

Breaking the Programmable Terminal Strip Syndrome

By Rex Crane, 2002, 2007

When it is necessary to view a process signal such as a temperature, flow rate, or simple on-off status of a device in an industrial environment you must use a programmable logic controller right? After all, a PLC is an industrial device with IO and has become the standard for industrial applications.

If the application is for machine or process control then the answer is probably yes. But what if the application is for merely monitoring real-time visibility or for collecting historic data on a signal? In that case the PLC becomes a rather expensive “programmable terminal strip.” PLC systems are optimized for control applications and normally not cost effective for distributed IO applications. Paying for a control processor, memory, and programming software can add significantly to the cost of a simple project.

Several industrial device manufacturing companies today offer distributed IO network systems. These systems offer virtually unlimited expandability making them well suited for visibility applications. Package sizes that allow you to place only the necessary functionality in a particular location often provide significant cost savings over PLC systems. The devices are designed with industrial applications in mind and therefore carry industrial ratings for temperature, humidity, and vibration.

Open network protocols such as Modbus and TCP/IP are readily available making the integration of the information into all popular supervisory control and data acquisition (SCADA) packages a simple task.

Note: Some PLC vendors offer “open” protocols with their products but be aware that they will often require proprietary hardware and/or software from the vendor to use them.

Example:

Let’s say you want to monitor the running status and load current for a motor control center with eight motors. This project is not a part of any other control system but needs to be integrated with an existing SCADA system. Ethernet communication is desired.

Using a PLC system will require a small enclosure with an IO rack, power supply, (1) 8 pt. analog input module, (1) 8 pt. discrete input module, and PLC processor with Ethernet capability. The total cost for this option including conduit and wiring and labor to mount and wire the panel is estimated at \$5,000.

Using a distributed Ethernet IO system will require one IO module and a power supply. There is a model available that combines both analog and discrete IO on the same module making it an excellent choice for this application. The module also has an on board Ethernet port eliminating the need for an addition communication processor. The small space requirement may allow the IO to be installed inside the motor control center eliminating the need for an external enclosure and the associated wiring. The total installed cost for this option is estimated at \$1,000.

Note: Not every application will provide this level of cost savings. But, as the example shows, distributed IO systems can offer significant advantages over a PLC system in the right application.

Summary:

When it is necessary to provide control for an application a traditional device such as a PLC is a good fit. This is especially true if the application is an “island of automation” and not part of a larger distributed control system. But in many applications a distributed IO system will offer benefits in space requirements, ease of integration, and cost. These benefits may well help you break the “programmable terminal strip” syndrome.