



User's Guide
TN-XFP-xxx
10G Small Form Factor
Pluggable (XFP) Transceiver
Modules

The Transition Network MSA compliant 10 Gigabit, TN-XFP-xxx small form factor pluggable (XFP) modules are designed to install in any XFP port, They connect 10GBase-xx fiber-optic cable to the network through the XFP connector.

The TN-XFP-xxx transceivers are designed for serial-optical data communications such as 10G Ethernet or 10G fiber channel at speeds up to 10.52 Gbps.

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Fiber Optic Part Numbers

Part Number	Duplex Fiber-Optic Port
TN-XFP-SR	LC, 10GBase-SR/SW, 850 nm multimode with DMI mgmt, 33m (108.3 ft)* on 62.5/12 μm fiber, 300m (984.3ft)* on 50/125 μm fiber
TN-XFP-LRI	LC, 10GBase-LR/LW, 1310 nm single imode with DMI mgmt 10 km (6.2 miles)*
TN-XFP-LRI-T	LC, 10GBase-LR/LW, 1310 nm single mode with DMI mgmt 10 km (6.2 miles)*
TN-XFP-LR2	LC, 10GBase-LR/LW, 1310 nm single mode with DMI mgmt 20 km (12.4 miles)*
TN-XFP-LR2-T	LC, 10GBase-LR/LW, 1310 nm single mode with DMI mgmt 20 km (12.4 miles)*
TN-XFP-ER	LC, 10GBase-ER, 1310 nm single mode with DMI mgmt 40 km (25 miles)*
TN-XFP-ER-T	LC, 10GBase-ER-T, 1310 nm single mode with DMI mgmt 40 km (25 miles)*
TN-XFP-ZR	LC, 10GBase-LR/LW, 1550 nm single mode with DMI mgmt 80 km (50 miles)*

*Unless otherwise indicated, the distances listed are the typical maximum cable distance. The actual maximum cable distances are dependent upon the physical characteristics of the network installation.

Installation

Important: In Cisco Systems' literature, Cisco switches with XFP slots do not accept XFP modules from other manufacturers. The Cisco switch identifies the manufacturer's ID along with the part number and blocks operations to the port for non-Cisco modules. Other major XFP switch manufacturers do not indicate in their literature that such restrictions are imposed.

Installing the XFP transceiver

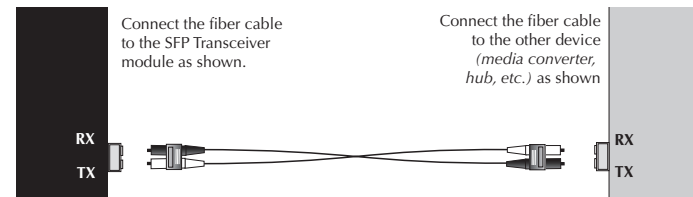
To install the XFP module into a media converter, do the following:

1. Position the module at the installation slot with the label faces up.
2. Slide the module into the slot fully to ensure proper connection.

Installing the fiber cable

To install the fiber cable, do the following:

1. Locate 1000Base-SR-compliant or 1000Base-LR-compliant fiber cable with male TX to RX connectors installed at both ends.
2. Install the fiber cable as shown below.



Diagnostic Monitoring Interface (DMI)

The following DMI port screen and explanation table contains brief definitions of the DMI support offered on Transition Networks XFP optical interfaces. For further information, please see the help option on the CPSMM-xxx SNMP agent or Focal Point, Transition Networks' GUI.

DMI RX Power		DMI RX Power Alarm	
210	uW -6.778 dBm	<input checked="" type="checkbox"/> Normal	<input type="checkbox"/> Low Warn <input type="checkbox"/> High Warn <input type="checkbox"/> Low Alarm <input type="checkbox"/> High Alarm
DMI Temp		DMI Temp Alarm	
30.1	°C 86.2 °F	<input checked="" type="checkbox"/> Normal	<input type="checkbox"/> Low Warn <input type="checkbox"/> High Warn <input type="checkbox"/> Low Alarm <input type="checkbox"/> High Alarm
DMI Bias Current		DMI Bias Alarm	
20	uA	<input type="checkbox"/> Normal	<input type="checkbox"/> Low Warn <input type="checkbox"/> High Warn <input type="checkbox"/> Low Alarm <input type="checkbox"/> High Alarm
DMI TX Power		DMI TX Power Alarm	
0	uW 0.000 dBm	<input type="checkbox"/> Normal	<input type="checkbox"/> Low Warn <input type="checkbox"/> High Warn <input checked="" type="checkbox"/> Low Alarm <input type="checkbox"/> High Alarm
Rx Power Intrusion Threshold		<input checked="" type="checkbox"/> Intrusion Detected	
1000	uW 0.000 dBm		

