



Application Story: I-7000 modules to Communicate to Opto22 Controller

I-7000 Modules Monitoring Electrical Parameters, Water Pressure and Flow

Straitway is an integration company based in Monterrey, NL, Mexico that has 20 years of experience. They provide electronic and software solutions for the chemical market in Mexico. They design solutions based on customer requests and requirements.

Straitway has experience in numerous fields like pumps, diesel power plants, radios, and PLC's-- so customers can deal with one contractor for all of their needs.

Straitway implemented an application to provide control to a pumping station at a diesel power plant. They need to monitor electrical parameters, water pressure and flow every second. The pumping station is located in the Salinillas Reservoir (upper left) and provides water to Anahuac City (bottom right) 36 kilometers away. A wireless system is used because the control room in Anahuac City is far away from Salinillas Reservoir. It provides important information: flow, pressure, electrical parameters, diesel generator status, etc. Flow and pressure are monitored 5 times per second using the [ICP DAS I-7000 modules](#).



Straitway chose an Opto22 controller for their application because they are comfortable with its programming software and it provides excellent serial RS-232/485 support. However, Opto22 I/O capabilities and its software support are very expensive. They needed some I/O modules that communicate with the Opto22 Controller over an RS-485 network. Carlos Alberto Estrada from Straitway says, "[ICP DAS I-7000](#) series I/O modules work transparently with Opto22 LCSX Controllers. [ICP DAS I-7000](#) modules have a powerful and simple protocol that can be used for gathering information by any controller with serial communication capabilities. There are no hard checksums to calculate and simple functions are provided to read and gather data. Straitway wrote subroutines to be used with Opto22 Factory Floor (available free upon request and "as-is") so other users can exploit the benefits of inexpensive I/O components. The subroutines detect the ICP modules attached to serial port, detect the model and monitor the I/O. The [ICP DAS I-7000](#) modules have all the functions onboard that user may need to interface with, including a PC. Other PLC's I/O have more functionality and most of the time, we pay for something we will never use. For this application, [I-7000 Series I/O Modules](#) were a cost effective and convenient solution to work with Opto22 LCSX Controllers to monitor 4-20mA input. The equivalent Opto22 Modules and racks require a module, rack and power supply and are much more expensive. In this

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solution, Opto22: LCSX+, B3000, PS245, Racks and ICP DAS [I-7000 I/O Modules](#) were used. In an enclosure, two [ICP DAS I-7000 modules](#) are din-rail mounted while providing more I/O points per square inch. Opto22 controllers have many functions, but not as powerful as those found in [WinCE.](#)"

Electrical parameters are monitored via RS-485 and exploiting capabilities of the soft starters to control the pumps. It is very important to monitor the state of the electrical parameters to detect if major blackouts from the energy provider. In this area blackouts happen frequently, which means a halt in the pumping operation and, no water going to Anahuac. Every second, the Control Room receives information in a PC from the Salinillas Reservoir in order to take proper steps to start/stop pumps. The Water Company saves all the costs related with transportation trucks, personnel, gas, maintenance, etc. with this system. The response is very effective.

Since wireless technology evolves everyday, in Straitway's future applications, they said they will just install ICP DAS I/O modules in the enclosures. The control will be done with a PC in the local room.

