EtherNet/IP™ with CIP™ Messaging

N-Tron Networking Series

## **Common Industrial Protocol (CIP)**

EtherNet/IP<sup>™</sup>, better known as the Common Industrial Protocol (CIP), was designed for use in process control and industrial automation applications. CIP was designed to provide consistent device access to eliminate the need for vendor specific software for configuration and monitoring of individual devices. With embedded support for CIP, *N-Tron* switches deliver switch information and configuration settings directly to Programmable Logic Controllers (PLC's) and HMIs (Human Machine Interface) through standard CIP messaging. Switch status, trending and configuration are easily viewed from a PanelView Plus with screen resolutions of 640 x 480 and higher. In addition to CIP, *N-Tron*'s robust fully managed feature set includes:

- IGMP Auto Configuration
- VLAN
- QoS
- Trunking
- Port Mirroring
- RSTP
- DHCP
- · Web Browser Management

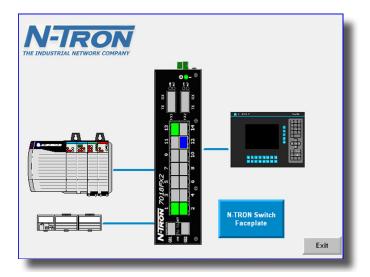
- SNMP v1, v2, v3
- N-View<sup>™</sup> Monitoring Technology
- Extended Environmental specifications: up to -40° to 85°C
- Configurable Alarm Contact and Bi-Color Fault LED
- N-Ring Technology
- N-Link Redundant N-Ring Coupling

EtherNet/IP with CIP Messaging is a standard feature on the N-Tron fully managed switch series. CIP tags, sample projects, and diagnostic faceplates for FactoryTalk® View ME/SE software are provided for quick setup and configuration in RSLogix 5000 environments (requires RSLogix 5000 version 17 and higher).

N-TRON 7018FX2: N-Tron Switch fe:8f:a0					
	2 🔎 🤰	2 🛛			
	IP Address	192.168.1.228			
	Subnet Mask	255.255.255.0			
9 <b>-</b> - ®	MAC Address	00.07.AF.FE.8F.A0			
12 50 00 00	Software Version	3.0.1			
2 🗖 🗖 2	Power Input	V1			
× ×	Contact Status	Closed			
	N-Ring Status	OK			
	IGMP Querier	Backup-Auto			
H H	IGMP Utilization	1 Not Supported N-Ring AutoMember			
ដ	Config Device				
۵ ۲	Role				
8	CPU Utilization	39			
χνi Io	Thursday, July 30, 2009				
18	45				
<b>0V</b> 70					
E C	35 0 5 0 1 5				
	9:28:00 AM	9:29:00 9:30:00 AM			
- 8 ° 8 °	🛛 Active 🔲 Inactive	📕 Disabled 📕 Error 📕 Fault			

Quickly view switch status on the Home display

- IP Address
- Subnet Mask
- MAC Address
- Software Version
- Power Input Status
- N-Ring StatusIGMP Querier Status
- IGMP Utilization
- Device Role
- CPU Utilization

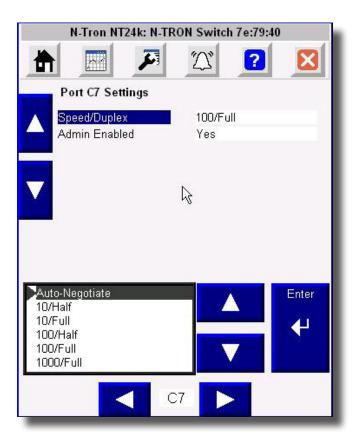






Port Diagnostics provides individual port status

- Link Status
- · Speed and Duplex setting
- Admin Enabled
- Port Role
- Trend Analysis
  - > Bandwidth utilization
  - > Broadcast transmit and receive in frames per second
  - > Multicast transmit and receive in frames per second
  - > Unicast transmit and receive in frames per second
  - > Port errors



N-TRON 708TX: N-TRON Switch ff:7a:a0				
		2	X	
Link U Speed	/Duplex I Enabled	Yes 100/Full Yes RSTP		
•	Bandwidth Utilization RX Broadcast FPS TX Broadcast FPS RX Multicast FPS TX Multicast FPS RX Unicast FPS TX Unicast FPS	0 0 0 7 9 11 0		
	Port Errors	-		
11 10   9 8:24:39 AM   8:25:39 8:25:39 AM   TX2				

Easily change port  $\ensuremath{\textbf{Settings}}$  or view  $\ensuremath{\textbf{Alarm}}$  status

N-Tron NT24k: N-TRON Switch 7e:79:40	-
h 🔤 🏓 🏋 🔁	
Power Supply 1 Error	
Power Supply 2 N/A	
Boot Loader Version OK	
Port Utilization OK	
N-Link N/A	
N-Ring N/A	
Configuration Device Not Present	
Temperature OK	
Low voltage on power input DC V2.	

