TRANSITION NETWORKS

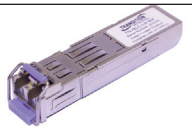
TN-GLC-T

User's Guide

TN-GLC-xx-xx and TN-CWDM-SFP-1xx0 Cisco CompatibleSmall Form Factor Pluggable (SFP) Transceiver Modules**

The Transition Networks TN-GLC-xx-xx and TN-CWDM-SFP-1xx0 series small form factor pluggable (SFP) transceiver modules are designed to install in any SFP port, allowing for1000Base-T, 1000Base-SX or 1000Base-LX interfaces to the network through the SFP connector. The TN-GLC-xxx and TN-CWDM-SFP-1xx0 transceivers are designed for bi-directional serial-optical data communications such as Gigabit Ethernet or fiber channel at speeds up to 2.125 Gbps.

TN-GLC-SX-MM



TN-CWDM-SFP-1xx0

TN-GLC-BX-0

Part Number	Port Description
TN-GLC-T	1000Base-T , RJ-45 100m *(328 ft)**
TN-GLC-SX-MM	1000Base-SX, duplex LC, 850 nm, 220 m *(722 ft)** on 62.5/125 µm fiber 550 m *(1840 ft)** on 50/125 µm fiber
TN-GLC-SX-MM-2K	1000Base-SX, duplex LC 1300 nm, extended multimode up to 2 km *(1.2 miles)**
TN-GLC-LH-SM	1000Base-LX, 1310 nm, single mode 10 km *(6.2 miles)**
TN-GLC-BX-U	1000Base-BX, Simplex LC 1310 nm Tx/1490 nm Rx nm, single mode, single fiber 10 km *(6.2 miles)**
TN-GLC-BX-D	1000Base-BX, Simplex LC 1490 nm Tx/1310 nm Rx nm, single mode, single fiber 10 km *(6.2 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.

**Transition Networks' SFP modules fully comply with the Multi-Sourcing Agreement (MSA). This compliance allows our SFP modules to be used in other MSA compliant SFP platforms without problems. In addition, TN SFP modules specified in this manual are also compatible with all Cisco SFP-based routers and switches, as well as its IOS software. TN SFP modules ARE NOT Cisco OEM brand modules.

Part Number	Port Description
TN-GLC-BX-U	1000Base-BX, Simplex LC 1310 nm Tx/1490 nm Rx, single mode, single fiber 10 km *(6.2 miles)**
TN-GLC-BX-D	1000Base-BX, Simplex LC 1490 nm Tx/1310 nm Rx, single mode, single fiber 10 km *(6.2 miles)**
TN-GLC-BX-U-40	1000Base-BX, Simplex LC 1310 nm Tx/1490 nm Rx, single mode, single fiber 40 km *(24.9 miles)**
TN-GLC-BX-D-40	1000Base-BX, Simplex LC 1490 nm Tx/1310 nm Rx, single mode, single fiber 40 km *(24.9 miles)**
TN-GLC-BX-U-60	1000Base-BX, Simplex LC 1310 nm Tx/1490 nm Rx, single mode, single fiber 60 km *(37.3 miles)**
TN-GLC-BX-D-60	1000Base-BX, Simplex LC 1490 nm Tx/1310 nm Rx, single mode, single fiber 60 km *(37.3 miles)**
TN-GLC-FE-100BX-U	100Base-BX, Simplex LC 1310 nm Tx/1550 nm Rx, single mode, single fiber 20 km *(12.4 miles)**
TN-GLC-FE-100BX-D	100Base-BX, Simplex LC 1550 nm Tx/1310 nm Rx , single mode, single fiber 20 km *(12.4 miles)**
TN-GLC-FE-100FX	100Base-BX, Duplex LC 1300 nm, multimode 2 km *(1.2 miles)**
TN-GLC-FE-100LX	100Base-BX, Duplex LC 1310 nm, single mode 20 km *(12.4 miles)**
TN-GLC-GE-100FX* **	100Base-BX, Duplex LC 1300 nm, multimode 2 km *(1.2 miles)**
TN-GLC-ZX-SM	1000Base-LX, 1550 nm, single mode 80 km *(49.7 miles)**
TN-CWDM-SFP-1xx0	1000Base-LX, single mode 80 km *(49.7 miles)**

xx = center wavelength (λ_c) ***(See technical specifications for more details.)***

27 =1270nm	39 = 1390nm	53 = 1530nm
29 = 1290nm	41 = 1410nm	55 = 1550nm
31 = 1310nm	43 = 1430nm	57 = 1570nm
33 = 1330nm	47 = 1470nm	59 = 1590nm
35 = 1350nm	49 = 1490nm	61 = 1610nm
37 = 1370nm	51 = 1510nm	

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***Provide 100Base-FX interface when plugged into a gigabit SFP slot on Cisco catalyst 3750, 3560, and 2970 series switches.

Note: Install simplex or single fiber SFP models in pairs in the same network where one is the local SFP and the other is the remote SFP.

