

# 7012FX2-HV

7000 SERIES  
Fully-Managed 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 (43-300 VDC)
- Configurable Bi-Color Fault Status LED

## 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
- RSTP 802.1d, 802.1w, 802.1D
- N-View™ OPC Monitoring
- 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
- Port Mirroring
- DHCP Server, Option 82 relay, Option 61, IP Fallback
- Local Port IP Addressing
- Port Security—MAC Address Based

## BUILT FOR EXTREME CONDITIONS

The rugged N-Tron® 7012FX2-HV compact, fully managed industrial Ethernet switch offers a powerful combination of eight 10/100BaseTX copper ports, two 100Base fiber ports and two SFP gigabit ports, as well as a hardened metal enclosure for maximum durability. It is ideally suited for use in industrial applications such as factory floor control networks, utilities, rail, intelligent traffic control and transportation, wind turbines, wastewater treatment facilities, and other extreme networking environments that demand high reliability, superior noise immunity, ultimate ruggedness, and support for extended distances.

## REMOTE MONITORING OPTIONS

Web browser and N-View OPC (OLE for process control) server software provides configuration and monitoring capability. N-View software easily combines with HMI software to monitor network traffic, alarms and trends. SNMP is also available for switch link and status monitoring. Status LEDs are configurable to indicate power failure and N-RING status.

## N-RING TECHNOLOGY

N-Ring technology provides expanded ring capacity, detailed fault diagnostics, and fast 30ms healing time. The ring manager validates the integrity of the ring using health check packets and quickly converts the ring to a linear topology within ~30ms when an error is detected. The health status of a ring comprised of all N-Tron fully managed switches may be monitored. A detailed ring map and fault location chart may be accessed by the ring manager's web browser or the OPC server. N-Link allows the linking of two N-Rings. Up to 250 fully managed N-Tron switches are supported in an N-Ring topology.

## INDUSTRIAL SPECIFICATIONS

High MTBF, extended shock and vibration specifications, wide operating temperature range and redundant power inputs are standard features.

## EASE OF USE

N-Tron's auto sensing capabilities allow all 10/100BaseTX ports to automatically negotiate maximum speed and performance. By default, advanced processing enables simultaneous full wire speed functionality on all ports. If, however, the application requires hard-coded values, the process can be easily handled through the user interface.

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## 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 (max): 1.65 lbs (0.75 kg)  
DIN-Rail Mount: 35mm

### Electrical

Redundant Input Voltage: 43-300 VDC (Regulated)  
Input Current (max) 140 mA @ 124 VDC  
BTU/hr: 60 @ 124 VDC  
N-TRON Power Supply: NTPS-48-2 (48V @ 2 amp)

### 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: 50g @ 10ms  
Vibration/Seismic: 30g, 10-200Hz, 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  
1000BaseSX: Two (2) LC duplex gigabit fiber ports (transceivers optional)

### Recommended Wiring Clearance

Top: 1" (2.6 cm)  
Front: 4" (10.2 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	-03.5 to 3.75 dB/km	-0.45dB/km	-0.35dB/km	-0.25dB/km

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

### Regulatory Certifications

EMI, Immunity and Environmental  
IEC 61850-3 Electric Utility Substations  
IEEE 1613 Electric Utility Substations

### Product Safety

TUV/GS EN 60950-1

### Emissions

FCC Title 47, Part 15, Radio Frequency Devices, Subpart B (Class B)  
ANSI C63.4-2003  
Industry Canada ICES-003 (Class B)  
EN 61000-6-4 (Class B)

