N-TRON Series

1000-POE+
Unmanaged Industrial
Single-Port Gigabit Mid-Span PoE+ Injector

User Manual &
Installation
Guide

Unmanaged Industrial Single-Port Gigabit Mid-Span PoE+ Injector Installation Guide

1000-POE+

Contact Information :

N-TRON Corp.
3101 International Drive, Building 6
Mobile, AL USA 36606
TEL: (251) 342-2164
FAX: (251) 342-6353
Website: www.n-tron.com
Email: N-TRON_Support@n-tron.com

GENERAL SAFETY WARNINGS
GÉNÉRAL AVERTISSEMENTS DE SÉCURITÉ

WARNING: 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.
ALERTE: Ne pas utiliser le matériel en présence de gaz ou de vapeurs inflammables. L'utilisation de matériel électrique dans un tel environnement constitue un danger certain.

WARNING: If the equipment is used in the manner not specified by N-Tron Corporation, the protection provided by the equipment may be impaired.
ALERTE : Si l'équipement est utilisé d'une manière non spécifiée par N-Tron Corporation, la protection fournie par l'équipement peut être compromise.

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.
ALERTE: Ne pas effectuer de services sur l'unité à moins d'être qualifié pour le faire. Ne pas remplacer avec des pièces non autorisées ou faire des modifications non autorisées sur l'appareil.

WARNING: Do not operate the unit with the end plates removed, as this could create a shock or fire hazard.
ALERTE: Ne pas faire fonctionner l'appareil avec les plaques d'extrémité supprimées, car cela pourrait créer un risque de choc ou d'incendie.

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.
ALERTE: L'unité doit être correctement mise à la terre avant tout raccordement à l'unité. Unités pas correctement mise à la terre peuvent causer un risque de sécurité et pourraient être dangereuses et peuvent annuler la garantie. Voir la section technique de mise à la terre dans ce mode d'emploi pour des moyens appropriés à la masse de l'appareil.

WARNING: Do not operate the equipment in a manner not specified by this manual.
ALERTE: Ne pas faire fonctionner l'équipement d'une manière non spécifiée par ce manuel.

ENVIRONMENTAL SAFETY WARNINGS

WARNING: Disconnect the power and allow to cool 5 minutes before touching.
ALERTE: Déconnectez le câble d'alimentation et laisser refroidir 5 minutes avant de la toucher.

ELECTRICAL SAFETY WARNINGS

WARNING: Disconnect the power cable before removing the end plates.
ALERTE: Débranchez le câble d'alimentation avant de retirer les plaques d'extrémité.

WARNING: Do not operate the unit with the end plates removed.
ALERTE: Ne pas faire fonctionner l'appareil avec les plaques d'extrémité supprimées.

WARNING: Never install or work on electrical equipment or cabling during periods of lightning activity.
ALERTE: Ne jamais installer ou travailler sur équipement électrique ou de câblage pendant les périodes d'activité de la foudre.

WARNING: Do not perform any services on the unit unless qualified to do so.
ALERTE: Ne pas effectuer de services sur l'appareil si vous n'êtes pas qualifié pour le faire.

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.
ALERTE: Respecter la polarité correcte de tension DC lors de l'installation des câbles d'alimentation d'entrée. Le renversement de la polarité de tension peut causer des dommages permanents à l'appareil et annule la garantie.

HAZARDOUS LOCATION INSTALLATION REQUIREMENTS

1. This equipment is suitable for use in Class I, Div 2, Groups A, B, C, and D, or unclassified or non-hazardous locations only.
   Cet équipement est adapté à une utilisation en Classe I, Division 2, Groupes A, B, C, et D, ou emplacements non classés ou non dangereux.

2. **WARNING:** Explosion Hazard - Substitution of components may impair suitability for Class I, Division 2.
   ALERTE: Risque d'explosion - LA SUBSTITUTION DE TOUT COMPOSANT PEUT NUIRE À LA CONFORMITÉ DE CLASSE I, DIVISION 2.

3. **WARNING:** Explosion Hazard - Do not connect or disconnect any connections while circuit is live unless area is known to be non-hazardous.
   ALERTE: Risque d'explosion - Ne pas brancher ou débrancher les connexions lorsque le circuit est sous tension sauf si la zone est connue pour être non dangereuse.

4. **WARNING:** Explosion Hazard - Do not remove or replace the device unless power has been switched off or the area is known to be non-hazardous.
   ALERTE: Risque d'explosion - Ne pas enlever ou remplacer l'unité à moins que l'alimentation a été coupée ou que la zone est connue pour être non dangereuse.

