

**400 Series
200 Series
Industrial
Ethernet
Switches
& Media Convertor**

**Installation
Guide**



Industrial Ethernet Switch Installation Guide

405TX
405FX-XX
202MC -XX
405FXE-XX-YY
202MCE-XX-YY

Where: XX = ST or SC
YY = -15, -40, -80





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Warning

Do not perform any services on the unit unless qualified to do so. Do not substitute unauthorized parts or make unauthorized modifications to the unit.

Do not operate the unit with the top cover removed, as this could create a shock or fire hazard.

Do not block the air vents on the sides or the top of the unit.

Do not operate the equipment in the presence of flammable gasses or fumes. Operating electrical equipment in such an environment constitutes a definite safety hazard.

Safety Warnings

ELECTRICAL SAFETY



WARNING: Disconnect the power cable before removing the enclosure top.

WARNING: Do not operate the unit with the top cover removed.

WARNING: Do not work on equipment or cables during periods of lightning activity.

WARNING: Do not perform any services on the unit unless qualified to do so.

WARNING: Do not block the air vents.

WARNING: Observe proper DC Voltage polarity when installing power input cables. Reversing voltage polarity can cause permanent damage to the unit and void the warranty.

LASER SAFETY (405FXE Only)



WARNING: CLASS 1 Laser Product, Do not stare into the laser



202MC/MCE 405TX/FX/FXE Hazardous Location Installation Requirements

1. **WARNING!** Do not disconnect while circuit is live, unless area is known to be non-hazardous.
2. **WARNING!** Install only in accordance with Local & National Codes of Authorities Having Jurisdiction.
3. Class I, Div 2 Installations require that power connections must be current limited at the power source with an in-line fuse rated at 0.5A.
4. Class I, Div 2 installations require that all devices connected to this product must be UL approved for the area in which it is installed.
5. Only UL approved wiring with temperature ratings greater than 90⁰C permitted for Class I, Div 2 installations operating at temperatures up to 70⁰C ambient.
6. Limited Operating Voltage: 12-30V for Class I, Div 2 installations.

405FX/405FXE/405TX Industrial Ethernet Switches

The 405TX and 405FX Unmanaged Industrial Ethernet Switches support high speed layer 2 switching between ports.

The 405TX is an affordable 5 port unmanaged switch that is capable of auto negotiating 10/100 Mb and half/full duplex communications. The N-TRON 405TX is housed in a ruggedized steel enclosure, and provides 5 Category 5 compliant 10/100-BaseT connections for high performance network design, and hub/repeater upgrades.

The 405FX is a 5 port unmanaged switch that has 4 ports identical to the 405TX, plus an additional multimode fiber optic up-link port, capable of 2 Kilometers of 100 Mb communications without the use of repeaters.

The 405FXE is a 5 port unmanaged switch that is similar to the 405FX, but with extended range. The N-TRON 405FXE utilizes a singlemode fiber transceiver that is capable of 15 Kilometers of 100 Mb communications.

Both the 405FX and 405FXE utilize the IEEE compliant SC or ST duplex connector for fiber optic communications. The 4 10/100Base-TX ports utilize the RJ45 shielded connector.

All N-TRON switches come housed in a steel ruggedized Din-Rail enclosure, designed to withstand the most demanding industrial applications, and have been fully tested and certified at industrial environmental extremes. All 405 Units operate on 10-30VDC @ 0.2A.

Key Features

- Full IEEE 802.3 & 100BASE-FX Compliance
- Extended Environmental Specifications
- Support for Full/Half Duplex Operation
- LED Link/Activity Status Indication
- Auto Sensing Speed and Flow Control
- Up to 1.0 Gb/s Maximum Throughput
- Industry Standard DIN-Rail Enclosure

202MC/MCE Media Convertor

The 202MC/MCE Media Convertor supports high speed media conversion between 10/100BaseT and 100BaseFX/FXE.

PACKAGE CONTENTS

Please make sure the Ethernet Switch package contains the following items:

1. 202MC/405FX/405FXE/405TX Unit
2. This Installation Guide

Contact your carrier if any items are damaged.

INSTALLATION

Read the following warning before beginning the installation:

WARNING



The 405FXE unit contain a class 1 laser. Do not stare into the laser beam (fiber optic connector) when installing or operating the product.



Never install or work on electrical equipment or cabling during periods of lightning activity.

