Data Management Solutions for Green Energy

Yokogawa provides complete solutions for green energy with a variety of measurement/control instruments

LF04Y99A09-01EN

Providing Critical Performance Data Measurement in Green Energy for accurate measurement, recording, and monitoring of development, evaluation, and operation.

Facing serious environmental problems for the whole earth, clean energy using solar, wind, geo-thermal, tidal, etc... to reduce CO_2 emissions is an inevitable matter. Renewable energy providers need economical/reliable/efficient solutions. Yokogawa provides a reliable data acquisition system with high accuracy for measurement and control instruments.

Solar Energy Data Recording and Remote Monitoring

Overview

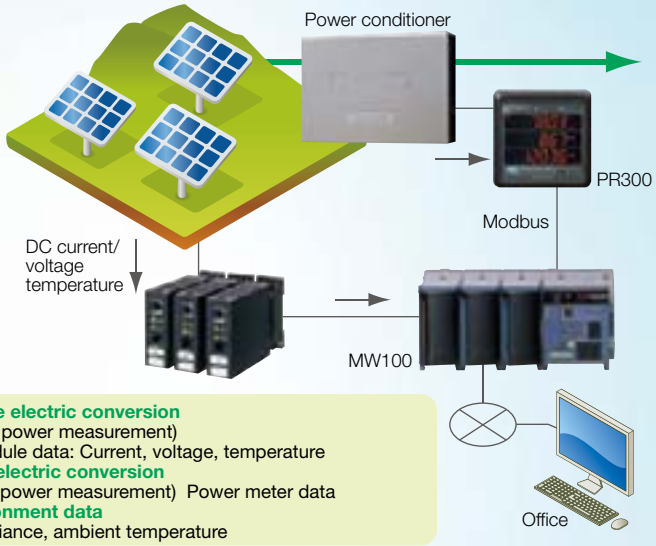
MW100 records solar power parameters such as radiance, ambient temperature and before/after electric conversion power data.

Application keys

- Solar module data (temperature, DC current/voltage) before electric conversion can be recorded via JUXTA (converter)
- Power data after electric conversion using power meter record by communication (digital data can be more accurate). Some inverters have direct Modbus output.
- Panel efficiency calculation from measurements in math channels

Benefits of using MW100

- On-demand data recording/monitoring
  Data recorded simultaneously to CF and network (OPC).
- Continuous data recording
  Even after power failure recovery failure, MW100 continues to record data.
- Sum of power data display
  Displays the integral value for each channel
- Operates in harsh environment (-20 to 60 C)



Before electric conversion
(DC power measurement)
Module data: Current, voltage, temperature
After electric conversion
(AC power measurement) Power meter data
Environment data
Radiance, ambient temperature

Wind Energy Data Recording and Monitoring

Overview

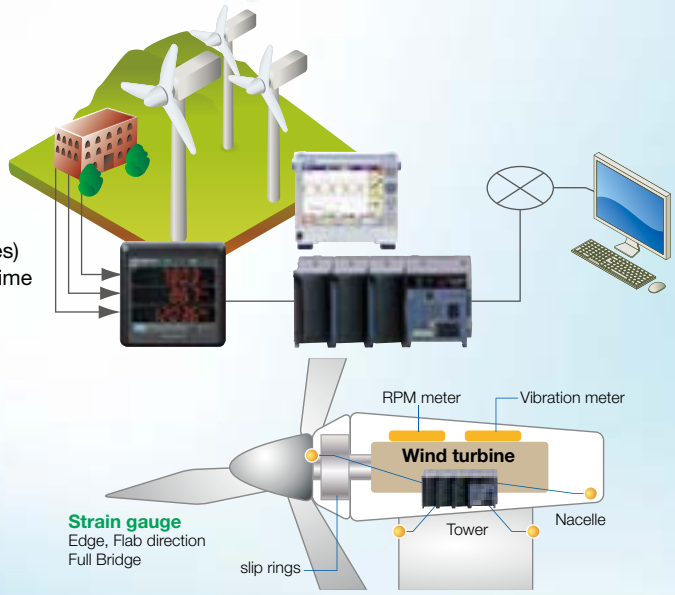
Power generator parameters and weather environment data at wind-farms can be recorded. Remote access allows users to monitor all data for operational status.