5. Use 60/75ºC rated Copper wire, (0.22Nm) 2 inch-lbs tightening torque for field installed connectors.
   Utilisez fil de cuivre classé 60/75 °C, (0.22Nm) 2 pouces-livres Couple de serrage pour les connecteurs installés sur le terrain.

6. **WARNING:** Install only in accordance with Local & National Codes of Authorities Having Jurisdiction.
   ALERTE: Installez uniquement en conformité avec les codes locaux et nationaux des autorités compétentes.

7. Class I, Div 2 installations require that all devices connected to this product must be UL listed for the area in which it is installed.
   Les installations de Classe I, Division 2 exigent que toutes les unités connectées à ce produit doivent être énumérées UL pour la zone dans laquelle il est installé.

8. **WARNING:** Damage may occur to the RJ-45 port of the powered device (PD), if the 1000-POE+ is not powered down before disconnecting the Cat5E cable.
   ALERTE: Des dommages peuvent survenir au port RJ-45 de l'unité alimentée (PD), si le 1000-POE + n'est pas mis hors tension avant de débrancher le câble Cat5E.

Functional Overview

The 1000-POE+ unmanaged industrial single-port Gigabit Mid-Span PoE+ injector is designed to provide power over Ethernet for POE capable devices where running a power line is either not possible or not cost effective. This feature allows an end user to power a POE camera, wireless access point, or any other PoE/PoE+ capable device without the need for running separate wires for power. This also allows the ability for a centralized battery backup for all these devices.

Key Features

- Compact, space saving package
- IEEE 802.3af/at compliant
- One 10/100/1000Base-T RJ-45 Port (DATA IN)
- One 10/100/1000Base-T RJ-45 PoE+ Port (DATA & POWER OUT)
- Unmanaged operation
- Extended Environmental Specifications
  -40°C to 80°C Operating Temperature
- Operating Humidity: 10% to 90% (Non Condensing)
- Full Wire Speed Communications
- PoE Active Status Indication LED
- Power Status LED
- Up to 1.0 Gb/s Maximum Throughput
- Industry Standard 35mm DIN Rail Mounted Enclosure
- Redundant power inputs (10-30 VDC)
- Supports up to 30 Watts per port (25.5 Watts at the Powered Device (PD))
- Hardened metal DIN Rail Enclosure

GOST-R Certified
ABS Type Approval for Shipboard Application

PACKAGE CONTENTS

Please make sure the package contains the following items:

1. 1000-POE+
2. Instruction Sheet

Contact your carrier if any items are damaged.

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.

INSTALLATION

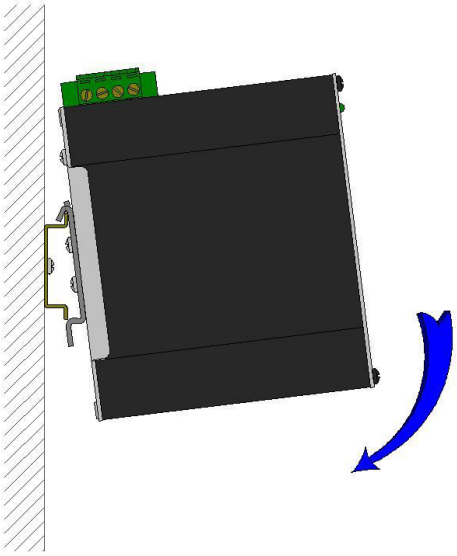
Read the following warnings before beginning the installation:

WARNING

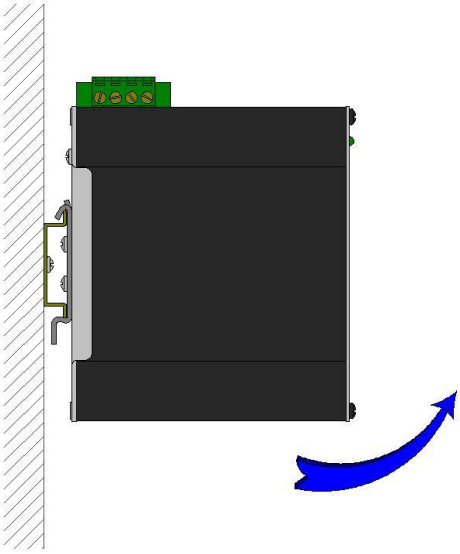
Never install or work on electrical equipment or cabling during periods of lightning activity. Never connect or disconnect power when hazardous gasses are present.
Ne jamais installer ou travailler sur l'équipement ou sur le câblage électrique pendant les périodes d'activité de la foudre. Ne jamais brancher ou débrancher l'alimentation lorsque des gaz dangereux sont présents.

