

LANTRONIX®



TN-J48xxx HP Compatible Small Form Factor Pluggables (SFPs) User Guide

**Part Number 33466
Revision C February 2022**

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Warranty

For details on the Lantronix warranty policy, please go to our web site at <http://www.lantronix.com/support/warranty>.

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Revision History

Date	Rev	Notes
9/30/13	A	Initial release.
7/28/15	B	Updated contact information and format
2/8/22	C	Initial Lantronix re-brand.

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Product Description

The Lantronix TN-J48xxx SFP series small form factor pluggable (SFP) transceiver modules are designed to install in any SFP port. The TN-J48-xxx SFP transceivers are designed for bi-directional, serial-optical data communications such as Gigabit Ethernet or fiber channels at speeds up to 1.25 Gbps.

Ordering Information

Part Number	Port Description
TN-J4858C	1000Base-SX, duplex LC, 850 nm, multimode 220 m (722 ft)* on 62.5/125 μ m fiber 550 m (1804.5 ft)* on 50/125 μ m fiber
TN-J4859C	1000Base-LX, duplex LC 1310 nm, single mode up to 20 km (12.3 miles)*
TN-J4860C	1000Base-LX/ZX, duplex LC 1550 nm, single mode up to 80 km (49.7 miles)*

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

Note: Lantronix 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 HP SFP-based ProCure Switches, including the software. Lantronix SFP modules ARE NOT HP OEM brand modules.

Features

- Hot-Pluggable SFP Optical Transceiver with Duplex LC Connector
- Class 1 Laser International Safety Standard IEC-60825 Compliant
- Compatible with SFP Multi-Sourcing Agreement (MSA) Compatible

Specifications

The TN-J48-xxx was designed to meet these standards and specifications:

Standards (All Models)	IEEE 802.3 2003; ANSI X3.297-1997
TN-J48xxx Standards	IEEE 802.3z Gigabit Ethernet
Compliance	IEC-60825; FDA 21; CFR 1040.10 and 1040.11
Dimensions	0.52 x 2.22 x 0.33 in (13.4 x 56.5 x 8.5 mm, Fiber)
Power	3.3V, Fiber 0.66 W
Weight	1 oz. (28 g) approximately
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
Warranty	Lifetime

Note: Per HP literature, HP switches with SFP slots do not accept modules other than HP's own SFPs. The HP switch identifies the manufacturer ID along with the part number and blocks operations to this port for non-HP interfaces. Other major SFP switch manufacturers do not indicate in their literature that

such restrictions are imposed. Lantronix SFP units fully comply with Multi-Sourcing Agreement (MSA). This compliance allows Lantronix SFP modules to be used on other MSA-compliant SFP platforms without any problems.

