CAMPBELL SCIENTIFIC®
WHEN MEASUREMENTS MATTER

Wind Energy
Wind Resource Assessment and Power Performance Measurement Systems

RELIABLE
SINCE 1974
MONITORING

Campbell Scientific's turn-key systems are designed for permanent operational meteorological, wind resource assessment, and power performance monitoring and testing. These systems have a wide range of options for measuring wind speed, wind direction, air density, and electric power. Real-time or interval data are stored locally on the datalogger, and can be can be transmitted via all standard communication methods.
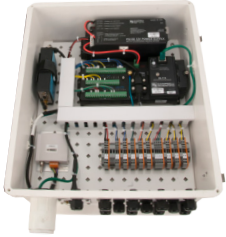
MAJOR SYSTEMS

	Measurements		Datalogger	Power Requirement	Communications Supported	Description
	Typical	Optional				
WMS100 | Wind Measurement System 100 Meteorological station for wind energy applications	Wind speed • Anemometer • Class 1 MEASNET • Ultrasonic • Heated • Vertical Wind direction Air temperature Differential air temperature Relative humidity Barometric pressure Precipitation Tower light diagnostics	3D wind speed/ direction Ice detection/ surface moisture Electric field, lightning warning Solar radiation Remote sensing Lidar Turbine electric power	CR3000 CR1000	AC, DC, or solar	Modbus cellular email DNP3 FTP TCP/IP fiber optic radio serial field display satellite Wi-Fi	Datalogger enclosure supports any user-specified sensor and communication specification in a turn-key package
WRA100 | Wind Resource Assessment Station 100 Meteorological station for wind resource assessment	Wind speed Wind direction Air temperature Relative humidity Barometric pressure	DC current/voltage Visibility/present weather Electric field, lightning warning Delta temperature Vertical wind speed	CR800	AC, DC, or solar	Modbus cellular email DNP3 FTP TCP/IP fiber optic radio serial field display satellite Wi-Fi	Configured to support legacy sensor designs and packages commonly deployed for performing wind resource assessment in North America
ZephIR300 | Remote Sensing Lidar	Horizontal wind speed, Vertical wind speed, Wind veer Wind shear Turbulence intensity Temperature Relative humidity Barometric pressure GPS location and time	Any co-located Campbell Scientific MET mast	CR1000 CR3000	AC, DC, or solar	Modbus cellular email DNP3 FTP TCP/IP fiber optic radio serial field display satellite Wi-Fi	Continuous wave lidar measurement system, used to make wind measurements at user-configurable heights from 10 m to 300 m

More info: **435.227.9120**

campbellsci.com/wind-energy

	Measurements		Datalogger	Power Requirement	Communications Supported	Description
	Typical	Optional				
SWP100 System for wind turbine performance monitoring	AC power DC power	Generator frequency Shaft speed Vibration Movement Stress Strain Meteorological	CR3000 CR1000 CR800	AC, DC, or solar	Modbus cellular email DNP3 FTP TCP/IP fiber optic radio serial field display satellite Wi-Fi	User-configurable station for power measurements. Ideal for IEC 61400-12-1 power performance tests

Custom Systems

Most of the systems we sell are customized. Tell us what you need and we'll help you configure a system that meets your exact needs.

Dataloggers used in Wind Monitoring

Our dataloggers can make and record measurements and control electrical devices. They can function as PLCs or RTUs, and have many channel types, allowing nearly any sensor to be measured on a single unit. For example, one datalogger can measure strain on turbine blades, wind speed, and power output of the turbine, even while controlling peripheral devices.

Wind Monitoring Sensors

Almost any sensor can be measured by our dataloggers, allowing the wind energy system to be customized for each application. Typical measurements include, but are not limited to: wind speed (anemometers, class 1 MEASNET, ultrasonic, heated sensors supported), wind direction, air temperature, differential air temperature, relative humidity, barometric pressure, vertical wind, solar radiation, precipitation, ice detection, and lightning potential.

Communications

The availability of multiple telecommunications and on-site options for retrieving data or reporting site conditions also allows our systems to be customized to meet exact needs. Options include: Modbus, cellular, email, DNP3, FTP, TCP/IP, fiber optic, radio, serial, field display, satellite, and Wi-Fi. Systems can be programmed to send alarms or report site conditions.

Software

Our PC-based support software simplifies the entire data acquisition process, from programming to data retrieval to data display and analysis. Our software automatically manages data retrieval from networks or single stations. Robust error-checking ensures data integrity. We can even help you post your data to the Internet.

Wind Energy Case Studies

Our wind energy systems have helped a variety of organizations reach their goals. The following are just a few of these:

A Campbell datalogging system monitors an offshore wind farm in Wales. Even though the wind farm experiences harsh conditions, the system has provided better than 99 percent data recovery.
www.campbellsci.com/wales-wind

Campbell gear is used to monitor meteorological and power-generating parameters at a wind farm in Tehachapi, California. CalWind Resources owns and operates the wind farm.
www.campbellsci.com/california-wind-energy

Campbell Scientific equipment allows the wind farm in Tehachapi, California to report data to the California ISO.