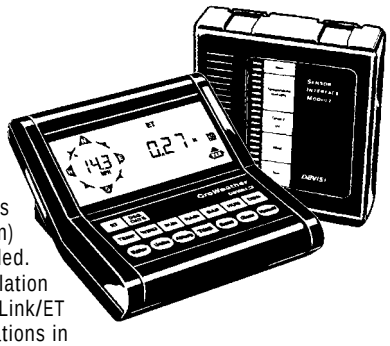
GROWEATHER® STATION, Standard



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STATIONS

The GroWeather station comprises two components: the Sensor Interface Module (SIM), to which all external sensors are connected, and the console, which performs A/D conversion, calculations, and display of data. A DC-power adapter and 8' (2.4 m) standard 8-conductor cable (for connecting the SIM to the console) are also included. The GroWeatherLink/ET Data Logger (#7871H) may be added to the station for calculation of ET. In conjunction with the GroWeatherLink software (#7871S), the GroWeatherLink/ET Data Logger also provides data logging and communication with a computer. Variations in system configuration and interconnection are discussed in Application Note 1, "System Configurations, Standard Stations".

SPECIFICATIONS

General

Console Operating Temperature	-5° to 140° F (-20° to 60° C)
Display Temperature	32° to 140° F (0° to 60° C)
SIM Operating Temperature	-40° to 150° F (-40° to 65° C)
Supply Power (adapter included)	16mA (typical) at 10 to 16 V (100mA when display is illuminated)
Connectors	Modular (RJ-11, RJ-12, and RJ-45)
Recommended Maximum Cable Length	200' (60 m), SIM to Console
Housing Material	Black ABS plastic
Display Type	LCD
Dimensions	
Console	5.25" x 5.4" x 3.0" (133 mm x 137 mm x 76 mm)
SIM	5.72" x 5.85" x 1.25" (145 mm x 149 mm x 32 mm)
Display	4.4" x 1.9" (112 mm x 48 mm)
Weight, total	3 lbs. 6 oz. (1.53 kg)

Sensor Inputs

RF Filtering	RC or LC low-pass filter on each signal line
Surge Protection	Micro-gap absorbers, 200±40 V, 500 A (8 x 20 usec)

Sensor Outputs (as displayed on console)

General

Update Interval	16 seconds
Times of Maximum and Minimum Values	Stored with value (except soil temperature)
Dates of Maximum and Minimum Values	Stored with value (except soil temperature) if within 14 days of occurrence
Automatic Clear of Maximum and Minimum Values	May be enabled/disabled individually for each function for which it is an option Time of automatic clear (AutoClear) is user-selectable

EvapoTranspiration (ETo) (requires External Temperature/Humidity Sensor, Anemometer, Solar Radiation Sensor, and WeatherLink Data Logger)

Calculation	Penman equation modified
Calculation Interval	Once per hour, using values averaged over hour
Resolution and Units	0.01" or 0.2 mm (user-selectable)
Daily ETo Range	0 to 99.99" (0 to 999.8 mm)
Total ETo Range	0 to 1999.9" (0 to 19999 mm)
Accuracy	±10% calculated and displayed in console (±5% calculated and displayed by GroWeatherLink software)
Functions (Period is selected by user)	Daily ETo Sum (alarm, AutoClear), Total ETo for period (alarm), Average ETo per day over period (ETo values for multiple crops calculated and displayed by GroWeatherLink software)
Daily ET Alarm	Duration is 8 to 24 seconds; Daily ETo Sum is reset after alarm

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DS7450-00 (Rev. B, 7/14/99)

Growing Degree-Days (Heat Units) (requires External Temperature Sensor, or External Temperature/Humidity Sensor)

Calculation	Real-time summation; integration interval = 1 minute (Values based on mean daily temperature are also calculated and displayed by GroWeatherLink software)
Thresholds/Limits	Base threshold and upper limit are user-selectable
Daily and Average Degree-Days Resolution and Units	0.1°F or 0.1°C (user-selectable)
Total Degree-Days Resolution and Units	1°F or 1°C (user-selectable)
Daily and Average Degree-Days Range	0 to 99.9°
Total Degree-Days Range	0 to 19999°
Functions (Period is selected by user)	Daily Degree-Days Sum (AutoClear), Total Degree-Days for period (alarm), Average Degree-Days per day over period

