

Ladybird - Model S

Environmental Sensing & Control Hub

Product Overview

The Ladybird S is a comprehensive multi-sensor IoT hub designed for agricultural and environmental monitoring. It integrates built-in sensors for air temperature, relative humidity, and an 11-channel spectrometer for advanced light analysis including PPFD/PAR and spectrum reconstruction (380-1000nm). The unit features three expansion ports supporting automation control, Modbus/RS485 sensors, and analog soil probes.

With LoRaWAN connectivity providing up to 10km range, long battery life (up to 5 years), and a fully weatherproof rugged design, the Ladybird S serves as the central hub for precision agriculture monitoring systems. All settings and data are managed via the Ladybird IoT Dashboard, which provides data visualisation, export, alerts, automated reporting, forecast and prediction features.

Applications

- Precision agriculture and smart farming
- Greenhouse and polytunnel climate monitoring
- Crop growth monitoring with light spectrum analysis
- Irrigation automation and scheduling
- Soil health and nutrient monitoring
- Weather station integration (wind, rain)
- Water level monitoring for tanks, troughs, and run-off
- Frost and environmental alert systems
- Research and field trials



Built-in Sensors

Air Temperature Range	-40 to +125°C
Air Temperature Accuracy	±0.3°C typical (at 0 to +90°C)
Relative Humidity Range	0 - 100% RH
Relative Humidity Accuracy	±3% RH typical (at 0-100% RH)
Spectrometer	11-channel (380-1000nm)
Light Metrics	Illuminance, Irradiance, Radiation, DLI, PPFD/PAR
Spectrum Reconstruction	Fine course within 380-1000nm, wide range intensity
Accelerometer	3-axis motion detection (x, y, z)
Orientation Detection	Pitch, roll, yaw

Connectivity & Power

Wireless Protocol	LoRaWAN
Wireless Range	Up to 10km (line of sight)
Power Source	6x replaceable AA batteries
Battery Life	Up to 5 years (depending on usage)



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Physical Specifications

Dimensions	145mm (L) × 135mm (W) × 91mm (H)
Weight	650g
Case Material	PC+ABS (UV stabilised)
Protection	Dust and water immersion resistant, rugged design
Operating Temperature	-20°C to +60°C
Installation	Wall mounting or pole mounting

Expansion Ports

The Ladybird S features four M12 connector ports for expansion and connectivity:

Port 1 - Automation	Turn ON/OFF existing systems (irrigation, lighting, ventilation)
Port 2 - Modbus/RS485	Connect RS485 sensors (water level, anemometer, soil probes, etc.)
Port 3 - Analog Sensors	Connect analog soil probes (e.g., Delta-t SM150T)
Port 4 - Program/Test	Programming interface and additional power supply input

Compatible RS485 Sensors (Port 2)

The following Modbus/RS485 sensors can be connected to Port 2:

Water Level Transmitters

Sensor Type	Model	Measurement Range	Accuracy
Water Level (1m)	WL23010	0 - 1.0m depth	±0.5% FS
Water Level (3.5m)	WL26035	0 - 3.5m depth	±0.5% FS
Water Level (Custom)	Other	Custom ranges available	±0.5% FS

Anemometer (Wind Speed & Direction)

Sensor Type	Model	Measurement Range	Accuracy
Wind Speed	WS0002	0 - 45 m/s	±(0.3+0.03V) m/s
Wind Direction	WS0002	0 - 360°	±3°
Start-up Speed	WS0002	-	≤0.3 m/s



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Leaf Temperature & Wetness Sensor

Sensor Type	Model	Measurement Range	Accuracy
Leaf Temperature	LTH0002	-30 to +70°C	±1°C
Leaf Wetness	LTH0002	0 - 100% RH	±3% RH

Rain Gauge

Sensor Type	Model	Measurement Range	Accuracy
Rainfall	RG0002	0 - 100mm per day	±3% FS
Rainfall Intensity	RG0002	0.01 - 4mm/min	-

8-in-1 Soil Probe

Sensor Type	Model	Measurement Range	Accuracy
Soil Temperature	SS8102	-30 to +70°C (operating temp: -30 to +70°C)	±0.2°C
Soil Moisture	SS8102	0 - 100%	±2% (0-50%)
Salinity	SS8102	0 - 20,000 mg/L	±3% FS
Conductivity (EC)	SS8102	0 - 20,000 µS/cm	±3% FS
pH	SS8102	3 - 10	±1
Nitrogen (N)	SS8102	0 - 1,999 mg/kg	±3% FS
Phosphorus (P)	SS8102	0 - 1,999 mg/kg	±3% FS
Potassium (K)	SS8102	0 - 1,999 mg/kg	±3% FS

