

N-TRON® 7014FX2 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

- Ten 10/100BaseTX RJ-45 Ports
- Two 100BaseFX Ports, ST or SC Style
- Two Optional SFP (Mini-GBIC) Gigabit Transceivers
  - 1000BaseSX/LX Fiber with LC style connectors or
  - 1000BaseT Copper with RJ-45 connectors
- Fiber Optic Ring Manager with ~30ms Healing
- Full SNMP and Web Browser Management with Detailed Ring Map and Fault Location Charting
- N-View™ OPC Monitoring with Fault Status for Ring Managers
- Plug-and-play IGMP Support
- 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:

- IGMP Snooping
- VLAN
- QoS
- Trunking
- Mirroring
- 802.1D-2004 Rapid Spanning Tree Protocol
- DHCP
- N-Ring™ Technology

## Management Features

The 7014FX2 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 7014FX2 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 prioritization 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.



Shown with Optional Gigabit SFP Transceivers installed

**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 7014FX2 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 7014FX2 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 7014FX2 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 topologies.

## Industrial Packaging and Specifications

The 7014FX2 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

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. A high speed processor allows wire speed capability on all 100BaseTX and 100Base FX ports simultaneously. The two optional Gigabit ports support full 2000 Mb/s communications via 1000BaseSX/LX/T. For added flexibility, these pluggable SFP (Mini-GBIC) Gigabit transceivers can be installed in our factory at the time of purchase, or upgraded later in the field.

## 7014FX2 Industrial Ethernet Switch Ordering Information

|                |   |
|----------------|---|
| 7014FX2-XX     | Ten 10/100BaseTX Ports, Two Multimode 100BaseFX Fiber Optic Ports                       |
| 7014FXE2-XX-YY | Ten 10/100BaseTX Ports, Two Singlemode 100BaseFX Fiber Optic Ports                      |
| 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 |

Where: XX = ST or SC, YY = 15, 40, or 80 for Singlemode, Blank for Multimode

E = Singlemode, and Blank Otherwise

ZZ = 10, 40, or 70 for GB Singlemode

If SFP Transceiver is Not Specified at the Time of Purchase, Slots Will Remain Blank with Covers

## Specifications

### Switch Properties

|                          |                   |
|--------------------------|-------------------|
| Number of MAC Addresses: | 4,096             |
| Aging Time:              | Programmable      |
| Latency Typical:         | 2.9 $\mu$ s       |
| Switching Method:        | Store-and-Forward |

### Physical

|                 |                   |
|-----------------|-------------------|
| Height:         | 2.50" (6.35cm)    |
| Width:          | 7.40" (18.8cm)    |
| Depth:          | 4.10" (10.4cm)    |
| Weight (max):   | 2.10 lbs (0.95kg) |
| DIN-Rail Mount: | 35mm              |

### Electrical

|                          |                           |
|--------------------------|---------------------------|
| Redundant Input Voltage: | 10-30 VDC                 |
| Input Current (max):     | 1.0A @24V                 |
| Inrush @ 24V:            | 12.6 Amp for 0.05ms       |
| N-TRON Power Supply:     | NTPS-24-1.3 (1.3 Amp@24V) |

### Environmental

|                        |                                |
|------------------------|--------------------------------|
| Operating Temperature: | -20°C to 70°C                  |
| Storage Temperature:   | -40°C to 85°C                  |
| Operating Humidity:    | 10% to 95%<br>(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         |
| 1000BaseT:             | >Cat5e Cable        |
| 100BaseFX, 1000BaseSX  |                     |
| Multimode:             | 50-62.5/125 $\mu$ m |
| 100BaseFXE, 1000BaseLX |                     |
| Singlemode:            | 7-10/125 $\mu$ m    |

### 100 Mb Fiber Transceiver Characteristics

| Fiber Length       | 2km*   | 15km** | 40km** | 80km** |
|--------------------|--------|--------|--------|--------|
| TX Power Min       | -19dBm | -15dBm | -5dBm  | -5dBm  |
| RX Sensitivity Max | -32dBm | -29dBm | -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*<br>275m for 62.5/125 $\mu$ m* | 10km**       | 40km**       | 70km**       |
|--------------------|--|--------------|--------------|--------------|
| TX Power Min       | -9.5dBm  | -9.5dBm      | -2dBm        | 0dBm         |
| RX Sensitivity Max | -17dBm   | -20dBm       | -22dBm       | -23dBm       |
| Wavelength         | 850nm  | 1310nm       | 1310nm       | 1550nm       |
| Assumed Fiber Loss | 3.5 to 3.75<br>dB/km                                   | .45<br>dB/km | .35<br>dB/km | .25<br>dB/km |
| Laser Type         | VCSEL  | FP           | DFB          | DFB          |

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

### Connectors

|               |   |
|---------------|---|
| 10/100BaseTX: | Ten (10) 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<br>Fiber Ports (optional) |

### Recommended Wiring Clearance

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

### Regulatory Approvals

FCC Title 47, Part 15, Subpart B - Class A  
CE: EN61000-6-2,4, EN55011, EN61000-4-2,3,4,5,6  
UL Listed ANSI/ISA-12.12.01-2000 (US and Canada) CLASS I, DIV 2,  
Groups A,B,C,D,T4, GOST-R Certified, RoHS Compliant  
Designed to comply with: IEEE 1613 for Electric Utility Substations,  
and NEMA TS1/TS2 for Traffic Control

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REV 080618