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Smart Data-Logging

Let's assume for the time being….

that you are an Operations Technician at a wastewater treatment plant for a small city. The plant processes 260 Million Gallons of wastewater per day. Aside from monitoring the facility's different filtration systems and associated instrumentation and control equipment, you are responsible for traveling to the plant's two lift stations. It is at these lift stations where the City's sewage water is first collected then pumped into the sewer force main. Ultimately this sewage is routed to the treatment plant. There are two pumps at each of the stations. One of each pump is used for when demand is high and/or system redundancy. Controlling these pumps is a programmable logic controller (PLC). This PLC regulates the intensity of the pump's actuation as well as its timing. For quality assurance purposes the water facility's general manager would like a bi-weekly report on how the pumps at the lift stations are operating. How can you accomplish this?

Enter *data-logging*.

This month's Tech. Corner will examine the topic of data-logging. This subject of storing process data with the intent of acting upon it accordingly is opportune for the industrial automation field, given that processes can almost always be refined. This improvement in operations translates into reaching production goals in a very cost-effective / streamlined fashion.

Firstly, let us consider what data-logging encompasses. Data–logging is the process of collecting, in real time, determined process parameters such as conditions, values, as well as the time that said information is collected, or noted.   Chances are that you, our reader, are no stranger to data-logging implementation. If that's the case, perhaps your experience with this "tool" has left a favorable impression upon you. You may know that PLCs, operator interfaces (Human machine interfaces), SCADA software, Remote Telemetry Units (RTUs), industrial embedded computers, and remote access router are used for data-logging. But how exactly do these devices log this data and what needs to occur for this data to be useful and to ultimately translate into benefits?

HOW IT WORKS

Many process controls devices, such as the ones mentioned in the preceding paragraph, now come with data-logging capability. This data storage is possible via the use of the device's SD card slot and respective SD card. This concept is similar to that of a memory card in a digital camera. Keeping with this example, when pictures are to be printed or transferred from the camera, a memory card reader is needed for reading the data saved on the memory card. With larger devices (i.e. industrial embedded computers & RTUs) hard disk drives and now more commonly solid state drives are used.

The typical format, in terms of spreadsheet document column headers, is as follows: "data", "time", "tag name" (assigned in PLC program and/or SCADA software), "description", "value", and "engineering units".

BUT WHY LOG THE DATA?

Reasons for data-logging include:

- Opportunity to capture live process / production data
- Potential to present data in report format for accurate process / production insight
- Ability to conclusively adjust process / production in question based on operation goals

It should be noted, nevertheless, that traditional data-logging methods although effective have now since been innovated, so to speak.

THE ULTIMATE WAY TO DATA-LOG

Suppose that a company technician, manager, or owner could access the data-logging information from their field-device or machine without needing to physically access the SD card. Or how about if he/she could be in another city, state, or county and be able to have real-time process / production data accessible? What's more, how about if preset alarms could be acknowledged while not being onsite via SMS texting, email notification and SMA (simple mobile access) to your iPhone, iPad, or any other PDA? This can be accomplished using the eWON Flexy. The Flexy can log up to 1,000,000 data points, and has an SD card to log in the event or Wi-Fi or cellular latency, create a circular file, and log into the webpage for a particular Flexy and see I/O analog process variables as the relate to the set point and see alarm points as to their status. Everything is now right in palm of your hand. Whether your Flexy can connect via 10/100BaseT, via an RJ-45 port to the Internet, or distance issues cause you to use Wi-Fi or 3G+ cellular, the eWON Flexy is the right choice.

The device pictured above is the **eWON Flexy 100**. The Flexy is a data collection gateway that supports remote data-logging accessibility. The point of difference the Flexy offers is its modular form factor; this platform enables users to customize their Flexy base with the remote connectivity modules that suit their needs. And if needs should change in the future the appropriate Flexy module can be implemented.

The Flexy is available in the following base module and extension card variations:

1. **Flexy 101/201**: 4x Ethernet LAN Switch
2. **Flexy 102/202**: 1x LAN + 1x serial RS232/485/422
3. **Flexy 103/203**: 1x LAN + 1x MPI/Profibus (Siemens S7)

Extension cards

1. **Dual serial ports**: Connect any RS232/485/422 devices for remote access applications or data acquisition using eWON Flexy I/O servers library
2. **Ethernet WAN**: 1x WAN Ethernet access to connect your industrial assets to the Internet
3. **3G+ HSUPA**: Pentaband modem for worldwide connectivity using 2G, 3G, or 3G+ cellular network with up to 7.3 Mb/sec download and 2 Mb./sec upload
4. **WiFi**: 802.11 b,g,n WiFi client for WAN access to Internet
5. **PSTN**: Industrial PSTN modem V92 (56.000 bps) for landlines connections
6. **ADSL**: ADSL 2/2+ VPN router for remote connectivity over standard ADSL (annex a)

Now, in what applications can the Flexy be useful?

- Utility – Solar, Wind, Geothermal, Hydroelectric remote sites
- Petrochemical – especially pipeline and oil production remote sites
- Municipal Water – Lift Stations
- Vehicles – Cement Trucks, Sandbag Making Machines, Asphalt, Smart Trailers, Farm equipment, Drilling Equipment
- Waste Treatment Sites – Methane Plants, etc.

Quantum Automation is here to help end-users learn about the eWON Flexy and how it can boost their production / process efficiency.

References:

"EWON." EWON Flexy 100/200. N.p., n.d. Web. 17 Apr. 2014. <http://www.ewon.biz/en/ewon-flexy-100-200.html?ewp=38>.

Question:

What are the benefits of data logging and remote access?

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