3-in-1 Soil Probe

Sensor Type	Model	Measurement Range	Accuracy
Soil Temperature	SS3102	-30 to +70°C (operating temp: -30 to +70°C)	±0.2°C
Soil Moisture	SS3102	0 - 100%	±2% (0-50%)
Conductivity (EC)	SS3102	0 - 20,000 µS/cm	±3% FS



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Compatible Analog Sensors (Port 3)

Sensor Type	Model	Measurement Range	Accuracy
Soil Moisture	Delta-t SM150T	0 - 100%	±3% (mineral/organic soil)
Soil Temperature	Delta-t SM150T	±0.5 °C (0 to +40 °C)	±0.75 °C (-20 to +60 °C)

Device Features

Physical features of the Ladybird S unit:

- Fully weatherproof enclosure - small footprint, waterproof and UV resistant
- Temperature & humidity sensor - integrated sensor for air monitoring
- Spectrometer dome - collects light and solar radiation data
- Power button & LED indicators - status and connectivity feedback
- Mounting plates - wall and pole mounting accessories
- Four M12 connector ports - automation, Modbus sensors, analog sensors, programming

Ladybird IoT Dashboard

The Ladybird S is fully managed via the web-based Ladybird IoT Dashboard, providing:

- Real-time data visualisation with customisable views
- Data export functionality for analysis and reporting
- Configurable alerts and notifications
- Automated reporting capabilities
- Forecast and prediction features
- Programmable automation rules for connected equipment
- Device settings and configuration management

Installation Notes

- Mount using wall plate or pole plate (both available as accessories)
- Position spectrometer dome facing upward for accurate light readings
- Ensure temperature/humidity sensor opening is not obstructed
- Connect external sensors via M12 connectors to appropriate ports
- Configure device settings and monitoring via Ladybird IoT Dashboard
- Ensure adequate LoRaWAN gateway coverage for reliable connectivity

Certifications & Compliance

CE | UKCA | RoHS



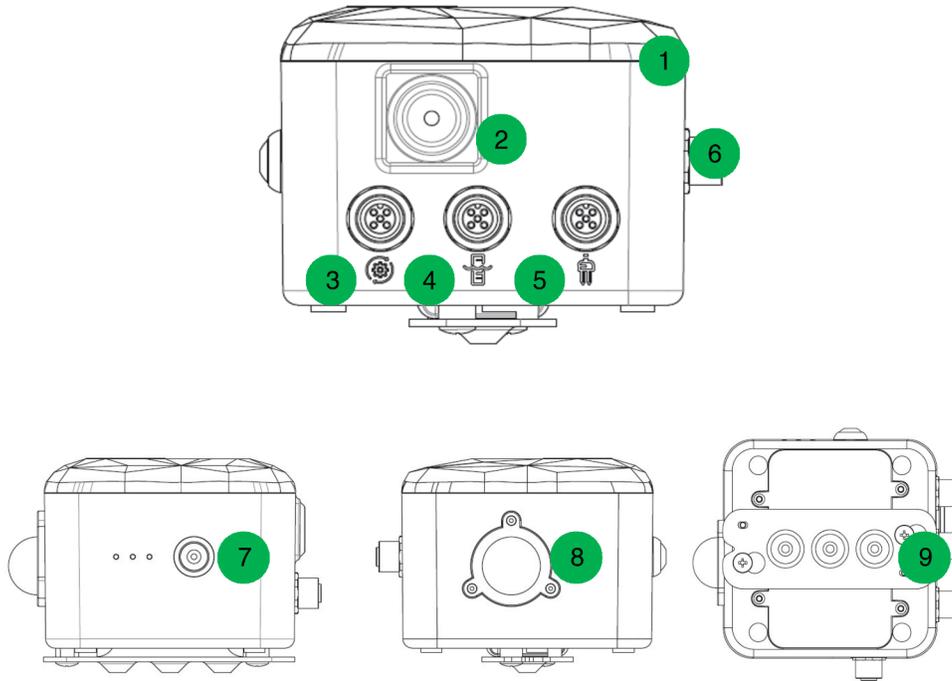
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Technical data sheet / Classification: Private
support.ladybirdiot.com

For more information: www.ladybirdiot.com

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- 1 FULLY WEATHERPROOF**
Small footprint, waterproof & UV resistant
- 2 TEMPERATURE & HUMIDITY SENSOR**
collects air temperature and relative humidity data
- 3 AUTOMATION CONTROL**
via M12 Connector
- 4 WATER LEVEL TRANSMITTER**
via M12 Connector
- 5 SOIL PROBE**
via M12 Connector
- 6 PROGRAM/TEST & ADDIT. POWER SUPPLY PORT**
via M12 Connector
- 7 POWER BUTTON & LEDS INDICATORS**
- 8 SPECTROMETER**
collects light and solar radiation data
- 9 MOUNTING PLATE**
wall and pole plates available



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