Outside Temperature (Air) (requires External Temperature Sensor, Stainless Steel Temperature Probe, or External Temperature/Humidity Sensor)

Resolution and Units	0.1°F or 0.1°C (user-selectable)
Range	-50° to 140° F (-45° to 60° C)
Accuracy	±1°F (±0.5°C)
Functions	Current Temperature (high and low alarms), Maximum and Minimum Temperatures (AutoClear)

Temperature 2 (Soil) (requires External Temperature Sensor or Stainless Steel Temperature Probe)

Resolution and Units	0.1°F or 0.1°C (user-selectable)
Range	-50° to 140° F (-45° to 60° C)
Accuracy	±1°F (±0.5°C)
Functions	Current Temperature (high and low alarms), Maximum and Minimum Temperatures (AutoClear)

Temperature-Humidity Index (THI) (requires External Temperature/Humidity Sensor)

Calculation Method	See R.G. Steadman, The Assessment of Sultriness, Part I, *Journal of Applied Meteorology*, July 1979 (Application Note 7, "Apparent Temperature: The Temperature-Humidity Index")
Resolution and Units	1°F or 1°C (user-selectable)
Range	For air temperatures above 68°F (20°C): 61° to 125° F (16° to 52° C)
Accuracy	±2°F (±1°C)
Functions	Current Temperature-Humidity Index (alarm), Maximum Temperature-Humidity Index (AutoClear)

Wind Speed (requires Anemometer)

Resolution and Units	1 mph, 1 km/hr, 0.1 m/s, or 1 knot (user-selectable)
Range	2 to 175 mph, 4 to 280 km/hr, 0.9 to 78 m/s, 2 to 152 knots
Accuracy	±5%
Functions	Current Speed (alarm), Maximum Speed (AutoClear)

Wind Run (requires Anemometer)

Resolution and Units	0.1 mile or 0.1 km (user-selectable)
Range	0 to 1999.9 miles (0 to 1999.9 km)
Accuracy	±5%
Functions (Period is selected by user)	Daily Wind Run Sum (AutoClear), Average Wind Run per day over period

Wind Direction (requires Anemometer)

Display Resolution	16 points (22.5°) on compass rose, 1° in digital display
Accuracy	±7°

Wind Chill (requires Anemometer and External Temperature Sensor, Stainless Steel Temperature Probe, or External Temperature/Humidity Sensor)

Resolution and Units	1°F or 1°C (user-selectable)
Range	-134° to 98° F (-92° to 37° C)
Accuracy	±4°F (±2°C)
Functions	Current Wind Chill (alarm), Minimum Wind Chill (AutoClear)

Solar Irradiance (requires Solar Radiation Sensor)

Resolution and Units	1 Watt/m^2
Range	0 to 1800 Watts/m^2
Accuracy	±5% at normal incidence
Cosine Response	±3% for angle of incidence = 0 to 75°
Temperature Coefficient	-0.034% per °F (-0.063% per °C); reference temperature = 72°F (22°C)
Functions	Current Intensity

Solar Energy (requires Solar Radiation Sensor)

Resolution and Units	0.1 Langley
Range	0 to 1999.9 Langleys
Accuracy	±6%
Temperature Coefficient	-0.034% per °F (-0.063% per °C); reference temperature = 72°F (22°C)
Functions (Period is selected by user)	Daily Energy Sum (AutoClear), Average Energy per day over period

Rainfall (requires Rain Collector)

Resolution and Units	0.01" or 0.2 mm (user-selectable)
Daily Rainfall Range	0 to 40.95" (0 to 819 mm)
Total Rainfall Range	0 to 99.99" (0 to 9999 mm)
Rate of Rainfall Range	0 to 72" (0 to 999 mm) per hour
Rainfall Accuracy	±(4% + 1 count) for rates from 0.01" to 2" (0.2 mm to 50 mm) per hour ±(5% + 1 count) for rates from 2" to 4" (50 mm to 100 mm) per hour
Rate of Rainfall Accuracy	±5%
Functions (Period is selected by user)	Total Rainfall for period, Daily Rainfall Amount (alarm, AutoClear), Current Rate of Rainfall, Maximum Rate of Rainfall (AutoClear)

Barometric Pressure (sensor located inside console)

