

# COMPLIANCE INFORMATION

UL Listed  
C-UL Listed (Canada)  
CISPR22/EN55022 Class A + EN55024  
CE Mark

## 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 weichen Fällen der Benutzer für entsprechende Gegenmaßnahmen verantwortlich ist.

### 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



**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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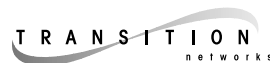
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# T1/E1 Twisted-Pair Copper to Fiber

## Media Converters

SSDTF10xx\*-100

## USER'S GUIDE

TRANSITION Networks SSDTF10xx-100 series media converters encode and decode T1 or E1 twisted-pair copper signals over duplex fiber-optic cable to extend the distance and transmission reliability of high speed T1 or E1 data traffic.

### SSDTF1011-100

Provides an RJ-45 twisted pair copper connector for T1 or E1 signals and a set of RX/TX **ST** connectors to **850 nm multimode** duplex fiber-optic cable.

### SSDTF1012-100

Provides an RJ-45 twisted pair copper connector for T1 or E1 signals and an RX/TX **ST** connector to **1300 nm singlemode** duplex fiber-optic cable.

### SSDTF1013-100

Provides an RJ-45 twisted pair copper connector for T1 or E1 signals and an RX/TX **SC** connector to **850 nm multimode** duplex fiber-optic cable.

### SSDTF1014-100

Provides an RJ-45 twisted pair copper connector for T1 or E1 signals and an RX/TX **SC-SM** connector to **1300 nm singlemode** duplex fiber-optic cable.



### SSDTF1015-100 (long haul)

Provides an RJ-45 twisted pair copper connector for T1 or E1 signals and an RX/TX **SC-LH** connector to **1300 nm singlemode** duplex fiber-optic cable.

### SSDTF1022-100 (long haul)

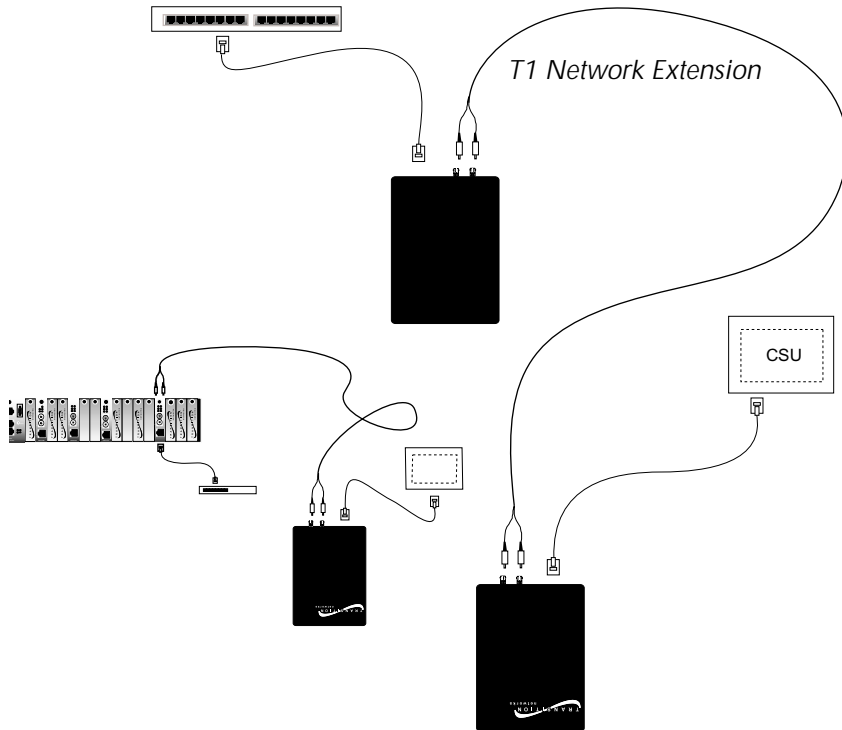
Provides an RJ-45 twisted pair copper connector for T1 or E1 signals and an RX/TX **ST** connector to **1300 nm singlemode** duplex fiber-optic cable.

