N-TRON
THE INDUSTRIAL NETWORK COMPANY

102MC
Industrial
Media Converter

User Manual &
Installation
Guide

![N-TRON - THE INDUSTRIAL NETWORK COMPANY]

Industrial Media Converter Installation Guide

102MC

The 102MC is a 2 port unmanaged transparent media converter that converts 10Base-T copper to 10Base-FL half duplex fiber.

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.

Do not operate the equipment in a manner not specified by this manual.

SAFETY WARNINGS

General Safety

WARNING: If the equipment is used in the manner not specified by N-TRON Corp., the protection provided by the equipment may be impaired.

Contact Information
N-TRON Corp.
820 South University Blvd.
Suite 4E
Mobile, AL 36609
TEL: (251) 342-2164
FAX: (251) 342-6353
Website: www.n-tron.com
Email: N-TRON_Support@n-tron.com

ENVIRONMENTAL SAFETY

WARNING: Disconnect the power and allow to cool 5 minutes before touching.

ELECTRICAL SAFETY

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

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

WARNING: Properly ground the unit before connecting anything else to the unit. Units not properly grounded may result in a safety risk and could be hazardous and may void the warranty. See the grounding technique section of this user manual for proper ways to ground the unit.

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.

WARNING: Explosion hazard – Substitution of components may impair suitability for Class I, Division 2.

WARNING: Explosion hazard, do not disconnect while circuit is live unless area is known to be non-hazardous.

WARNING: Explosion hazard, do not replace the device unless power has been switched off or the area is known to be non-hazardous.

Use 60/75°C rated Copper wire, (0.22Nm) 2 inch-lbs Tightening torque for field installed conductors.

PACKAGE CONTENTS

Please make sure the Serial over Ethernet package contains the following items:

1.   102MC Media Converter
2.   Product CD

Contact your carrier if any items are damaged.

INSTALLATION

Read the following warning before beginning the installation:

WARNING

Never install or work on electrical equipment or cabling during periods of lightning activity. Never connect or disconnect power when hazardous gasses are present.

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.
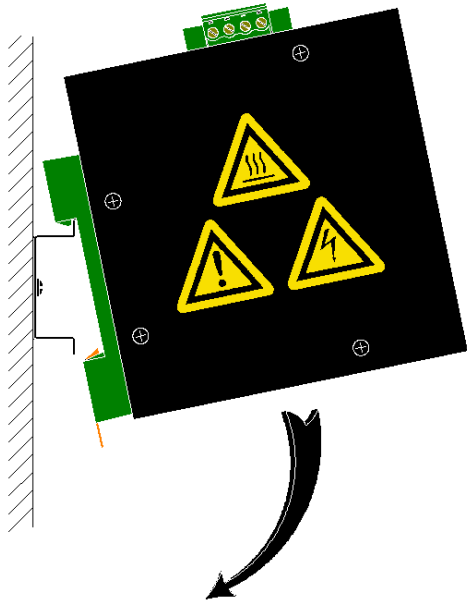
CLEANING

Clean only with a damp cloth.

SERVICING

Jumper J3 can be changed on the board to change the RJ45 copper port's MDIX setting. See Connecting the Unit on page 8 for more details.
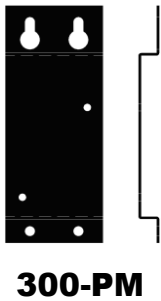
DIN-Rail Mounting

Install the unit on a standard 35mm DIN-Rail. Recess the unit to allow at least 5" of horizontal clearance for the fiber optic cable bend radius.