DIN-Rail Mounting

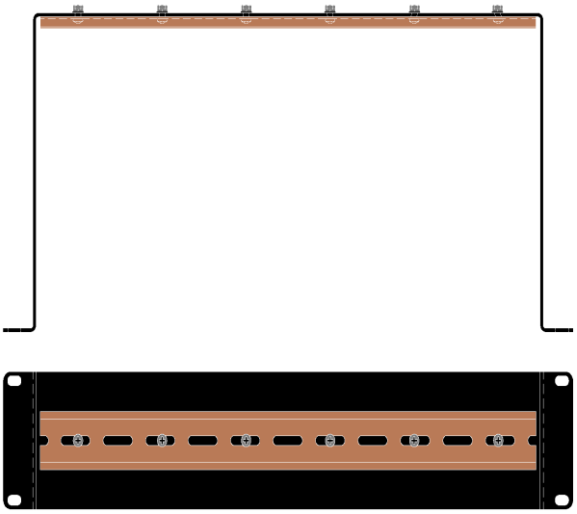
Install the unit in a standard DIN rail. Recess the unit to allow at least 2” of horizontal clearance for CAT5e cable bend radius.



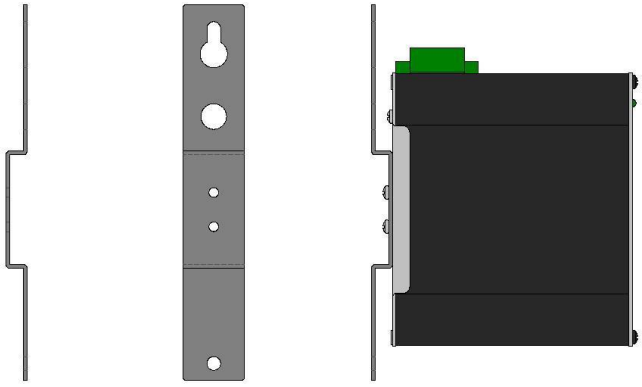
To install the unit to 35mm industrial DIN rail, place the top edge of the included mounting bracket on the back of the unit against the DIN rail at a 15° angle as shown. Rotate the bottom of the unit to the back (away from you) until it snaps into place.



To remove the unit from the 35mm industrial DIN rail, pull forward on the unit until it disengages from the bottom of the DIN rail. Rotate the bottom of the unit towards you and up at and approximate 15° upward angle to completely remove the unit.



URMK



1000-PM

Most Red Lion products are designed to be mounted on industry standard 35mm DIN rail. However, DIN rail mounting may not be suitable for all applications. Our Universal Rack Mount Kit (P/N: URMK) may be used to mount the 1000-POE+ enclosure to a standard 19" rack, and our Panel Mount Assembly (P/N: 1000-PM) may be used to mount the 1000-POE+ enclosure to a panel or any other flat surface.