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\*In SSDTF10xx model designation, **10** represents the T1 or E1 RJ-45 connector; **xx** represents the selectable fiber connector installed on the media converter.

# SSDTF10xx IN THE NETWORK

NOTE: THE SSDTF10xx REQUIRES A CSU BETWEEN THE MEDIA CONVERTER AND THE PUBLIC TELEPHONE NETWORK.



NOTE: T1/E1 MEDIA CONVERTERS MUST BE USED IN PAIRS. A TRANSITION Networks SSDTF10xx stand-alone media converter can be used with another SSDTF10xx stand-alone media converter, with a CSDTF10xx chassis media converter, or with a previous model TRANSITION Networks T1/E1 media converter, such as a C/T1E1-CF-01 or a T1E1-CF-01.

## Features

- Media converter is framing independent (as ESF vs D4) and supports all common line codes, (AMI, B8ZS, HDB3).
- Dry relay contacts allow media converter to be tied into separate alarm circuit
- All Ones Insertion (AIS) on loss of signal at copper and/or fiber interface.

# TECHNICAL SPECIFICATIONS

<b>Standards</b>	<i>Emissions:</i> CISPR A <i>T1/E1 Physical Layer:</i> ITU-T, ANSI, AT&T, ETSI
<b>Dimensions</b>	2.9" x 4.8" x 1.4"
<b>Weight</b>	8 oz (approximate)
<b>Power Source</b>	7.5-15.9 VDC AC Adapter
<b>Power Consumption</b>	5 watts

**Power Supply Requirements** Replace power supply with only the equivalent input rating (see below) and output rating (regulated 9VDC at 550 mA).

TN PN	Requirement	Location
25034 or 3525	240 volts, 50 hertz	United Kingdom
25034 or 3525	230 volts, 50 hertz	Europe
3518	120 volts, 60 hertz	USA/Canada/Mexico
3514	100 volts, 50-60 hertz	Japan
25034 or 3525	240 volts, 50 hertz	Australia

<b>Environment</b>	Typical Operating Temperature*: 0° to 50°C (32° to 122°F)
	Storage Temperature: -20° to 85°C (-4° to 185°F)
	Humidity 10-90%, non condensing
	Altitude 0-10,000 feet
<b>Warranty</b>	Lifetime

**TRANSITION NETWORKS**

**DECLARATION OF CONFORMITY**

Name of Mfg: **Transition Networks**  
6475 City West Parkway, Minneapolis MN 55344 USA

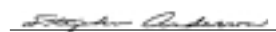
Model: **SSDTF10xx Series Copper-to-Fiber Media Converter**

Part Number: **SSDTF1011-100, SSDTF1012-100, SSDTF1013-100, SSDTF1022-100**

Regulation: **EMC Directive 89/336/EEC**

Purpose: To declare that the **SSDTF10xx** to which this declaration refers is in conformity with the following standards.  
EN 55022:1994; EN 55024:1998; FCC Part 15 Class A; EN 60950 A4:1997; UL 1950

*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

January 8, 2001  
Date

## CABLE SPECIFICATIONS (continued)

### Twisted-Pair Copper Cable

Twisted pair connection requires two active pairs. The two active pairs in a T1/E1 network are pins 1 & 2 and pins 4 & 5. Use only dedicated wire pairs (such as blue/white & white/blue, orange/white & white/orange) for the active pins.

Category 3 or better twisted-pair copper wire is required. Either shielded twisted-pair (STP) or unshielded twisted-pair (UTP) can be used.

