

DeviceNet Reduces Life-Cycle Costs

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Large machinery and machine tools with embedded controls are ideal applications for DeviceNet. OEMs who manufacture such equipment realize significant savings in wiring, installation labor, and post-installation troubleshooting. The end user benefits from DeviceNet's diagnostic capabilities.

With a maximum bus length of 1,600 ft, the linear topology (Trunk-line/Dropline) DeviceNet bus accommodates a maximum 64 nodes per bus and 32 I/O per node. Bus addressing includes master-slave, peer-to-peer, multicast (one-to-many), and change-of-state (exception-based reporting). At a maximum speed of 500K baud, its scan time is 7.2 msec for 63 devices in master-slave format, faster in other address modes. Its data package size is zero to eight bytes, with messages in multiple of eight bytes.

Integrating different brands of equipment on the plant floor is one of the problems end users want to focus on when looking at device-level networks. The DeviceNet interface allows products from different vendors to communicate because of their common communications technology. Many large manufacturing companies have multiple facilities. DeviceNet's common interfacing technology will allow each facility to choose the vendor they are most comfortable with, and still maintain a level of consistency from plant to plant. DeviceNet products are virtually interchangeable because of the network's Device Profiles. These profiles define the parameter, diagnostics, and required features of DeviceNet products.

Key to simplifying device integration is the reduced wiring and wiring maintenance involved in a plant with a DeviceNet network. Most OEMs select a device network for the wiring savings, but the savings are not just the cost of the wire and initial stringing of the wire. It is also the cost of electricians who perform the physical terminations. OEMs find savings during the design stage of a plant because DeviceNet eliminates the need to draw wires going everywhere. The address to be configured into each device is all that is needed on the design drawings.

While wiring alone can justify DeviceNet in many cases, end users find that the network provides an additional benefit as well. The advanced diagnostic capability, for instance, allows for the immediate awareness of unstable conditions. When a device is broken or misaligned, the problem may remain undiscovered until conveyors jam, products are mispackaged, or other more serious problems occur. DeviceNet systems perform self-diagnostics internally and are able to report the working status of each device over the network--even when a machine is in standby mode. When a fault occurs, diagnostics identify the location, eliminating the time-consuming process of tracing I/O back to the control panel.

DeviceNet adds intelligence to areas in the machine or plant that never had it before. No control system has the ability to report when a light bulb filament burns out unless you go through the hassle of putting in a control code to test it. With DeviceNet, the light socket is intelligent: It can notify the operator when it is being given power but not consuming any current.