CAMPBELL SCIENTIFIC®
WHEN MEASUREMENTS MATTER

LW110
Lightning Warning System

Overview

The LW110 continuously monitors local electric fields and triggers warnings when there is potential for lightning. Because warnings are based on electric field measurements instead of lightning strikes, the system can detect lightning danger, even when no other strikes have occurred.

By measuring the electric field at your location, the LW110 can be relied upon to remove the guesswork from critical decisions: 1) when to seek shelter as a storm approaches and 2) when it's safe to resume activities as a storm passes.

Benefits and Features

- Warning before the first strike—senses potential for lightning
- All clear notices when lightning threat has passed
- Up to 7 mile detection radius
- Visual and audible alarms
- PC, web, and email alarms when communication is added
- Optional SG000 Strike Detector—detects strikes up to 20 mile radius
- Optional meteorological sensors for expanded weather monitoring and logging
- Rugged construction
- Low power consumption
- Low maintenance—extensive diagnostics lets you know when maintenance is needed

LW110 Lightning Warning System

The basic LW110 Lightning Warning System requires a CS110 Electric Field Meter, an embedded CR1000M Measurement and Control Datalogger, and a pre-wired 14-inch-by-16-inch fiberglass enclosure. Besides the basic equipment, Campbell Scientific offers the following products that can be added to your LW110 system to fit your application's needs; contact Campbell Scientific for more information.

Mounting

The CS110 field meter and enclosure are mounted on a tripod or 2-inch IPS (2.4 inch OD) vertical pole. Several of the poles include a J-bolt mounting kit for securing the pole to a concrete pad. The J-bolt kits allow the user to more easily control the pole's placement.

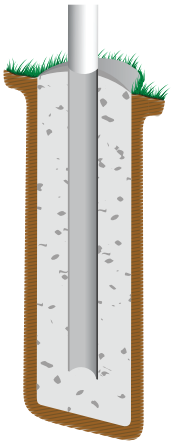
Tripod

- CM106B 7-to-10 ft Galvanized-Steel-Tubing Tripod
- CM110 10 ft Stainless-Steel Instrument Tripod

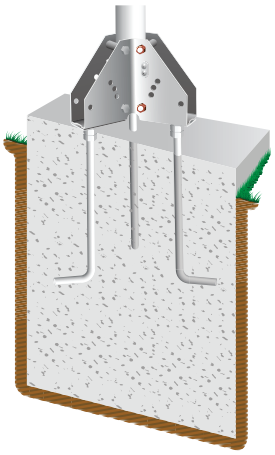
Pole

- CM500 10 ft, Galvanized-Steel Pole. Typically placed in a 2 ft hole that is back filled with concrete.
- CM505 8 ft Galvanized-Steel Pole with J-bolt mounting kit
- CM510 8 ft, 304 Stainless Steel Pole with J-bolt mounting kit. Its 304 stainless-steel pole is better looking and more resistive to corrosive agents than the CM505's galvanized pole.
- CM515 8 ft, 316L Stainless Steel Pole with J-bolt mounting kit. Its 316L stainless-steel pole does well in salty environments.

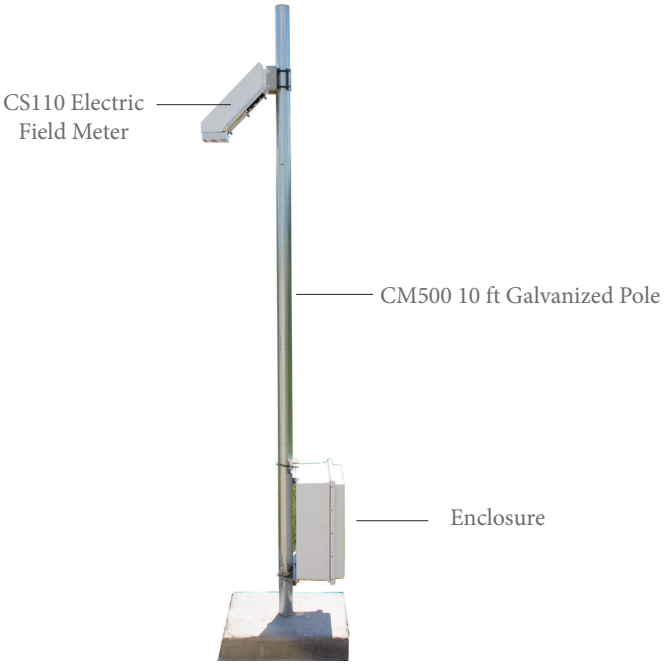
CM106B Galvanized-Steel and CM110 Stainless-Steel (shown above) Tripods are ideal for roof or temporary installations.



At left shows a typical installation of the CM500.



The CM505, CM510, and CM515 (at right) include a J-bolt kit that allows users to more easily control the pole's placement.



CM500-series poles are better for more permanent general installations.

Power Supply

Campbell Scientific offers both ac and solar power supply options. AC power is recommended when the system has the RA100 strobe and siren alarm. Our ac power supply options support 50 or 60 Hz and 100 to 240 Vac. They include a 12 Ah battery that keeps the system operational during ac power outages.

