TRANSITION NETWORKS

User's Guide

SCSCF30xx-11x

Standalone Device

- **DS3, T3/E3, or STS-1**
- **Coax *(BNC)* to Fiber**

Transition Networks SCSCF30xx-11x series stand-alone encode and decode DS3, E3/T3, or STS-1 coax copper signals over fiber optic cable to extend the distance and transmission reliability of high-speed DS3, E3/T3, or STS-1 data traffic. The SCSCF30xx-11x is designed as a standalone device.

Part Number	Port One - Copper	Port Two - Duplex Fiber-Optic
SCSCF3011-110	75 ohm coax *(BNC)*	ST, 1300 nm multimode, 2 km *(1.2 miles)**
SCSCF3013-110	75 ohm coax *(BNC)*	SC, 1300 nm multimode, 2 km *(1.2 miles)**
SCSCF3014-110	75 ohm coax *(BNC)*	SC, 1310 nm single mode, 20 km *(12.4 miles)**
SCSCF3015-110	75 ohm coax *(BNC)*	SC, 1310 nm single mode, 40 km *(24.8 miles)**
SCSCF3016-110	75 ohm coax *(BNC)*	SC, 1310 nm single mode, 60 km *(37.3 miles)**
SCSCF3017-110	75 ohm coax *(BNC)*	SC, 1550 nm single mode, 80 km *(49.7 miles)**
SCSCF3029-110	75 ohm coax *(BNC)*	SC, 1310 mn (TX)/1550 nm (RX) single mode, 20 km *(12.4 miles)**
SCSCF3029-111	75 ohm coax *(BNC)*	SC, 1550 mn (TX)/1310 nm (RX) single mode, 20 km *(12.4 miles)**

SCSCF3029-110 and -111 are intended to be installed as a pair in the same network where one is the local Device and the other is the remote Device.

*Typical maximum cable distance. Actual distance is dependent upon the physical characteristics of the network.

Note: The CCSCF30xx-11x model is the chassis version of the Device. For more information, see the CCSCF30xx-11x user's guide on-line at www.transition.com.

Part Number	Port One - Copper	Port Two - Duplex Fiber-Optic
SCSCF3029-112	75 ohm coax (BNC)	SC, 1310 nm (TX)/1550 nm (RX) single mode, 40 km *(24.8 miles)**
SCSCF3029-113	75 ohm coax (BNC)	SC, 1550 nm (TX)/1310 nm (RX) single mode, 40 km *(24.8 miles)**
SCSCF3029-114	75 ohm coax (BNC)	SC, 1310 nm (TX)/1550 nm (RX single mode, 60km *(37.3.miles)**
SCSCF3029-115	75 ohm coax (BNC)	SC, 1550 nm (TX)/1310 nm (RX) single mode, 60km *(37.3.miles)**
SCSCF3029-116	75 ohm coax (BNC)	SC, 1310 nm (TX)/1550 nm (RX single mode, 80km *(49.7.miles)**
SCSCF3029-117	75 ohm coax (BNC)	SC, 1550 nm (TX)/1310 nm (RX) single mode, 80km *(49.7.miles)**
SCSCF3040-110	75 ohm coax (BNC)	Empty slot

CCSCF3029-112/-113, -114/-115, -116/-117 are intended to be installed in pairs, as grouped, in the same network where one is the local device and the other is the remote device.

*Typical maximum cable distance. Actual distance is dependent upon the physical characteristics of the network.

Optional Accessories *(sold separately)*

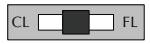
Part Number	Description
SPS-1872-SA	Optional External Power Supply; 18-72VDC Standalone Output: 12.6VDC, 1.0 A
SPS-1872-PS	Optional External Power Supply; 18-72VDC Piggy-back; Output: 12.6VDC, 1.0 A
E-MCR-05	12-Slot Device Rack *(includes universal internal power supply)* 17 x 15 x 5 in. *(432 x 381 x 127 mm)*
WMBL	Optional Wall Mount Brackets, 4.0 in. *(102 mm)*
WMBV	Optional Vertical Mount Bracket, 5.0 in. *(127 mm)*
WMBD	Optional DIN Rail Mount Bracket, 5.0 in. *(127 mm)*
WMBD-F	Optional DIN Rail Mount Bracket *(flat)*, 3.3in. *(84 mm)*

Installation

Set the loop-back switch

The loop-back switch is located on the front panel of the Device. The switch is used for the installation and network debugging procedures.

