Simpler Approachto Process Controls

Controlling T-Buss with Modbus cuts installation costs

‘It costs less to run a single pair of wires to all sensors than to run multiple pairs from each point.’ Abraham Brecher is president at Tracer Electronics, 158 Edison Rd., Lake Hopatcong, NJ 07849, which specializes in developing low-cost monitoring and control components. He can be reached at 800-523-7232. Additional information is available at www.Tracer-Inc.com.
By Abraham Brecher

There is more than one way to monitor and control remote sensors. Machine control systems, process control systems and life/safety systems can benefit by employing a T-Buss point identification system, a simple two-wire scheme that often can be used in place of more expensive methods of multiplexing. It’s plug and play with existing Modbus interfaces.
The difference between conventional multiplexing and a T-Buss system boils down to a simple fact. Although both use end modules that identify a system’s sensors, a multiplex system uses an identification module to serve several sensors while T-Buss modules are so small and inexpensive that one can be dedicated to each sensor. A T-Buss multiplex system monitors and regulates remote sensors by superimposing numerous signals on a single pair of wires while retaining each signal’s identity. Paired wires are routed from each sensor to a multiplexer panel, which in turn communicates with a smart terminal, typically a PC. Alternatively, the multiplexer can be integrated into a system. With either method, the user knows what is happening in the control system being regulated. A T-Buss system is a variation on the multiplexer theme. Each of 255 addressable points can be located up to 6,000 feet from the T-Buss controller. The T-Buss scans each addressable device &#151 the device can be read from and written to &#151 in 1.6 microseconds.

Simplicity and Lower Costs

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It costs less to run a single pair of wires to all sensors than to run multiple pairs from each point. In addition, maintenance is simplified by the ability of a T-Buss system to pinpoint sensor failure or a break in wiring.
An identification module (IDM) can be placed anywhere between a sensor and the two-wire bus, but experience shows that it’s advantageous to place it as close as possible to the sensor. Even better is having an IDM built into the sensor housing.

This minimizes wiring and makes the module easy to locate. The market offers sensor-housed IDMs that are sealed, water resistant and noise-tolerant and that interface directly with mechanical or electrical contacts. Although a device exists that utilizes an end-of-line resistor for supervision across the contacts to be monitored, an analog sensor will be available soon. Other advantages of T-Buss systems include the ability to convert any conventional contact into an addressable point, regardless of application. These systems have analog capability that permits the use of analog and digital sensors on the same T-Buss.

Modbus and Versatility

It is common to see a T-Buss system joined with Modbus to achieve greater convenience and versatility. In simplest terms, Modbus can be considered a structured command protocol. It employs a standard language to relay communications back and forth between a T-Buss controller and a system's head-end computer.
With Modbus as a translator, messages can be understood with any system software. If the computer requests a voltage level reading, for example, it issues a structured command and Modbus provides the data in the same manner. In practical terms, Modbus converts system messages to a standard protocol and thus accommodates equipment from a variety of manufacturers. The user is assured compatibility. Obviously, this makes installations and add-ons easier. The adjacent chart, which depicts an interface with a steam-generating system, illustrates the simplicity of T-Buss. The IDMs, all connected to the same pair of wires, monitor all system components and send data to a T-Buss controller, which in turn is connected to a head-end computer. Tied into and controlled by T-Buss are the steam generator, a separator that removes remaining water from generated steam, and a receiver that maintains pressure level and vents steam if pressure is too high. Conversely, if steam is lost, the make-up tank replaces it. The dryer removes remaining traces of water. This T-Buss system controls all pumps by means of positive feedback relays. It controls tank levels by converting analog signals into digital and sending them to the main controller. Pressure sensors monitor steam pressure, and a sensor and thermometer work together to watch the dryer's performance. The simplicity of the system can be attributed to the fact that all components are tied into the same wire pair. Problems are flagged quickly. Adding a new component is a matter of splicing in and modifying the head-end computer's software. It's a supervised two-wire loop, transmitting data and power on the same pair of wires.

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