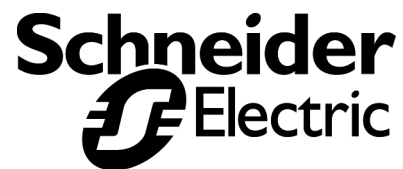170 LNT 710 00
DeviceNet Communication Adapter for
Modicon TSX Momentum

User Guide

870 USE 104 00

Version 2.0

May 2002

Schneider Electric

Modicon TSX Momentum DeviceNet Communication Adapter 170 LNT 710 00

1

This Communication Adapter can be connected to any TSX Momentum I/O base to create a functional I/O module. It provides direct connection to the DeviceNet network, enabling a programmable controller or other DeviceNet master device to communicate with field devices wired to the I/O base terminals.

Figure 1 shows the layout of a typical adapter and I/O base.

Figure 1   Communication Adapter with TSX Momentum I/O Base
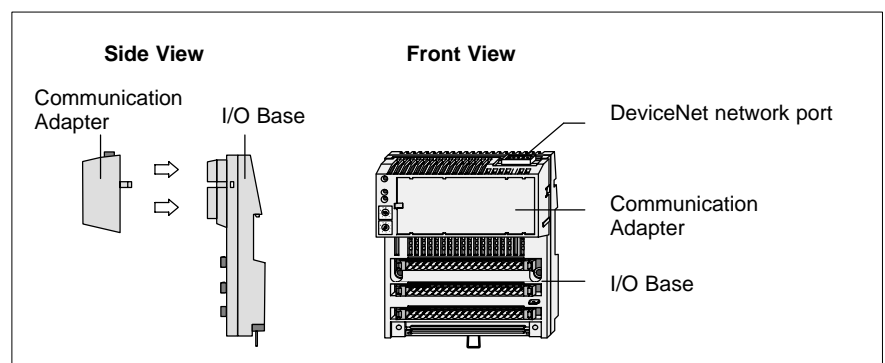
This book describes:

■ Product Overview

■ Status Indicators

■ Connecting to the Network

■ Setting the Network Node Address

1.1   **Product Overview**

1.1.1   **Function**

This adapter is installed on any TSX Momentum I/O base to form a complete I/O module that communicates on a DeviceNet network. A programmable controller or other DeviceNet master device on the network can then read from the input terminals and write to the output terminals of the I/O base.

For information about the use of I/O data words in communication with I/O bases, refer to the *TSX Momentum I/O Bases User Manual*, part number 870 USE 002.

1.1.2   **Physical Structure**

Each adapter connects to the internal communication connector of its I/O base. Clips lock the adapter in place, and can be released with a common screwdriver to remove the adapter. The user can fill out the front panel wiring label to identify the wiring connections and application of the I/O base terminals.

1.1.3   **Network Compatibility**

The adapter complies with the Open DeviceNet Vendor Association (ODVA) Specification Release 2.0 for for group 2 only slave devices supporting polled and strobed connections.

For a complete description of the DeviceNet network, including software operation of this device on the network, physical installation and wiring guidelines, refer to the DeviceNet specification published by ODVA. Current information about the ODVA specification can be obtained at the ODVA Web site: http://www.odva.org

ODVA Vendor ID
The ODVA Vendor ID number for Schneider Automation is 243 decimal.

1.1.4   **Operating Voltages and Error Control**

Power for the adapter and I/O base is provided by the user at the field location. The adapter receives its operating voltage through its I/O base internal connection. The adapter monitors its voltage and goes offline to the network if the voltage is not within tolerance.

1.2 # **Specifications**

Table 1   General Specifications

Description	Specification
ODVA compliance	Complies with ODVA Specification Release 2.0 for group 2 only slave supporting polled and strobed connections.
Data rate	Supports 125/250/500 Kbaud standard DeviceNet rates.
Network power loading	Voltage: Operational from 11 ... 25 Vdc. Current drain: 110 mA maximum, 75 mA typical.
Required enclosure	Adapter is considered open equipment, requires enclosure according to application.
Environment, RFI, EMI	Adapter conforms to the specification for the I/O base upon which it is mounted. See the *Momentum I/O Bases User Manual,* 870 USE 002 00 for I/O base specifications.
Agency approval	ODVA Certification UL 508, 746C, 94 CSA 22.2 No. 142 CE Mark FM Class 1 Div 2 Groups A, B, C, D