#### T1:

Gauge	24 to 22 AWG
Attenuation	2.6 dB/100 meters @ 1.0 MHz
Differential Characteristic Impedance	100 $\Omega$ $\pm$ 10%

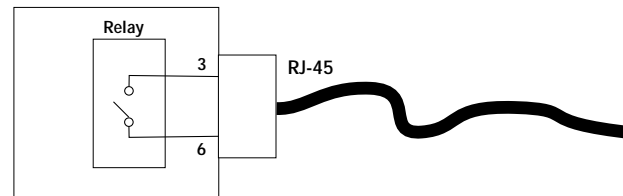
#### E1:

Gauge	24 to 22 AWG
Attenuation	2.6 dB/100 meters @ 1.0 MHz
Differential Characteristic Impedance	120 $\Omega$ $\pm$ 10%

### Dry-Contact Relay

RJ-45 dry-contact relay opens if power, signal detect/copper or signal detect/fiber are lost.

Operational rating on pins 3 and 6: 0-30VDC maximum 1A



### Switch-Selectable Configurations

#### T1 COPPER RJ-45

Configured as either "long haul" or "short haul" on 100 ohm cable, with a variety of selectable distance settings.

#### E1 COPPER RJ-45

Configured as either "long haul" or "short haul" on 120 ohm cable.

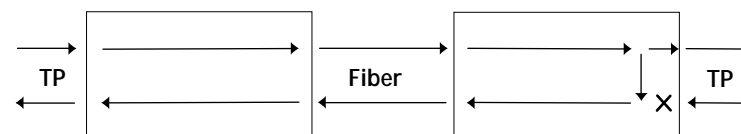
#### STRAIGHT-THROUGH/CROSSOVER RJ-45

Allows straight-through cable to be used where crossover-configuration cable is required.

### Switch-Selectable Functions

#### LOOPBACK TEST FUNCTION

A loopback switch facilitates installation and network debug procedures. The path for the SSDTF10xx loopback is shown:



#### TRANSMIT ALL ONES FUNCTION

A selectable Transmit All Ones switch on the fiber interface and on the twisted-pair interface allows for insertion of an "all ones" pattern on that interface when *signal detect* is lost, which creates an alarm condition at the equipment connected to the interface.

# INSTALLATION

**CAUTION:** Wear a grounding device and observe electrostatic discharge precautions when setting switch and when installing Media Converter Slide-in-Module in the Media Conversion Center. Failure to observe this caution could result in damage to, and subsequent failure of, the Media Converter Slide-in-Module.

## Set Loopback Test Switch

NOTE: The Loopback Test switch, located on Media Converter Slide-in-Module front panel, allows the network administrator to enable a loopback test for installation and network debug procedures.

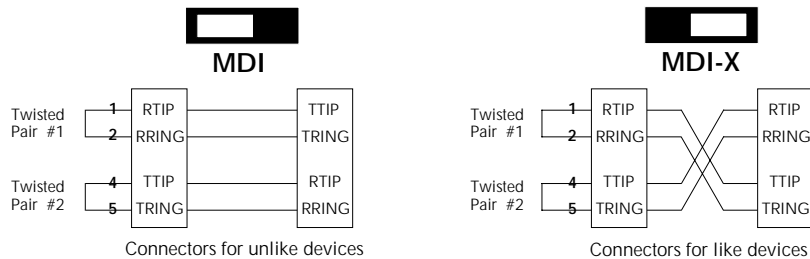


Use small flatblade screwdriver or similar device to set recessed switches. Refer to drawing for switch locations.

## Set MDI/MDI-X Switch

NOTE: The MDI/MDI-X switch allows the network administrator to use straight-through cable in installations where crossover-configuration cable is required.

Use small flatblade screwdriver or similar device to set recessed switches. Refer to drawing for switch settings.



## Set 8-Position Switch

NOTE: An eight-position switch allows the network administrator to configure the media converter for network conditions.

Use small flatblade screwdriver or similar device to set recessed switches for site installation. Refer to drawings at right for eight-position switch settings.