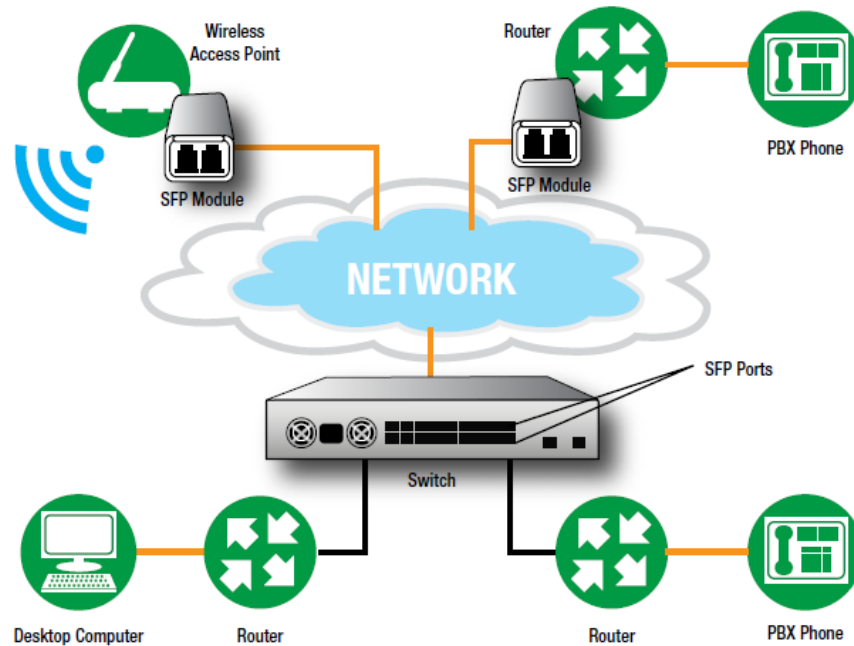
Optical Specifications

The Optical Spec for all Lantronix SFPs are listed at www.transition.com/sfp.pdf.

Part Number	Description
TN-J4858C	1000Base-SX 850nm (LC) multimode [62.5/125 μ m fiber: 220 m/722 ft.] [50/125 μ m fiber: 550 m/1804 ft.] Link Budget: 9.0 dB
TN-J4859C	1000Base-LX 1310nm (LC) single mode [20 km/12.4 mi.] Link Budget: 16.0 dB
TN-J4860C	1000Base-LX/ZX 1550nm (LC) single mode [80 km/49.7 mi.] Link Budget: 24.0 dB

Application: Fiber Connections with SFPs

SFPs are used with Gigabit Ethernet Switches and Routers, Fibre Channel Switch Infrastructure, xDSL applications, Metro Edge Switching, etc.



Safety Instructions

When a connector is removed during installation, testing, or servicing, or when an energized fiber is broken, a risk of ocular exposure to optical energy that may be potentially hazardous occurs, depending on the laser output power. The primary hazards of exposure to laser radiation from an optical-fiber system are:

- Damage to the eye by accidental exposure to a beam emitted by a laser source.
- Damage to the eye from viewing a connector attached to a broken fiber or an energized fiber.

Danger: Never attempt to view optical connectors that might be emitting laser energy.

Do not power up the laser product without connecting the laser to the optical fiber and putting the cover in position, as laser outputs will emit infrared laser light at this point.

See the Lantronix [SFP page](#) for our full line of SFP transceivers. See the [FOA webpage](#) for additional information.

High Risk Activities Disclaimer

Components, units, or third-party products used in the product described herein are NOT fault-tolerant and are NOT designed, manufactured, or intended for use as on-line control equipment in the following hazardous environments requiring fail-safe controls: the operation of Nuclear Facilities, Aircraft Navigation or Aircraft Communication Systems, Air Traffic Control, Life Support, or Weapons Systems ("High Risk Activities"). Lantronix and its supplier(s) specifically disclaim any expressed or implied warranty of fitness for such High Risk Activities.

SFP Unpacking

Before you start installing the TN-J48-xxx, verify that the package contains the following items:

- One TN-J48-xxx
- Two protective foam pieces
- One Documentation Postcard

Please notify your sales representative immediately if any of the above items is missing or damaged. Save the packaging for possible future use.