Variable Name	Description
DMI Rx Power	Measured Receive optical power in microwatts and in decibels relative to 1mW.
DMI Rx Power Alarm	Alarm status of measured receive optical power.
DMI Temp	Internally measured temperature of transceiver in degrees C and degrees F.
DMI Temp Alarm	Alarm status for internally measured temperature of the transceiver.
DMI Bias Current	Measured transmit bias current in microamperes.
DMI Bias Alarm	Alarm status for measured transmit bias current for the interface.
DMI Tx Power	Measured transmit power in microwatts and in decibels relative to 1mW.
DMI Tx Power Alarm	Alarm status of measured transmit power.
Rx Power Intrusion Threshold	Instructs the converter to stop passing traffic when the receive power drops below the new threshold. This feature is sometimes referred to as 'Intrusion Detection,' since tapping into a fiber to intercept traffic leads to a reduction in receive power. This value can be entered in microwatts or in decibels relative to 1mW. Note: This feature is not available on all devices.

Fiber Cable Specification

The physical characteristics must meet or exceed IEEE 802.3z™ specifications.

Single mode fiber (<i>recommended</i>):	9 µm
Multimode fiber (<i>recommended</i>):	62.5/125 µm
Multimode fiber (<i>optional</i>):	100/140, 85/140, 50/125 µm
TN-XFP-SR	850 nm multimode
Fiber Optic Transmitter Power:	min: -6.5 dBm max: -1.5 dBm
Fiber Optic Receiver Sensitivity:	min: -7.5 dBm max: -1.0 dBm
Link Budget:	1.0 dB
TN-XFP-LR1	1310 nm single mode
Fiber Optic Transmitter Power:	min: -8.5dBm max: 0.5 dBm
Fiber Optic Receiver Sensitivity:	min: -14.4 dBm max: 0.5 dBm
Link Budget:	5.9 dB
TN-XFP-LR1-T	1310 nm single mode
Fiber Optic Transmitter Power:	min: -8.5dBm max: 0.5 dBm
Fiber Optic Receiver Sensitivity:	min: -14.4 dBm max: 0.5 dBm
Link Budget:	5.9 dB
TN-XFP-LR2	1310 nm single mode
Fiber Optic Transmitter Power:	min: -3.0 dBm max: 1.0 dBm
Fiber Optic Receiver Sensitivity:	min: -15.0 dBm max: 1.0 dBm
Link Budget:	12.0 dB
TN-XFP-LR2-T	1310 nm single mode
Fiber Optic Transmitter Power:	min: -3.0 dBm max: 1.0 dBm
Fiber Optic Receiver Sensitivity:	min: -15.0 dBm max: 1.0 dBm
Link Budget:	12.0 dB
TN-XFP-ER	1550 nm single mode
Fiber Optic Transmitter Power:	min: 1.5 dBm max: 5.0 dBm
Fiber Optic Receiver Sensitivity:	min: -15.0 dBm max: 1.0 dBm
Link Budget:	16.5 dB
TN-XFP-ER-T	1310 nm single mode
Fiber Optic Transmitter Power:	min: -1.5 dBm max: 5.0 dBm
Fiber Optic Receiver Sensitivity:	min: -15.0 dBm max: 10 dBm
Link Budget:	16.5 dB
TN-XFP-ZR	1550 nm single mode
Fiber Optic Transmitter Power:	min: -1.0 dBm max: 4.0 dBm
Fiber Optic Receiver Sensitivity:	min: -24.0 dBm max: -7.0 dBm
Link Budget:	23.0 dB

Technical Specification

For use with Transition Networks Model TN-XFP-xxx, TN-XFP-xxx-x, or equivalent.

