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# Evapotranspiration Monitoring Station

## Model ET107

Campbell Scientific's ET107 is an automated system designed for commercial agriculture and irrigation scheduling. The station calculates potential evapotranspiration ( $ET_0$ ), which is the amount of water lost from the soil due to evaporation and plant transpiration. Calculating a crop's evapotranspiration rate can aid in the development of an irrigation schedule that provides sufficient water for the crops without overwatering.

The ET107  $ET_0$  Station consists of meteorological sensors, a 3-m aluminum pole, and an environmental enclosure that houses a CR1000M module and a 7-Ahr sealed rechargeable battery. The battery is recharged via an AC transformer or a 10-W solar panel. Sealed circular connectors are provided on the outside of the enclosure to simplify sensor hook-up. Meteorological sensors included with the ET107 are the CS305-ET Solar Radiation Sensor, HMP50-ET Air Temperature and Relative Humidity Probe, TE525-ET Tipping Bucket Rain Gage, and either the 034B-ETM Wind Set or WindSonic1-ETM 2-D Sonic Wind Sensor. Data is typically telemetered via a short-haul or phone modem.

Configuration of the station requires selection of a charging source option, communication option, and wind sensor option; see Ordering Information provided below.

### Ordering Information

ET107 Evapotranspiration Monitoring Station

#### Charging Source Options (one required)

- AC AC Power Kit
- SP 10 W Solar Panel

#### Communication Device Options (one required)

- SH Short Haul Modem Kit
- PH Phone Modem Kit

#### Wind Sensor Options (one required)

- MW Met One 034B-ETM Wind Set w/Mount
- GW Gill WindSonic1-ETM 2-D Sonic Wind Sensor w/Mount

### Additional Sensors

For the following sensors, enter the lead length, in feet, after the -LC.

- 107-LC Soil Temperature Probe (-35° to +50°C)
- 108-LC Soil Temperature Probe (-5° to +95°C)
- CS616-LC Soil Water Content Reflectometer

### Alternative Data Retrieval Methods

Digital cellular phones, spread spectrum radios, and voice synthesized modems may be used for some applications; contact Campbell Scientific for more information.



The ET107 provides real-time weather measurements and calculates  $ET_0$  on an hourly and daily basis.

## Specifications

### CR1000M Measurement and Control Module (without wiring panel)

Temperature Range: -25° to +50°C

Accuracy of Voltage Measurement:  $\pm(0.06\%$  of reading + offset), 0° to +40°C;  $\pm(0.12\%$  of reading + offset), -25° to 50°C

Memory: 2 Mbytes Flash for operating system; 2 Mbytes for CPU usage, program storage, and data storage

Power Supply Requirements: 9.6 to 16 Vdc

Typical Current Drain: ~0.6mA (sleep mode);  
1 to 16 mA (w/o RS-232 communication);  
17 to 28 mA (w/RS-232 communication)

### HMP50-ET Air Temperature and Relative Humidity Probe (includes radiation shield)

Measurement Range: -25° to +60°C; 0 to 98% RH

Temperature Sensor: 1000 ohm Platinum Resistance Thermometer

Temperature Accuracy:  $\pm 0.8^\circ\text{C}$

Relative Humidity Sensor: Vaisala's INTERCAP capacitive chip

RH Accuracy:  $\pm 3\%$ , 0 to 90% range;  $\pm 5\%$ , 90 to 98% range

### TE525-ET Tipping Bucket Rain Gage

Sensor: Magnetic reed switch

Orifice: 6.0" diameter

Sensitivity: 1 tip per 0.01" (0.25 mm)

Accuracy:  $\pm 1\%$  accuracy @ 2" per hr (50.8 mm per hr) or less

### CS305-ETM Pyranometer with Mount

Sensor: Silicon photocell

Accuracy:  $\pm 5\%$  for daily total radiation

Output: 0.2 mV per  $\text{W m}^{-2}$

### 034B-ETM Wind Set w/Mount

Sensor: Cup anemometer (wind speed), vane (wind direction)