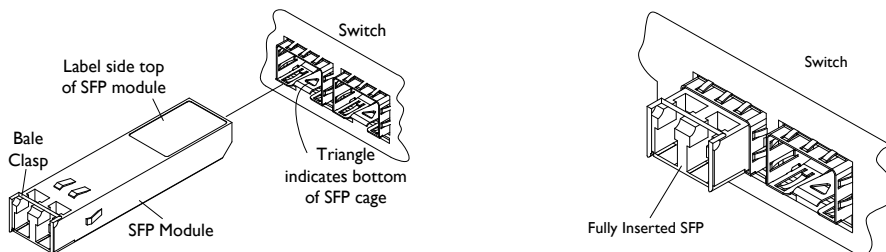
SFP Installation

Cautions

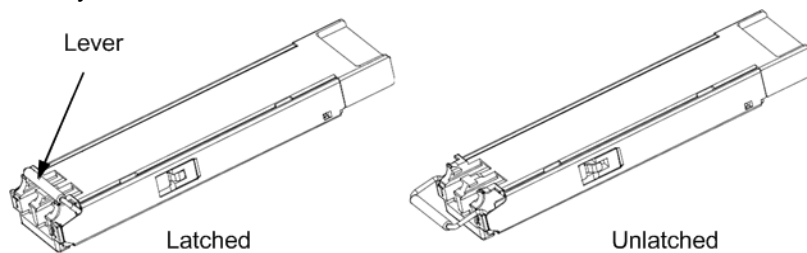
- The SFP transceiver module is keyed to only be installed one way. However, if forced the wrong way, damage may occur.
- Avoid getting dust or other contaminants into the fiber bore of the SFP transceiver module, as this will cause the optics to not operate properly.
- Clean the optic surfaces of the optical fiber before you plug them back in to the optical bores of another SFP transceiver module.
- Each port must match the wavelength specifications on the other end of the cable, and the cable must not exceed the specified cable length for reliable communications.

Installing an SFP Module

1. Attach an ESD-preventive wrist strap to your wrist and to the ESD ground connector or a bare metal surface on your chassis.
2. Remove the SFP transceiver module from its protective packaging. Note: Do not remove the optical bore dust plugs until directed to do so in a later procedure.
3. Check the slot orientation. Note that for some devices (e.g., S4224) some slots are “upside down” compared to other slots.
4. Position the SFP device at the desired installation slot, with the label facing correctly.
5. Carefully slide the SFP device into the slot, aligning it with the internal installation guides.



6. Ensure that the SFP device is firmly seated against the internal mating connector. To verify that the SFP is seated and latched properly. **a)** Grasp the SFP by the sides and try to remove it without releasing the latch. **b)** If the SFP cannot be removed, it is installed and seated properly. If the SFP can be removed, reinsert it and press harder with your thumb; repeat if necessary until it is latched securely into the socket.



7. Connect the fiber cable to the fiber port connector of the SFP device. Make sure the SFP release latch is in the up (closed) position when you insert the cable connector into the SFP.
8. Remove the dust plug from the connector. Save the dust plug for future use.
9. Attach an appropriate cable into the SFP module port.
10. Attach the other end of the cable into the other device.
11. Observe the status LED(s). See the related manual for details.

Fiber Cable Physical Characteristics

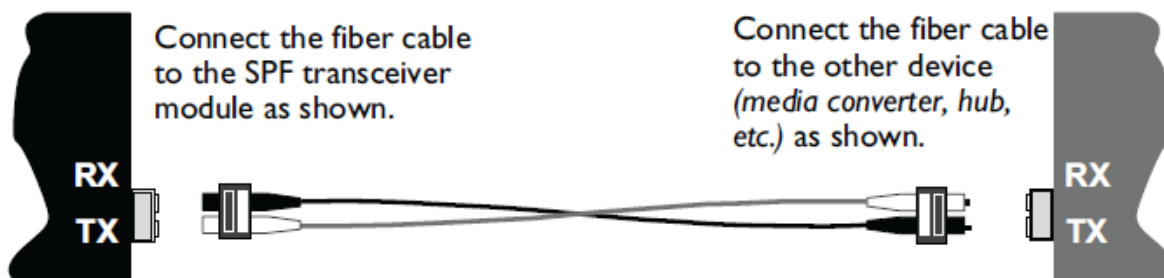
The fiber cable physical characteristics must meet or exceed IEEE 802.3ae specifications:

- Single mode fiber (recommended): 9 μm
- Multimode fiber (recommended): 62.5/125 μm
- Multimode fiber (optional): 100/140, 85/140, 50/125 μm

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

Installing the Fiber Cables

1. Locate a 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.



Fiber Cable Specifications

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

Single mode fiber (recommended):

