

# DeviceNet Scanner For Modicon TSX Quantum PLCs

## Lets you connect your DeviceNet devices to a Modicon TSX Quantum PLC

### Features:

- **A single-slot module that resides in a Modicon TSX Quantum PLC rack; can be local, remote or DIO rack.\***
- **Lets you connect up to 63 slave devices.**
- **Communicates directly with the PLC's backplane using 8 or 32 input and output registers.**
- **DeviceNet time can be saved by not transferring I/O values unless a change-of-state (COS) has occurred.**
- **DeviceNet transfer of I/O data can be scheduled (cyclic data).**

*\*Because DIO rack supports a maximum of 30 input registers, the scanner module in a DIO rack can be used only with 8 word configuration.*



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The PLC DeviceNet Scanner acts as an interface between DeviceNet devices such as photoelectric sensors, proximity switches, valve manifolds, motor starters, process sensors, bar code readers, variable frequency drives, panel displays, and operator interfaces and a Modicon TSX Quantum PLC processor. It provides connection to a single DeviceNet network. It communicates with DeviceNet devices over the network to:

- Read inputs from a device
- Write outputs to a device
- Download configuration data
- Monitor a device's operational status

Information exchanged includes device I/O data, status information, and configuration data.

### DeviceNet Basics

DeviceNet is an open network standard. This means that users may specify, install, and use various products from a wide number of suppliers without the need to purchase special equipment, software, or licensing rights. Thus, the user can create a system from a variety of vendors, yet specific to the exact application, mainly using off-the-shelf parts.

DeviceNet is a low-cost communication link that connects industrial devices, such as limit switches, photoelectric sensors, proximity sensors, valve manifolds, motor starters, process sensors, bar code readers, variable frequency drives, panel displays, and operator interfaces to a common network.

Networking devices eliminates the necessity for expensive hard wiring, and the attendant testing and maintenance that goes with it. It also reduces the cost and time needed to wire and install automation devices, while providing improved communication between devices, as well as important device-level diagnostics not easily accessible or available through hardwired I/O interfaces.



Modicon TSX  
Quantum PLC Plug-in DeviceNet Scanner Module

### The DeviceNet Functionality

The DeviceNet bus topology is described as "Linear" (trunkline/dropline); and power and signal reside on the same network. Nodes may be removed or inserted from the network without powering down the network.

### Bus Addressing is either:

#### Peer-to-Peer with Multi-Cast—

Peer-to-peer are generally token-pass networks. Each device can send messages only when they have the token. The token gets passed based on node number (round robin) or possibly via user defined priority list. There is no sense of mastership or priority and it is not deterministic. Multi-Cast allows one-to-many and many-to-one relationships to be built dynamically.

#### Multi-Master with Multi-Cast—

Multi-Master addressing is where more than one unit acts as a Master.

**Master/Slave special case—**polled or change-of-state (exception-based). Rather than a Master going through a polling list (scanning), devices report data (input or output) on a COS (change-of-state) basis as the events occur. This mode is considered more efficient for discrete applications. Network traffic is reduced, significantly.

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# DeviceNet Scanner (cont.)

## DeviceNet supports the following operations:

**Strobed**—Multicast message starts off the scan cycle. Strobbable slaves respond, based on their latency.

**Polled**—Master interrogates each node according to the "polling list." Polls are sent out even as strobe responses are being received, as bandwidth allows.

**Cyclic**—Devices report data on a user-configured time increment basis (input or output). Cyclic data production is considered more efficient for applications with slowly changing analog I/O.

**Change-of-State (COS)**—Device reports its data only when there is a change. This is considered more efficient since only data changes are transmitted. It can be used along with Poll or Strobe.

**Application-triggered data movement**—Rather than being triggered by a Master, the movement of data is initiated by the application.

A DeviceNet product may behave as a Client or a Server or both. Up to 64 node addresses, called Media Access Control Identifiers or "MAC IDs" can be connected to a single DeviceNet network and the end-to-end network distances that can be accommodated are dependent on the speed of the network. A DeviceNet running at a baud rate of 125 kbps can extend up to 500 meters (1,640 ft) while a DeviceNet, running at a baud rate of 500 kbps, can only go 100 m (328 ft).

## Specifications

### DeviceNet Data:

- Strobed-Multicast message starts off the scan cycle. Strobbable slaves respond, based on their latency.
- Polled-Master interrogates each node according to the "polling list." Polls are sent out even as strobe responses are being received, as bandwidth allows.
- Cyclic-Devices report data on a user-configured time increment basis (input or output). Cyclic data production is considered more efficient for applications with slowly changing analog I/O.
- Change-of-State (COS)-Device reports its data only when there is a change. This is considered more efficient since only data changes are transmitted. It can be used along with Poll or Strobe.
- Application-triggered data movement-Rather than being triggered by a Master, the movement of data is initiated by the application.
- Configurable data
- Background poll rate
- Strobe or poll for each node

### PLC Processor-to-Scanner Communication:

8 Input/8 Output registers or 32 Input/32 Output registers, user selectable.

### Power Consumption:

- DeviceNet Current Load: 90 mA (max.)
- Backplane Current Load: 700 mA @ 5 VDC (max.)

### Communication Rates:

125 kbps, 250 kbps, 500 kbps

### Messaging Capabilities:

Master: . . . .Poll, strobe, COS, or cyclic

### Isolation:

Optical isolation between Backplane and Channel 1

### Module Location:

Any I/O slot in Quantum PLC rack

Network Address: . . . . .00-63

### ENVIRONMENTAL CONDITIONS:

#### Operating Temperature:

32 to 140 °F (0 to 60 °C)

#### Storage Temperature:

-40 to +185 °F(-40 to +85 °C)

#### Humidity:

5 to 95%, noncondensing

#### Shock Unpacked:

• Operating: . . . . . 30g

• Nonoperating: . . . . . 50g

#### Vibration:

Unpacked: 5g from 10 to 500 Hz



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## How to Order

SAC-QDNET-010:

DeviceNet scanner module for Quantum PLC