

# 7012FX2 Industrial Ethernet Switch

N-Tron Networking Series



## Managed Industrial Ethernet Switch

### PRODUCT FEATURES

- Eight 10/100BaseTX RJ-45 ports
- Two 100BaseFX ports, ST or SC style
- Two SFP gigabit ports
- -40°C to 70°C operating temperature
- Onboard temperature sensor
- ESD and surge protection diodes on all ports
- Auto-sensing 10/100BaseTX, duplex, and MDIX
- Store-and-Forward technology
- Rugged DIN-rail enclosure
- Redundant power inputs (10-49VDC)

### FULLY MANAGED FEATURES

- SNMP v1, v2, v3 and web browser management
- Configuration backup via optional SD card
- Detailed ring map and fault location charting
- N-Ring™ technology with ~30ms healing
- N-Link™ redundant N-Ring coupling
- N-View™ OPC monitoring
- RSTP - IEEE 802.1D
- IGMP auto-configuration
- 802.1Q tag VLAN and port VLAN
- 802.1p QoS, port QoS, and DSCP
- EtherNet/IP™ CIP messaging
- LLDP (Link Layer Discovery Protocol)
- Trunking and port mirroring
- 802.1d, 802.1w, 802.1D RSTP
- DHCP server, option 82 relay, option 61, IP fallback
- Local port IP addressing
- Port security—MAC address-based



### BUILT FOR EXTREME CONDITIONS

The compact N-TRON® 7012FX2 fully-managed industrial Ethernet switch is ideal for industrial and utility applications that demand extreme performance under harsh conditions. Housed in a rugged industrial metal enclosure, the switch offers a powerful combination of eight 10/100BaseTX copper ports, two 100Base fiber ports, two SFP gigabit ports, and redundant power inputs for robust network support. The device boasts exceptional MTBF and extended tolerances to shock, vibration, temperature fluctuations and noise—common elements in factory floor control networks, utilities, wastewater treatment, wind turbines, rail car, intelligent traffic control and transportation applications.

### ADVANCED RING TECHNOLOGY

Advanced N-Ring technology provides expanded capacity, detailed fault diagnostics, and fast ~30ms healing time for N-TRON-based rings. The integrity of the ring is continually checked by sending heart beat packets around the network. If an error is detected, the ring converts to a linear topology within ~30ms and communication is immediately restored. A detailed ring map and fault location chart may be accessed by the ring manager's web browser or the OPC server. Each N-Ring accommodates up to 250 fully-managed N-TRON switches. To establish redundancy, N-Link technology easily connects multiple N-Rings, creating additional pathways to critical applications and increasing overall resiliency.

### MONITORING OPTIONS

N-TRON provides multiple tools to monitor the 7012FX2. The robust web-based interface provides a convenient dashboard to view and configure switch options, as well as monitor network traffic, alarms, and trend information. For tightly controlled environments, N-View OPC server software easily combines with HMI control and monitoring applications to form a complete surveillance solution for N-View-enabled switches. The iSNMP Software Suite is also available for link and status monitoring. For local monitoring, each switch features configurable LEDs to indicate power failure and N-Ring status.

### EASY TO USE

The 7012FX2 features auto-sensing and auto-configuring 10/100BaseTX ports. Each copper port automatically negotiates for maximum speed and performance but can be hardcoded through the user interface. A high-speed processor allows wire speed capability on all ports simultaneously.

## SPECIFICATIONS

### Switch Properties

Number of MAC Addresses: 8000  
 Aging Time: Configurable  
 Latency (typical): 2.6  $\mu$ s  
 Switching Method: Store-and-Forward

### Case Dimensions

Height: 4.3" (10.8 cm)  
 Width: 3.1" (7.9 cm)  
 Depth: 4.6" (11.5 cm)  
 Weight (maximum): 1.4 lbs (0.64 kg)  
 DIN-Rail Mount: 35mm

### Electrical

Redundant Input Voltage: 10-49VDC (regulated)  
 Input Current (max): 525mA@24VDC  
 BTU/hr: 44@24VDC  
 N-TRON Power Supply: NTPS-24-1.3 (1.3A@24V)

### Environmental

Operating Temperature: -40°C to 70°C  
 Storage Temperature: -40°C to 85°C  
 Operating Humidity: 5% 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: >2 million hours

### Network Media

10BaseT:  $\geq$ Cat3 cable  
 100BaseTX:  $\geq$ Cat5 cable  
 1000BaseT:  $\geq$ Cat5e cable

### Connectors

10/100BaseTX: Eight (8) RJ-45 copper ports  
 100BaseFX: Two (2) SC or ST fiber duplex ports  
 1000BaseT: Up to two (2) RJ-45 gigabit copper ports  
 1000BaseSX: Up to two (2) LC duplex gigabit fiber ports

### Recommended Wiring Clearance

Top: 1" (2.6 cm)  
 Front: 4" (10.2 cm)  
 Side: 1" (2.6 cm)

