



The MX2311 pairs research-grade sensing of multiple growing parameters with wireless convenience, integrating the renowned LI-COR LI-200R pyranometer and LI-300/350 volumetric water content (VMC)/ soil electrical conductivity (EC) sensors that deliver key measurements with scientific-grade accuracy (calibration uncertainty of $\pm 3\%$ typical).

This all-in-one device captures a comprehensive climate picture, describing the root-zone conditions that most directly influence water uptake, nutrient movement, plant stress, and irrigation decisions. VWC tells you whether the root zone has enough water. Soil EC tells you whether dissolved salts in that water are becoming too concentrated. Combining an external LI-200R pyranometer (measuring total solar irradiance in the 400–1100 nm range) and LI-300 Soil Moisture sensor, along with built-in temperature and relative humidity sensors, this multiparameter logger enables the calculation of critical metrics such as Accumulated Solar Radiation (MJ/m^2), Daily Light Integral (DLI of Solar, $\text{MJ}/\text{m}^2/\text{day}$), Vapor Pressure Deficit (VPD, kPa), Electrical Conductivity (EC), Volumetric Water Content (VWC) and Dew Point. Providing laboratory-quality measurements of solar climate conditions in an affordable, mobile logger, the rugged, battery-powered MX2311 is easily deployed and expands monitoring capabilities to an even broader range of environmental and energy applications.

IMPORTANT NOTE: For mounting, an M-PLT and 2003S Leveling Fixture are required. Mounting to poles or pipes require an M-BRK and 2003S.

Users can mount the sensor in the field, and setup and data retrieval are seamlessly simple—no cables or additional download devices needed using the free HOBObconnect app on your phone or tablet. Effortlessly configure the logger and download data via Bluetooth (up to a 100 ft range), which allows you to deploy in and download data from hard-to-reach spots.

Expand your remote monitoring by adding an MX Data Plan, which allows you to upload data to LI-COR Cloud remote software for further analysis, sharing, and more.

Features:



Wireless Bluetooth Data Offload
Fast, easy logger setup and download via phone or tablet (up to ~100 ft range)



Research-grade Solar Radiation Measurements
irradiance in the 400–1100 nm range with $\pm 3\%$ typical calibration uncertainty



Integrated Temp & RH Monitoring
Logged temperature and humidity alongside solar radiation for a complete view of environmental conditions



Rugged, Weatherproof Design
Durable IP67/NEMA 6 housing stands up to humid, wet, and dusty environments found in greenhouses, growth chambers, or outdoor field sites



Long Battery Life & Memory
User-replaceable battery lasts up to ~2+ years and ample data storage supports extended deployments



Alarms and Alerts
See out-of-range conditions with logger's LED readout, and configure threshold alerts using HOBOnnect for proactive monitoring



Easy Deployment
Users can deploy the logger in minutes, configure logging intervals via the HOBOnnect app, and wirelessly retrieve data (without a laptop) in the field!

Technical Specifications:

Temperature Sensors

Range	: -40 to 70°C (-40 to 158°F)
Accuracy	: ± 0.2 °C (typical) within -40 to 70 °C
Resolution	: 0.008°C (0.014 °F)
Drift	: <0.01°C (0.018°F) per year
Response Time* Without Solar Radiation Shield	: 17 minutes in air moving 1 m/sec
Response Time* With Solar Radiation Shield	: 24 minutes in air moving 1 m/sec

Relative Humidity (RH) Sensor

Range	: 0 to 100% RH, -40° to 70 °C exposure to conditions below -20°C (-4°F) or above 95% RH may temporarily increase the maximum RH sensor error by an additional 1%
Accuracy	: $\pm 2.5\%$ from 10% to 90% (typical) to a maximum of $\pm 3.5\%$ including hysteresis at 25°C (77°F); below 10% RH and above 90% RH $\pm 5\%$ typical
Resolution	: 0.01% RH
Drift	: <1% per year typical
Response Time* Without Solar Radiation Shield	: 30 seconds in air moving 1 m/sec
Response Time* With Solar Radiation Shield	: 40 seconds in air moving 1 m/sec
Calculated Metrics	: Vapor Pressure Deficit (VPD) in kPa, and Dew Point (computed from logged data)

Soil Moisture: Volumetric Water Content (VWC)

