

# 9000

The N-TRON® 9000 Series Gigabit Capable Industrial Ethernet Switch offers outstanding performance and ease of use. It is ideally suited for connecting Ethernet enabled industrial and/or security equipment and is a fully managed switch.

#### PRODUCT FEATURES

- Four Slot Modular Switch
- Six Port 10/100BaseTX Modules
- Two and Four Port 100BaseFX Modules
- Two Optional SFP (Mini-GBIC) 1000BaseSX/LX Fiber Gigabit Transceivers with LC style connectors
- Fiber Optic Ring Manager with ~30ms Healing
- N-View<sup>™</sup> OPC Monitoring with Fault Status for Ring Managers
- Full IEEE 802.3 and 1613 Compliance
- NEMA TS1/TS2 Compliance
- American Bureau of Shipping (ABS) Type Approval
- Extended Environmental Specifications
- Auto Sensing 10/100BaseTX, Duplex, and MDIX
- Store and Forward Technology
- Rugged DIN-Rail Enclosure
- Redundant Power Inputs (10-30 VDC)

### **Fully Managed Features:**

- Full SNMP and Web Browser Management with Detailed Ring Map and Fault Location Charting
- IGMP Snooping
- VLAN
- QoS
- Trunking
- Mirroring
- 802.1w Rapid Spanning Tree Protocol
- DHCP
- N-TRON N-Ring<sup>TM</sup> Technology
- · IGMP Snooping
- VLAN
- QoS
- Trunking
- Mirroring
- 802.1w Rapid Spanning Tree Protocol
- DHCP

### **Management Features**

The 9000 Series offers several management functions that can be easily configured using a Web Browser, Telnet or a COM port.

**IGMP Snooping** - Internet Group Management Protocol is a feature that allows the 9000 Series switch to forward and filter multicast traffic intelligently.

**VLAN** - Virtual Local Area Network allows you to segment the switch in order to create two or more separate local area network domains.

**QoS** - Quality of Service provides proioritization of network traffic in order to provide better network service. The primary goal of QoS is to improve the latency of prioritized Ethernet packets required for ring management, real-time, and other interactive applications.

**Trunking** - Trunking (Link Aggregation) enables multiple physical ports to be linked together and function as one uplink to another N-TRON trunking capable switch configured in the same manner, thereby increasing the bandwidth between switches. This configuration can provide increased bandwidth and redundancy to applications requiring high levels of fault tolerant operation.

**Port Mirroring -** This function allows the traffic on one port to be duplicated and sent to a designated mirror port. Port mirroring can be used to monitor Ethernet traffic on the designated source port using the assigned mirror port.



**Rapid Spanning Tree -** This function allows the switch to be configured in a Ring or Mesh topology, and provides support for redundant path communications with high speed (rapid) healing.

### **Remote Monitoring Options**

For ease of configuration and monitoring the 9000 Series offers Web Browser Management and N-View OLE for Process Control (OPC) Server Software. The N-TRON N-View Software can be combined with popular HMI software packages to add network traffic monitoring, trending, and alarming to any application using N-TRON switches. In addition, SNMP, COM port, and Telnet interfaces are available for switch link and status monitoring.

### N-Ring Technology

N-TRON's 9000 Series Ring Manager using N-TRON's N-Ring technology offers expanded ring size capacity, detailed fault diagnostics, and a standard healing time of -30ms. The 9000 Series Ring Manager periodically checks the health of the Ring via packets. If the Ring Manager stops receiving these health check packets, it times out and converts the Ring to a fiber optic backbone within -30ms. In addition to standard Ring Manager protocol, when using all N-TRON fully managed switches in the ring, a detailed ring map and fault location chart will also be provided on the Ring Manager's web browser and OPC Server to identify the health status of the ring. Up to 250 fully managed or 50 unmanaged monitored N-TRON switches can participate in N-Ring topology.

### **Industrial Packaging and Specifications**

The N-TRON 9000 Series is designed to operate in industrial environments. It is housed in a rugged steel DIN-Rail enclosure. It has extended industrial specifications and features to meet or exceed the specifications of the equipment it is connecting. These include extended temperature ratings, extended shock and vibrations specs, redundant power inputs, and high MTBF (greater than 1M hours).

### Ease of Use and Performance

The 10/100BaseTX ports are auto sensing and auto configuring. Each copper port is automatically negotiated for maximum speed and performance by default, but can also be hard coded using the user interface. The two GB fiber optic ports support full 2000 Mb/s communications via 1000BaseSX. LED's are provided to display the link status, and activity of each port as well as power on/off status. A high speed processor and backplane allows wire speed capability on all 100BaseTX and 100BaseFX ports simultaneously.



## QUALITY MANAGEMENT SYSTEM CERTIFIED BY DNV

= ISO 9001:2008 =

### 9000 Specifications

**Switch Properties** 

Number of MAC Addresses: 4,096

Aging Time: Programmable

Latency Typical: 2.9µs
Backplane Speed: 6.6 Gb/s

Switching Method: Store-and-Forward

**Case Dimensions** 

 Height:
 5.12" (13.0cm)

 Width:
 9.0" (22.8cm)

 Depth:
 5.6" (14.2cm)

 Weight (max):
 ~5 lbs (2.3kg)

DIN-Rail Mount: 35mm

**Electrical** 

Redundant Input Voltage: 10-30 VDC

Input Current (max):2.5A@24V (fully populated)BTU/hr:20.48@24V (fully populated)Inrush @ 24V:16.0 Amp for 7.5ms

N-TRON Power Supply: NTPS-24-5 (5 Amp@24V)

**Environmental** 

Operating Temperature: -20°C to 70°C Storage Temperature: -40°C to 85°C Operating Humidity: 10% to 95%

(Non Condensing)

Operating Altitude: 0 to 10,000 ft.

