

TN-4100 Series

EN 50155 4-port ETBN repeaters



Features and Benefits

Preliminary

- Dual isolated IEC 61375 ETBN repeaters in one compact form factor
- 4 DIP switch-configurable ports with full TTDP/TRDP protocol transparency
- IEC 61076-010 compliant inner-locking M12 push-pull ports, relay alarms, and hardware bypass
- Isolated power module with dual 24 to 110 VDC inputs
- Complies with all EN 50155 mandatory test items¹
- -40 to 70°C wide-temperature design

Certifications



EN 50155



EN 50121-4



Introduction

The ToughNet TN-4100 Series M12 ETBN repeaters are EN 50155-certified devices designed for harsh industrial and railway rolling stock environments. By regenerating both Ethernet frame data and electrical signal characteristics, the TN-4100 Series enables Ethernet segment extension beyond the standard 100-meter limit. In accordance with IEC 61375-2-1, these repeaters are installed between Ethernet train backbone nodes (ETBNs) to provide transparent link extension, ensuring stable communication across extended vehicle consist lengths, such as articulated or multi-car trains.

The TN-4100 Series combines two isolated IEC 61375 ETBN repeaters into a single compact housing to save installation space and simplify system deployment. Equipped with four M12 ports featuring IEC 61076-010 inner-locking push-pull connectors and DIP switch configuration, these repeaters ensure tight, robust connections and offer complete protocol transparency for train communications, including TTDP and TRDP.

All TN-4100 Series models support an extended operating temperature range of -40 to 70°C and fully comply with the mandatory requirements of the EN 50155 standard, including temperature, power input range, surge, ESD, and vibration resistance. Additionally, the TN-4100 Series features a single isolated power module with dual 24 to 110 VDC power inputs and integrated relay alarm outputs to ensure high availability, scalable network design, and uninterrupted on-board operations.

Specifications

Ethernet Interface

100BaseT(X) Ports (M12 D-coded 4-pin female connector with bypass relay)	4
Standards	IEEE 802.3u for 100BaseT(X)

LED Interface

LED Indicators	PWR, Ethernet ports, MDI/MDIX
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Power Parameters

Input Current	0.25 A @ 24 VDC
Input Voltage	24/36/48/72/96/110 VDC
No. of Power Inputs	2
Operating Voltage	16.8 to 137.5 VDC
Power Connector	M12 K-coded 5-pin male connector

1. This product is suitable for rolling stock railway applications, as defined by the EN 50155 standard. For a more detailed statement, click here: www.moxa.com/doc/specs/EN_50155_Compliance.pdf

Overload Current Protection	Supported
Reverse Polarity Protection	Supported
Physical Characteristics	
Housing	Metal
IP Rating	IP40
Dimensions	115 x 159.8 x 70 mm (4.53 x 6.29 x 2.76 in)
Weight	792 g (1.75 lb)
Installation	Wall mounting
Protection	PCB conformal coating
Environmental Limits	
Operating Temperature	-40 to 70°C (-40 to 158°F)
Storage Temperature (package included)	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)
Altitude	3000 m
Standards and Certifications	
EMC	EN 55032/35
EMI	CISPR 32, FCC Part 15B Class A
EMS	IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF
Radio Frequency	FCC
Environmental Testing	IEC 60068-2-1, EN 50155 IEC 60068-2-14, EN 50155 IEC 60068-2-2, EN 50155 IEC 60068-2-30, EN 50155 IEC 60068-2-78
Railway	EN 50121-4 EN 50155 IEC 60571
Railway Fire Protection	EN 45545-2
Safety	IEC 62368-1 UL 62368-1 EN 62368-1
Salt Spray Test	EN 50155
Shock	IEC 60068-2-27, IEC 61373, EN 50155
Vibration	IEC 60068-2-64, IEC 61373, EN 50155
Package Vibration Test	ISTA 1A
Package Drop Test	ISTA 1A

