

Easily Build Data Acquisition for Solar Farms Over the Cloud

Solar Production Efficiency Relies on Accurate Data Acquisition

In the past, usage of solar energy dramatically increased in response to high oil prices. Solar panels were originally established for households and commercial buildings as a way to reduce electricity costs. The production efficiency of solar power was not considered an important factor until governments and power plants around the world began purchasing surplus solar power from private sectors.

Raising the production efficiency of solar energy is now one of the top issues for system integrators and solar solution providers. Achieving this goal requires effective monitoring of key production indicators, including total daily flux as well as solar inverter temperatures and data. Remote data acquisition for solar energy systems must run efficiently and smoothly.

The Call for Communication Standardization Gets Stronger

As the solar market grows, existing remote data acquisition systems have faced several issues due to the lack of standard communication protocols.

For example, it is still common for vendors to use non-industrial protocols, particularly for solar inverters. However, industrial-grade collector devices and data concentrators are designed for industrial protocols, making it a challenge to establish efficient data communication. To address this problem, engineers often rely on PCs to serve as data concentrators, an approach that leads to another issue.

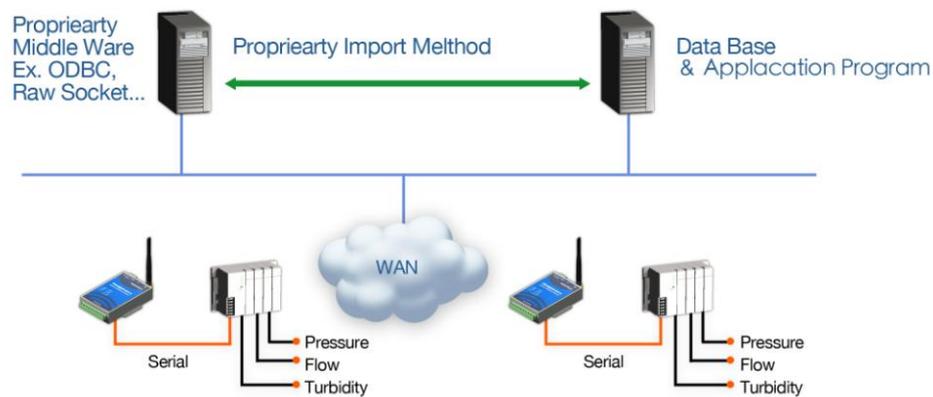
Since many industrial PCs are not designed for high operating temperatures, built-in fans are often used for cooling purposes. These fan-cooled computers are more likely to have stability issues and require more frequent on-site trouble shooting and maintenance.

Two trends have therefore emerged for remote data acquisition applications – the use of open programmable platforms that enable communication with non-industrial standard protocols, and the preference for fanless hardware designs that are better able to withstand harsh environments.

Another challenge faced by solar energy system integrators and solution providers is perhaps the toughest issue to overcome – the difficulty of sending data to the central host through the Cloud (the Internet) using their proprietary protocols.

System integrators and solution providers generally develop their own protocols for relaying the logged and processed data over the Cloud to the central host for collection and analysis. This means additional programming is required to convert the data and feed it into the database.

Data communication over the Internet is inherently less stable than in a LAN environments, and there are many additional communication parameters to consider, such as timeout, communication alive check, etc. Not to mention, system integrators still need to build a custom socket program that can feed the received data into the database. For this reason, data acquisition over the Cloud is a very tough task.

