Capricorn 2000™

Innovative Weather Technology For A Changing World

CAPRICORN 2000™ WEATHER STATION
CONTROL MODULE

Columbia
Weather Systems

The Capricorn 2000™ Weather Station

For Critical Weather Monitoring Requirements

- **Modular Flexibility**
- **Field Proven Reliability**
- **Dependable Accuracy**
- **Powerful Software**
- **Superior Customer Service**
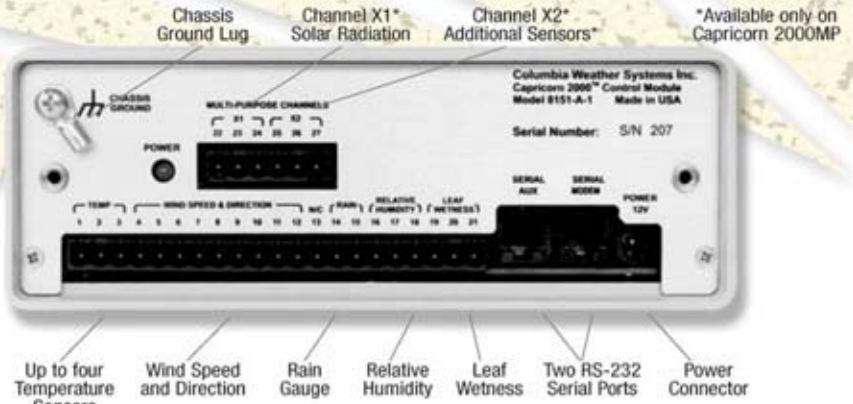
Chassis Ground Lug — Channel X1* Solar Radiation — Channel X2* Additional Sensors* — *Available only on Capricorn 2000MP

CHASSIS GROUND — MULTI-PURPOSE CHANNELS — Columbia Weather Systems Inc. Capricorn 2000™ Control Module Model 8151-A-1 Made in USA — Serial Number: S/N 207 — POWER — SERIAL AUX — SERIAL MODEM — POWER 12V — TEMP — WIND SPEED & DIRECTION — N/C — RAIN — RELATIVE HUMIDITY — LEAF WETNESS

Up to four Temperature Sensors — Wind Speed and Direction — Rain Gauge — Relative Humidity — Leaf Wetness — Two RS-232 Serial Ports — Power Connector

The Capricorn 2000™ weather station's modular design provides professional grade data capture, storage and transfer. Designed around the Control Module, this flexible system can easily accept signal inputs from a wide variety of meteorological sensors.

Data is viewed using the Capricorn 2000 Weather Display Console and/or computer software connected to the Control Module via dual RS-232 ports.

Control Module

Housed in a compact, utility-grade enclosure, the Control Module includes a data logger storing up to 511 records at user-defined intervals with time and date stamp. Max/min information is also stored at user-defined intervals. Dual on-board RS-232 interfaces allow connection to a display console, modem, or directly to a computer at the same time.

The Capricorn 2000™MP includes two multi-purpose channels and is required for solar radiation and additional sensors.

Dimensions: 10" L x 7.5" W x 3" H	Weight: 3 lbs.	Power Requirement: +12V DC, 200m Amp (Via wall mount power supply)
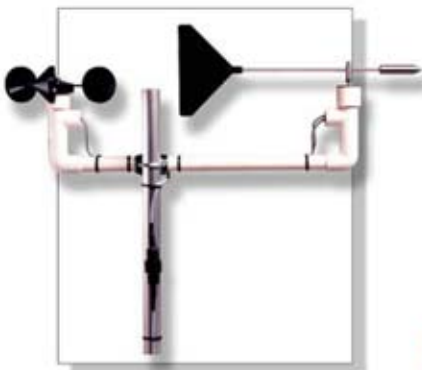
Wind Speed & Direction

The wind speed and direction sensors use a solid state, infrared optical design to decrease wear and improve reliability. These rugged sensors, with a proprietary design incorporating years of experience and testing, are enclosed in a hardened PVC housing surrounding stainless steel parts.

Speed Accuracy: ± 5% or better from 20 to 125 mph; ± 1 mph from 5 to 20 mph	Speed Mechanical Threshold: 0.5 mph
Speed Range: 0 to 125 mph (higher gusts may be recorded)	Direction Resolution: 16 compass points	

Barometric Pressure

Housed in the Control Module, the barometric pressure sensor is a silicon shear stress strain gauge. This state-of-the-art sensor integrates on-chip, bipolar op amp circuitry and thin film resistor networks to provide a high-level analog output signal and true temperature compensation. The on-chip integration results in high reliability and accuracy. The sensor is calibrated at the factory to NIST traceable standard.

Accuracy: ±0.03 in. Hg over range at sea level, with temperature between 32° and 182°F
Range: 27 to 33.96 in. Hg	Resolution: 0.01 in. Hg	

Relative Humidity

This capacitive sensor is compact and easy to use. It can be installed in a radiation shield for protection from the elements. This sensor offers long-term stability with minimal drift and resistance to contamination.
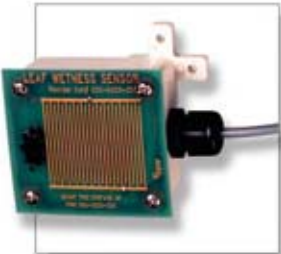
Accuracy: ± 3% (or better) from 10 to 90% RH at 68°F	Temperature Effect: less than 1.5% RH
Repeatability: 0.5% RH	Stability: ± 2% RH over two years	Range: 0 to 100%

Leaf Wetness

Measured with a capacitance grid, this proprietary leaf wetness sensor provides a precise, high resolution scale, not just wet or dry. It is useful to determine the wetness condition of surfaces including foliage, for example, in preparation for spraying pesticides.

