

Nano-PLC Lets Machines Act Big

PRODUCTION DATA REPORTING, remote diagnostics and troubleshooting long have been the higher-hanging fruit reserved for complex machines and control systems containing the hardware to accommodate such luxuries.

“Most small machines either don’t have analog I/O or maybe have a couple, and they never have Ethernet built-in,” explains Leon Yew, chief technology officer at Triangle Research. “That’s typically an add-on, and usually it’s only on the higher-end CPU product. If anyone wants to connect equipment to the Internet, that’s got to be done with a high-priced controller and it can be an expensive solution.”

Triangle’s new Nano-10 has only 10 I/O, but is a full-function PLC. Measuring 3.3x2.8 in. and weighing 2.6 oz, this nano-class controller has a built-in Ethernet port that supports Modbus TCP/IP server and client connections.

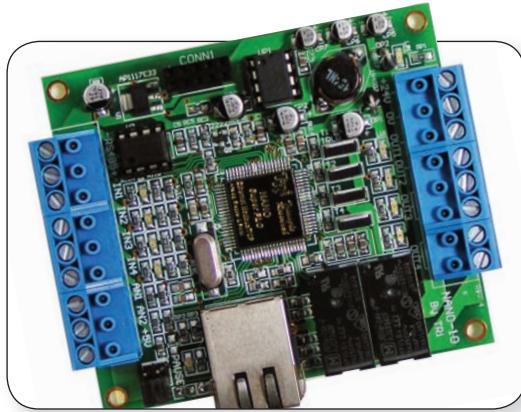
In addition, an RS-485 connection that supports native host link commands protocol, as well as Modbus RTU and Modbus ASCII, makes it possible not only to communicate with other Triangle Research PLCs, but also to work with a whole range of other devices that support the same industry standards.

Nano-10 is a direct panel-mount device, but an optional DIN-rail mounting kit is available.

“We support open networking standards, so the controller can talk to many devices, and it can talk machine to machine,” explains Yew. “You can put a whole lot of these into an assembly line or conveying line, or they also can run in stand-alone machines such as in small packaging machines, in stamping machines or in automatic drill presses.”

Designed to be Internet-savvy, Nano-10 allows machine builders or system integrators to create a Web page to control the equipment without writing a single line of Internet program. This is done by defining a background image and modifying a few variables that define the I/O labels and their locations on a browser screen. The programming of Nano-10 is done using the iTrilogi Ladder+Basic language.

“They don’t have to write any Java,” says Yew. “The Web page will run on any type of browser, including an iPhone. Up to now, if you wanted to create a customized Web page with your own



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background and positioning of the I/Os you want to control, you had to hire someone with specific skills to write the Web page.”

If a user wants to connect to a network for production status monitoring/reporting or for troubleshooting, that capability has been added, says Yew. “Normally, the production reporting is done manually by someone using a counter,” he says. “For troubleshooting or for changing a program or parameters, a manufacturer has to have someone on staff or incur the cost of field support from the machine builder to do that.”

The PLC has four digital inputs that support high-speed counter and interrupt functions. The four digital outputs, two of which are voltage-free relays, can supply two channels of pulse-width-modulation (PWM) current or control pulse and direction for a stepper motor.

Other features of this PLC include a processing speed of 4 μ s per step, counters/internal relays/sequencers, PID computation engine and real-time clock.

An optional add-on module provides non-volatile ferromagnetic RAM for data storage and a battery-backup real-time clock.

Operating range of Nano-10 is 0–70 °C, and it is designed for operation in relative humidity up to 90%. Available accessories include Auto485 converter between RS-485 and RS-232 and U485 for RS-485 connection to USB port on PC. A networkable serial LCD message display, the MDS100-BW, also is available for multiple-display applications. 