Shock and Vibration (bulkhead mounted)

Shock: 200g @ 10ms

Vibration/Seismic: 50g, 5-200Hz, Triaxial

Reliability

MTBF: >1 Million Hours

**Network Media** 

10BaseT: >Cat3 Cable 100BaseTX: >Cat5 Cable

100BaseFX, 1000BaseSX

*Multimode:* 50-62.5/125μm

100BaseFXE, 1000BaseLX

Singlemode: 7-10/125μm

### **Fiber Transceiver Characteristics**

	Fiber Length	2km*	15km**	40km**	80km**
	TX Power Min	-19dBm	-15dBm	-5dBm	-5dBm
	RX Sensitivity Max	-31dBm	-31dBm	-34dBm	-34dBm
	Wavelength	1310nm	1310nm	1310nm	1550nm

<sup>\*</sup> Multimode Fiber Optic Cable \*\* Singlemode Fiber Optic Cable

### **SFP Gigabit Fiber Transceiver Characteristics**

Fiber Length	550m for 50/125μm 275m @62.5/125μm	10km**	40km**	80km**
TX Power Min	-9.5dBm	-9.5dBm	-2dBm	0dBm
RX Sensitivity Max	-17dBm	-20dBm	-22dBm	-24dBm
Wavelength	850nm	1310nm	1310nm	1550nm
Assumed Fiber Loss	3.5 to 3.75 dB/km	.45dB/km	.35dB/km	.25dB/km

<sup>\*</sup> SX Fiber Optic Cable
\*\* LX Fiber Optic Cable

Connectors

10/100BaseTX: Up to Twenty-four RJ-45 Copper Ports
100BaseFX: Up to Sixteen SC or ST Fiber Ports
1000BaseSX/LX SFP: Two (2) SFP LC Duplex Gigabit Fiber Ports

**Recommended Wiring Clearance** 

Front: 4" (10.16cm) Side: 1" (2.54cm)

Regulatory Approvals

FCC Part 15 Class A,

UL Listed 1604 (US and Canada) CLASS I, DIV 2, GROUPS A,B,C,D,T4A

CE: EN61000-6-2,4, EN55011, EN61000-4-2,3,4,5,6,

GOST-R Certified, RoHS Compliant,

ABS Type Approval for Shipboard Applications, IEEE 1613 for Electric Utility Substations, and NEMA TS1/TS2 for Traffic Control

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**REV 100426** 



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### 9000 Series Industrial Ethernet Switch Ordering Information

9000BP 5 Slot Backplane 9000CPU CPU Module

9002CPU-NN-ZZ
9006TX
Six Port 10/100BaseTX Copper Module
9002FXE-XX-YY
9004FXE-XX-YY
9000-UTA107
CPU Module with 2 SFP Gigabit Ports
Six Port 10/100BaseTX Copper Module
Two Port 100BaseFX Fiber Ports
Optional Metal DIN rail Mount

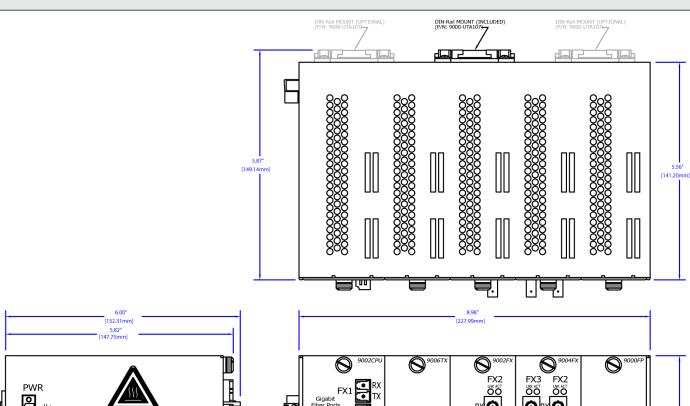
(Note: one included, up to 2 more may be utilized for additional stability.)

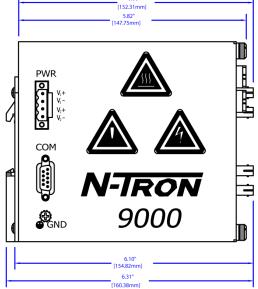
Gigabit Fiber options: NN = SX for Multimode, LX for Singlemode

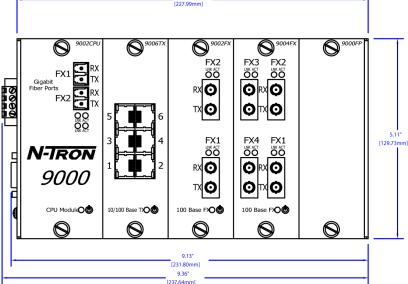
ZZ = 10, 40, 80 for LX Singlemode

100BaseFX options: XX = ST or SC (100BaseFX ports)

YY = 15, 40, or 80 for Singlemode, Blank for Multimode







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