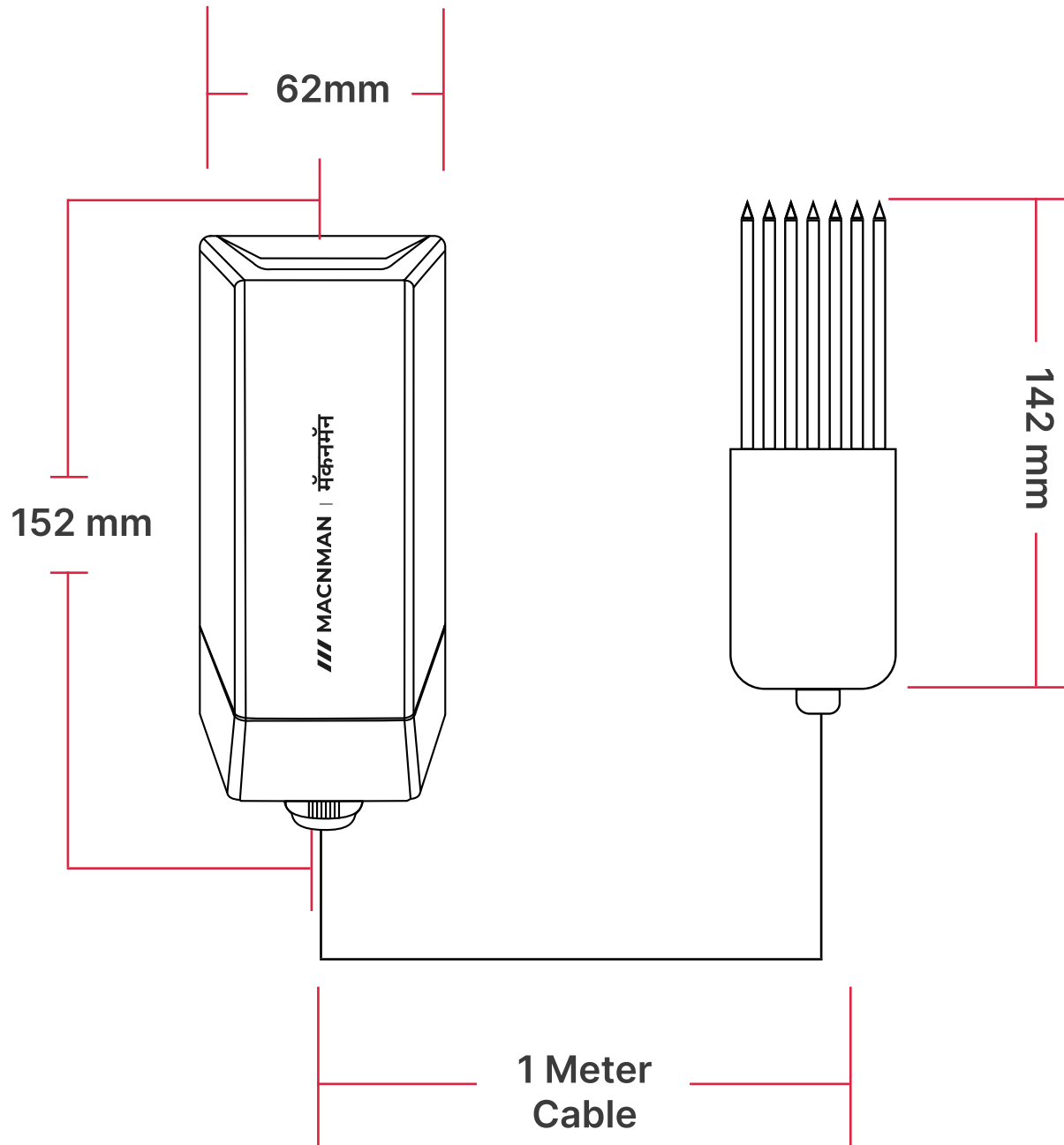
Models & Ordering Information

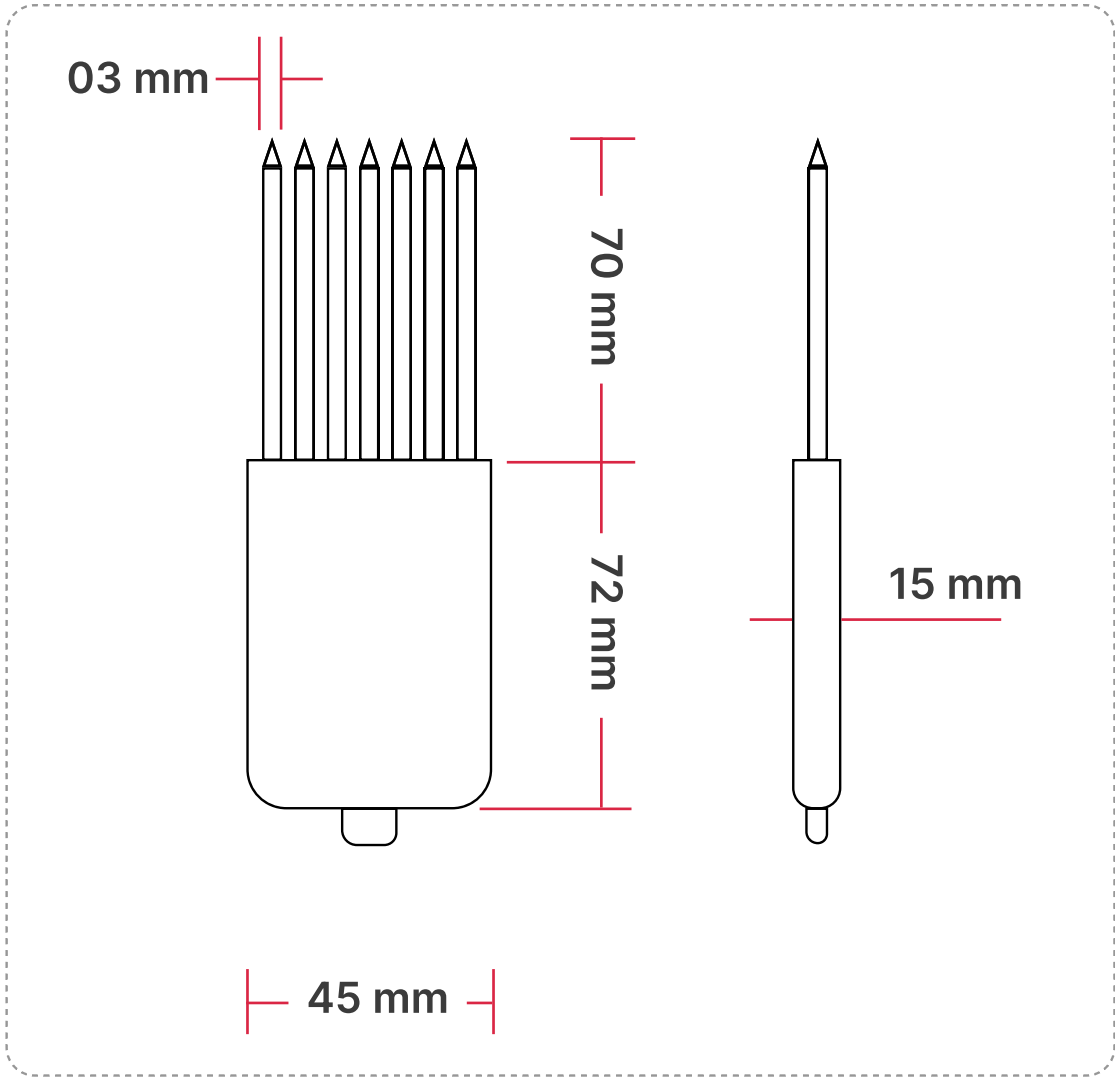
Variant Name	Power Source	SKU
MacSync LSS X5 BO	Integrated Battery - 19,000 mAh	830
MacSync LSS X5 SO	20 W Solar Panel + 8000 mAh Battery	831

Notes

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

Device Dimensions








Sensor Probe

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