Campbell SCIENTIFIC®

Bringing You Superior Data-Acquisition Solutions Since 1974

We pride ourselves on our customer service. We work with government, research, and commercial clients to design environmental, infrastructure, and renewable energy measurement solutions, bringing trusted, key data insights to their specific monitoring needs.

Our Products

Campbell Scientific products are recognised globally for quality, reliability, and accuracy. We provide a wide range of products including data loggers, sensors, communications devices, power supplies, and software, which can be purchased as stand-alone products or customised to create a bespoke data-acquisition system specific to your needs.

A Campbell Scientific system provides you with top-of-the-range, industrial, and research-grade products that are highly accurate, precise, and robust enough to withstand harsh environmental conditions.

Our systems are designed by our experienced technical sales and support team members who are experts in their field, offering comprehensive pre- and post-sale customer service.

Our customers trust us to work with them to provide quality and reliable solutions in a variety of applications related to weather, water, energy, gas flux and turbulence, infrastructure, and soil.

A Long History

Campbell Scientific began in Logan, Utah, USA in 1974 and has grown to a global company with 13 offices throughout the world. In Australia, we have been the leading provider of environmental data-acquisition solutions in Australia, the Asia-Pacific region, and New Zealand since 1993.

Our Promise

- Provide quality and reliable products
- Deliver expertise through our Australia-based technical sales and support teams
- Offer quality technical support, training services, and local repairs centre

We value our people. Our mission statement, developed with our staff, demonstrates our values:
"We believe in the power of environmental insights to drive decisions for a better world. What sets us apart is the way we strive to deliver on this every day, we act with integrity and take pride in our expertise to deliver quality and reliable data acquisition solutions for our customers. What we do matters."

FOR ALMOST 50 YEARS

CAMPBELL SCIENTIFIC PRODUCTS HAVE BEEN KNOWN GLOBALLY FOR

FLEXIBILITY, ACCURACY & DEPENDABILITY, IN HARSH, REMOTE ENVIRONMENTS.

Meteorology

We are a leading provider of turn-key and customised solutions for the measurement of meteorological parameters, and have become the supplier of choice to many national meteorological and hydrological services around the world.

From single research weather stations to mesoscale weather networks (mesonet), the reliability and flexibility of Campbell Scientific automatic weather stations (AWS) offer you the peace of mind of trusted data as part of forecasting and monitoring systems worldwide.

Our equipment is designed to meet the intricate needs of every application. With low power consumption, rugged designs to sustain even the most extreme environments, and the ability to easily access data remotely, our AWS are ideal for all types of agricultural, meteorological, and climatological monitoring.

Campbell Scientific meteorological monitoring solutions are used in a variety of applications including:

- Environmental research
- Air quality and pollution
- Agriculture and soils research
- Evapotranspiration and commercial irrigation
- Road weather information systems (RWIS)
- Airport weather observation systems (AWOS)
- Fire, alpine, and coastal weather monitoring

At the centre of our systems is a powerful and versatile data logger that allows for any type of sensor to be integrated and custom programmed, resulting in quality data and optional associated alarms to be transmitted reliably when it matters most.

Our meteorological monitoring products include data loggers, communications devices, and sensors.

Data loggers

- CR300
- CR310
- CR350
- CR800
- CR1000X

Communications Devices

- CELL2xx (option to add to our CR300 and CR310 data loggers)

Sensors

- BaroVue™10
- ClimaVue™50
- CS120A/CS125
- HygroVue™10
- RainVue™
- SkyVue™8
- SoilVue™10

Data can be delivered via any traditional telemetry but typically:

- Cellular telemetry via the CELL2xx or satellite using the BGAN INMARSAT Hughes modem for remote locations
- Ethernet (NL201) or Wi-Fi (NL241) in more populated areas using any of the traditional IP-based protocols

The data received can be viewed through any platform—from a private, remote desktop to a tablet/phone or a public, cloud-based dashboard.