9 μm

TN-J4858C

850 nm multimode

Fiber Optic Transmitter Power:

min: -9.0 dBm

max: -3.0 dBm

Fiber Optic Receiver Sensitivity:

min: -18.0 dBm

max: -0.0 dBm

Link Budget:

9.0 dB

TN-J4859C

1310 nm single mode

Fiber Optic Transmitter Power:

min: -9.0 dBm

max: -3.0 dBm

Fiber Optic Receiver Sensitivity:

min: -25.0 dBm

max: -3.0 dBm

Link Budget:

16.0 dB

TN-J4860C

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:

24.0 dB

Removing an SFP Module

Caution: Be careful when removing the SFP or SFP+ from a device. Some SFP transceiver module temperatures may exceed 160°F (70°C) and be too hot to touch with bare hands. **Note:** Do not remove and replace the SFP modules more often than necessary; excessive SFP removing and replacing can shorten the SFPs useful life.

1. Attach an ESD-preventive wrist strap to your wrist and to the ESD ground connector or a bare metal surface on your chassis.
2. For future reattachment of fiber-optic cables, note which connector plug is send (TX) and which is receive (RX).
3. Remove the SFP transceiver module:
 - a. If the SFP transceiver module has an **actuator button latch**, gently press the actuator button on the front of the SFP transceiver module until it clicks and the latch mechanism releases the SFP transceiver module from the socket connector. Grasp the actuator button between your thumb and index finger, and carefully pull the SFP transceiver module straight out of the module slot.
 - b. If the SFP transceiver module has a **bail clasp latch**, pull the latch out and down to eject the SFP transceiver module from the socket connector. If the bail clasp latch is obstructed and you cannot use your index finger to open it, use a small, flat-blade screwdriver or other long, narrow instrument to open the bail clasp latch. Grasp the SFP transceiver module between your thumb and index finger, and carefully remove it from the socket.
4. Replace the Dust Plug.
5. Place the removed SFP/SFP+ transceiver module in an antistatic bag or other protective package.

SFP distances, TX power, RX power, and link budgets can be found on the Lantronix [website](#), document “SFP/XFP Fiber and Copper Connectors.”

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.

WARNING: Visible and invisible laser radiation when open. Do not stare into the beam or view the beam directly with optical instruments. Failure to observe this warning could result in an eye injury or blindness.

IMPORTANT: Copper based media ports such as Twisted Pair (TP) Ethernet, USB, RS232, RS422, RS485, DS1, DS3, Video Coax, etc., are intended to be connected to intra-building (inside plant) link segments that are not subject to lightening transients or power faults. Copper-based media ports such as Twisted Pair (TP) Ethernet, USB, RS232, RS422, RS485, DS1, DS3, Video Coax, etc., are NOT to be connected to inter-building (outside plant) link segments that are subject to lightening transients or power faults.

DDMI (Digital Diagnostics Monitoring Interface)

DDMI (Digital Diagnostics Monitoring Interface) provides enhanced digital DMI for optical transceivers which allows real time access to device operating parameters.

The following DMI port screen and explanation table contains brief definitions of the DDMI support offered on some Small Form Factor Pluggable (SFP) Transceiver Modules. For further information, see the help option or User Guide for the S3290, S4140, S4212, and S4224. **Note:** This feature is not available on all devices and may vary between products. See the related manual for more information.

The screenshot shows a web interface for monitoring a transceiver. On the left is a navigation menu with options like System, Ports, Link OAM, DHCP, Security, LACP, Loop Protection, Spanning Tree, MVR, IPMC, LLDP, Ethernet Services, Performance Monitor, PTP, MAC Table, VLANs, DDMI (Overview, Detailed), UDLD, and Diagnostics. The main content area is titled 'Transceiver Information' and includes a table with the following data:

Vendor	Transion
Part Number	TN-10GSFP-LR1
Serial Number	8800022
Revision	0001
Date Code	2011-08-09
Transceiver	10G