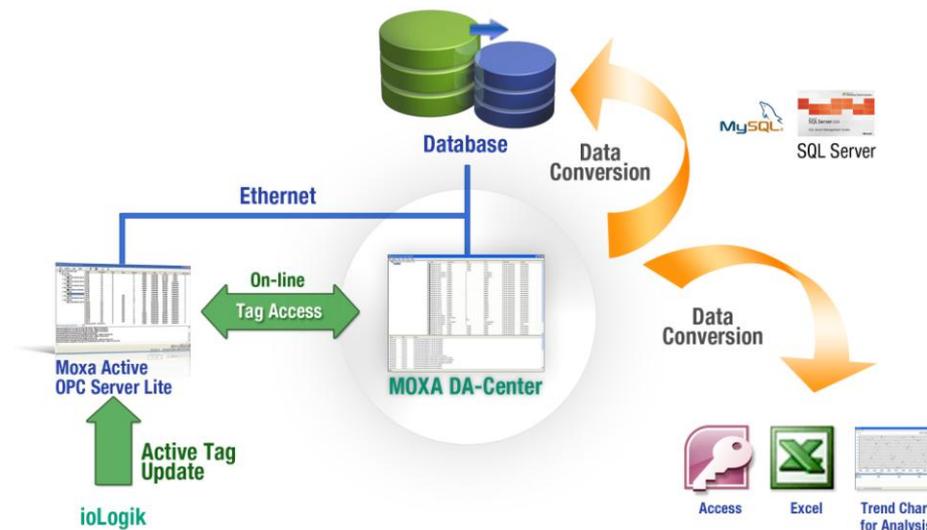


- Problems:
- Application requires on event, periodic ally, push based communication
 - Many programming efforts on proprietary middleware
 - Very difficult for PC to have Socket based push communication
 - Ones it is built, it will be very difficult to replac existing host

Extensive experience with remote data acquisition applications have taught us that system integrators and solutions providers can offer the best value by enabling customers to perform data mining, rather than simply implementing data transmission and acquisition.

Moxa has therefore focused its efforts towards simplifying the processes of data transmissions and data conversion so system integrators and solution providers can

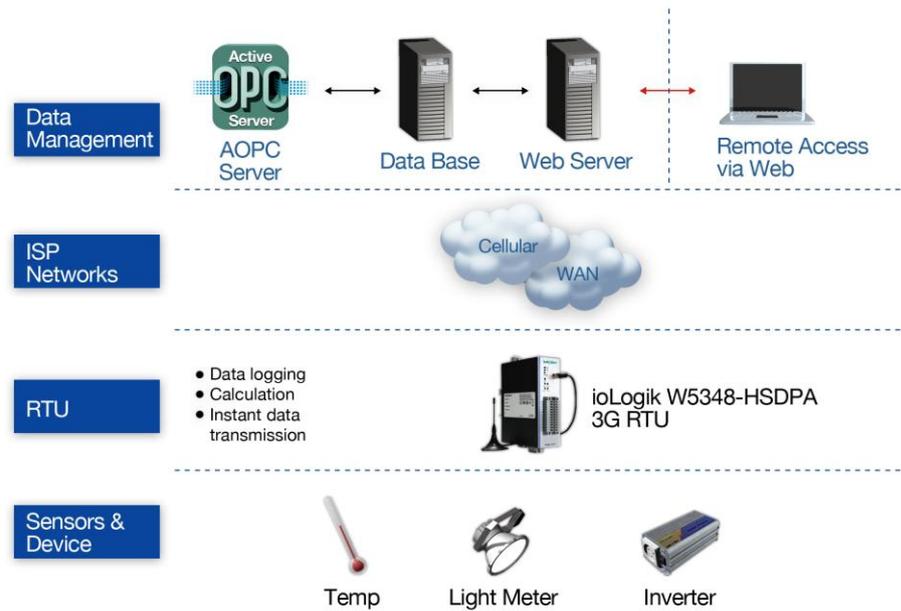
save time and effort in building data acquisition systems. Active OPC Server and DA-Center are free software packages available from Moxa that allow data concentrators to actively report data through the Cloud to the server, and convert that data directly into the database.



Active OPC Server is an industry-standard OPC server that enables data communication from remote sites without requiring additional programming. It also incorporates Moxa's patented auto tag generation technology, which minimizes I/O setup time and allows users to import data into the server with a push of a button.

DA-Center is an OPC client that only requires simple configuration. Data sent from remote devices to Active OPC Server is automatically written into DA-Center and fed into the user's database.

These are innovative solutions that are designed to help system integrators reduce the effort spent handling system operation so they can focus on data mining and their true value proposition.



Moxa's Cellular Remote Data Acquisition Solutions

This year, Moxa released a new remote data acquisition device that supports C programming and cellular communication. The ioLogik W5348-HSDPA has 4 analog inputs, 8 digital input and output contacts, 2 relays outputs, and a built-in cellular modem. It also comes with 2 serial ports that can communicate with inverters and I/O expansion modules, and a LAN port that can connect IP cameras or other Ethernet devices over the 3G network. The on-board SD card supports up to 32G of data storage to facilitate data integrity. The ioLogik W5348-HSDPA also supports complete APIs for I/Os, serials, Modbus master/slave protocol, and OPC tags.