Declaration

Green Product

RoHS, CRoHS, WEEE

MTBF

Time

3,270,455 hrs

Standards

Telcordia SR332 Issue 4

Warranty

Warranty Period

5 years

Details

See www.moxa.com/warranty

Package Contents

Device

1 x TN-4100 Series switch

Installation Kit

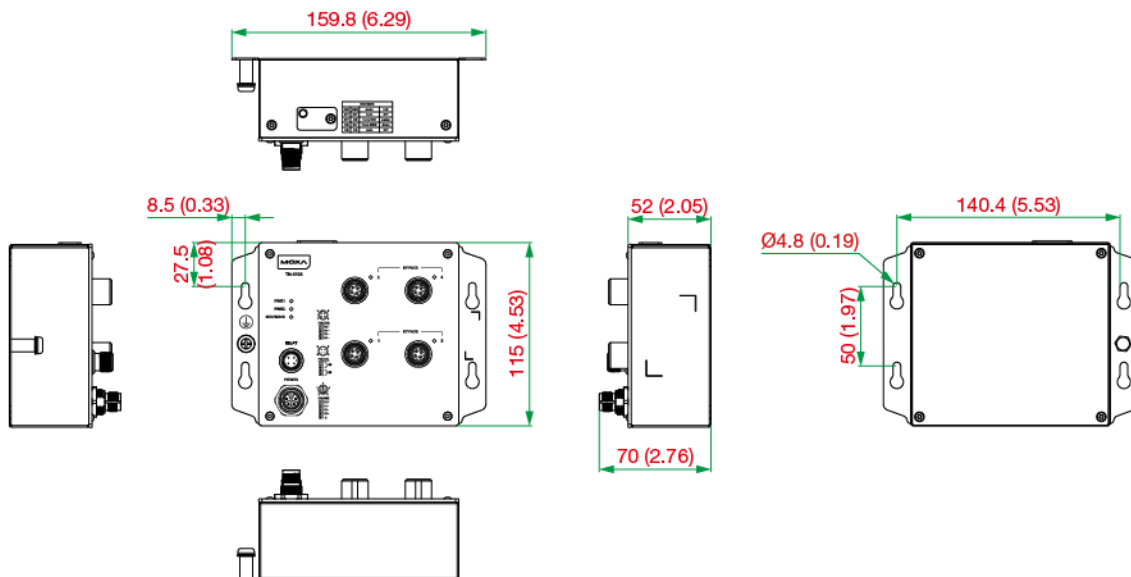
1 x wall-mounting kit (4 mounting screws included)
1 x cap, female, metal, for M12 relay port (pre-installed on switch)

Documentation

1 x quick installation guide
1 x warranty card

Dimensions

Unit: mm (inch)



Ordering Information

Model Name	100BaseT(X) Ports, M12 D-coded 4 pin Female Connector With Bypass Relay	100/1000BaseT(X) Ports, M12 X-coded 8 pin Female Connector With Bypass Relay	Conformal Coating
TN-4104-4TXBP-WV-CT-T	4	-	✓

Accessories (sold separately)

Cables

CBL-M12DMM4PM12DMM4P-BK-100-IP67	D-coded male M12-to-D-coded female M12 Ethernet cable, black, IP67-rated, 1 m
CBL-M12D(MM4P)/RJ45-100 IP67	D-coded male M12-to-RJ45 Ethernet cable, black, IP67-rated, 1 m
CBL-M12(FF4P)/Open-BK-100-IP68	A-coded female M12-to-4-pin open cable, black, IP68-rated, 1 m

CBL-M12KFF5POPEN-O-150-IP67	K-coded female M12-to-5-pin open wire power cable, orange, IP67-rated, 1.5 m
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M12 Connector Caps

A-CAP-M12M-M	Metal cap for M12 male connector
A-CAP-M12F-M-PP	Metal cap for M12 female push-pull connector

Connectors

M12D-4P-IP68	Solder type M12 connector, male 4-pin, D-coded, IP68-rated
M12D-4PMM-IP67	IDC type M12 connector, male 4-pin, D-coded, IP67-rated
M12A-5PFF-IP67-HTG (5 Pin)	Crimp type M12 connector, female 5-pin, A-coded, IP67-rated
M12A-5P-IP68	Solder type M12 connector, female 5-pin, A-coded, IP68-rated
M12K-5PFF-IP65-PxC	Crimp type M12 connector, female 5-pin, K-coded, IP65-rated

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