Below this is the 'DDMI Information' section, which contains a table with the following data:

Type	Current	High Alarm Threshold	High Warn Threshold	Low Warn Threshold	Low Alarm Threshold
Temperature(C)	52.875	85.000	80.000	0.000	-5.000
Voltage(V)	3.2600	3.6000	3.5000	3.1000	3.0000
Tx Bias(mA)	38.896	90.000	80.000	4.000	2.000
Tx Power(mW)	0.5624	1.4125	1.1220	0.1585	0.1259
Rx Power(mW)	0.0000 --	1.4125	1.1220	0.0363	0.0229
Tx Power(dBm)	-2.50	1.50	0.50	-8.00	-9.00
Rx Power(dBm)	-inf	1.50	0.50	-14.40	-16.40

The Transceiver Information and DDMI Information sections are described below.

DDMI Parameter	Description
DMI	Rx Power (uW) Intrusion Threshold; a level for Rx Power on the Fiber port. If the DMI read value falls below the preset value, an intrusion is detected, and a trap is generated. The default is 0 uW. The range is 0 - 65,535 uW.
Port	The device's port number.
Vendor	The SFP vendor's name.
Part Number	The SFP vendor Part number provided by the SFP vendor (<i>TN-10GSFP-SR</i>).
Serial Number	The SFP Vendor Serial number provided by the SFP vendor (e.g., <i>8672105</i>).
Revision	The SFP vendor Revision level for part number provided by the SFP vendor.
Data Code	The vendor's manufacturing date code (e.g., <i>2011-08-09</i>).
Transeiver	The Transceiver compatibility (e.g., <i>1000BASE_SX</i> or <i>10G</i>).
Current	The current value of temperature, voltage, TX bias, TX power, and RX power.
High Alarm Threshold	The high alarm threshold value of temperature, voltage, TX bias, TX power, and RX power.
High Warn Threshold	The high warn threshold value of temperature, voltage, TX bias, TX power, and RX power.
Low Warn Threshold	The low warn threshold value of temperature, voltage, TX bias, TX power, and RX power.
Low Alarm Threshold	The low alarm threshold value of temperature, voltage, TX bias, TX power, and RX power.

SFP Information and SFP Detail Info

Note: This feature is not available on all devices and may vary between products. See the related manual for more information.

SFP Information

This page displays general SFP information and monitoring information as shown and described below.

Port	Tx Central Wavelength	Bit Rate	Temperature	Vcc	Mon1 (Bias)	Mon2 (TxPwr)	Mon3 (RxPwr)
1							
2							
3							
4							
5							
6							
7							
8							
9							
10	1310	10 Gbps	27.07 C	3.35 V	0 mA	0.00 dBm	none