Installation

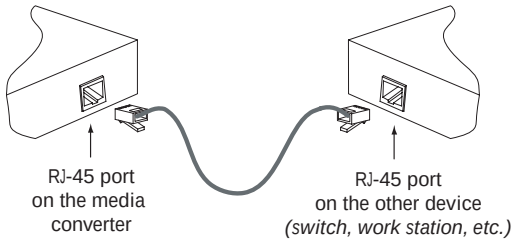
Installing the SFP transceiver

To install the SFP module into a network switches media converter, do the following:

1. Position the module at the installation slot so that the label faces up.
2. Carefully slide the module into the installation slot, aligning it with the internal installation guides.

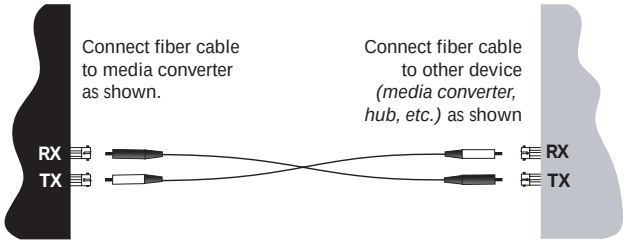
Installing copper cables

1. Locate or build 1000Base-T compliant copper cables with male, RJ-45 connectors installed at both ends.
2. Connect the RJ-45 connector at one end of the cable to the RJ-45 port on the media converter.
3. Connect the RJ-45 connector at the other end of the cable to the RJ-45 port on the other device.



Installing the fiber cables

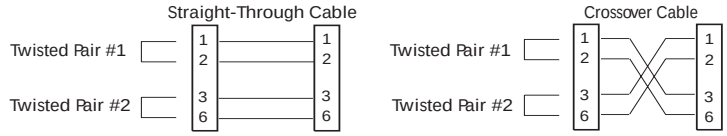
1. Locate or build 1000Base-SX-compliant or 1000Base-LX-compliant fiber cable with male TX to RX connectors installed at both ends.
2. Install the fiber cable as shown below.



Cable Specification

Copper cable *(Category 5 -- minimum requirement)*

- Gauge = 24 to 22 AWG; Attenuation = 22.0 dB /100m @ 100 MHz
- Straight-through OR crossover cable may be used.
- Shielded twisted-pair (STP) OR unshielded twisted-pair (UTP) may be used
- All pin pairs *(1&2, 3&6, 4&5, 7&8)* are active in a gigabit network.
- Use only dedicated wire pairs for the active pins; e.g., blue/white & white/blue,
  orange/white & white/orange, etc.
- Do not use flat or silver satin wire.



Fiber cable

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

Singlemode fiber *(recommended)*:	9 µm
Multimode fiber *(recommended)*:	62.5/125 µm
Multimode fiber *(optional)*:	100/140, 85/140, 50/125 µm

TN-GLC-SX-MM	850 nm multimode	
Fiber Optic Transmitter Power:	min: -9.5 dBm	max: -3.5 dBm
Fiber Optic Receiver Sensitivity:	min: -18.0 dBm	max: -1.0 dBm
Link Budget:	8.5 dB	

TN-GLC-SX-MM-2k	1300 nm multimode	
Fiber Optic Transmitter Power:	min: -9.0 dBm	max: -1.0dBm
Fiber Optic Receiver Sensitivity:	min: -19.0 dBm	max: -1.0 dBm
Link Budget:	18.0 dB	

TN-GLC-LH-SM	1310 nm singlemode	
Fiber Optic Transmitter Power:	min: -9.5 dBm	max: -3.0 dBm
Fiber Optic Receiver Sensitivity:	min: -20.0 dBm	max: -3.0 dBm
Link Budget:	10.5 dB	

TN-GLC-BX-U	1310 nm Tx/1490 nm Rx single mode	
TN-GLC-BX-D	1490 nm Tx/1310 nm Rx single mode	
Fiber Optic Transmitter Power:	min: -9.0 dBm	max: -1.0 dBm
Fiber Optic Receiver Sensitivity:	min: -21.0 dBm	max: -1.0 dBm
Link Budget:	12.0 dB	

TN-GLC-BX-U-40	1310 nm Tx/1490 nm Rx single mode	
TN-GLC-BX-D-40	1490 nm Tx/1310 nm Rx single mode	
Fiber Optic Transmitter Power:	min: -3.0 dBm	max: +2.0 dBm
Fiber Optic Receiver Sensitivity:	min: -23.0 dBm	max: -1.0 dBm
Link Budget:	20.0 dB	

TN-GLC-BX-U-60	1310 nm Tx/1490 nm Rx single mode	
TN-GLC-BX-D-60	1490 nm Tx/1310 nm Rx single mode	
Fiber Optic Transmitter Power:	min: -2.0 dBm	max: +4.0 dBm
Fiber Optic Receiver Sensitivity:	min: -25.0 dBm	max: -1.0 dBm
Link Budget:	23.0 dB	

TN-GLC-FE-100BX-U	1310 nm Tx/1550 nm Rx single mode	
TN-GLC-FE-100BX-D	1550 nm Tx/1310 nm Rx single mode	
Fiber Optic Transmitter Power:	min: -14.0 dBm	max: -8.0 dBm
Fiber Optic Receiver Sensitivity:	min: -32.0 dBm	max: -0.0 dBm
Link Budget:	18.0 dB	