To install the unit to 35mm industrial DIN-Rail, place the top edge of the included mounting bracket on the back of the unit against the DIN-Rail at a 15° angle as shown. Rotate the bottom of the unit to the back (away from you) until it snaps into place.
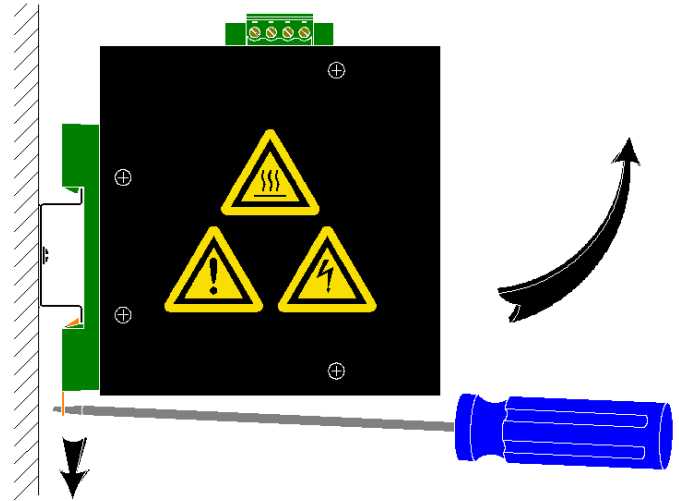
To remove the unit from the 35mm industrial DIN-Rail, place a flat head screwdriver into the orange release clip found at the bottom of the unit, and apply downward force on the clip until it disengages from the bottom of the unit from the DIN-Rail. Rotate the bottom of the unit towards you and up at an approximate 15° upward angle to completely remove the unit.

300-PM
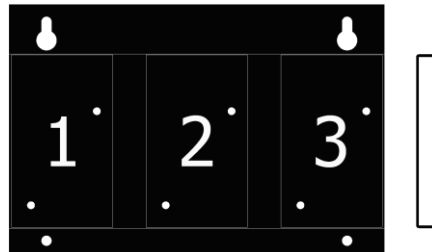
900-PM

URMK
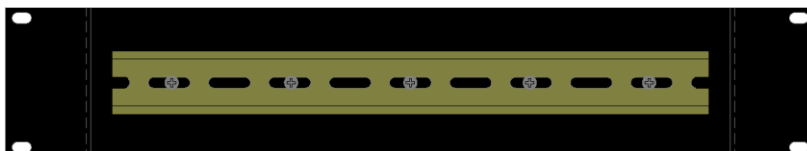
With the exception of the 524TX and 526FX2, all N-Tron™ products are designed to be mounted on industry standard 35mm DIN-Rail. However, DIN-Rail mounting may not be suitable for all applications. We offer three alternative mounting solutions: Our 300 Panel Mount Assembly (P/N: 300-PM) may be used to mount a single 100 or 300 Series unit to a panel or other flat surface. Our 900 Panel Mount Assembly (P/N: 900-PM) may be used to securely mount our 100, 200, 300, 400, 500, or 900 Series products to a panel or other flat surface; Our Universal Rack Mount Kit (P/N: URMK) may be used to mount our products to standard 19" racks.

FRONT PANEL

From Top to Bottom:

⏻	Green LED lights when Power is connected
RJ45 Port	10Base-T Connection
ACT	Activity LED for Fiber Optic Port
LNK	Link LED for Fiber Optic Port
RX	Fiber Optic Receiver Port
TX	Fiber Optic Transmitter Port.

NOTE: The RJ45 data port has two LED's located at the left side of the connector. The top LED indicates Activity (ACT), and the lower LED indicates Link (LNK) status.

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

LED	Color	Description
⏻	GREEN	Power is Applied
	OFF	Power is OFF
LNK	GREEN	10 Mb Link between ports
	OFF	No Link between ports
ACT	GREEN	Data is active between ports
	OFF	Data is inactive between ports

APPLYING POWER (Top View)
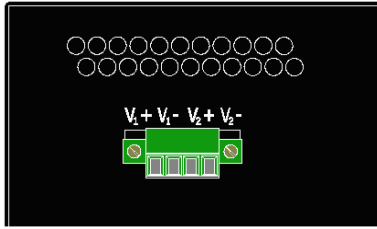
Unscrew & Remove the DC Voltage Input Plug from the Power Input Header
Install the DC Power Cables into the Plug (observing polarity).
Plug the Voltage Input Plug back into the Power Input Header.
Tightening torque for the terminal block power plug is **0.22 Nm/0.162 Pound Foot**.
Verify the Power LED stays ON (GREEN).

Note: Only 1 power supply must be connected to power for minimal operation. For redundant power operation, V_1 and V_2 inputs must be connected to separate DC Voltage sources. This device will draw current from both sources simultaneously. Use 16-28 gauge wire when connecting to the power supply.