Application keys

- Strain gauge sensor at slip-ring and communications across rotating interface.
- Environmental tolerances (vibration and operational temperatures)
- Reliable data logging with local storage and ability to feed real-time data to SCADA package
- Event based recording with reporting options

Benefits

- Remote monitoring via WAN
- On site continuous data logging for extended periods
- Recovery of data logging after power failure
- Critical diagnostics alarm function
- E-mail notification by an alarm on math and I/O channels helps users keep track of system for maintenance etc.



Geothermal Electrical Generation Control and Monitoring

Overview

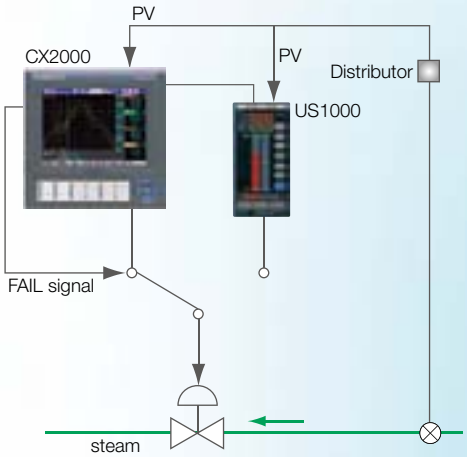
Hot rocks and water come together in select areas to produce renewable energy. CX2000s networked to US/UP controllers provide primary control with distributed backup control for steam turbines.

Application keys

- Fail safe operation of control valves using CX2000 as primary controller with US1000 controllers as backup
- Distributed Control and Data Acquisition

Benefits of using CX2000 and US1000's

- Networking capability of CX2000 to US1000 for accurate data transfer
- Internal logic capabilities of CX2000
- System Fault to Fail relay for transfer of control to US1000's
- Data logging capability of CX2000 to CF card
- Ability of US1000's to accept pass through control output and switch to local control output as backup control strategy



CX2000: Primary control
US1000: Backup control

Hydrogen Fuel Cell Monitoring

Overview

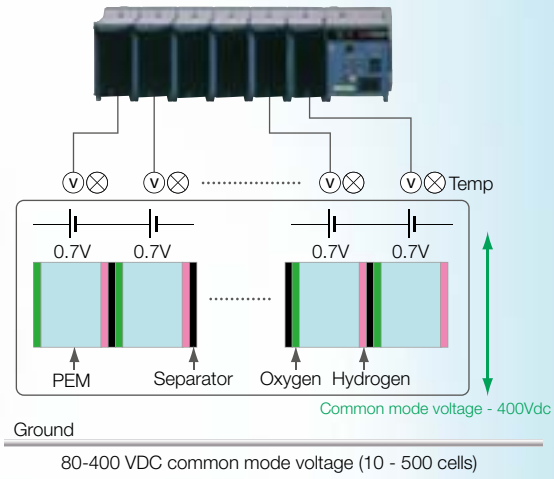
Industrial hydrogen fuel cells can be used to produce hydrogen and oxygen from distilled water as well as run in reverse to generate electricity. Fuel cells can also be used in conjunction with intermittent energy sources like solar or wind to provide regulated continuous energy output.

Application keys

- Scalable voltage and temperature measurement and monitoring (stacked cells)
- High levels of noise rejection and channel to channel isolation
- 100ms collection rate for channel data
- Ability to communicate real-time data via Modbus TCP

Benefits of using MW100

- Options for communicating with control systems Modbus TCP, Modbus RTU, Ethernet IP, DNP 3
- Superior noise rejection compared to competitor models
- High density of isolated inputs per MW100 rack
- Event based data logging for diagnostic purposes



80-400 VDC common mode voltage (10 - 500 cells)

Fuel cell evaluation logging/monitoring cell voltage/temperature data

Energy Monitoring for Manufacturing Lines

Overview

MW100 and PR300 system measures and quantifies the electrical energy consumption for each assembly line