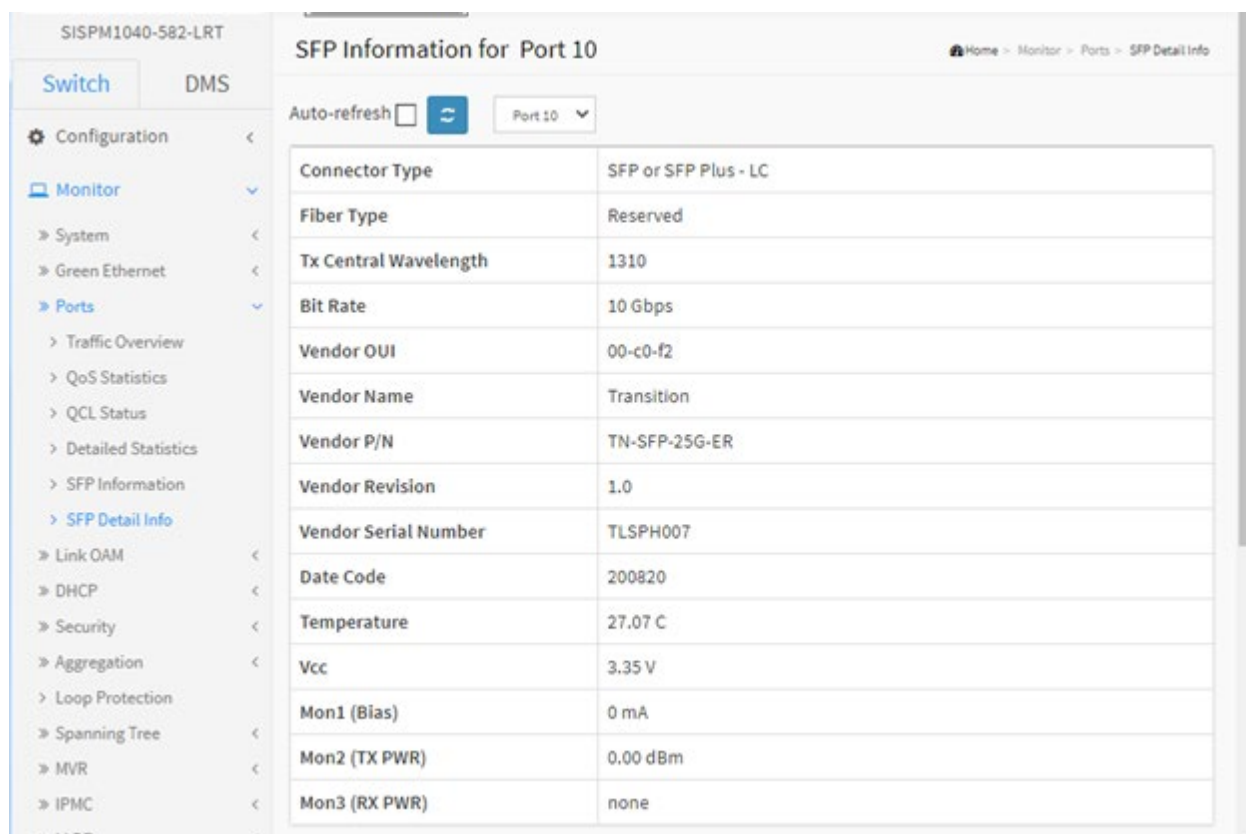
Parameter descriptions:

Parameter	Description
Port	The logical port for the settings contained in the same row.
Tx Central Wavelength	Displays the nominal transmitter output wavelength in nm.
Bit rate	Displays the nominal bit rate of the transceiver.
Temperature	Displays the internally measured transceiver temperature. Temperature accuracy is vendor specific but must be better than 3 degrees Celsius over specified operating temperature and voltage.
Vcc	Displays the internally measured transceiver supply voltage. Accuracy is vendor specific but must be better than 3 percent of the manufacturer's nominal value over specified operating temperature and voltage. Note that in some transceivers, transmitter supply voltage and receiver supply voltage are isolated. In that case, only one supply is monitored. Refer to the device specification for more detail.
Mon1 (Bias)	Displays the measured TX bias current in uA. Accuracy is vendor specific but must be better than 10 percent of the manufacturer's nominal value over specified operating temperature and voltage.
Mon2 (TX PWR)	Displays the measured coupled TX output power in mW. Accuracy is vendor specific but must be better than 3dB over specified operating temperature

	and voltage. Data is assumed to be based on measurement of a laser monitor photodiode current. Data is not valid when the transmitter is disabled.
Mon3 (RX PWR)	Displays the measured received optical power in mW. Absolute accuracy is dependent upon the exact optical wavelength. For the vendor specified wavelength, accuracy should be better than 3dB over specified temperature and voltage. This accuracy should be maintained for input power levels up to the lesser of maximum transmitted or maximum received optical power per the appropriate standard. It should be maintained down to the minimum transmitted power minus cable plant loss (insertion loss or passive loss) per the appropriate standard. Absolute accuracy beyond this minimum required received input optical power range is vendor specific.