To set the switch, use a small flatblade screwdriver or a similar tool *(see the drawing to the right)*.



CL	*(Coax loop-back)*	Enable loop-back on the local coax interface.
–	*(Center Position)*	Normal operation.
FL	*(Fiber loop-back)*	Enable loop-back on the local fiber interface.

Note: Three loop-back test scenarios are described in the Troubleshooting sections.

CAUTION: Wear a grounding device and observe electrostatic discharge precautions when setting the configuration switches. Failure to observe this caution could result in damage to the circuit board in the Device.

Set the configuration switches

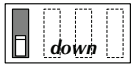
The configuration switches are located on the side of the Device. Use a small, flat-blade screwdriver to set the recessed switches.

Switch 1 – Select DS3 or E3

up - Supports a DS3 interface.

down - Supports a E3 interface.

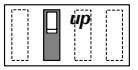
DS3



E3

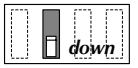
Switch 2 – Coax Line Build Out *(DS3 only)*

up - The DS3 line is set up to operate at distances up to 225 ft. *(68.6 m)*.



<225 ft *(68.6 m)*

down - The DS3 line is set up to operate at distances greater than 225 ft. *(68.6 m)*.



>225 ft *(68.6 m)*

Installation — continued

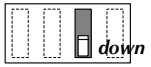
Setting configuration switches — continued

Switch 3 – Signal on loss of carrier

up - Transmits an AIS on the loss of the input carrier *(unframed)*.

down - No signal is transmitted on the loss of the input carrier *(unframed)*.

Transmit alarm

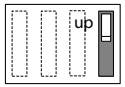


No signal

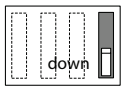
Switch 4 – AIS alarm

up - AIS alarm is defined as a pattern of alternating *(1s and 0s)* unframed.

down - AIS alarm is defined as a pattern of all (1s) unframed.



Alarms = 1s and 0s

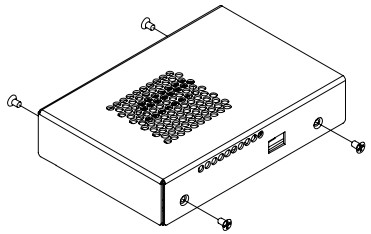


Alarm = all 1s

Setting up jumpers

The headers are located on the circuit board of the SCSCF30xx-11x. To set the jumpers:

1. Using a small screwdriver, remove the four (4) screws shown below that secure the cover and carefully remove the cover from the Device. Save the screws.



2. Using small needle-nosed pliers or similar tool to move the jumper to the desired position.
3. See Coax Grounding and Data Mode jumpers sections on the next page.

Installation — Continued

Coax grounding jumper

Note: Rmove the jumpers on headers J15 and J17, or J17 and J19 only if necessary.

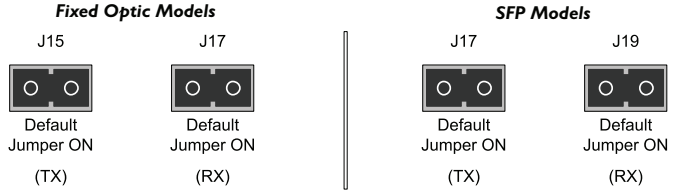
Headers J15/J17 Fixed Optic models, and J17/J19 SFP models *(located on the circuit board near the coax ports)* provide a grounding feature so that the SCSCF30xx-11x standalone Device complies with ITU-T G.703 standard where:

- The TX output coax port outer shield is connected to earth ground.
- The RX input coax port outer shield is connected to earth ground.

The factory default settings for these two headers are:

Header J15 *(jumper ON)* = Output coax port outer shield is connected to earth ground. See J15 (TX) illustration below for fixed optic models, and J17 (TX) for SFP Models.