Wind Speed Range: 0 to 49.5  $\text{m s}^{-1}$  with a starting threshold of 0.4  $\text{m s}^{-1}$

Wind Direction Range: 0° to 360° mechanical; 0° to 356° electrical

Wind Speed Accuracy:  $\pm 0.11 \text{ m s}^{-1}$  when less than 10.1  $\text{m s}^{-1}$ ;

$\pm 1.1\%$  of true when greater than 10.1  $\text{m s}^{-1}$

Wind Direction Accuracy:  $\pm 4^\circ$

### WindSonic1-ETM 2-D Sonic Wind Sensor w/Mount

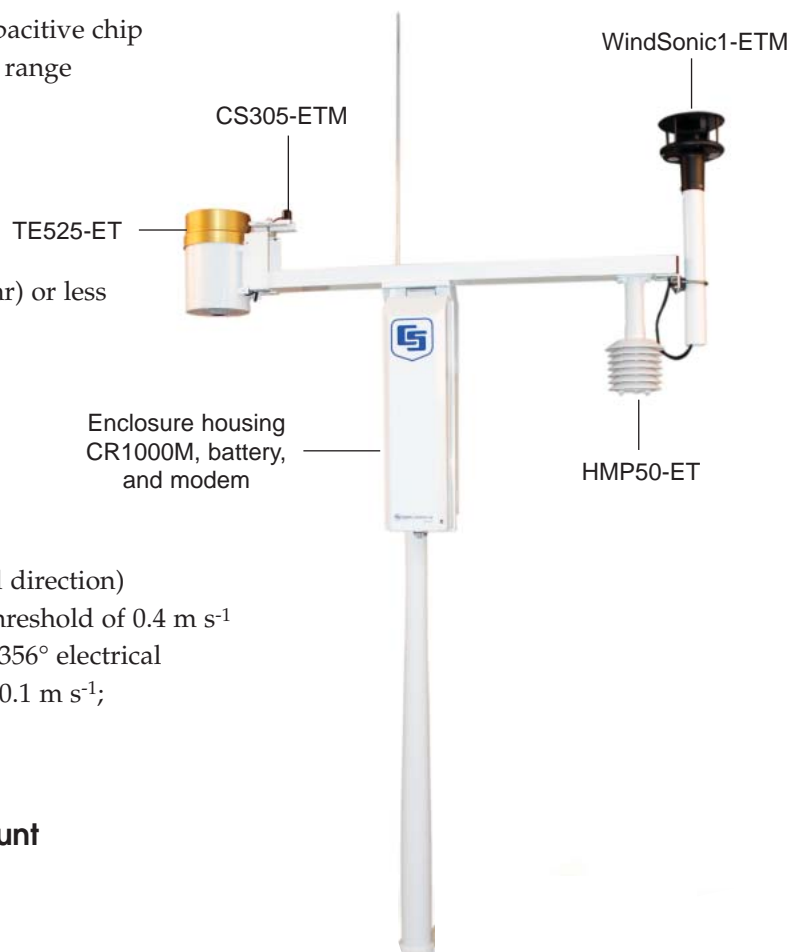
Sensor: 2-D ultrasonic anemometer

Wind Speed Range: 0 to 60  $\text{m s}^{-1}$

Wind Direction Range: 0° to 360°

Wind Speed Accuracy:  $\pm 2\%$  of reading

Wind Direction Accuracy:  $\pm 3^\circ$



#### NOTES:

1. Additional specifications are provided on our CS300, HMP50, TE525, 034B, WindSonic, and CR1000 product literature. The CS300 and CS305 are essentially the same sensor except the CS305 has a different fixed multiplier.
2. Sensor manufacturers are Apogee, Inc., (CS305), Vaisala, Inc., (HMP50), Texas Electronics, Inc., (TE525), Met One (034B), and Gill (WindSonic1).