Table 2   Environmental Specifications

Description	Reference	Specification
Temperature, Operating	IEC 68–2–14	0 ... 60°C ambient
Temperatore, Storage	IEC 68–2–14	–40 ... 85°C
Humidity	IEC 68–2–3	95% RH at 60°C non–condensing
Altitude	MIL–STD–810	15 000 ft
Vibration, Operating	IEC 68–2–6	10 ... 57 Hz: 0.075 mm DA 57 ... 150 Hz: 1 g
Shock, Operating	IEC 68–2–27	15 g, 11 ms, 3 shocks/axis
Free Fall, Unpackaged	IEC 68–2–32	0.1 m
Free Fall, Packaged	IEC 68–2–32	24 in

<table>
<tr><td>1.2.1</td><td></td></tr>
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1.2.1   **Exec. V. 1.10 vs. V. 1.20**

Exec. V. 1.20 changed the behavior of certain I/O bases if a field side fault occurred. This change affects the following bases.

- 170 ADM 350 10
- 170 ADM 350 11
- 170 ADM 390 10
- 170 ADM 370 10

The following table describes the differences between the two versions in more detail. Refer to the *TSX Momentum I/O Base User Guide* (870 USE 002 00) for module specifications.

Table 3   Exec. V. 1.10 vs. V. 1.20

Firmware	Module	Action
Version 1.10	170 ADM 350 10 170 ADM 350 11 170 ADM 370 10	If one of the field side outputs faults (shorts out), the host will read all inputs as zeros, regardless of the input signal state.
	170 ADM 390 10	If one of the field side outputs faults (shorts out), the host will read all inputs as zeros, regardless of the input signal state. If an open condition exists (unconnected) on any of the input points, the host will read all inputs as zeros, regardless of the input signal state.
Version 1.20	170 ADM 350 10 170 ADM 350 11 170 ADM 370 10	If one of the field side outputs faults (shorts out), the host will continue to read the inputs normally.
	170 ADM 390 10	If one of the field side outputs faults (shorts out), the host will continue to read the inputs normally. If an open condition exists (unconnected) on any of the input points, the host will read ■ open inputs as zero (fault) and ■ remaining non–faulted inputs normally.

1.3   # Status Indicators

The adapter has three front panel indicators showing its operating status.

Figure 2   Status Indicators
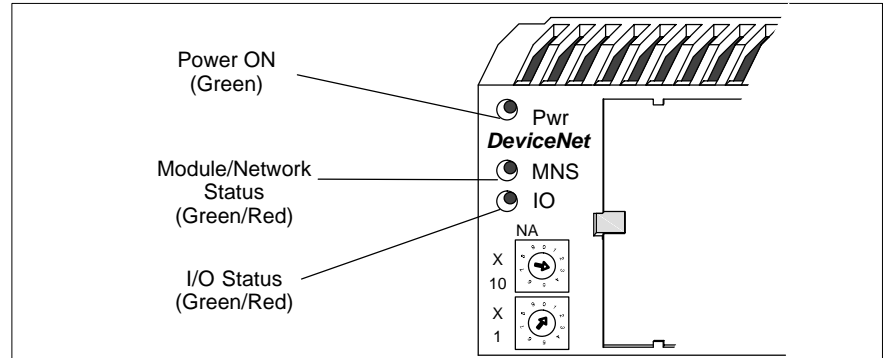
Table 4   Power ON Indicator

Indicator State	Status
Green (steady)	Normal operation: power is present from I/O base.
Off	Adapter is not receiving power from I/O base.

Table 5   Module/Network Status Indicator

Indicator State	Status
Green (steady)	Normal operation: adapter is communicating on network.
Off	Adapter is not receiving power from I/O base.
Green (flashing)	Adapter does not have an established network connection.
Red (steady)	Unrecoverable fault in network communication.
Red (flashing)	Adapter connection to I/O base has timed out.
Red/Green (flashing)	Network access error.