We design and build systems for unattended, long-term water level and water quality monitoring in many natural and industrial environments, including streams, dams, weirs, watersheds, wells, caves, aquaculture operations, stormwater systems, water/wastewater treatment plants, landfills, and processing plants.

In addition, we have become the worldwide standard for climate and water quality measurements in harsh coastal environments. From single research stations onshore, on buoys, or on ships to integrated monitoring networks, these systems are integral for marine weather forecasting applications and monitoring the environmental impacts of port activity and capital dredging.

Whether you're looking for flood warning, water level and flow, water quality, or coastal monitoring, our products and systems offer accurate measurements, low power requirements, and proven reliability in extreme conditions worldwide.

Products

Our hardware's flexible nature makes it ideal for delivering data logging and telemetry solutions in hydrological applications. With support for a wide range of digital and analog sensors, Campbell Scientific data loggers can be used to consolidate and log data from a number of instruments with onboard QA/QC routines and multiple options for remote telemetry.

We have also designed a robust range of Automated Local Evaluation in Real Time (ALERT), ALERT2™, hybrid ALERT, and customised flood-warning systems. This includes a turn-key transmitter packaged in a traditional Event Reporting Radio Telemetry System (ERRTS)-style canister for standpipe installation.

Our products include:

Data loggers

- CR300
- CR310
- CR350
- CR800
- CR1000X

Sensors

- LevelVue
- RainVue

Communications devices

- CELL2xx (option to add to our CR300, CR310, and CR350 dataloggers)

ALERT2

- AL200
- AL205B
- AL205R
- ALERT205

Hydrology

Data delivery

- Open-source data delivery to third-party platforms

ALERT2

- Cellular telemetry via the CELL2xx or using an ALERT VHF radio in conjunction with the AL200 Encoder Modulator
- ALERT2 Administrator and LoggerNet software used

Coastal monitoring data delivery

- Cellular telemetry via the CELL2xx or via satellite for remote locations; radio link options also available
- Eagle.io and LoggerNet software used

Geotechnical and Structural

Our measurement automation platforms are designed with over 45 years of experience in geotechnical monitoring and data-acquisition systems. Known for monitoring solutions used globally in some of the most extreme and unforgiving environments on earth, each platform provides accuracy and reliability for critical geotechnical and structural applications.

Simple interfaces, ease of setup, and long-term reliability make our platform the preferred platform for service providers in:

- Structural health monitoring
- Strain, vibration, and deflection monitoring
- Dam monitoring
- Bridge monitoring
- Construction
- Geotechnical solutions
- Mining
- Blast monitoring
- Seismic monitoring
- Wind speed/load monitoring
- Slope stability

System design is completed after consultation with our clients to determine the specific needs of the application and users. There are many options in system design given our technology and sensors are brand agnostic.

Our team of experts offer practical knowledge on many instruments and sensor technologies used in the industry. They have experience in high-speed monitoring (500hz–1kHz); designing monitoring systems for buildings, tunnels,

bridges, railways, and dams; working with universities and researchers to design novel monitoring solutions; and developing custom graphical user interfaces (GUI) for monitoring solutions.

Data loggers

- CR6
- CRVW3
- CR310
- CR1000X
- CR350
- GRANITE 6
- GRANITE 9

The CR6 is our flagship data logger, which can interface with virtually any type of analog and serial sensors across 12 unique and versatile universal channels. Our patented VSPECT® technology allows the CR6 to natively read vibrating-wire sensors. This industry-leading technology is chosen for its precision and long-term reliability.

Measurement modules

- VOLT 108
- VOLT 116
- VWIRE 305
- AVW200
- TEMP 120
- TDR200

The GRANITE series is our solution for projects that require dynamic monitoring. It is a distributed-network approach to monitoring where the data acquisition is synchronised at the peripheral level, allowing for a large number of sensors to be dynamically interrogated in sync across the network.

