APPLICATION NOTE

CAS DATALOGGERS

Data Logger Serves as Automated Solar Energy Monitor For School Building

DataTaker Self-Contained Solution Remotely Sends Data via FTP

CAS DataLoggers has provided the automated solar energy monitor data logging solution to a government-owned school building retrofitted with a solar energy system as part of its renewable energy initiative. The federal department responsible wanted a device in the building to remotely monitor and record their system's energy generation and usage both to establish the ongoing feasibility of the system and to track their return on investment.

A grid of solar panels connects to an inverter, which in turn communicates to a dataTaker data logger.

Energy Monitoring

Users needed a data logging system that perform energy monitoring unattended, could read data from smart power meters and solar inverters, and which could also perform remote monitoring and data collection through the school's hard-wired Internet connection. The department also planned on adding gas flow monitoring to the project so their solution also needed to be compatible with flow sensors.

EQUIPMENT

CAS DataLoggers provided the school building's solar installation with the Series 4 dataTaker DT82I Data Logger. This intelligent device has several useful features for this application:

- A cost-effective data logger designed with the industrial market in mind
- Up to 6 analog sensor inputs for voltage (±30V), current, thermocouple or resistance inputs
- Built-in web and FTP server gives users remote access to logged data, configuration and diagnostics
- Modbus master and slave functionality allows connection to smart devices and SCADA systems via Serial or TCP/IP

- Two smart serial ports, capable of interfacing to RS232, RS485 and RS422 sensors and modems
- Rugged construction provides reliable standalone operation even under extreme conditions

Sensors

- Solar Inverter with Modbus RS-485
- Schneider PowerLogic ION6200 Power Meter
- Pyranometer (measuring Solar Radiation)
- Gas Flow Sensors

Installation

The solar inverter and power meter both communicate using the Modbus RTU protocol over a serial RS-485 link. The inverter reports the energy generated by the solar panels and the power meter reports the energy being used at the facility.

The dataTaker DT82I is the perfect logger for this setup because it features multiple Modbus-compatible serial ports in addition to its analog and digital channels. The datataker's universal inputs will log almost any physical value including voltage, 4-20 mA current, resistance, strain, and frequency. The solar inverter and power meter both network to the same RS-485 serial port and the Modbus data is transferred automatically according to the dataTaker's schedule, while the high-accuracy pyranometer is used to help view and document solar panel efficiency.

The low-power DT82I datalogger has support for Modbus sensors and SCADA systems, FTP and Web interfaces. This intelligent system features many options to connect locally via USB, RS232 or Ethernet.

Here the school's technician has left the standalone datalogger to log while unattended operating on its internal battery. The dataTaker can store up to 10 million data points with memory expansion possible so users can record as much data as they need. In this application the data logger also automatically transfers its data back to an office via the facility's hardwired TCP/IP network connection. This was just a simple case of plugging the Ethernet cable into the existing secured router/infrastructure.

Software

Over the Ethernet connection, the dataTaker can be configured, monitored and accessed 24 hours a day via its internal web-based software (dEX). The logger also automatically backs up new data every day via FTP with minimum setup requirements. This ensures another level of data redundancy.

Benefits

All in all, the DT82I forms a completely self-contained solution for this green application, providing as a solar energy monitor and connecting to a wide range of sensors for flexible monitoring. The dataTaker provides an extensive array of communications features that include FTP, Modbus/SCADA connection, and more. Each dataTaker data logger also includes the FREE dEX graphical interface software.

In the future when gas flow sensors are fitted to the school building, the DT82I will connect to these using its analog or digital counter channels, depending on whether the flow sensors have voltage, 4-20mA current signal or digital pulse outputs.

For further information on our dataTaker data loggers, solar energy monitors, or to find the ideal solution for your application-specific needs, contact a CAS Data Logger Application Specialist at **(800) 956-4437** or www.DataLoggerInc.com.