# ►►► EtherNet/IP<sup>™</sup> with CIP<sup>™</sup> Messaging Specifications

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en P				AQI fo	r N-TRON switch.		
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				Date	e: August 7,2009		
0				A0I for N-TRON	NTRON_SWITCH		
				AOI_NTRON_S Switch_Inputs	N228:I.Data		
				Switch_Output	N228:O.Data[0] 0 ←		
				Switch_Parame Get Message	eters N228Params N228GetMsg		
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				Set_Message SetData	N228SetMsg N228SetData		
				Octoata	142200612/ata		
	Example: Use	CIP messaging to disable port 4 on a	switch. (A Generic Ethernet Module, co	onfigured for the switch, is needed for the MSG k	block.)		
				Configure class=F6, instance=4, attribute=9 on the			
				Message Configuration dialog, and select path to generic			
	Set to 1 to enable one time.	Send one byte.	Use 1 to enable and 2 to	ethernet module for the switch.	Set to 1 to enable one time.		
	bSetMessage	MOV	disable port MOV	MSG-	bSetMessage		
1	3 [	Move Source 1	Move Source 2		N)		
		Dest Set_Message.REQ_LEN	Dest SetMsg		R)—		
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(End)							
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MainPr	Routine						
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Ladder logic samples are included

CIP Status View	CIP configuration and status are also available via a web browser
Identity Information	
Product Name N-Tron NT24k	
Vendor 1006 (N-Tron Corporation)	USER: admin   ACCESS: Admin   LOGOUT
Device Type 0x0C (hex) (Communications Adapter)	USER admin   ACCESS: Admin   LOGOUT
Major Revision 1	THE INDUSTRIAL NETWORK COMPANY HELP   SUPPORT WEBSITE   SUPPORT EMAIL
Minor Revision 1	- Product Information
Serial Number 0xAF7D95C0 (hex)	CIP Configuration View
Connection InformationNumber of Multicast Connections1Number of Unicast Connections0	
Connection Summary	Status Modify Refresh
Transport Class     Connection State     Config RPI     Output Assembly     Input Assembly     Peer Address	0-0 V-Link D-0 V-Ring
1 established 1000 103 102 101 192.168.1.40	
Refresh	

### CIP tags include:

#### **Ethernet Link Tags**

Interface\_Speed Interface\_Flags Physical\_Address InÖctets InUcastPackets InNucastPacket InDiscards InErrors InUnknownProtos **OutOctets OutUcastPackets OutNucastPacket** OutDiscards OutErrors Alignment Errors FCS\_Errors Single\_Collisions Multiple\_Collisions SQE\_Test\_Errors Deferred\_Transmissions Late\_Collisions MAC\_Transmit\_Errors Carrier\_Sense\_Errors Frame\_Too\_Long MAC\_Receive\_Errors Control Bits Forced\_Interface\_Speed Interface\_Type Interface\_Type Interface\_State Admin\_State Interface\_Label Interface\_Description Interface\_Utilization Utilization Alarm Upper Threshold Utilization\_Alarm\_Lower\_Threshold Broadcast Limit TX\_Unicast\_Packet\_Rate RX\_Unicast\_Packet\_Rate RX\_Unitast\_Packet\_Rate TX\_Multicast\_Packet\_Rate RX\_Multicast\_Packet\_Rate TX\_Broadcast\_Packet\_Rate RX\_Broadcast\_Packets RX\_Multicast\_Packets RX\_Multicast\_Packets TX\_Broadcast\_Packets TX\_Broadcast Packets RX\_Broadcast Packets Port\_Role

#### Switch Tags

Device\_Uptime Port\_Count Valid\_Ports Global\_Admin\_Status Global\_Link\_Status System\_Faults IGMP\_Querier\_Status IGMP\_Querier\_Status IGMP\_Version IGMP\_Resource\_Usage IGMP\_Active\_Querier CPU\_Usage Class1\_Connections Class3\_Connections Temperature\_Alarm\_Upper\_Threshold Temperature\_Alarm\_Lower\_Threshold Contact\_Status Temperature\_C Temperature\_F Reset\_MIB\_Counts Device\_MAC\_Address Device\_Role Config\_Device\_Status System\_Configuration System\_Firmware\_Version\_String System\_Boot\_Loader\_Version\_String System\_Fault\_String

#### **Faults Tags**

Faults Power\_Supply\_1 Power\_Suppy\_2 NRing\_Full NRing\_Part\_Low NRing\_Part\_High NRing\_Part\_Multiple\_Managers System Config\_Device Nlink Boot\_Loader\_Version Port\_Utilization Temperature

#### **TCP/IP Interface Tags**

Status Configuration\_Capability Configuration\_Control Path\_Size Object\_Path\_1 Object\_Path\_2 IP\_Address Network\_Mask Gateway\_Address Name\_Server\_1 Name\_Server\_2 Domain\_Name Host\_Name

#### **CIP Identity**

Vendor\_ID Device\_Type Product\_Code Major\_Revision Minor\_Revision Status Serial\_Number Product\_Name Assigned\_Name Geographic\_Location

#### **Generic Inputs**

Admin\_Status (1-64) Link\_Status (1-64) Utilization\_Alarm (1-64) Class1\_Connections Class3\_Connections Temperature\_C Temperature\_F CPU\_Utilization Contact\_Status Utilization (1-64) Update\_Counter



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