

# Evapotranspiration Monitoring Station

## Model ET106

Campbell Scientific's ET106 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 ET106 station consists of electronics housed in an environmental enclosure, a 2- or 3-meter aluminum mounting pole, and meteorological sensors. Sealed circular connectors for sensor hookup simplifies installation. The station is powered with a 7 Ahr sealed-rechargeable battery that can be float charged with ac power or a #10616 10-Watt solar panel.

The enclosure includes electronics for measuring sensors, processing and storing data, and communicating with a central computer. Data can be telemetered via phone (including voice synthesized) or short-haul modems.

The ET106 is configured in minutes using Visual Weather software. Visual Weather software supports programming, manual and scheduled data retrieval, and report generation. The software also includes on-board equations that calculate  $ET_0$  based on the FAO-56 Penman Monteith equation, crop water needs, growing degree days, wet bulb temperature, dew point, wind chill, and chill hours.

The standard ET106 measures:

- Solar Radiation
- Air Temperature
- Relative Humidity
- Rainfall
- Wind Speed
- Wind Direction

Optional sensors are also compatible:

- 107-LC Soil Temperature Probe
- CS616-LC Soil Water Content Reflectometer
- SR50-LC Snow Depth Sensor



*The ET106 provides real-time weather measurements and calculates  $ET_0$  on an hourly and daily basis.*



**CAMPBELL SCIENTIFIC, INC.**

815 W. 1800 N. • Logan, Utah 84321-1784 • (435) 753-2342 • FAX (435) 750-9540 • [www.campbellsci.com](http://www.campbellsci.com)

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## Specifications

### LI200X-ETM Solar Radiation Sensor with mount

Sensor:	Silicon photocell
Accuracy:	Absolute error in natural daylight is $\pm 5\%$ maximum; $\pm 3\%$ typical
Sensitivity:	$0.2 \text{ kW m}^{-2} \text{ mV}^{-1}$

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

Operating Range:	$-25^\circ$ to $+60^\circ\text{C}$ , 0 to 98% RH
Temperature Sensor:	Platinum Resistance Thermometer
Temperature Accuracy:	$\pm 0.8^\circ\text{C}$
Relative Humidity Sensor:	Vaisala's INTERCAP capacitive chip
RH Accuracy:	$\pm 3\%$ for 0 to 90% range, $\pm 5\%$ for 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

### 034B-ET Wind Speed and Direction Sensor

Sensor:	Cup anemometer (wind speed), vane (wind direction)
Range:	0 to $49.5 \text{ m s}^{-1}$ (0 to 110 mph), $360^\circ$ mechanical, $356^\circ$ electrical
Starting Threshold:	$0.4 \text{ m s}^{-1}$ (0.9 mph) @ $\pm 4^\circ$ displacement
Damping Ratio:	0.25
Wind Speed Accuracy:	$\pm 0.11 \text{ m s}^{-1}$ ( $\pm 0.25$ mph) when $< 10.1 \text{ m s}^{-1}$ (22.7 mph); $\pm 1.1$ of true when $> 10.1 \text{ m s}^{-1}$ (22.7 mph)
Wind Direction Accuracy:	$\pm 4^\circ$

### Measurement and Control Electronics

Temperature Range:	$-25^\circ$ to $+50^\circ\text{C}$
Accuracy of Voltage Measurement:	$\pm 0.05\%$ of Full Scale Range ( $0^\circ$ to $+40^\circ\text{C}$ ) $\pm 0.1\%$ of Full Scale Range ( $-25^\circ$ to $+50^\circ\text{C}$ )
Data Values Stored:	62,000
Power Supply Requirements:	9.6 to 16 Vdc
Typical Current Drain:	$< 1 \text{ mA}$ (quiescent), $12 \text{ mA}$ (processing), $46 \text{ mA}$ (during analog measurements)

Sensor manufacturers are:	LI-200X, Li-Cor, Inc. Lincoln, NE HMP50, Vaisala, Inc., Woburn, MA TE525, Texas Electronics Inc., Dallas, TX 034B, Met One Inc., Grants Pass, OR
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