Recommended 24V DC Power Supplies, similar to:

   100VAC/240VAC:

          N-Tron's NTPS-24-1.3, DC 24V/1.3A

N-TRON SWITCH GROUNDING TECHNIQUES

The grounding philosophy of any control system is an integral part of the design. N-Tron switches are designed to be grounded, but the user has been given the flexibility to float the switch when required. The best noise immunity and emissions (i.e. CE) are obtained when the N-Tron switch chassis is connected to earth ground via a drain wire. Some N-Tron switches have metal din-rail brackets that can ground the switch if the din-rail is grounded. In some cases, N-Tron switches with metal brackets can be supplied with optional plastic brackets if isolation is required.
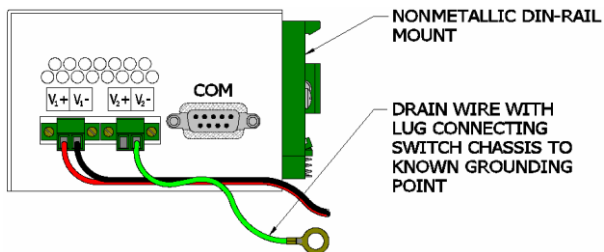
Both V- legs of the power input connector are connected to chassis internally on the PCB. Connecting a drain wire to earth ground from one of the V- terminal plugs as shown here will ground the switch and the chassis. The power leads from the power source should be limited to 3 meters or less in length.

As an alternate, users can run a drain wire & lug from any of the Din-Rail screws or empty PEM nuts on the enclosure. When using an unused PEM nut to connect a ground lug via a machine screw, care should be taken to limit the penetration of the outer skin by less than 1/4 in. Failure to do so may cause irreversible damage to the internal components of the switch.

Note: Before applying power to the grounded switch, you must use a volt meter to verify there is no voltage difference between the power supply's negative output terminal and the switch chassis grounding point.
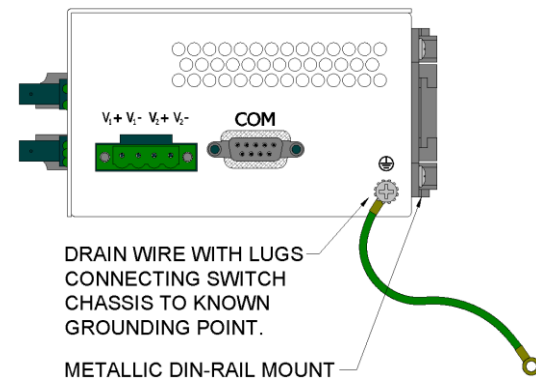
If the use of shielded cables is required, it is generally recommended to only connect the shield at one end to prevent ground loops and interfere with low level signals (i.e. thermocouples, RTD, etc.). Cat5e cables manufactured to EIA-568A or 568B specifications are required for use with N-Tron Switches.

In the event all Cat5e patch cable distances are small (i.e. All Ethernet devices are located the same local cabinet and/or referenced to the same earth ground), it is permissible to use fully shielded cables terminated to chassis ground at both ends in systems void of low level analog signals.

RJ45 CONNECTOR CRIMP SPECIFICATIONS

Please reference the illustration below for your Cat5 cable specifications:

0.232"±0.005
[5.89±0.127]

0.237"±0.005
[6.02±0.13]