Data delivery

- Connections can be made using radio, Wi-Fi, cellular, satellite, and LAN. Data can be delivered directly to a PC (automated collections using LoggerNet or via data push).
- Other common delivery solutions include data sent via email, FTP, direct to Modbus/ SCADA systems, and uploaded to cloud-hosted data platforms.

Software

Some examples of our software offering include:

- PC400 Datalogger Support Software
- SURVEYOR PC-Based Data Acquisition
- DVW Toolbox PC-Based Data Acquisition
- LoggerNet Datalogger Support Software
- RTMCPRO Real-Time Monitor and Control Software
- PC-TDR Support Software

Renewables

Solutions

Weather and meteorological conditions can impact electrical power generation when it is generated from renewable sources. Local and accurate monitoring of these conditions is required to accurately assess plant operations, especially when larger installations are involved. You can count on Campbell Scientific to create a well-designed MET station that will provide you with the most accurate meteorological measurements.

We work with a network of skilled integration partners to deliver projects in the wind and solar markets. We also supply tailored solutions for other energy sectors such as hydropower, geothermal, utilities, and oil and gas.

Data for our energy solutions are delivered via a range of telemetry solutions. Campbell Scientific specialises in the delivery of data to onsite SCADA systems via Modbus TCP and DNP3. Remote telemetry solutions such as cellular and satellite are also available for remote locations.

Our team works closely with customers and integrators to design customised, advanced research and development stations, as well as custom programming for data collection.

Solar Energy

Campbell Scientific offers automated data-acquisition systems specifically designed for solar monitoring applications, including:

- Industrial rooftop solar
- Large utility solar farms
- Solar prospecting
- Soiling

Preconfigured solar energy systems—designed to meet IEC 61724 standards for solar monitoring and telemetry—are available for photovoltaic and concentrated solar technology projects of all sizes.

Solar Energy Products

- Measurement and control data loggers such as the CR1000X, CR310, and CR350
- Distributed Solar Resource Monitoring Platform, the MeteoPV
- Full turn-key systems such as the SunScout
- Easy-to-install and integrate soiling measurements such as the DustSens
- Back-of-module temperature sensors
- Pyranometers and all-in-one weather solutions such as the MetSens

Wind Energy

Our turn-key systems for wind-resource assessment and power performance are specifically designed to meet the requirements of IEC 61400-12-1.

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 data logger and can be transmitted via all standard communications methods.

Wind Energy Products

- Measurement and control data loggers such as the CR1000X, CR310, CR6, and CR350
- MEASNET-certified anemometers

Micrometeorology

Globally, we have been involved in gas flux and turbulence monitoring applications for well over 30 years. Our research and development teams have produced quality instruments specifically for eddy-covariance measurements in that time, leading to the release of products such as the Krypton Hygrometer (KH20) in 1983, the 3-D Sonic Anemometer (CSAT3) in 1995, the Fine-Wire Thermocouple (FW05) in 1996, and many more since then.

Our experts are available to assist with designing, configuring, and supporting eddy-covariance systems for our clients and partners.

We offer low-power, turn-key solutions for open- and closed-path eddy-covariance applications that can be customised to add your preferred additional sensors for energy and/or water balance measurements or most other desired parameters. These systems offer a measurement quality that is second-to-none in the industry.

Products

Our gas flux and eddy-covariance systems monitor data at high speeds (10 or 20Hz) and log the raw data to an SD card while computing online, 30-minute fluxes onboard the data logger. This data can be retrieved remotely using telemetry by polling or having the data files pushed to a server.

The data logger application is controlled and managed by the EasyFlux® DL application, which is a versatile and configurable data logger program that supports multiple sensor options and commonly used data format outputs.

For post-processing data flexibility using techniques other than what is already implemented in EasyFlux DL, EasyFlux PC is a computer program that processes the raw, high-frequency,
time-series data into fluxes using a range of community-accepted practices and theories.