Header J17 *(jumper ON)* = Input coax port outer shield is connected to earth ground. See J17 (RX) illustration below for fixed optic models, and J19 (RX) for SFP Models

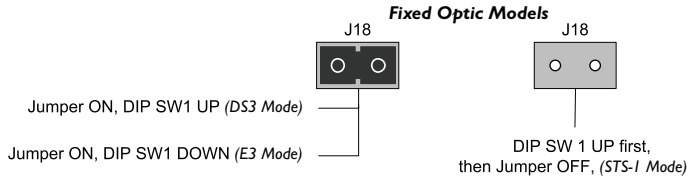


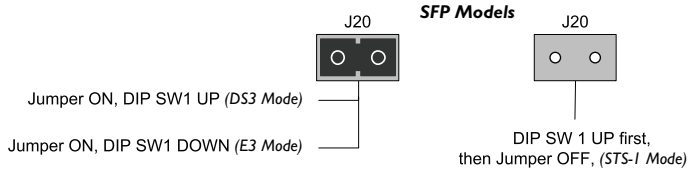
Data modes for Fixed Optic and SFP models

The SCSCF30xx-11x series stand-alone Devices encode and decode DS3, E3/T3, or STS-1 coax copper signals over fiber optic cable at the following data rates:

- DS3 *(Digital signal)* 44.7 Mbps
- E3 (*European standard)* 34.4 Mbps
- STS-1 *(Synchronous transport signal)* 51.8 Mbps

Factory default is DS3 mode *(jumper on header J18 for the Fixed Optic models and J20 for the SFP Models with DIP SW1 UP)*. To select a different data mode, see illustrations below.





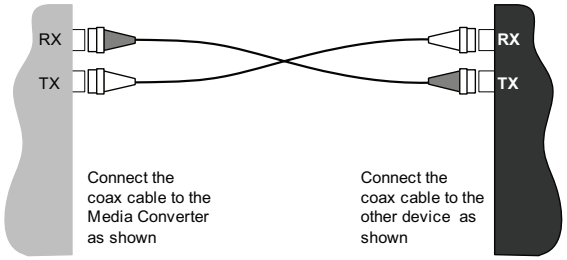
Installation — Continued

Re-installing the cover on the Device

1. Locate the four screws used to secure the cover to the Device.
2. Position the cover on the Device.
3. Insert and tighten the four screws to secure the cover to the Device.

Install the coax cable

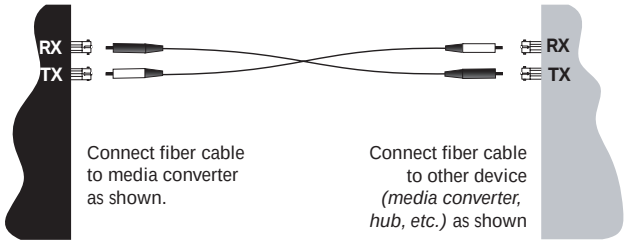
1. Locate or build coax cables with female connectors installed at both ends.
2. Connect the coax cables to the Device as described:
   - Connect the female TX cable connector to the male TX port.
   - Connect the female RX cable connector to the male RX port.
3. Connect the coax cables to the other device *(switch, workstation, etc.)* as described:
   - Connect the female TX cable connector to the male RX port.
   - Connect the female RX cable connector to the male TX port.



Installation — Continued

Install the fiber cable

1. Locate or build fiber cables with male, two-stranded TX to RX connectors installed at both ends.
2. Connect the fiber cables to the local SCSCF30xx-11x Device as described:
   - Connect the male TX cable connector to the female TX port.
   - Connect the male RX cable connector to the female RX port.
3. Connect the fiber cables to the remote SCSCF30xx-11x Device as described:
   - Connect the male TX cable connector to the female RX port.
   - Connect the male RX cable connector to the female TX port.



Power the device

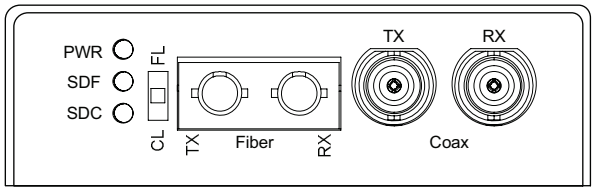
AC

1. Connect the barrel connector on the power adapter to the power port *(located on the back of the Device)*.
2. Connect the power adapter plug into an AC power wall outlet.
3. Verify that the Device is powered by observing the illuminated LED power indicator light.