Disconnect the power cable before removing the enclosure top.
Do not operate the unit with the top cover removed

UNPACKING

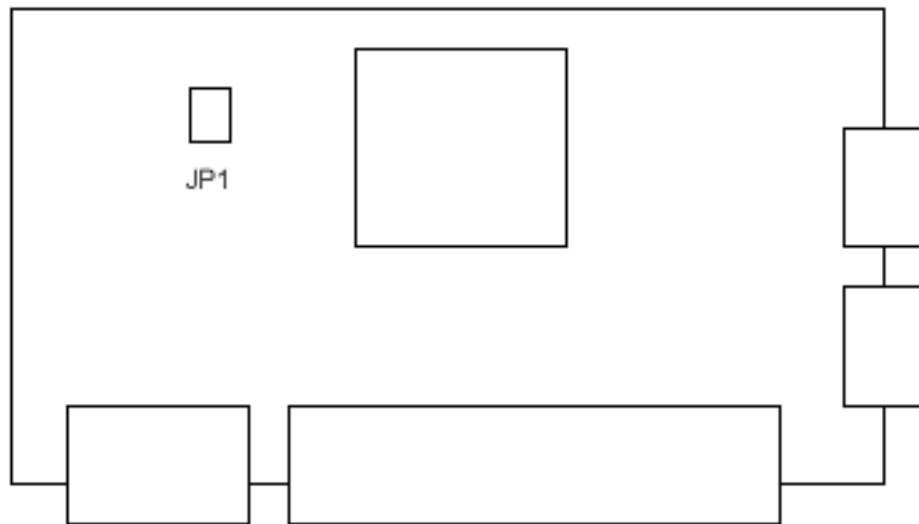
Remove all the equipment from the packaging, and store the packaging in a safe place.

File any damage claims with the carrier.

202MC/MCE /405FX/405FXE FIBER OPTIC FIBER HALF DUPLEX CONFIGURATION

While all RJ45 ports are autosensing, the 202MC/MCE, 405FX/FXE Fiber Optic ports are jumper configured for half or full duplex (the factory default is full duplex, JP1 = 1-2). If half duplex operation is desired, then follow these steps:

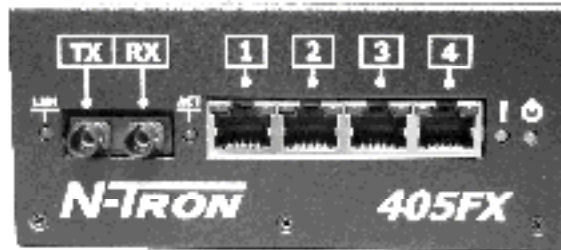
1. Remove the Voltage Input Power Plugs.
2. Remove the top cover (8 screws).
3. Set jumper JP1 = 3-4 for Half Duplex
4. Replace the top cover.
5. Proceed with the installation.



DIN-Rail Mounting

Install the unit in a standard Din-Rail. Recess the unit to allow at least 5" of horizontal clearance for fiber optic cable bend radius (2" for TX models).

FRONT PANEL



From Left to Right:

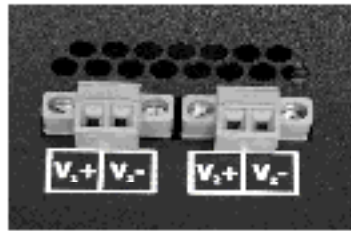
LNK	Link LED for Fiber Optic Port (all models except 405TX)
TX	Fiber Optic Transmit Port (all models except 405TX)
RX	Fiber Optic Receive Port (All models except 405TX)
ACT	Activity LED for Fiber Optic Port (all models except 405TX)
X	RJ45 Crossover Uplink Port (405TX Only)
RJ45 Ports	Ports 1-4 Auto sensing 10/100 BaseT Connections
!	Red LED indicates controller error
⏻	Green LED lights when Power is connected

NOTE: Each RJ45 data port has two LED's located at the top of each connector. The left LED indicates LINK status, and the right LED indicates ACTIVITY.

LED's: The table below describes the operating modes:

LED	Color	Description
⏻	GREEN	Power is Applied
	OFF	Power is OFF
!	RED	Controller HW Error
	OFF	No Errors. Normal Operation.
LNK	GREEN	Link between ports established
	OFF	No Link between ports
ACT	GREEN	Data is active between ports
	OFF	Data is inactive between ports

APPLYING POWER (Side View)



Unscrew & Remove the DC Voltage Input Plug(s) from the side header
Install the DC Power Cables into the Plug(s) (observing polarity).
Plug the Voltage Input Plug(s) back into the side header.
All LED's will flash ON Momentarily (including the Error LED)
Verify the Power LED stays ON (GREEN).
Verify the Error LED is OFF (after a few seconds).

Note: Only 1 plug must be connected to power for minimal operation.
For redundant power operation, V₁ and V₂ plugs must be connected to separate DC Voltage sources. Use wire sizes 16-28 guage.

Recommended 24V DC Power Supplies, similar to

120VAC:

Phoenix Contact: QUINT-PS-120AC/24VDC/x
(x=1,2,5,5,10,20 represents currents in Amps)

230VAC:



Phoenix Contact: QUINT-PS-230/24 DC/x

CONNECTING THE UNIT

For 202MC/MCE, 405FX/FXE units, remove the dust cap from the fiber optic connectors and connect the fiber optic cables. The TX port on the 202/405FX should be connected to the RX port of the far end station. The RX port on the 202/405FX should be connected to the TX port of the far end station.

For 10/100 Base-TX ports, plug a Category 5 twisted pair cable into the RJ45 connector. Connect the other end to the far end station. Verify that the LNK LED's are ON once the connection has been completed. For Switch to Switch or Switch to Repeater connections, use the X-port and a standard Category 5 cable. To connect any other port (other than the X-Port) to another Switch or Repeater, use a standard Category 5 crossover cable. **Note:** The 202MC RJ45 port is not an X port.