FRONT PANEL

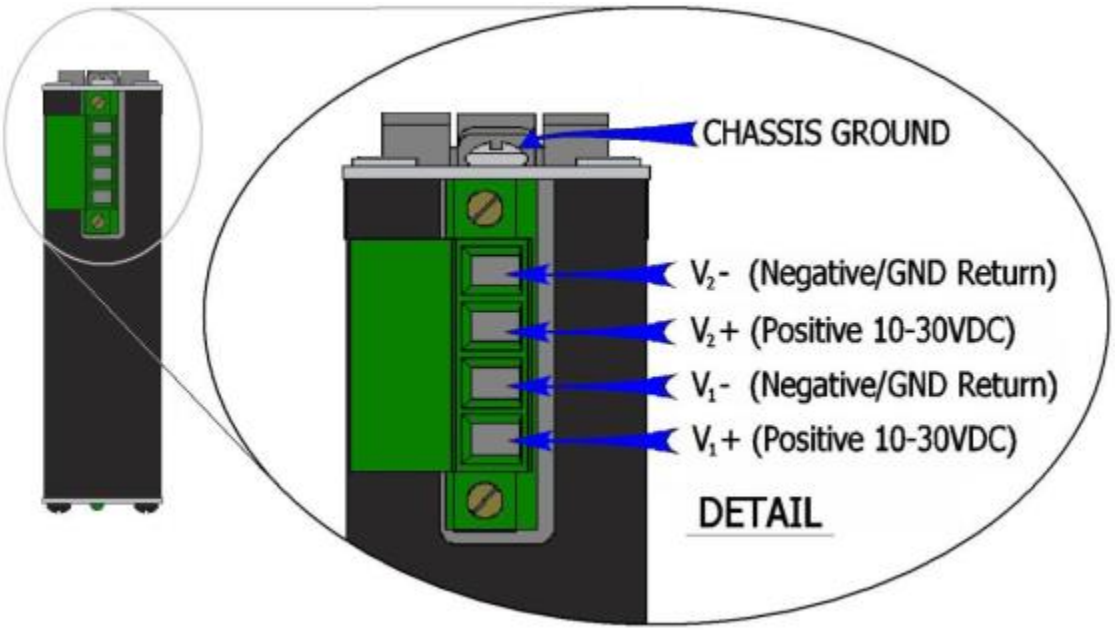
From Top to Bottom:

⏻	Power LED
Active	PoE Active status LED

LEDs: The table below describes the operating modes for the LEDs.

LED	Color	Description
⏻	Green	Valid Power (10-30VDC) is applied.
	OFF	No power is applied to the device.
Active	Green	PoE has detected a valid device (PD) and power is being sourced onto the port.
	Blinking	Indicates an overcurrent or invalid device detection occurred.
	OFF	PoE power is not being applied to the PoE port.

APPLYING POWER (Top View)



Unscrew & Remove the DC Voltage Input Plug from the top header.
Install the DC Power Cables into the Plug (observing polarity on unit).
Plug the Voltage Input Plug back into the top header.
Tightening torque for the terminal block power plug is **0.22 Nm/0.162 Pound Foot**.
Turn the power on the wire.
Note: It is only safe to turn the power on the wires after the wires have been secured to the 1000-POE+.
WARNING: Inserting the input plug while power is applied may cause arcing, and damage the input connector permanently.

Verify the Power LED stays ON (GREEN).

Note: Either V_1 or V_2 can be connected to power for minimal operation. For redundant power operation, V_1 and V_2 plugs must be connected to separate DC Voltage sources. Use wire sizes of 20-10 gauge. The power cord should be limited to less than 10 meters in order to ensure optimum performance.

Note: Redundant power inputs will not balance the power load. Only load from one power supply is used at a time.

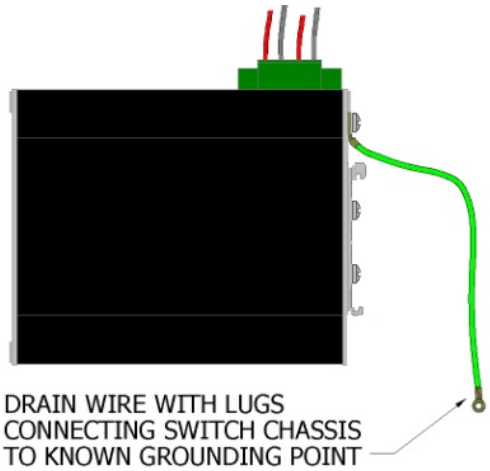
Recommended 24V DC Power Supplies, similar to:

<u>100-240VAC</u>:

N-Tron NTPS-24-2.5, DC 24V/2.5A or N-Tron NTPS-24-3, DC 24V/3A

1000-POE+ MID-SPAN GROUNDING TECHNIQUES

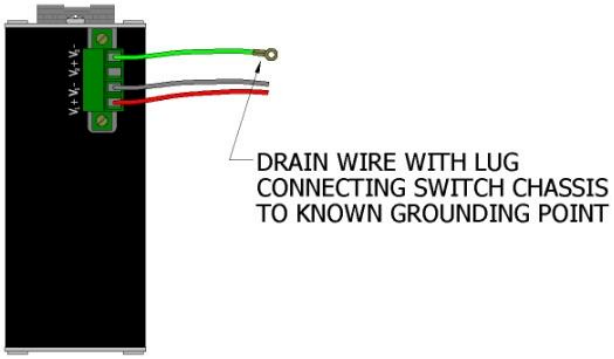
The grounding philosophy of any control system is an integral part of the design. Red Lion switches are designed to be grounded, but the user has been given the flexibility to float the switch when required. The best noise immunity and emissions (i.e. CE) are obtained when the Red Lion switch chassis is connected to earth ground via a drain wire. Some Red Lion switches have metal DIN-Rail brackets that can ground the switch if the DIN-rail is grounded. In some cases, Red Lion switches with metal brackets can be supplied with optional plastic brackets if isolation is required.