Operation

After installation, the Device should function without operator intervention. Use the status LEDs to monitor the Device operation in the network.

SDC	Green ON	The coax link is up.
	Green FLASHING	The coax link is in loop-back mode.
	Yellow ON	AIS on the coax link.
SDF	Green ON	The fiber link is up.
	Green FLASHING	The fiber link is in loop-back mode.
	Yellow ON	AIS on the fiber link.
PWR	Green ON	The Device is connected to external power.



Cable Specifications

Coax cable

DS3/E3/STS-1: 75 ohm coax cable with BNC connectors. Peak pulse power in DBm *(Decibel millwatts)*.

TX output	RX input
min: +1.25 dBm	min: -9.47 dBm
max: +3.25 dBm	max: +9.25 dBm

Fiber cable

Single mode fiber *(recommended):*	9 µm
Multimode fiber *(recommended):*	62.5/125 µm
Multimode fiber *(optional):*	100/140, 85/140, 50/125 µm
SCSCF3011-110	1300 nm multimode
Fiber Optic Transmitter Power:	min: -19.0 dBm max: -14.0 dBm
Fiber Optic Receiver Sensitivity:	min: -30.0 dBm max: -14.0 dBm
Link Budget:	11.0 dB
SCSCF3013-110	1300 nm multimode
Fiber Optic Transmitter Power:	min: -19.0 dBm max: -14.0 dBm
Fiber Optic Receiver Sensitivity:	min: -30.0 dBm max: -14.0 dBm
Link Budget:	11.0 dB
SCSCF3014-110	1310 nm single mode
Fiber-optic Transmitter Power:	min: -15.0 dBm max: -8.0 dBm
Fiber-optic Receiver Sensitivity:	min: -31.0 dBm max: -8.0 dBm
Link Budget:	16.0 dB
SCSCF3015-110	1310 nm single mode
Fiber Optic Transmitter Power:	min: -8.0 dBm max: -2.0 dBm
Fiber Optic Receiver Sensitivity:	min: -34.0 dBm max: -7.0 dBm
Link Budget:	26.0 dB
SCSCF3016-110	1310 nm single mode
Fiber-optic Transmitter Power:	min: -5.0 dBm max: 0.0 dBm
Fiber-optic Receiver Sensitivity:	min: -34.0 dBm max: -7.0 dBm
Link Budget:	29.0 dB
SCSCF3017-110	1310 nm single mode
Fiber-optic Transmitter Power:	min: -5.0 dBm max: 0.0 dBm
Fiber-optic Receiver Sensitivity:	min: -34.0 dBm max: -7.0 dBm
Link Budget:	29.0 dB
SCSCF3029-110	1310 nm (TX) / 1550 nm (RX)
SCSCF3029-111	1550 nm (TX) / 1310 nm (RX)
Fiber-optic Transmitter Power:	min: -13.0 dBm max: -6.0 dBm
Fiber-optic Receiver Sensitivity:	min: -32.0 dBm max: -3.0 dBm
Link Budget:	19.0 dB

Cable Specifications — Continued

Fiber cable — continued

SCSCF3029-112	1310 nm (TX) / 1550 nm (RX)	
SCSCF3029-113	1550 nm (TX) / 1310 nm (RX)	
Fiber-optic Transmitter Power:	min: -8.0 dBm	max: -3.0 dBm
Fiber-optic Receiver Sensitivity:	min: -33.0 dBm	max: -3.0 dBm
Link Budget:	25.0 dB	
SCSCF3029-114	1310 nm (TX) / 1550 nm (RX)	
SCSCF3029-115	1550 nm (TX) / 1310 nm (RX)	
Fiber-optic Transmitter Power:	min: -5.0 dBm	max: 0.0 dBm
Fiber-optic Receiver Sensitivity:	min: -34.0 dBm	max: -3.0 dBm
Link Budget:	29.0 dB 1530 nm	
SCSCF3029-116	1310 nm (TX) / 1550 nm (RX)	
Fiber-optic Transmitter Power:	min: -2.0 dBm	max: 3.0 dBm
Fiber-optic Receiver Sensitivity:	min: -35.0 dBm	max: -3.0 dBm
Link Budget:	33.0 dB	
SCSCF3029-117	1550 nm (TX) / 1310 nm (RX)	
Fiber-optic Transmitter Power:	min: -3.0 dBm	max: 2.0 dBm
Fiber-optic Receiver Sensitivity:	min: -35.0 dBm	max: -3.0 dBm
Link Budget:	32.0 dB	

The fiber optic transmitters on this slide-in card meet Class I Laser safety requirements per IEC-825/CDRH standards and comply with 21 CFR1040.10 and 21CFR1040.11.