Fiber cable -- continued

TN-GLC-FE-100FX	1300 nm multimode	
TN-GLC-GE-100FX	1300 nm multimode	
Fiber Optic Transmitter Power:	min: -23.5 dBm	max: -14.0 dBm
Fiber Optic Receiver Sensitivity:	min: -32.0 dBm	max: -8.0 dBm
Link Budget:	8.5 dB	

TN-GLC-FE-100LX	1310 nm single mode	
Fiber Optic Transmitter Power:	min: -15.0 dBm	max: -8.0 dBm
Fiber Optic Receiver Sensitivity:	min: -34.0 dBm	max: -0.0 dBm
Link Budget:	19.0 dB	

TN-GLC-ZX-SM	1550 nm single mode	
Fiber Optic Transmitter Power:	min: 0.0 dBm	max: +5.0 dBm
Fiber Optic Receiver Sensitivity:	min: -24.0 dBm	max: -3.0 dBm
Link Budget:	24 dB	

TN-CWDM-SFP-1xx0	1270nm -1610nm single mode	
Fiber Optic Transmitter Power:	min: 0.0 dBm	max: +5.0 dBm
Fiber Optic Receiver Sensitivity:	min: -25.0 dBm	max: -3.0 dBm
Link Budget:	25 dB	

For the most up-to-date information on the TN-GLC-xx-xx transceiver module, view the user's guide on-line at: www.transition.com.

Product is certified by the manufacturer to comply with DHHS Rule 21/CFR, Subchapter J applicable at the date of manufacture.

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-825/CDRH standards and comply with 21 CFR1040.10 and 21CFR1040.11.

Technical Specification

For use with Transition Networks Model TN-GLC-xxx or equivalent.

Standard:	IEEE 802.3 2003; ANSI X3.297-1997
	TN-GLC-FE-xxx and TN-GLC-GE-xxx: Compiant with IEEE 802.3 100Base-Fx; IEEE802.3ah 100Base-Bx; Intermediate - Reach Sonet OC-3/SDH STM-1 (s-1-1)
Compliant with	TN-GLC-xx-xx and TN-CWDM-SFP-1xx0 modules: IEEE 802.3z Gigabit Ethernet; FC-1x/2x SM-LC-L FC-PI. TN-GLC-T modules: Compliant with IEEE 802.32 Gigabit Ethernet *(1000Base-T)*
Output wavelength	$-6.0 < \lambda_c < +7.5$ nm
Dimensions:	0.52 x 2.18 x 0.33'' *(13.4 x 55.5 x 8.5 mm, Fiber)*
	0.95 x 2.8 x 0.54" *(14-0 x 71.1 13.7 mm, Copper)*
Weight:	1 oz. *(28 g)* approximately
Power:	3.3V, Fiber 0.66 W; Copper 1.0 W
Operating Temp:	0°C to 70°C *(32°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

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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.

Web-Based seminars

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.

techsupport@transition.com

Address

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telephone: 952-941-7600
toll free: 800-526-9267
fax: 952-941-2322

TRANSITION NETWORKS

Declaration of Conformity

Name of Mfg:	Transition Networks 10900 Red Circle Drive, Minnetonka MN 55343 U.S.A.
Model:	TN-GLC-xx-xx Series Transceiver Modules
Part Number(s):	TN-GLC-T, TN-GLC-SX-MM, N-GLC-SX-MM-2k, TN-GLC-LH-SM, TN-GLC-BX-U, TN-GLC-BX-D, TN-GLC-BX-U-40, TN-GLC-BX-D-40, TN-GLC-BX-U-60, TN-GLC-BX-D-60, TN-GLC-FE-100BX-U, TN-GLC-FE-100BX-D, TN-GLC-FE-100FX, TN-GLC-FE-100LX, TN-GLC-GE-100LX, TN-GLC-ZX-SM, TN-CWDM-SFP-1xx0
Regulation:	EMC Directive 89/336/EEC
Purpose:	To declare that the TN-GLC-xxx to which this declaration refers is in conformity with the following standards:

IEC 60825-1; IEC60825-2; FC1X/2X SM-LC-L FC-PI; IEEE 802.3z 2003; ANSI X3.297 1997; Class A; FDA 21; CFR1040.10; CFR1040.11

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).

Stephen Anderson, Vice-President of Engineering

October 2008
Date

Compliance Information

CE Mark: 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 Fäll ist der Benutzer für Gegenmaßnahmen verantwortlich.

Attention !

Ceci est un produit de Classe A. Dans un environment domestique, ce produit risque de créer des interférences radioélectriques, il appartiendra alors à l'utilsateur de prende les measures 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 öffentlickes Telekommunikationsnetz in den EG-Mitgliedstaaten verstösst gegen die jeweligen einzelstaatlichen Gesetze zur Anwendung der Richtlinie 91/263/EWG zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über Telekommunikationsendeinrichtungen einschliesslich der gegenseitigen Anerkennung ihrer Konformität.