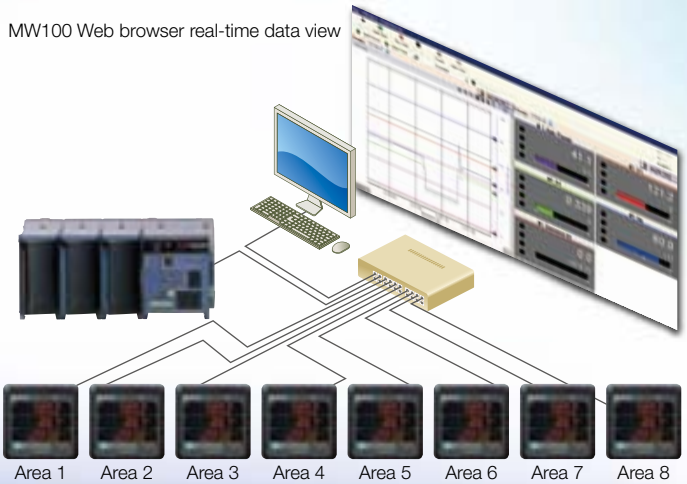
Application keys

- Scalable from a single node to 100's of locations
- Cost effective Individual electrical monitoring for many areas
- Demand monitoring with alarm output for load shedding

Benefits of using MW100/PR300

- On demand data recording/monitoring with easy access
- Easy connection with MW100/PR300
- Available with serial or Ethernet communications
- Remote monitoring from any PC with internet connection

MW100 Web browser real-time data view



MW100 Web-Enabled Data Acquisition/Stand-Alone Data Logging System

– Max. 10 ms measurement interval and mixing of three different measurement intervals
– Acquire up to 360 channels in one system
– High-withstand-voltage: 3700 Vrms, 600 Vrms/V DC
– Standard 10/100 Base T Ethernet with MODBUS TCP, EtherNet/IP, WITS and DNP3
– Wide range of operation temperatures: -20 to 60°C

DX1000/DX2000 DAQSTATION DXAdvanced

– Max. 25ms measurement interval and Max. 48 Channels
– Custom display and multi batch function
– Dust- and splash-proof front panel (IP65, Nema4 compliant)
– Standard Ethernet interface. RS485/RS232 interface.
– Networking functions: Web server, FTP data transfer, and E-mail messaging
– MODBUS, EtherNet/IP, PROFIBUS-DP protocol support

CX1000/CX2000 Control/Measurement Station

– Max. 6 control loops and 20 measurement channels
– Program control function (Max. 30 program patterns)
– Support for up to 16 external loop controllers
– Dust and splash-proof front panel (IP65, Nema4 compliant)
– Standard Ethernet interface. RS485/RS232 interface.
– Networking functions: Web server, FTP data transfer, and E-mail messaging

MV1000/MV2000 Portable Paperless Recorder

– Max. 25ms measurement interval and Max. 48 Channels (MV2000) 24 channels (MV1000)
– Insulated between channels,1000 VAC withstand voltage.
– The simplified interface lets you start measuring sooner
– Standard Ethernet communication with FTP data transfer and e-mail notification
– MODBUS TCP/RTU protocol support

PR300 Power and Energy Meter

– Measurement functions for Wh, W, PF, Hz, V, A etc as well as transducer function
– Three desired measurement items display
– High accuracy measurement: Voltage, Current: 0.25 % of F.S.
– Ethernet and RS485 communication
  Demand measurement and demand alarm output

UT52A/55A Digital Indicating Controllers

– Universal input and Max. 50 ms control cycle
– Ladder sequence control and fuzzy logic control
– Active color LCD display
– Ethernet, RS485 and PROFIBUS DP* communication
  *PROFIBUS DP coming soon

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VigilantPlant is Yokogawa's automation concept for safe, reliable, and profitable plant operations. VigilantPlant aims to enable an ongoing state of Operational Excellence where plant personnel are watchful and attentive, well-informed, and ready to take actions that optimize plant and business performance.

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