Technical Specifications

For use with Transition Networks Model SCSCF30xx-11x or equivalent.

Data Rates:	DS3/T3	= 44.7 Mbps
	E3	= 34.4 Mbps
	STS-1	= 51.8 Mbps
Dimensions:	3.25" x 4.7" x 1.0" *(83 mm x 119 mm x 25 mm)*	
Weight:	10 oz. *(283 g)* approximately	
Power Consumption:	3.0 Watts	
Power Supply:	12 VDC, 0.8 Amp *(minimum)*	
	DC outlet minimum output regulation: 5%	
MTBF*:	Greater than 41,660 *(MIL-HDBD-217F)*	
	Greater than 114,580 *(Bellcore hours)*	
Environment		
Operating Temp:	-10 to 65°C *(14° to 149°F)*	
Storage Temp:	-20° to 85°C *(-4° to 185°F)*	
Humidity:	5 to 95%, non-condensing	
Warranty:	Lifetime	

*Based on a 50,000 hour power supply.

For the most up-to-date information on the SCSCF30xx-11x stand-alone Device, 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 in damage to your eye.

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

NOTICE: Copper based media ports, e.g., 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, e.g., 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.

Troubleshooting

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

1. Is the PWR *(Power)* LED on the Device illuminated?

   NO
   - Ensure that the power adapter is the proper type of voltage and cycle frequency for the outlet.
   - Ensure the power adapter is properly installed in the Device and in the grounded outlet.
   - Contact Tech Support: 1-800-260-1312, Int'l: 00-1-952-941-7600.

   YES
   - Proceed to step 2.

2. Is the SDC *(Signal Detect/Coax)* LED illuminated green?

   NO
   - Check the coax cables for the proper connection.
   - Contact Tech Support: 1-800-260-1312, Int'l: 00-1-952-941-7600.

   YES
   - Proceed to step 3.

3. Is the SDF *(Signal Detect/Fiber)* LED illuminated green?

   NO
   - Check the fiber cables for proper connection.
   - Verify that the TX and RX cables on the local Device are connected to the RX and TX ports, respectively, on the remote Device.
   - Contact Tech Support: 1-800-260-1312, Int'l: 00-1-952-941-7600.

   YES
   - Proceed to step 4.

4. Is the SDC *(Signal Detect/Coax)* LED flashing green?

   YES
   - The coax link is in loop-back mode. For normal operation, set the loop-back switch to the center *(normal)* position.
   - Contact Tech Support: 1-800-260-1312, Int'l: 00-1-952-941-7600.

   NO
   - Proceed to step 5.

5. Is the SDF *(Signal Detect/Fiber)* LED flashing green?

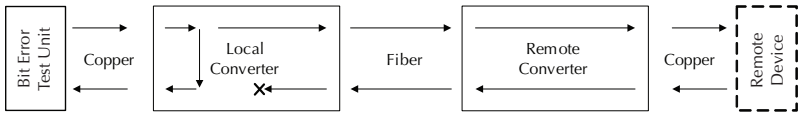
   YES
   - The fiber link is in loop-back mode. For normal operation, set the loop-back switch to the center *(normal)* position.
   - Contact Tech Support: 1-800-260-1312, Int'l: 00-1-952-941-7600.

   NO
   - Proceed to step 6.