Solar power supply options are offered for systems where ac power is not available. Typically, the 50 W solar panel option is recommended. Contact Campbell Scientific for information on calculating a system's power budget.

- AC Power with 12 Ah battery and NEC compliant
- AC Power with 12 Ah battery and UL508A certification
- 20 W Solar Panel with 24 Ah battery
- 50 W Solar Panel with 84 Ah battery

Alarms

Visual and Audible

The LW110 can have one or more RA100s and/or RA110s that provide the following visual and audible alarms:

Type	Details	LED (SAE J845 class)	120 dB siren
Lightning Warnings	Lightning highly likely, imminent, or in progress.	Flashing red	Intermittent
Lightning Watches	Threat of lightning but occurrence not certain	Flashing yellow	--
All Clear	Lightning threat has passed	Flashing blue	--

The strobe and siren alarm pole (RA100) can be hardwired to the LW110 if the distance is less than 61 m (200 ft). If the distance is greater than 61 m (200 ft) then a communication option and the RA110 are required.

Computer, Web-Based, Email, Text (SMS)

These alarm methods require a communication option, software, and a user-supplied PC. Typically Campbell Scientific's LoggerNet and RTMC Pro will be needed. LoggerNetAdm is recommended when LoggerNet needs to run as a service on a server.

RA100 Remote Alarm

Communication

Campbell Scientific offers several communication options that support different communication distances.

Internet and IP Networks

- NL201 Network Link Interface

- *<0.5 km (<0.3 miles); two antenna options offered*

  NL241 WiFi Network Link

Fiber (plastic optical fiber needs to be in conduit)

- *<100 m (<330 ft)*

  FC100 Fiber Optic Converter (remote)
  FC100 Fiber Optic Converter (base)

Radio

- *<1.6 km (<1 mile) depending on antenna option*

  RF407 900 MHz Spread Spectrum Radio (remote)
  RF407 900 MHz Spread Spectrum Radio (base)

- *<21 km (<13 miles) depending on antenna option*

  RF451 900 MHz, 1 W Spread-Spectrum Radio (remote)
  RF451 900 MHz, 1 W Spread-Spectrum Radio (base)

- *<40 km (<25 miles); requires FCC license & frequency specific antenna*

  RF322 Narrowband Radio (remote)
  RF322 Narrowband Radio (base)

Customizations

Customizations include a lightning detector and meteorological sensors that can be connected to the CS110's connector panel.

Lightning Detector—Increase Active Storm Warning Time

- SG000 detector provides more evacuation time by detecting active storms over a greater range than the LW110 alone. The SG000 detects lightning strikes within a 20 mile radius. The SG000 is recommended for stadiums or large crowds.
- When the SG000 is combined with a radio telemetry option (RF407 or RF451), the antenna and SG000 must be 15 or 60 feet apart, respectively.

C1 Temperature and Relative Humidity Connector

HMP60 Temperature and Relative Humidity Probe

- Field replaceable chip
- RH Accuracy (0 to 90% RH): ±5% RH
- RH Accuracy (90% to 100% RH): ±7% RH

- Temperature Range: -40° to +60°C (-40° to +140°F)
- Requires 41303-5B 6-plate radiation shield with bracket for mounting to a 2.4 in. OD pole (at right)

C2 Wind Speed and Direction Connector

05103 Wind Monitor

- Includes CM220 Right Angle Mounting Kit and vertical pipe
- Requires the CM202SS or CM204SS Crossarm to mount to the tripod or pole

C3 Miscellaneous Connector

CS100 Barometer

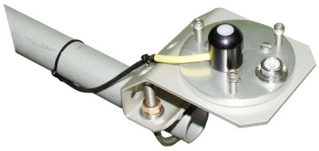
- Includes sensor cable
- Mounted and wired in the enclosure

GPS16X-HVS GPS Sensor for Clock Accuracy

- Clock Accuracy: ±10 µs
- Includes the 17212 GPS Magnetic Mount and CM235 Magnetic Mounting Stand
- Mounts to a tripod mast

CS300 Pyranometer (solar radiation)

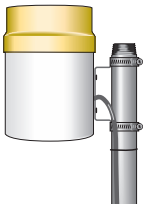
- Includes the 18356 leveling base, CM225 Solar Sensor Mounting Stand, 29200 vertical pipe, and CM220 Right Angle Mounting Kit
- Requires the CM202SS or CM204SS Crossarm to mount to the tripod or pole



C4 Rain Connector

TE525 Tipping Bucket Rain Gage

- Requires the CM305-PJ 47 in. mounting pole with J-bolt kit or a user-supplied pole



TB4 Tipping Bucket Raingage with Siphon

- Includes CM240 Leveling Base and Mount
- Requires the CM305-PJ 47 in. mounting pole with J-bolt kit or a user-supplied pole

CAMPBELL SCIENTIFIC
411 Bayswater Road | Garbutt, QLD 4814 | +61 (07) 4401 7700 | www.campbellsci.com.au
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