Compliance:

TN-XFP-SR/SW

IEEE 802.3ae 10GBase-SR/SW, 10G Fiber Channel 1200-MX-SN-1, MSA

TN-XFP-LR/LRx, TN-XFP-ER, TN-XFP-ZR

IEEE 802.3ae 10GBase-LR/LW, 10G Fiber Channel 1200-SM-LL-L, XF1 10G Serial Electronic Interface, MSA

Dimensions: 0.52 x 2.18 x 0.33" (13.4 x 55.5 x 8.5 mm)

Weight: 1 oz. (28 g) approximately

Power: +3.3V

O Temp: TN-XFP-SR/SW
-0°C to 85°C (32°F to 185°F)

TN-XFP-LR/LX, TN-XFP-LR/LX-x, TN-XFP-ERx, TN-XFP-ERx-x:
-5°C to 70°C (23°F to 158°F)

Storage Temp: -40°C to 85°C (-40° to 185°F)

Humidity: 5% to 95%, non-condensing

Altitude: 0 to 10,000 feet

Warranty: Lifetime

Note: Transition Networks' XFP modules fully comply with Multi-Sourcing Agreement (MSA). This compliance allows our XFP modules to be used in other MSA compliant most other XFP platforms without any problems.

For the most up-to-date information on the TN-XFP-xxx-x transceiver modules, view the user's guide on-line at: www.transition.com.

WARNING: Visible and invisible laser radiation when open. Do not stare into beam or view directly with optical instruments. Failure to observe this warning could result damage to your eyes or blindness.

WARNING: Use of controls, adjustments or the performance of procedures other than those specified herein could result in hazardous radiation exposure.

The fiber optic transmitters on this device meet Class I Laser safety requirements per IEC-60825/CDRH standards and comply with 21 CFR1040.10 and 21CFR1040.11

Contact Us

Technical support

Technical support is available 24 hours a day.

U.S.A. and Canada: 1-800-260-1312

International: 00-1-952-941-7600

Transition now

Chat live via the Web with Transition Networks Technical Support.

Log onto www.transition.com and click the Transition Now link.

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Transition Networks provides seminars via live web-based training.

Log onto www.transition.com and click the Learning Center link.

E-Mail

Ask a question anytime by sending an e-mail to our technical support staff.

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	Declaration of Conformity
	<p>Name of Mfg: Transition Networks 10900 Red Circle Drive, Minnetonka MN 55343 U.S.A.</p> <p>Model: TN-XFP-xxx Series Transceiver Modules</p> <p>Part Number(s): TN-XFP-SR, TN-XFP-LR1, TN-XFP-LR1-T, TN-XFP-LR2, TN-XFP-LR2-T, TN-XFP-ER TN-XFP-ER-T, TN-XFP-ZR,</p> <p>Regulation: EMC Directive 89/336/EEC</p> <p>Purpose: To declare that the TN-XFP-xxx series XFPs to which this declaration refers is in conformity with the following standards: IEC 60825-1; IEC60825-2; IEEE 802.3ae; 10G FC 1200-MX-SN-1; 10G FC 1200-SM-LL-L; FDA 21; CFR1040.10; CFR1040.11</p> <p>I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).</p> <p align="center">  Stephen Anderson, Vice-President of Engineering </p>
	<p>April, 2009 Date</p>

Compliance Information

IEC-60825; FDA 21; CFR 1040.10 and 1040.11

FCC regulations

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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at the user's own expense.

Canadian regulations

This digital apparatus does not exceed the Class A limits for radio noise for digital apparatus set out on the radio interference regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Class A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

European regulations

Warning

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Achtung !

Dieses ist ein Gerät der Funkstörgrenzwertklasse A. In Wohnbereichen können bei Betrieb dieses Gerätes Rundfunkstörungen auftreten. In diesem Fall ist der Benutzer für Gegenmaßnahmen verantwortlich.

Attention !

Ceci est un produit de Classe A. Dans un environnement domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilisateur de prendre les mesures spécifiques appropriées.



In accordance with European Union Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003, Transition Networks will accept post usage returns of this product for proper disposal. The contact information for this activity can be found in the 'Contact Us' portion of this document.



CAUTION: RJ connectors are NOT INTENDED FOR CONNECTION TO THE PUBLIC TELEPHONE NETWORK. Failure to observe this caution could result in damage to the public telephone network.

Der Anschluss dieses Gerätes an ein öffentliches Telekommunikationsnetz in den EG-Mitgliedstaaten verstösst gegen die jeweiligen einzelstaatlichen Gesetze zur Anwendung der Richtlinie 91/263/EWG zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über Telekommunikationsendeinrichtungen einschliesslich der gegenseitigen Anerkennung ihrer Konformität.

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