# CABLE SPECIFICATIONS

## Fiber Cable

Bit error rate:  $\leq 10^{-9}$

### MULTIMODE

Fiber Optic Cable Recommended: 62.5 / 125  $\mu\text{m}$  multimode fiber  
 Optional: 100 / 140  $\mu\text{m}$  multimode fiber  
 85 / 125  $\mu\text{m}$  multimode fiber  
 50 / 125  $\mu\text{m}$  multimode fiber

#### SSDTF1011-100

Fiber Optic Transmitter Power: min: -14.0 dBm max: -12.0 dBm  
 Fiber Optic Receiver Sensitivity: min: -25.0 dBm max: -12.0 dBm

**Typical** Maximum Cable Distance\*: 2 kilometers

#### SSDTF1013-100

850 nM  
 Fiber-optic Transmitter Power: min: -14.0 dBm max: -12.0 dBm  
 Fiber-optic Receiver Sensitivity: min: -25.0 dBm max: -12.0 dBm

**Typical** Maximum Cable Distance\*: 2 kilometers

### SINGLEMODE

Fiber Optic Cable Recommended: 9  $\mu\text{m}$  singlemode fiber  
 1300 nM

Fiber-optic Transmitter Power: min: -21.0 dBm max: -14.0 dBm  
 Fiber-optic Receiver Sensitivity: min: -25.0 dBm max: -14.0 dBm

**Typical** Maximum Cable Distance\*: 8 kilometers

#### SCSDTF1014-100

1300 nM  
 Fiber-optic Transmitter Power: min: -21.0 dBm max: -14.0 dBm  
 Fiber-optic Receiver Sensitivity: min: -27.0 dBm max: -14.0 dBm

**Typical** Maximum Cable Distance\*: 8 kilometers

#### SSDTF1015-100 (long haul)

1300 nM  
 Fiber-optic Transmitter Power: min: -15.0 dBm max: -5.0 dBm  
 Fiber-optic Receiver Sensitivity: min: -27.0 dBm max: -14.0 dBm

**Typical** Maximum Cable Distance\*: 15 kilometers

#### SSDTF1022-100 (long haul)

1300 nM  
 Fiber-optic Transmitter Power: min: -15.0 dBm max: -5.0 dBm  
 Fiber-optic Receiver Sensitivity: min: -25.0 dBm max: -14.0 dBm

**Typical** Maximum Cable Distance\*: 15 kilometers

\*Actual distance dependent upon physical characteristics of network installation.

# FAULT ISOLATION and CORRECTION

If the media converter fails, isolate and correct the failure by determining the answers to the following questions and then taking the indicated action:

## 1. Is the P(o)W(e)R LED on the media converter illuminated?

### NO

- Is the power adapter the proper voltage and cycle frequency for the AC outlet?
- NOTE: Refer to the "Power Supply Requirements" on page 7.
- Is the power adapter properly installed in the media converter and in the outlet?
- Contact Technical Support: (800) 260-1312/(800) LAN-WANS.

### YES

- Proceed to step 2.

## 2. Is the SDF (Signal Detect/Fiber) LED illuminated?

### NO

- Check fiber cables for proper connection.
- Verify that TX and RX cables on media converter are connected to RX and TX ports, respectively, on other media converter.
- Contact Technical Support: (800) 260-1312/(800) LAN-WANS.

### YES

- Proceed to step 3.

## 3. Is the SDC (Signal Detect/Copper) LED illuminated?

### NO

- Check twisted pair cables for proper connection.
- Check RJ-45 Pinning Switch for correct twisted pair cable configuration.
- Check integrity of device attached to media converter by twisted-pair cable.
- Contact Technical Support: (800) 260-1312/(800) LAN-WANS.

### YES

- Contact Technical Support: (800) 260-1312/(800) LAN-WANS.

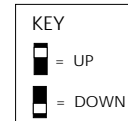
### NOTE:

T1 must be selected (LEFT SWITCH SET #4 UP) for RIGHT SWITCH SET to have any effect.

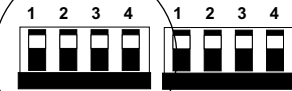
If E1 is selected (LEFT SWITCH SET #4 DOWN), RIGHT SWITCH SET is ignored and the default is E1 3.0V 120Ω cable.