A typical open-path eddy-covariance system consists of three main instrumentation components:

- A data logger and expansion module
  - CR6 or CR1000X
  - VOLT 108 or VOLT 116 for additional sensor flexibility
- An infrared gas analyser and 3-D sonic anemometer (EC150 paired with CSAT3A/B or fully integrated IRGASON)
- A suite of energy-balance sensors, including soil moisture, temperature, and heat flux

A typical closed-path eddy-covariance system consists of:

- The CR6 data logger and VOLT 116 expansion module for extended sensor suites and flexibility
- An infrared gas analyser and 3-D sonic anemometer (EC155 Closed-Path CO2/H2O Gas Analyser and CSAT3A)
- CPEC pump module

There are numerous options and add-ons for both the open- and closed-path eddy-covariance systems, including valve modules to automatically provide field calibrations and support for multiple sampling locations within a closed-path profiling system.

Services and Support

Our products are backed by our comprehensive service offering. We provide a range of services to help you select, install, configure, and maintain the right solution for your unique application.

Our technical assistance and application support, available to all customers, includes:

- Application consultation and programming
- System and network design
- Edge-computing programming for:
  - Advanced engineering unit conversion
  - Data quality and validity
- Data visualisation
- Project services
- Full pre-wiring and testing
- Technical support:
  - Instrument and SCADA integration
  - Remote diagnosis of potential issues with on-site stations, sensors, and communications
- Calibration and repair services
- Online training
- Installation and long-term maintenance through our partners

Case Studies

Meteorology

The Oklahoma, USA Mesonet is a state-wide environmental monitoring network developed to make timely and useful weather information available to the citizens of Oklahoma. The mesonet consists of 121 CR6-based automated weather stations that continuously measure an array of weather and soil instruments.

Hydrology

The Port of Townsville Limited's channel upgrade project to widen the existing entrance channel to the port through capital dredging activities will allow larger vessels to access the port. We worked with our client to build custom monitoring buoys with multiple water-quality instruments and sensors mounted to frames to measure parameters required in accordance with project approval specifications and then communicate that data.

Geotechnical

GKM Consultants was contracted by a nationally leading engineering firm to develop, commission, and install a state-of-the-art structural health monitoring system for an aging highway overpass in Canada. This monitoring system will help extend the lifespan of the structure by providing real-time, high-quality strain data. GKM installed 72 vibrating-wire strain gauges (Geokon model 4000) on the girders of the structure. The data-acquisition system is built upon Campbell Scientific's GRANITE platform. The system performs automatic, long-term, static measurements of the structure as well as collects periodic bursts of dynamic data to track fatigue in individual girders.

Renewables

CalWind Resources owns and operates a wind farm in Tehachapi, California, USA. The wind farm has been in operation for many years, but with the new requirement to report data to the California independent system operator (ISO), CalWind Resources needed to procure and install new measurement and communications equipment. Campbell Scientific equipment was chosen to be installed on the wind farm to meet the measurement and communication needs.
The California ISO operates the wholesale power system in California with the goal of providing higher transmission reliability while controlling costs.

Flux

The Warra long-term ecological research (LTER) site (measuring 15,900 hectares) located in Southwestern Tasmania was founded in 1995 to monitor long-term ecological health and dynamics within a wet eucalyptus forest. The project measured exchanges of carbon dioxide, water vapor, and energy between the forest and the atmosphere using eddy-covariance micrometeorological techniques. Also used were flux tower measurements—in combination with remote sensing data and land surface models—to upscale and estimate the net exchanges of carbon and water at regional scales.

Campbell
SCIENTIFIC®

As a trusted provider of measurement solutions since 1974, Campbell Scientific has delivered the information that helps mitigate severe weather casualties; aids scientists in gathering data to assist in the understanding of climate change and other human-made environmental impacts; and supports countless organisations, institutions, and national agencies in providing more efficient services to their people. Our instrumentation hardware is known to be the best in the business. Our software services provide an unrivalled level of insight. Our project delivery expertise combines both to deliver a unique end-to-end solution capable of changing the world.

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