EIA 568B

CAT5e CABLE

CAT5e CABLE
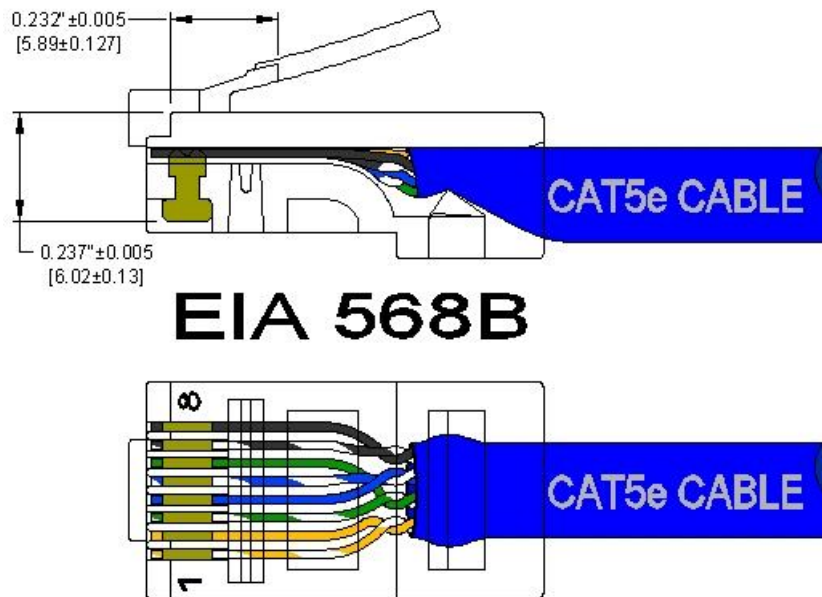
CONNECTING THE UNIT

For the 10Base-FL Fiber Optic port, remove both of the dust caps from the fiber optic connectors and connect the fiber optic cables. The TX port on the local unit should be connected to the RX port of the far end device, and the RX port should be connected to the TX port of the far end device.

For 10Base-T port, plug a Category 3 or better twisted pair cable into the RJ45 connector. Connect the other end to the far end device. Verify that the LNK LED's are ON once both the fiber and the copper are linked. The MDIX mode of the 102MC can be changed using jumper J3 on the board. By factory default the device is set up to use a straight through cable for a PC. Any N-Tron switch will automatically determine what MDIX the 102MC is using and will connect it to the network.

Warning: Creating a port to port connection on the same switch (i.e. loop) is an illegal operation and will create a broadcast storm which will crash the network!
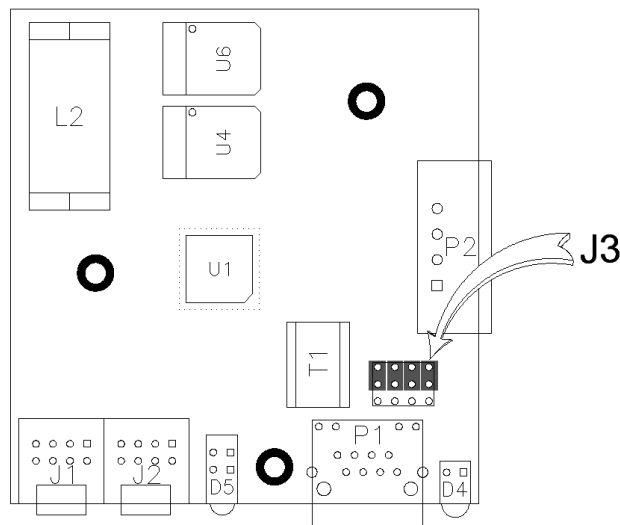
Note: The 102MC is a transparent media converter. Both the fiber port and the copper port must be linked in order for the unit to display any link status on the link LEDs. At least one of the two ports must be hard set to 10Base (if the fiber device is 10Base-FL then it is automatically set to 10Base).

TROUBLESHOOTING

1. Make sure the ⏻ (Power LED) is ON.

2. Make sure you are supplying sufficient current for the version chosen. Note: The Inrush current will exceed the steady state current by ~ 2X.

3. Verify that Link LED's are ON for both ports.

4. Verify cabling used between stations.

5. Verify that cabling is Category 3 or greater for 10Mbit Operation.

6. The 102MC is a transparent media converter; if one side isn't linked properly both ports will not indicate a valid link.

SUPPORT

        Contact N-TRON Corp. at:
        TEL: 251-342-2164
        FAX: 251-342-6353
        www.n-tron.com
        N-TRON_Support@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

Height:	3.49"
Width:	2.01"
Depth:	4.00"
Weight:	0.75 lbs
DIN-Rail:	35mm

Electrical

Redundant Input Voltage:	10-30 VDC (Regulated)
Input Current:	80 mA @ 24VDC (Steady State)
Inrush Current:	7.3Amp/1.0ms @ 24VDC
Input Ripple:	Less than 100 mV
Input Wire Size:	16-28 AWG

Environmental

Operating Temp:	-40°C to 80°C
Storage Temp:	-40°C to 85°C
Operating Humidity:	10% to 90% (Non Condensing)
Operating Altitude:	0 to 10,000 ft.