### Immunity

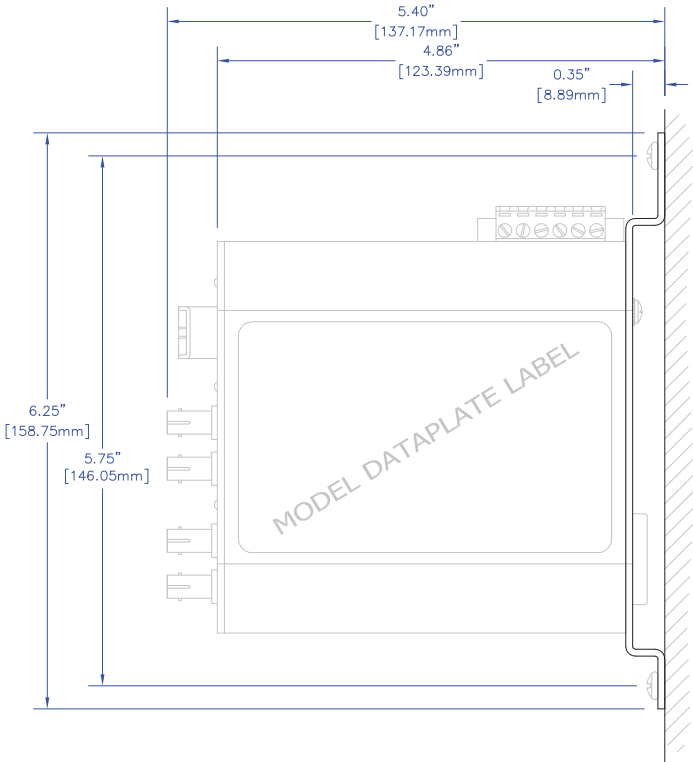
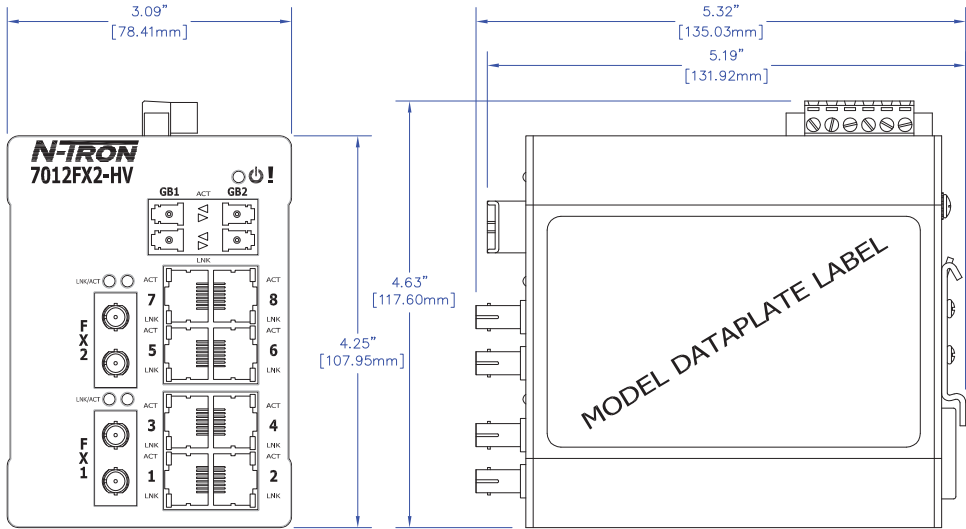
EN 61000-6-2  
IEC 61000-4-2 (ESD)  
IEC 61000-4-3 (RFAM)  
IEC 61000-4-4 (EFT)  
IEC 61000-4-5 (SURGE)  
IEC 61000-4-6 (RFCM)  
IEC 61000-4-8 (PFMF)

### Other

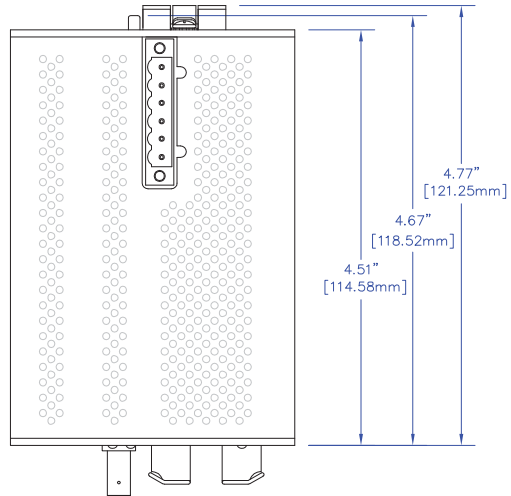
NEMA TS 2 Traffic Control Equipment  
GOST-R

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





**OPTIONAL COMPACT PANEL MOUNT ASSY.**  
 ( P/N: CPMA-2 )



# 7012FX2-HV

## ORDERING INFORMATION

PART NUMBER	DESCRIPTION
7012FX2-XX-HV	12-port (8 10/100BaseTX, 2 100BaseFX Fiber, and 2 SFP Mini-GBIC Gigabit Fiber Expansion Ports, 43-300 VDC) Fully Managed Industrial Ethernet Switch, DIN-Rail
7012FXE2-XX-YY	12-port (8 10/100BaseTX, 2 100BaseFX Fiber, and 2 SFP Mini-GBIC Gigabit Fiber Expansion Ports, 43-300 VDC) Fully Managed Industrial Ethernet Switch, DIN-Rail
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-48-2	DIN-Rail power supply 48V @ 2 amp
CPMA-2	Compact panel mount (factory installed option)
URMK	Universal rack mount kit

Where: E = Singlemode  
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)

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**QUALITY MANAGEMENT SYSTEM**  
**CERTIFIED BY DNV**  
**ISO 9001:2008**