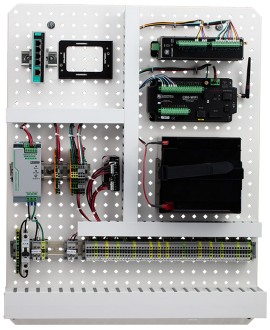
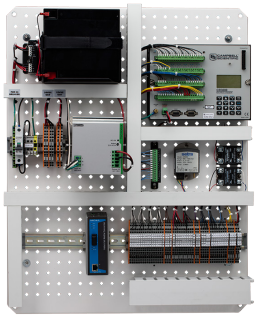
CAMPBELL SCIENTIFIC®
WHEN MEASUREMENTS MATTER

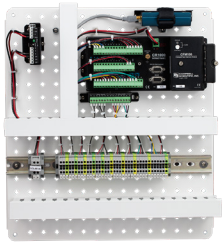
Wind Energy

Wind Resource Assessment and Power Performance Measurement Systems

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				
WMS100A | Advanced 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	CR6	AC, DC, or solar	Modbus cellular email DNP3 FTP TCP/IP fiber optic radio serial field display satellite Wi-Fi	Datalogger enclosure supports user-specified sensor and communication specification in a turn-key package. Installation, maintenance, and field servicing are quicker and easier because of CR6 features.
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

		Measurements		Datalogger	Power Requirement	Communications Supported	Description
		Typical	Optional				
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	CR1000X 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

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.