### 100 mb 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

\* Multimode Fiber Optic Cable  
 \*\* Singlemode Fiber Optic Cable

### SFP Gigabit Fiber Transceiver Characteristics

Fiber Length	550m for 50/125 $\mu$ m 275m @62.5/125 $\mu$ m*	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	-0.45dB/km	-0.35dB/km	-0.25dB/km

\* SX Fiber Optic Cable  
 \*\* LX Fiber Optic Cable

### Designed to comply with

- IEEE 1613 for electric utility substations
- NEMA TS1/ TS2 for traffic control

### Regulatory Certifications



Certificate  
 POCC  
 US.AB28.B06519

FCC Part 15  
 Class A

UL Listed  
 Class I, Div 2  
 Groups A/B/C/D  
 E214222  
 Industry Canada  
 ICES-003 Issue 3



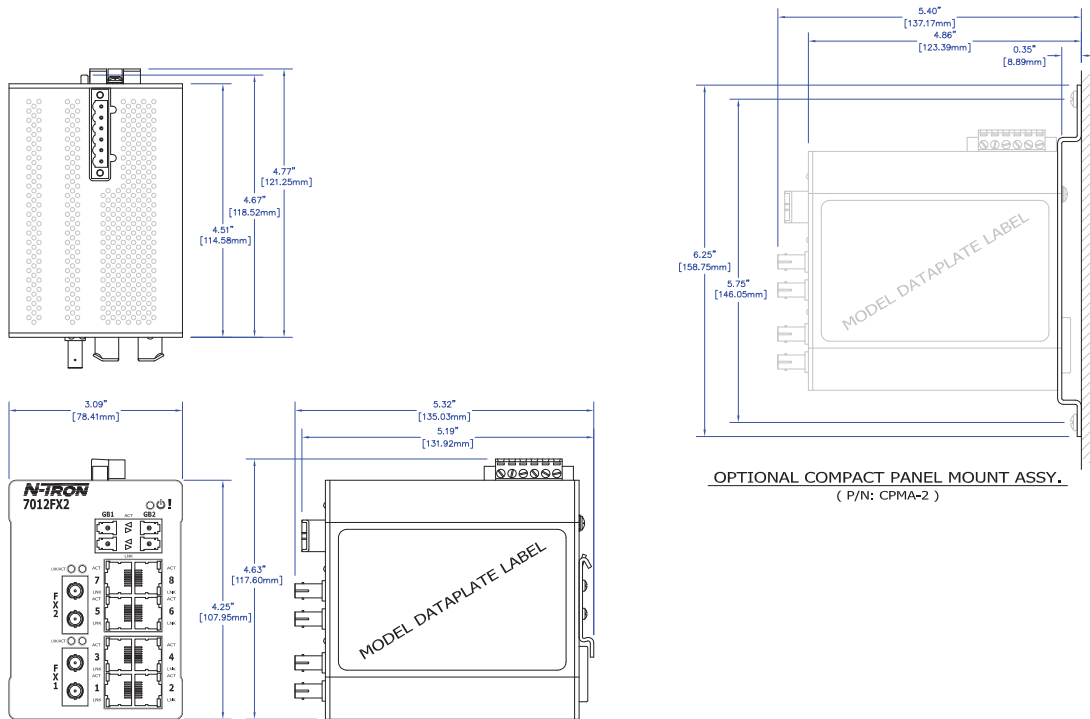
Further information regarding this product's regulatory conformity can be found on the N-TRON website at [www.n-tron.com/tech\\_docs.php](http://www.n-tron.com/tech_docs.php)

# ▶▶▶ 7012FX2 Specifications

## ORDERING INFORMATION

PART NUMBER	DESCRIPTION
7012FX2-XX.....	12-port (8 10/100BaseTX, 2 100BaseFX Fiber, and 2 SFP Mini-GBIC Gigabit Fiber Expansion Ports) switch
7012FXE2-XX-YY.....	12-port (8 10/100BaseTX, 2 100BaseFX Fiber, and 2 SFP Mini-GBIC Gigabit Fiber Expansion Ports) switch
NTSFP-TX.....	Optional SFP (mini-GBIC) transceiver with one 1000BaseT GB copper port
NTSFP-SX.....	Optional SFP (mini-GBIC) transceiver with one 1000BaseSX multimode GB fiber optic port
NTSFP-LX-ZZ.....	Optional SFP (mini-GBIC) transceiver with one 1000BaseLX singlemode GB fiber optic port
NTCD128.....	Optional configuration card for backup/restore
NTPS-24-1.3.....	N-TRON DIN-rail power supply (1.3 amp@24VDC)
CPMA-2.....	Compact panel mount (factory installed option)
URMK.....	Universal rack mount kit

Where: XX = ST or SC connector  
 YY = 15, 40, or 80 for singlemode, blank for multimode  
 ZZ = 10, 40, or 80 for GB singlemode (If SFP transceiver is not specified at the time of purchase, slots will remain blank with covers)  
 E = Singlemode



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