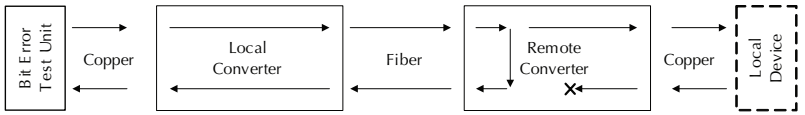
Troubleshooting — continued

6. Is Data Transfer Failing?

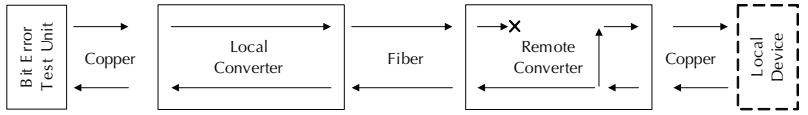
   YES
   - Verify the local copper connection by starting a local copper loop-back *(set the loop-back switch on the local Device to "CL")* and then use a bit error test unit at the local location to run a bit error test.



   - Verify the local fiber connection by starting a local fiber loop-back at the remote location *(set the loop-back switch on the remote Device to "FL")* and then use a bit error test unit at the local location to run a bit error test.



   - Verify the remote copper connection by starting a local copper loop-back at the remote location *(set the loop-back switch on the remote Device to "CL")* and then use a bit error test unit at the remote location to run a bit error test.

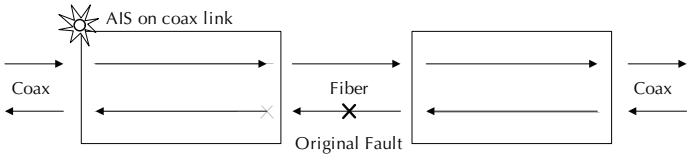


   - Contact Tech Support: 1-800-260-1312, Int'l: 00-1-952-941-7600.

   NO
   - Proceed to step 7.

Troubleshooting — continued

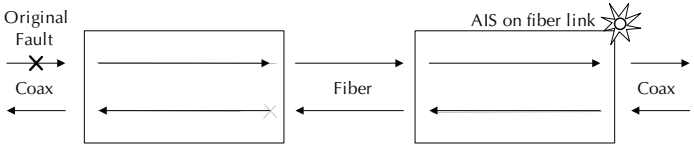
7. Is the SDC *(Signal Detect / Coax)* LED illuminated yellow?
YES
   - A failure of the remote unit connected to the coax interface has caused an Alarm Indication Signal (AIS) on the coax interface. Correct the remote unit failure.



   - Contact Tech Support: 1-800-260-1312, Int'l: 00-1-952-941-7600.

NO
   - Proceed to step 8.

8. Is the SDF *(Signal Detect / Fiber)* LED illuminated yellow?
YES
   - A broken coax link has caused an AIS on the fiber interface. Correct the coax link failure.



   - Contact Tech Support: 1-800-260-1312, Int'l: 00-1-952-941-7600.

NO
   - Contact Tech Support: 1-800-260-1312, Int'l: 00-1-952-941-7600.

TRANSITION NETWORKS

Declaration of Conformity

Name of Mfg: **Transition Networks**
10900 Red Circle Drive, Minnetonka MN, 55343 U.S.A.

Model Numbers: SCSCF3011-110, SCSCF3013-110, SCSCF3014-110, SCSCF3015-110, SCSCF3016-110, SCSCF3017-110, SCSCF3029-110, SCSCF3029-111, SCSCF3029-112, SCSCF3029-113, SCSCF3029-114, SCSCF3039-115, SCSCF3039-116, SCSCF3039-117, SCSCF3040-110

Purpose: To declare that the SCSCF30xx-11x Series Device to which this declaration refers is in compliance with the following directive(s) and standard(s):

EMC Directive 2004/108/EC; EN 55022:2006+A1:2007 Class A; EN55024:1998+A1:2001+A2:2003; EN6100-2-3; EN6100-3-3; CFR Title 47 Part 15 Subpart B Class A. Low Voltage Directive: 2006/95/EC; IEC 60950-1:2005; CFR Title 21 Section 1040.10 Class I; CE Mark.

I, the undersigned, hereby declare that the model number(s) listed in this declaration of conformity are in compliance with the directive(s) and standard(s) herein.

Stephen Anderson, Vice-President of Engineering — February, 2010 Date

Contact Us

Technical Support

Technical support is available 24 hours a day.
US and Canada: 1-800-260-1312 International: 00-1-952-941-7600

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www.techsupport@transition.com

Address

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telephone: 952-941-7600
toll free: 800-526-9267
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Compliance Information

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.

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