Resolution and Units	0.01" of Hg, 0.1 mm of Hg, or 0.1 hPa (user-selectable)
Range	26.00" to 32.00", 660.0 to 810.0 mm, 880.0 to 1080.0 hPa
Accuracy	±0.05", ±1.3 mm, ±1.7 hPa (at room temperature)
Trend (change in 1 hour)	±0.2", ±5.0 mm, ±7.0 hPa
Functions	Current Barometric Pressure, Current Barometric Pressure Trend, Stored Barometric Pressure Reading

Relative Humidity (requires External Temperature/Humidity Sensor)

Range	0% to 100% RH
Accuracy	±5%
Functions	Current Relative Humidity (high and low alarms), Maximum and Minimum Relative Humidity Values (AutoClear)

Dewpoint (requires External Temperature/Humidity Sensor)

Resolution and Units	1°F or 1°C (user-selectable)
Range	-99° to 140° F (-73° to 60° C)
Accuracy	±4°F (±2°C)
Function	Current Dew Point

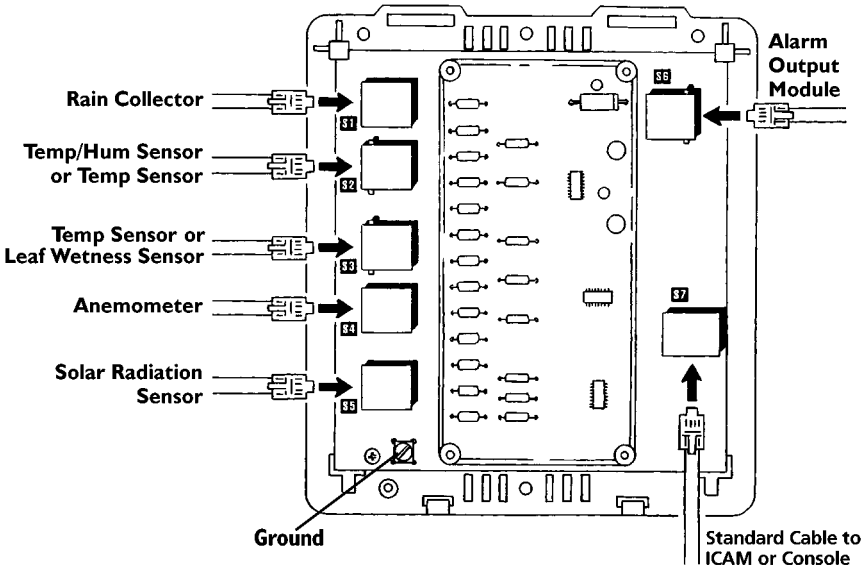
Leaf Wetness (requires Leaf Wetness Sensor)

Display Resolution	1
Range	0 to 15
Dry/Wet Threshold	User-selectable
Function	Current Leaf Wetness (Leaf-wet hours calculated and displayed by GroWeatherLink software)

Time

Accuracy	±15 seconds/month
Functions	Current Time, Current Date, Current Year

SENSOR INTERFACE MODULE CONNECTION DIAGRAM



PACKAGED SYSTEMS

Several packaged GroWeather systems are available.

- **GroWeather Growing Degree-Day System, Standard (#7450GD)**
  Includes GroWeather station and External Temperature Sensor or Probe.
- **GroWeather EvapoTranspiration System, Standard (#7450ET)**
  Includes GroWeather station, External Temperature/Humidity Sensor, Solar Radiation Sensor, Anemometer, and GroWeatherLink/ET Data Logger.
- **Comprehensive GroWeather System, Standard (#7450CS)**
  Includes GroWeather station, External Temperature Sensor or Probe, External Temperature/Humidity Sensor, Solar Radiation Sensor, Anemometer, Rain Collector, Leaf Wetness Sensor, and GroWeatherLink/ET Data Logger.
- **GroWeather EvapoTranspiration System with Rain Collector, Field Installation, Standard (#7450PS)**
  Includes GroWeather station, External Temperature/Humidity Sensor, Solar Radiation Sensor, Anemometer, Rain Collector, GroWeatherLink/ET Data Logger, Sensor Mounting Arm, Rain Collector Shelf, Radiation Shield, Complete System Shelter, and Grounding Kit.