TROUBLESHOOTING

1. Make sure the  (Power LED) is ON.
2. Make sure the  (Error LED) remains OFF 3 seconds after initial power up.
3. Verify that Link LED's are ON for connected ports.
4. Verify straight through cabling used between stations.
5. Verify crossover cabling used between switches or repeaters (non X-Port only).
6. Verify that cabling is Category 5 for 100Mbit Operation.
7. Verify TX is connected to far end RX and vice versa (202/405FX/FXE only).

SUPPORT

Contact N-TRON Corp. at:
TEL: 251-666-9878
FAX: 251-666-9833
www.n-tron.com

FCC STATEMENT

This product complies with Part 15 of the FCC-A Rules.

Operation is subject to the following conditions:

- (1) This device may not cause harmful Interference
- (2) This device must accept any interference received, including interference that may cause undesired operation.

KEY SPECIFICATIONS

Physical

<i>Height:</i>	2.13"	(5.41 cm)
<i>Width:</i>	5.00"	(12.70 cm)
<i>Depth:</i>	3.00"	(7.62 cm)
<i>Weight:</i>	~ 1.2 lbs	(0.6 kg)

(Note: can be mounted horizontally or vertically)

Electrical

<i>Input Voltage:</i>	10-30 VDC (Regulated)
<i>Input Current:</i>	0.2A @ 24VDC (Steady State)
<i>Surge Current:</i>	0.5A @24VDC
<i>Input Ripple:</i>	Less than 100 mV
<i>Input Wire Size:</i>	16-28 AWG

Environmental

<i>Operating Temperature:</i>	0C to 70C
<i>Storage Temperature:</i>	-20C to 85C
<i>Operating Humidity:</i>	10% to 90% (Non Condensing)
<i>Operating Altitude:</i>	0 to 10,000 ft.

Network Media

<i>10/100BaseT:</i>	Category-3,4,5 Cable (Cat5 for 100 Mbit)
<i>100BaseFX:</i>	62.5/50 mm Fiber @ 1300nm

Fiber Transceiver Characteristics (202/405FX/FXE Models Only)

<i>Transmit Power:</i>	-17dBm (typical)
<i>Receiver Sensitivity:</i>	-33dBm (typical)
<i>Segment Length:</i>	FX - up to 2km E versions – 15,40,or 80km

Connectors

<i>10/100BaseT:</i>	5 (five) RJ45 UTP Ports (405TX)
	4 (four) RJ45 UTP Ports (405FX/FXE)
	1 (one) RJ45 UTP Port (202MC)
<i>100BaseFX:</i>	SC or ST Duplex Port (202/405FX/FXE)

Recommended Minimum Wiring Clearance:

<i>Front:</i>	2" (5.08 cm)	(405TX)
	5" (12.7 cm)	(202/405FX/FXE)
<i>Side:</i>	1" (2.54 cm)	

Emissions and Safety Approvals:

FCC Part 15 Class A CE

Warranty 1 year from the date of purchase

N-TRON Limited Warranty

N-TRON, Corp. warrants to the end user that this hardware product will be free from defects in workmanship and materials, under normal use and service, for the applicable warranty period from the date of purchase from N-TRON or its authorized reseller. If a product does not operate as warranted during the applicable warranty period, N-TRON shall, at its option and expense, repair the defective product or part, deliver to customer an equivalent product or part to replace the defective item, or refund to customer the purchase price paid for the defective product. All products that are replaced will become the property of N-TRON. Replacement products may be new or reconditioned. Any replaced or repaired product or part has a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer. N-TRON shall not be responsible for any custom software or firmware, configuration information, or memory data of customer contained in, stored on, or integrated with any products returned to N-TRON pursuant to any warranty.

OBTAINING WARRANTY SERVICE: Customer must contact N-TRON within the applicable warranty period to obtain warranty service authorization. Dated proof of purchase from N-TRON or its authorized reseller may be required. Products returned to N-TRON must be pre-authorized by N-TRON with a Return Material Authorization (RMA) number marked on the outside of the package, and sent prepaid and packaged appropriately for safe shipment. Responsibility for loss or damage does not transfer to N-TRON until the returned item is received by N-TRON. The repaired or replaced item will be shipped to the customer, at N-TRON's expense, not later than thirty (30) days after N-TRON receives the product. N-TRON shall not be responsible for any software, firmware, information, or memory data of customer contained in, stored on, or integrated with any products returned to N-TRON for repair, whether under warranty or not.

ADVANCE REPLACEMENT OPTION: Upon registration, this product qualifies for advance replacement. A replacement product will be shipped within three (3) days after verification by N-TRON that the product is considered defective. The shipment of advance replacement products is subject to local legal requirements and may not be available in all locations. When an advance replacement is provided and customer fails to return the original product to N-TRON within fifteen (15) days after shipment of the replacement, N-TRON will charge customer for the replacement product, at list price.

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GOVERNING LAW: This Limited Warranty shall be governed by the laws of the State of Alabama, U.S.A.