Users may run a drain wire & lug from the screw provided on the back face of the enclosure. In the event the provided grounding screw has been lost, care should be taken to limit the penetration of the outer skin by less than 1/4". Failure to do so may cause irreversible damage to the internal components of the switch.

Note: Ensure the power supply is grounded properly before applying 10-30VDC power to the grounded switch. This may be verified by using a voltmeter to determine that there is no voltage difference between the power supply's negative output terminal and the chassis grounding point of the switch.

As an alternative grounding method, 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.



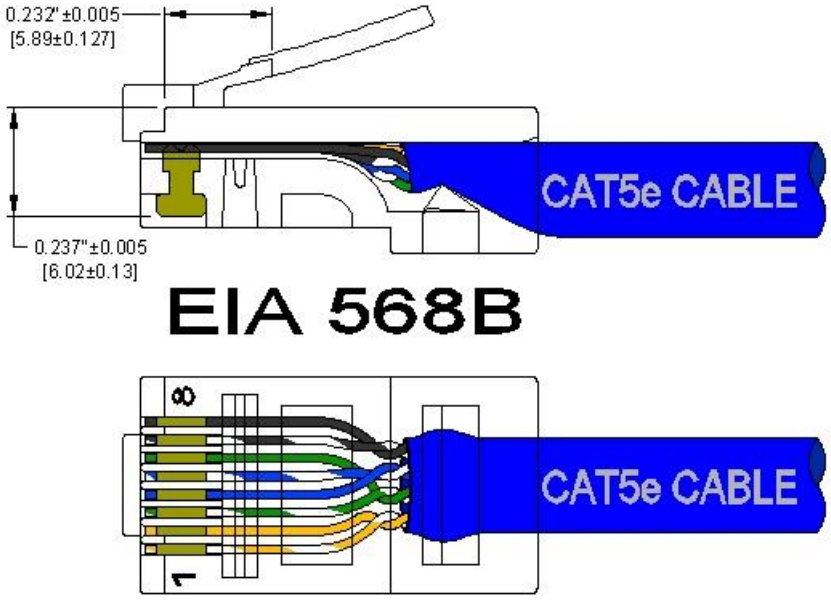
Note: Before applying power to the grounded switch, you must use a voltmeter to verify there is no voltage difference between the power supply's negative output terminal and the switch chassis grounding point.

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.

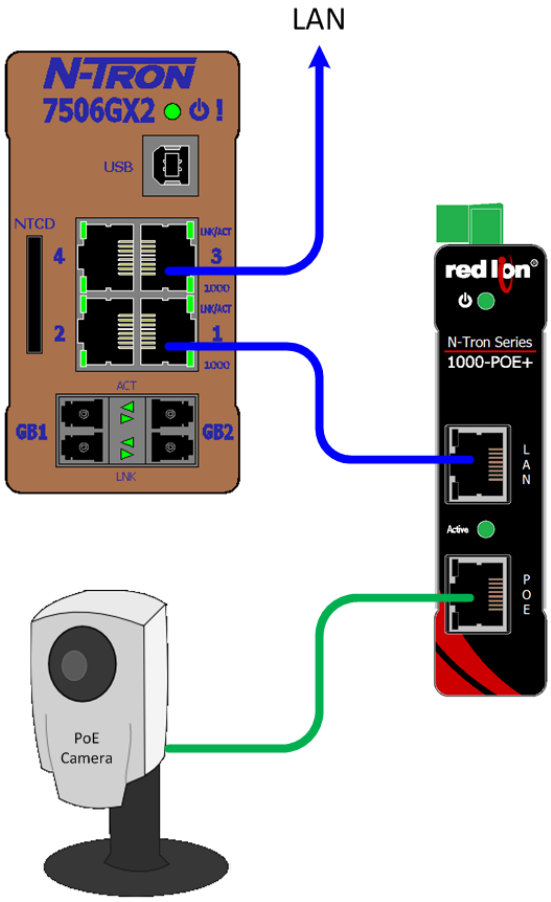
In the event all Cat5e patch cable distances are small (i.e. All Ethernet devices are located the same local cabinet and/or referenced to the same earth ground), it is permissible to use fully shielded cables terminated to chassis ground at both ends in systems void of low level analog signals.