If T1 and short haul are selected (LEFT SWITCH SET #3 UP, #4 UP), but RIGHT SWITCH SET is not set to a valid short haul value, the short haul default is DSX-1 0'-133' cable.

If T1 and long haul are selected (LEFT SWITCH SET #3 DOWN, #4 UP), but RIGHT SWITCH SET is not set to a valid long haul value, the long haul default is 0db 100Ω cable.

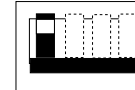


### LEFT SWITCH SET

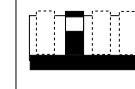


### NETWORK Switch Settings

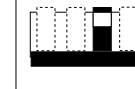
1 2 3 4



Transmit All Ones onto Fiber on loss of TP Carrier Detect  
UP= Enabled



Transmit All Ones onto TP on loss of FiberCarrier Detect  
UP= Enabled

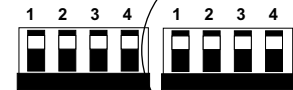


Long Haul/Short Haul (T1 only)  
UP= Short Haul



T1/E1 Selection  
UP= T1

### RIGHT SWITCH SET



### LONG HAUL Switch Settings\*

1 2 3 4



-22.5db  
100 ohm cable



-15db  
100 ohm cable



-7.5db  
100 ohm cable



0db  
100 ohm cable

### SHORT HAUL Switch Settings\*

1 2 3 4



DSX-1 533'-655'  
100 ohm cable



DSX-1 399'-533'  
100 ohm cable



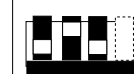
DSX-1 266'-399'  
100 ohm cable



DSX-1 133'-266'  
100 ohm cable



DSX-1 1 0'-133'  
and ANSI T1.403  
100 ohm cable



DSX-1 6.0V  
100 ohm cable

## INSTALLATION (continued)

### Install Cable

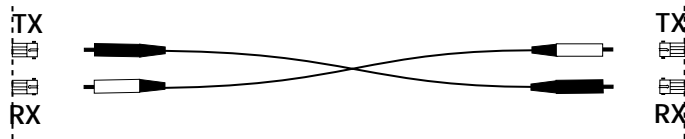
#### COPPER

##### T1 100 OHM (RJ-45 CONNECTOR)

1. Locate or build twisted-pair cables that are compliant with specifications on page 10, with RJ-45 plug connectors at both ends.
2. Ensure that MDI/MDI-X switch is set according to network conditions.
3. Connect RJ-45 plug connector at one end of cable to media converter RJ-45 jack connector.
4. Connect RJ-45 plug connector at other end of cable to network equipment.

#### FIBER

1. Locate or build fiber cables that are compliant with specifications on page 9, with male two-stranded TX to RX connectors installed at both ends.
2. Connect cable with connector installed at TX location on media converter to RX location on attached device.



3. Connect cable with connector installed at RX location on media converter to TX location on attached device.

### Power the Media Converter

1. Install power adapter cord at back of media converter.
2. Connect power adapter plug to AC power.
3. Verify that media converter is powered by observing illuminated LED(s).

## OPERATION

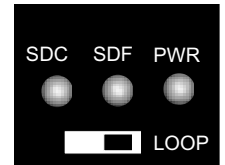
After installation, the media converter should function without operator intervention.

### Status LEDs

Use the status LEDs to monitor media converter operation in the network.

#### SDC

**Signal Detect/Copper** - Steady LED indicates twisted-pair copper link is up.  
Flashing LED (once/second) indicates transmitting on link if other link is down.  
Flashing LED (5 times/second) indicates All Ones detected on Link.



#### SDF

**Signal Detect/Fiber** - Steady LED indicates fiber link is up.  
Flashing LED (once/second) indicates transmitting on link if other link is down.  
Flashing LED (5 times/second) indicates All Ones detected on Link.

#### P(o)W(e)R

Steady green LED indicates connection to external AC power.

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