Table 6   I/O Status Indicator

| Indicator State	Status
Green (steady)	Normal operation: I/O is active, no faults.
Off	I/O inactive.
Green (flashing)	I/O inactive, no faults.
Red (steady)	I/O has unrecoverable fault.
Red (flashing)	I/O has fault.

1.4	# Connecting to the Network

1.4.1	### Network Connector

The adapter has one 5–pin male connector for connection to the network. Its pin–to–pin spacing is 5.00 mm. A suggested mating connector is: Schneider Automation part 170 XTS 060 00.

Figure 3   Network Connector

Pin	Connection	Wire Color
1	V–	Black
2	CAN_L	Blue
3	Shield	– –
4	CAN_H	White
5	V+	Red
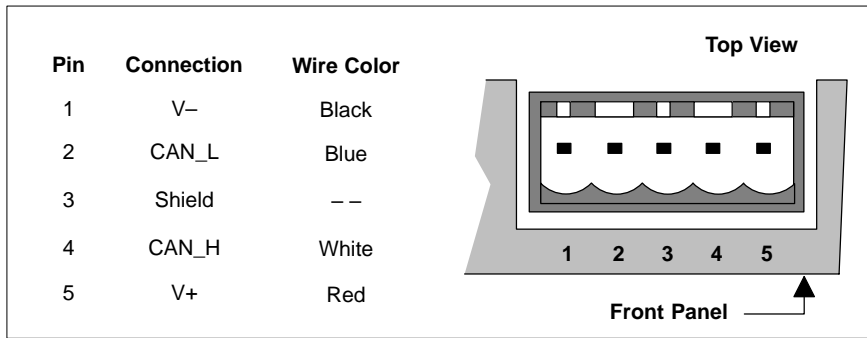
1.4.2	### Network Terminator Jumper

The adapter has a jumper to provide terminating impedance to the network cable. It is shipped with the jumper in the non–terminated position (pins 3 and 4). If the adapter is being installed as the last node on the network cable, move the jumper to pins 1 and 2 and mark a "X" in the box provided on the adapter's bottom panel.

Figure 4   Network Terminator Jumper

Pin	Termination
1/2	IN
3/4	OUT

The adapter is shipped with the Jumper on pins 3/4.

If the adapter is the last node on the network cable, move the Jumper to pins 1/2, and mark an 'X' in the TERMINATED box on the Bottom Panel.
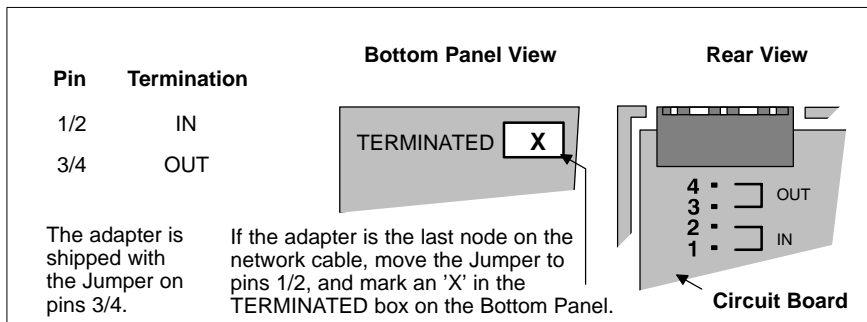
1.5   # Setting the Network Node Address

DeviceNet nodes are identified by unique addresses assigned to them by the user, in the range 0 ... 63. Duplicate addresses are not allowed.

The address is assigned in a pair of rotary switches on the adapter's front panel. The address that is set in the switches must correspond to the address defined for that adapter in the application program. This is required to ensure that messages will be transferred properly to the correct nodes across the network.

Before installing the adapter, set its switches to the address that is required for your application.