Accuracy: ± 5%	Resolution: 0.01 volts	Range: wet 0.5 volts to 4.4 volts dry

Rainfall

The tipping bucket electronic rain gauge is composed of a complex spun collector funnel with a knife edge that diverts the water to a tipping bucket mechanism. For each tip, a magnet causes an electronic pulse to be recorded. The rainfall sensor is completely automatic and requires no servicing.

Accuracy: ± 1% at 2 in./hr. or less	Resolution: 0.01 inch

Solar Radiation

This sensor has a rugged uni-body design which houses a high performance silicon photodiode detector mounted beneath a conical shaped (self-cleaning) diffuser. Due to the unique diffuser design, the sensitivity of this sensor is proportional to the cosine of incidence of the incoming solar irradiance, allowing for accurate and consistent measurement.

This sensor offers a higher nominal sensitivity than most competitive sensors (about 100mV/W/m²), thus offering improved signal to noise ratio.

Sensitivity: 100 mV/W/m²	Spectral response: 0.4 to 1.1µm	Temperature Range: -22 to +158° F	Response time: < 1 sec
Maximum irradiance: 2000 W/m²	Temperature dependence: ± 0.15%/ °C	Cosine error (0 to 80° C): <10%	

Temperature

The Capricorn 2000™ comes standard with one temperature sensor and 50 feet of cable. Up to four temperature sensors can be connected with a maximum of 400 feet combined cable length. These digital, semiconductor-type probes all connect to a single port, reducing susceptibility to noise interference, reducing cost, and increasing accuracy. The sensors are calibrated at the factory to NIST traceable standard.

Accuracy: ± 0.9° from -67° to 247° F
Resolution: 0.01° F

Soil/Water Temperature

An environmentally hardened temperature sensor is also available for soil and water temperature. This sensor is housed in stainless steel and is sealed in thermally conductive epoxy to provide protection against corrosion and moisture. The sensor is calibrated at the factory to NIST traceable standard.

Accuracy: ± 0.9° from -67° to 247° F
Resolution: 0.01° F

Soil Moisture

The soil moisture sensor emits high frequency oscillations to measure the dielectric coefficient (capacitance) of the soil. Since the dielectric coefficient of water is 80 and soil ranges from 5 to 10, there is a significant dielectric response in soil with varying moisture content.

Soil moisture is reported as a percentage – 100 percent being saturated. Sensors can be connected to a hand-held meter or to the Capricorn 2000™ weather station for continuous monitoring.

Analog Output: 0 to 5 volts D.C.	
Dimensions:	1.1 inches diameter
7.5 inches long	Range: 0 - 100%

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Weather Display

The Capricorn 2000™ Weather Display uses "intelligent" touch-screen technology. With its programmable microprocessor and abundant memory, the Capricorn 2000™ Weather Display can display weather information, perform complex computations, and store relatively large amounts of weather data.

The Capricorn 2000™ Weather Display is also available in Aviation or Agricultural Edition

Aviation Edition: Density altitude and additional wind speed and direction calculations and charts.

Agricultural Edition: Evapotranspiration and degree day calculations.

The Weather Display is also available in a 19" rack-mount chasis.

WeatherMaster 2000™ Software

WeatherMaster 2000™ is a professional grade weather monitoring software.
This software package is designed for specialized markets that require robust weather calculations, interoperability with computer models, and data interfaces to other industrial systems. WeatherMaster 2000™ utilizes Microsoft Access® database for easy data access and manipulation.

WeatherMaster 2000™ is also capable of monitoring multiple stations via a wireless link.

Weather View 32™ Software

Operating in Windows graphic environment, Weather View 32™ helps you monitor, record, and store local weather data for current or future analysis.

Weather View 32™ offers:

- User-defined real time monitoring display
- Internet and email interface
- Calculated parameters including wind chill, dew point, heat index, and degree days
- Monthly calculations for degree days heating and cooling
- Full-featured graphing and printing capabilities
- Six separate alarm functions
- A climatological database that covers the U.S. and Canada
- Modem access for remote weather stations
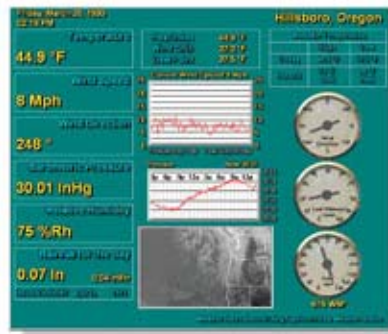
Capricorn 2000™ Accessories

- Wireless transceivers (900 MHz and 2.4GHz)
- Vehicle, tripod, wall and roof mounting kits with mast options
- Weatherproof enclosure for the Capricorn 2000™ Control Module
- Self-Aspirating radiation shield for temperature and humidity sensors

Pegasus Flyaway Kit

A portable version of the Capricorn 2000™ Weather Station, Pegasus is designed to meet the growing need for weather sensing in a highly mobile environment.

- Capricorn 2000™ Control Module housed in a weatherproof enclosure with quick-connect sensor plug-in jacks
- Wind speed & direction, temperature, and relative humidity sensors with waterproof cable connectors
- Self-Aspirating radiation shield for temperature and humidity sensors with quick-connect mounting hardware
- Two wireless transceivers offer remote weather sensing when hard-wire options are not feasible
- 10ft. tripod with telescoping sensor mast, tiedown kit, compass, and mounting hardware with transportation bag
- Heavy-duty polyethylene transportation case to protect and keep equipment in a constant state of readiness
- Several battery options are available for system power.

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