Measurement Range

(select one at configuration)**** : 0.00 to 1.0 m³/m³ VWC in mineral soils
0.00 to 1.0 m³/m³ VWC in soilless media
Apparent Dielectric Permittivity: 1 (air) to 80 (water)

Accuracy : ±0.03 m³/m³ typical
±0.06 m³/m³ maximum
Apparent Dielectric Permittivity: ±1 ε_a

Resolution : 0.001 m³/m³
Apparent Dielectric Permittivity: 0.002 ε_a

Dielectric Measurement Frequency: 70 MHz

Volume of Influence : 1400 ml

Percent of Field Capacity

(for VWC measurements only) : Range: 0 to 200%
Resolution: 0.1%

Soil Temperature*****

Measurement Range : -40 to 70°C (-40 to 158°F)

Accuracy : ±0.5°C from -40° to -20°C
±0.3°C from -20°C to 70°C

Resolution : 0.1°C (0.18°F)

Soil Bulk Electrical Conductivity (EC)

Measurement Range : 0 to 20000 μS cm⁻¹

Accuracy : ±5 % from 0 to 10000 μS cm⁻¹
±8 % from 10000 to 20000 μS cm⁻¹

Resolution : 1 μS cm⁻¹

Global Solar Radiation (GSR) Sensor

Range : 0 to 1280 W/m² (full sunlight)

Accuracy : ±3% typical, ± 5% maximum (LI-200R Absolute Calibration)***

Offset : ± 0.5 W/m²

Resolution : 0.05 W/ m²

Spectral Range : 400–1100 nm

Linearity : Maximum deviation of 1%

Stability : ≤ 2% change over one year

Temperature : -40 to 65°C (-40 to 149°F)

Temperature Dependence : ±0.15% per °C maximum

Cosine Correction : Cosine corrected up to 82° angle of incidence

Azimuth : ≤±1% error over 360° at 45° elevation

Tilt : No error induced from orientation

Detector : High stability silicon photovoltaic detector (blue enhanced)

Sensor Housing : Weatherproof anodized aluminum case with acrylic diffuser and stainless steel hardware. O-ring seal on the sensor base.

Sensor Size : 2.36 cm diameter x 3.63 cm (0.95" x 1.43")

Cable Length : 1.8 m

Calculated Metrics : Accumulated solar radiation in MJ/m², daily light integral (DLI) of solar

Logger

Operating Range	: -40 to 70°C (-40 to 158°F)
Radio Power	: 1mW (0 dBm)
Transmission Range	: Approximately 30.5 m (100 ft) line-of-sight
Wireless Data Standard	: Bluetooth Low Energy (Bluetooth Smart)
Logging Rate	: 1 second to 18 hours
Logging Modes	: Fixed interval (normal, statistics) or burst
Memory Modes	: Wrap when full or stop when full
Start Modes	: Immediate, push button, date & time, or next interval
Stop Modes	: When memory is full, push button, date & time, or after a set logging period
Time Accuracy	: ±1 minute per month 0° to 50°C (32° to 122°F)
Battery Type	: 2/3 AA 3.6 Volt lithium, user replaceable
Battery Life	: 2 years, typical with logging interval of 1 minute and Bluetooth Always On enabled; 4 years, typical with logging interval of 1 minute and Bluetooth Always On disabled. Faster logging intervals and statistics sampling intervals, burst logging, remaining connected with the app, excessive downloads, and paging may impact battery life.
Memory	: 195,000 measurements, maximum
Full Memory Download Time	: Approximately 4-5 minutes; may take longer the further the device is from the logger
Dimensions	: Logger housing: 10.8 x 5.08 x 2.24 cm (4.25 x 2.0 x 0.88 in.) Soil moisture sensor (only): 4.6 x 4.6 x 10.9 cm (1.81 x 1.81 x 4.31 in) Soil moisture sensor needle length: 5.4 cm (2.14 in) Soil moisture sensor needle diameter: 0.40 cm (0.16 in) Sensor cable length: 2 m (6.56 ft)
Weight (Unpackaged)	: 333 g, 11.8 oz
Weight (Packaged)	: 490 g, 17.3 oz
Materials	: Acetal, silicone gasket, stainless steel screws Soil Moisture Sensor: ASA plastic body with polyurethane epoxy filling and stainless-steel pins Cable: PVC, UV resistant and rodent repellent (soil moisture sensor cable)
Environmental Rating	: Logger: NEMA 6 and Ip67 Soil Moisture sensor and cable: xxxx