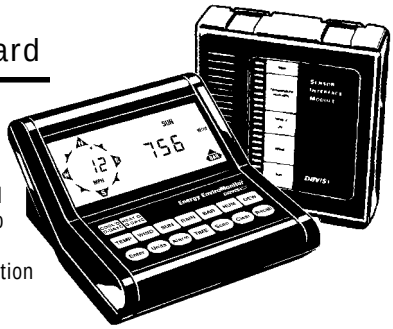
ENERGY ENVIROMONITOR® STATION, Standard

7460 STATIONS



The Energy EnviroMonitor 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 Energy WeatherLink may be added to the station for 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) . . . . . 16 mA (typical) at 10 to 16 V (100 mA 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
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

Heating Degree-Days (requires External Temperature Sensor, Stainless Steel Temperature Probe, 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 software)
Base Threshold . . . . . 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

Wind-Chill Heating Degree-Days (requires Anemometer and External Temperature Sensor, Stainless Steel Temperature Probe, or External Temperature/Humidity Sensor)
Calculation . . . . . Real-time summation; integration interval = 1 minute
Base Threshold . . . . . 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

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DS7460-00 (Rev. B, 7/14/99)

Cooling Degree-Days (requires External Temperature Sensor, Stainless Steel Temperature Probe, 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 software)
- Base Threshold . . . . . 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

Temperature-Humidity Index Cooling Degree-Days (requires External Temperature/Humidity Sensor)
- Calculation . . . . . Real-time summation; integration interval = 1 minute
- Base Threshold . . . . . 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)

Inside Temperature (Air) (sensor located inside console)
- Resolution and Units . . . . . 0.1° F or 0.1° C (user-selectable)
- Range . . . . . 32° to 140° F (0° 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 Meterology*, 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)
Function	Current Intensity

Solar Energy (requires Solar Radiation Sensor)

Resolution and Units	0.1 Langley (Joules/m^2 displayed by Energy WeatherLink software)
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 .01" to 2" (.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

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)

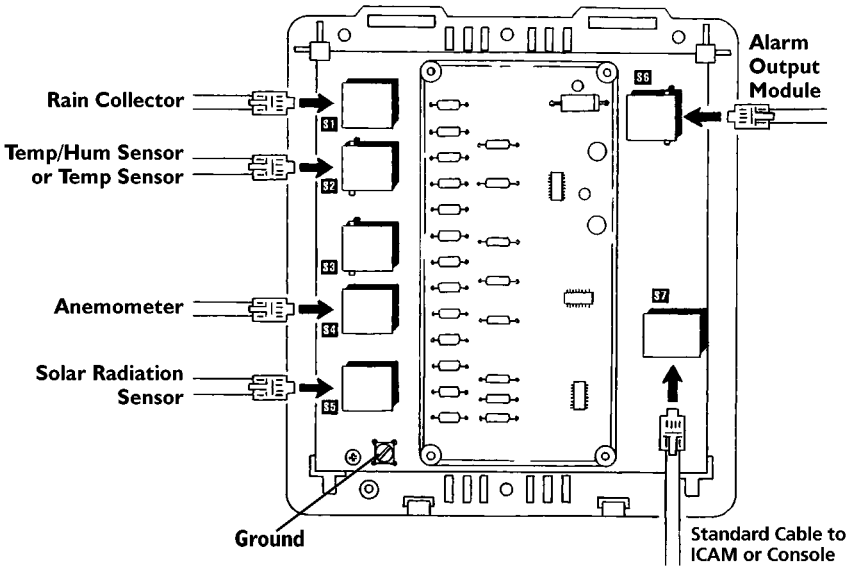
Dewpoint (requires External Temperature/Humidity Sensor)

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

Time

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

SENSOR INTERFACE MODULE CONNECTION DIAGRAM



PACKAGED SYSTEMS

Several packaged Energy EnviroMonitor systems are available.

- **Energy Degree-Day System, Standard (#7460ED)**
  Includes Energy EnviroMonitor station and External Temperature Sensor or Probe.
- **Wind Energy System, Standard (#7460WE)**
  Includes Energy EnviroMonitor station and Anemometer.
- **Solar Energy System, Standard (#7460SE)**
  Includes Energy EnviroMonitor station and Solar Radiation Sensor.
- **Comprehensive Energy System, Standard (#7460CE)**
  Includes Energy EnviroMonitor station, External Temperature/Humidity Sensor, Solar Radiation Sensor and Anemometer.