Default Address
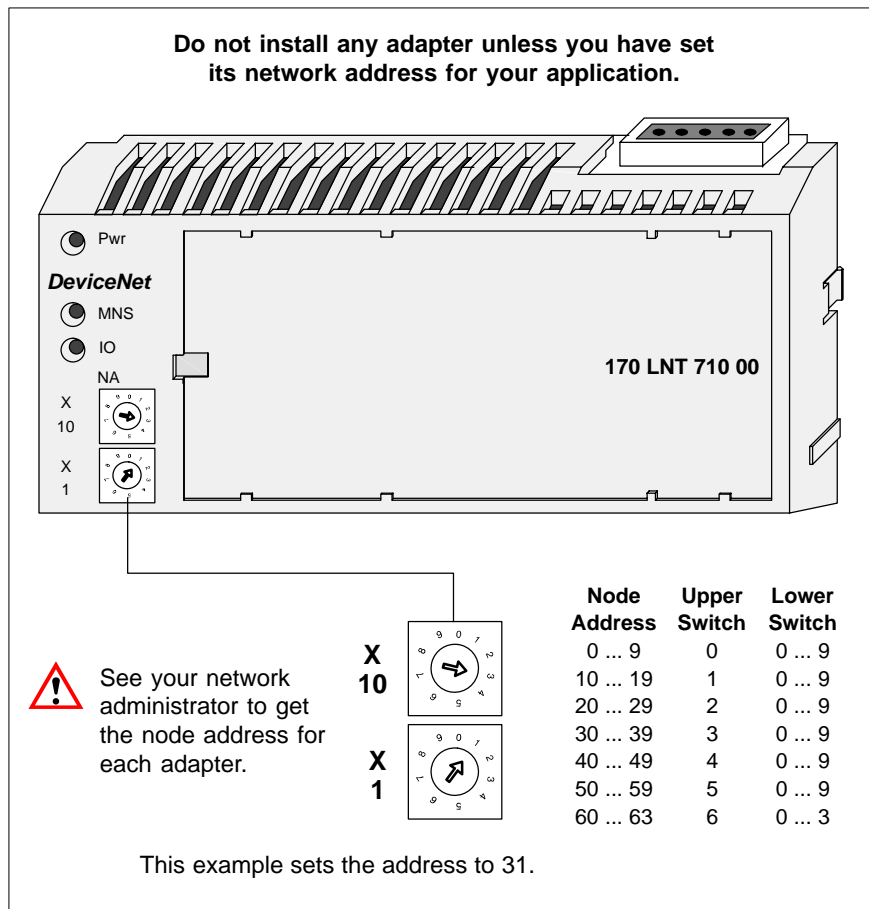The adapter is shipped with the switches preset to the default address 63.

How to Set the Address
Before you set the switches, make sure that operating power is removed from the adapter. The switch setting is sensed when power is next applied to the adapter.

Note that the adapter receives its power from the I/O base. If the adapter is already mounted on its I/O base, you must remove power to the I/O base.

If you are changing the adapter's switch setting to a new address, you must still remove all power to the adapter before setting the new address in the switches. Then reapply power to allow the adapter to sense the new setting.

Figure 5   Setting the Network Node Address

**Do not install any adapter unless you have set
its network address for your application.**

Pwr

DeviceNet

MNS

IO

NA

X
10

X
1

170 LNT 710 00

See your network
administrator to get
the node address for
each adapter.

X
10

X
1

Node Address	Upper Switch	Lower Switch
0 ... 9	0	0 ... 9
10 ... 19	1	0 ... 9
20 ... 29	2	0 ... 9
30 ... 39	3	0 ... 9
40 ... 49	4	0 ... 9
50 ... 59	5	0 ... 9
60 ... 63	6	0 ... 3

This example sets the address to 31.

1.6 Electronic Data Sheet (EDS) Disk

An Electronic Data Sheet (EDS) disk is included with this guidebook. It supplies the parameters for setup of each type of I/O base. Each file's format on the disk complies with the ODVA specification for DeviceNet I/O module EDS parameters.

README.TXT File
The disk contains a README.TXT file in a standard text (ASCII) format, which can be viewed and printed with any standard word processor or text editor program. The README.TXT file describes the directory structure and filename conventions used on the EDS disk.

EDS File Updates
Updated EDS files are available for downloading from the Customer Support areas of the Schneider Automation Web Site and Bulletin Board service. EDS files are all contained in a "zipped" (compressed) format in a single file, named EDS.ZIP. After downloading the EDS.ZIP file, "unzip" its contents into a temporary directory and use your application to install the EDS files.

Table 7 EDS File Download Sources

Source	How to Access	How to Locate EDS.ZIP
Web Site	http://www.modicon.com	select: Support
Bulletin Board	1–978–975–9779	select: Files to Download