Shock and Vibration

Shock:	200g @ 10ms
Vibration/Seismic:	50g, 5-200Hz, Triaxial

Note: Unit must be Bulkhead mounted to achieve these levels.

Reliability

MTBF:	>2Million Hours

Network Media

10BaseT:	>Cat3 Cable
10BaseFL:	50/125 μm Fiber @ 850nm
	62.5/125 μm Fiber @ 850nm
	100/140 μm and 200 μm Fiber @ 850nm

Connectors

10BaseT:	One (1) RJ-45 Copper Port
10BaseFL:	SC or ST Duplex Port

Recommended Wiring Clearance:

> *Top: 1 " (2.54 cm)*
> *Front: 4 " (10.16 cm)*

Emissions and Safety Approvals:

FCC Part 15 Class A

Suitable for use in Class I, Division 2, Groups A, B, C and D Hazardous Locations, or Nonhazardous Locations only.

Warranty: Effective January 1, 2008, all N-TRON products carry a 3 year limited warranty 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.

WARRANTIES EXCLUSIVE: IF AN N-TRON PRODUCT DOES NOT OPERATE AS WARRANTED ABOVE, CUSTOMER'S SOLE REMEDY FOR BREACH OF THAT WARRANTY SHALL BE REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT N-TRON'S OPTION. TO THE FULL EXTENT ALLOWED BY LAW, THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES, TERMS, OR CONDITIONS, EXPRESS OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, STATUTORY OR OTHERWISE, INCLUDING WARRANTIES, TERMS, OR CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, SATISFACTORY QUALITY, CORRESPONDENCE WITH DESCRIPTION, AND NON-INFRINGEMENT, ALL OF WHICH ARE EXPRESSLY DISCLAIMED. N-TRON NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE OR USE OF ITS PRODUCTS. N-TRON SHALL NOT BE LIABLE UNDER THIS WARRANTY IF ITS TESTING AND EXAMINATION DISCLOSE THAT THE ALLEGED DEFECT OR MALFUNCTION IN THE PRODUCT DOES NOT EXIST OR WAS CAUSED BY CUSTOMER'S OR ANY THIRD PERSON'S MISUSE, NEGLECT, IMPROPER INSTALLATION OR TESTING, UNAUTHORIZED ATTEMPTS TO OPEN, REPAIR OR MODIFY THE PRODUCT, OR ANY OTHER CAUSE BEYOND THE RANGE OF THE INTENDED USE, OR BY ACCIDENT, FIRE, LIGHTNING, POWER CUTS OR OUTAGES, OTHER HAZARDS, OR ACTS OF GOD.

LIMITATION OF LIABILITY: TO THE FULL EXTENT ALLOWED BY LAW, N-TRON ALSO EXCLUDES FOR ITSELF AND ITS SUPPLIERS ANY LIABILITY, WHETHER BASED IN CONTRACT OR TORT (INCLUDING NEGLIGENCE), FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL, OR PUNITIVE DAMAGES OF ANY KIND, OR FOR LOSS OF REVENUE OR PROFITS, LOSS OF BUSINESS, LOSS OF INFORMATION OR DATA, OR OTHER FINANCIAL LOSS ARISING OUT OF OR IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE, USE, PERFORMANCE, FAILURE, OR INTERRUPTION OF ITS PRODUCTS, EVEN IF N-TRON OR ITS AUTHORIZED RESELLER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, AND LIMITS ITS LIABILITY TO REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT N-TRON'S OPTION. THIS DISCLAIMER OF LIABILITY FOR DAMAGES WILL NOT BE AFFECTED IF ANY REMEDY PROVIDED HEREIN SHALL FAIL OF ITS ESSENTIAL PURPOSE.

DISCLAIMER: Some countries, states, or provinces do not allow the exclusion or limitation of implied warranties or the limitation of incidental or consequential damages for certain products supplied to consumers, or the limitation of liability for personal injury, so the above limitations and exclusions may be limited in their application to you. When the implied warranties are not allowed to be excluded in their entirety, they will be limited to the duration of the applicable written warranty. This warranty gives you specific legal rights which may vary depending on local law.

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