RJ45 CONNECTOR CRIMP SPECIFICATIONS

Please reference the illustration below for your Cat5e cable specifications:



TYPICAL APPLICATION



CONNECTING THE UNIT

For 10/100/1000Base-T ports, plug a Category 5e (or greater) twisted pair cable into the RJ45 connector. Connect the other end to the far end station. The total length of cable should not exceed 100 meters. Although power is being applied to the Ethernet port, the power does not boost data on the lines.

TROUBLESHOOTING

1. Make sure the ⏻ (Power LED) is ON.
2. Make sure you are supplying sufficient current for the 1000-POE+ and all the powered devices plugged into it. **Note: The inrush current and steady state current is dependent on the power requirements of the powered devices plugged into the 1000-POE+**.
3. Verify that the Active LED is on solid.
4. Verify cabling used is Cat 5e or greater. The 1000-POE+ is a mid-span injector, not a PoE switch so the PoE+ power is applied to pins 4/5 (+) and pins 7/8 (-).

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.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at own expense.

INDUSTRY CANADA

This Class A digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. Operation is subject to the following two conditions; (1) this device digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations. Operation is subject to the following two conditions; (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Cet appareillage numérique de la classe A répond à toutes les exigences de l'interférence canadienne causant des règlements d'équipement. L'opération est sujette aux deux conditions suivantes: (1) ce dispositif peut ne pas causer l'interférence nocive, et (2) ce dispositif doit accepter n'importe quelle interférence reçue, y compris l'interférence qui peut causer l'opération peu désirée.

Regulatory Approvals:

Safety
UL 508
ANSI/ISA-12.12.01-2013, Class I and II, Division 2 and Class III, Divisions 1 and 2 Groups A, B, C and D Hazardous Locations
C22.2 No. 14
C22.2 No. 213-M1987 Class I, Division 2 Hazardous Locations
Temperature code T4A

EMI/EMC
FCC 47 CFR Part 15 Subpart B
ANSI C63.4-2003
CFR 47, Part 15, Subpart B
Industry Canada ICES-003 Issue 4
Electromagnetic Compatibility Directive – 2004/108/EC
Immunity Product Standard: EN 61000-6-2
Emissions Product Standard(s): EN 61000-6-4, EN 61000-3-2, EN 61000-3-3 and EN55011
IEC 61000-4-2
IEC 61000-4-3
IEC 61000-4-4
IEC 61000-4-5
IEC 61000-4-6
IEC 61000-4-8
IEC 61000-4-11

Rail
EN 50155, EN 50121 and EN 61373

GOST-R certified, RoHS compliant

Designed to comply with:
IEEE 1613 for Electric Utility Substations
NEMA TS1/TS2 for Traffic Control

KEY SPECIFICATIONS

Physical

Height:	4.3” (10.92cm)
Width:	1.0” (2.54cm)
Depth:	3.63” (9.22cm)
Including DIN-Rail Mount:	3.83” (9.73cm)
Weight:	0.6 lbs. (0.27kg)
DIN-Rail:	35mm

Electrical

Input Voltage:	10-30 VDC
Steady Input Current:	1.32 A @ 24 VDC (under full load)
Steady Input Current:	66 mA @ 24 VDC (under no load)
Inrush Current:	22 Amp/2.1 ms @ 24VDC (under full load)
Input Ripple:	Less than 100 mV
Input Wire Size:	20-10 AWG

Power over Ethernet

PoE Standard:	IEEE 802.3af/at compliant Mid-span PSE
PoE Output Power:	54VDC / 30W (25.5W at PD)
Power Pin Assignments:	Pins 4/5 (+), Pins 7/8 (-)

Environmental

Operating Temperature:	-40°C to 80°C
Storage Temperature:	-40°C to 85°C
Operating Humidity:	10% to 95% (Non Condensing)
Operating Altitude:	0 to 10,000 ft.

Network Media

10/100/1000Base-T:	> Cat-5e Cable

Connectors

10/100/1000Base-T:	Two (2) RJ45 TX Copper Ports

Recommended Minimum Wiring Clearance:

Top: 1 " (2.54 cm)
Front: 2 " (5.08 cm)

Reliability:

MTBF:	>2 Million Hours

Warranty: 3 years

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 date 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.