SFP Detail Info

This page displays detailed SFP information and monitoring information as shown and described below.



Parameter descriptions:

Parameter	Description
Connector Type	Displays the external optical or electrical cable connector provided as the media interface.
Fiber Type	Displays the fiber channel transmission media.
Tx Central Wavelength	Displays the nominal transmitter output wavelength in nm.
Bit rate	Displays the nominal bit rate of the transceiver.
Vendor OUI	Displays the vendor IEEE company ID (Organizationally Unique Identifier).

Vendor Name	Displays the vendor name (e.g., TN-SFP-25G-ER).
Vendor P/N	Displays the vendor part number or product name.
Vendor Revision	Displays the vendor product revision.
Vendor Serial Number	Displays the vendor serial number for the transceiver.
Date Code :	Displays the vendor's manufacturing date code.
Temperature	Displays the internally measured transceiver temperature. Temperature accuracy is vendor specific but must be better than 3 degrees Celsius over specified operating temperature and voltage.
Vcc	Displays the internally measured transceiver supply voltage. Accuracy is vendor specific but must be better than 3 percent of the manufacturer's nominal value over specified operating temperature and voltage. Note that in some transceivers, transmitter supply voltage and receiver supply voltage are isolated. In that case, only one supply is monitored. Refer to the device specification for more detail.
Mon1 (Bias)	Displays the measured TX bias current in uA. Accuracy is vendor specific but must be better than 10 percent of the manufacturer's nominal value over specified operating temperature and voltage.
Mon2 (TX PWR)	Displays the measured coupled TX output power in mW. Accuracy is vendor specific but must be better than 3dB over specified operating temperature and voltage. Data is assumed to be based on measurement of a laser monitor photodiode current. Data is not valid when the transmitter is disabled.
Mon3 (RX PWR)	Displays the measured received optical power in mW. Absolute accuracy is dependent upon the exact optical wavelength. For the vendor specified wavelength, accuracy should be better than 3dB over specified temperature and voltage. This accuracy should be maintained for input power levels up to the lesser of maximum transmitted or maximum received optical power per the appropriate standard. It should be maintained down to the minimum transmitted power minus cable plant loss (insertion loss or passive loss) per the appropriate standard. Absolute accuracy beyond this minimum required received input optical power range is vendor specific.

Compliance Information

CE Mark: IEC-60825; FDA 21; CFR 1040.10 and 1040.11

Class I Laser Compliance

This product has been tested and found to comply with the limits for FDA Class I laser for IEC60825, EN60825, and 21CFR1040 specifications.

Translated Safety Warnings

Warning Class I laser product.

Waarschuwing Klasse-I laser produkt.

Varoitus Luokan I lasertuote.

Attention Produit laser de classe I

Warnung Laserprodukt der Klasse I.

Avvertenza Prodotto laser di Classe I.

Advarsel Laserprodukt av klasse I.

Aviso Produto laser de classe I.

¡Advertencia! Producto láser Clase I.

Varning! Laserprodukt av klass I.

Aviso Produto a laser de classe I.

Advarsel Klasse I laserprodukt.

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, Lantronix 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.



Der Anschluss dieses Gerätes an ein öffentliches Telekommunikationsnetz in den EGMitgliedstaaten 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.



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 EGMitgliedstaaten 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.

Declaration of Conformity

	Declaration of Conformity
Name of Mfg:	Transition Networks 10900 Red Circle Drive, Minnetonka MN 55343 U.S.A.
Model:	TN-J48xxx SFP Series Transceiver Modules
Part Number(s):	TN-J4858C, TN-J4859C, TN-J460C
Regulation:	EMC Directive 89/336/EEC
Purpose:	To declare that the TN-J48xxx 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).
	<u>August 2009</u>
Stephen Anderson, Vice-President of Engineering	Date

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Technical Support

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Sales Offices

For a current list of our domestic and international sales offices, go to the Lantronix web site at www.lantronix.com/about/contact.