TRANSITION
NETWORKS®

User's Guide
CCSCF30xx-11x
Slide-In Card (SIC)
- **DS3, ES/T3, and STS-1**
- **Coax** *(BNC)* **to Fiber**

Transition Networks CCSCF30xx-11x series SICs 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 CCSCF30xx-11x is designed to install in a Transition Networks PointSystem chassis.

Part Number	Port One - Copper	Port Two - Duplex Fiber-Optic
CCSCF3011-110	75 ohm coax *(BNC)*	ST, 1300 nm multimode, 2 km *(1.2 miles)**
CCSCF3013-110	75 ohm coax *(BNC)*	SC, 1300 nm multimode, 2 km *(1.2 miles)**
CCSCF3014-110	75 ohm coax *(BNC)*	SC, 1310 nm single mode, 20 km *(12.4 miles)**
CCSCF3015-110	75 ohm coax *(BNC)*	SC, 1310 nm single mode, 40 km *(24.8 miles)**
CCSCF3016-110	75 ohm coax *(BNC)*	SC, 1310 nm single mode, 60 km *(37.3 miles)**
CCSCF3017-110	75 ohm coax *(BNC)*	SC, 1550 nm single mode, 80 km *(49.7 miles)**

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

Note: The SCSCF30xx-11x model is the standalone version. For more information, see the SCSCF30xx-11x user's guide on-line @:
http://www.transition.com/TransitionNetworks/Products2/ProductFinder/Default.aspx

Part Number	Port One - Copper	Port Two - Single Fiber Optic
CCSCF3029-110**	75 ohm coax *(BNC)*	SC, 1310 nm (TX)/1550 nm (RX) single mode, 20 km *(12.4 miles)**
CCSCF3029-111**	75 ohm coax *(BNC)*	SC, 1550 nm (TX)/1310 nm (RX) single mode, 20 km *(12.4 miles)**
CCSCF3029-112**	75 ohm coax *(BNC)*	SC, 1310 nm (TX)/1550 nm (RX) single mode, 40 km *(24.8 miles)**
CCSCF3029-113**	75 ohm coax *(BNC)*	SC, 1550 nm (TX)/1310 nm (RX) single mode, 40 km *(24.8 miles)**
CCSCF3029-114**	75 ohm coax *(BNC)*	SC, 1310 nm (TX)/1550 nm (RX single mode, 60km *(37.3.miles)**
CCSCF3029-115**	75 ohm coax *(BNC)*	SC, 1550 nm (TX)/1310 nm (RX) single mode, 60km *(37.3.miles)**
CCSCF3029-116**	75 ohm coax *(BNC)*	SC, 1310 nm (TX)/1550 nm (RX single mode, 80km *(49.7.miles)**
CCSCF3029-117**	75 ohm coax *(BNC)*	SC, 1550 nm (TX)/1310 nm (RX) single mode, 80km *(49.7.miles)**
CCSCF3040-110	75 ohm coax *(BNC)*	SFP empty slot

*Typical maximum cable distance; actual distance is dependent on the physical characteristics of the network. (TX) = transmit (RX) = receive.

**CCSCF3029-110/-111, -112/-113, -114/-115, -116/-117 are intended to be installed, as a grouped pair, in the same network with one being the local Device and the other being the remote Device.
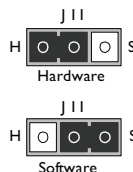
Installation

CAUTION: Wear a grounding device and observe electrostatic discharge precautions when handling SICs. Failure to observe this caution could result in damage to the SIC.

Selecting hardware or software mode

The hardware/software header J11 is located on the circuit board. Use a small needle-nose pliers or similar tool to move the jumper to the desired mode.

Hardware	The mode of the SIC is determined by this switch settings.	
Software	The mode of the SIC is determined by the most-recently saved, on-board microprocessor settings in this position.	

Installation — Continued

Set the coax grounding jumper *(optional)*

Note: Remove the jumpers on headers J15/J17, and J17/J19, only if necessary.
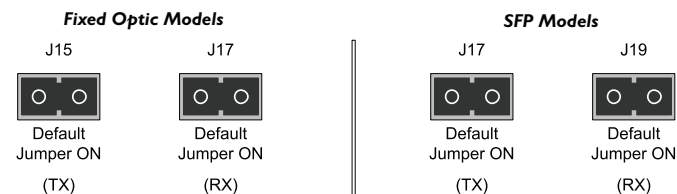
Headers J15/J17 Fixed Optic models, and J17/J19 SFP Models *(located on the circuit board near the coax ports)* provide a grounding feature so that the CCSCF30xx-11x SIC complies with ITU-T G.703 standard where:

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

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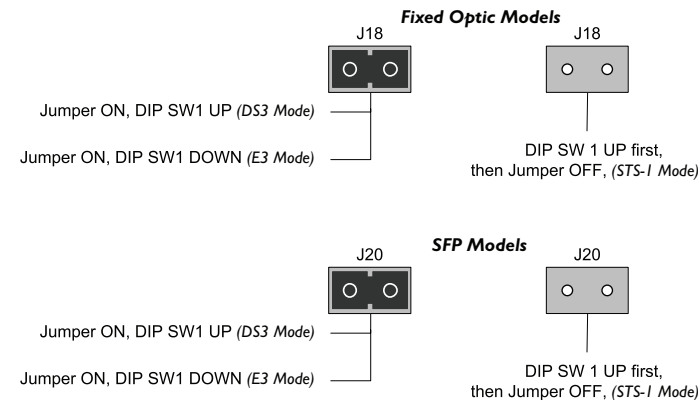

Data modes for Fixed Optic and SFP models

The CCSCF30xx-11x series SICs 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

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 slide-in card.
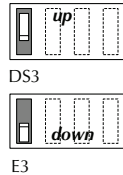
Setting up the configuration switches

The configuration switches are located on the circuit board. Use a small, flat-blade screwdriver to set the recessed switches.

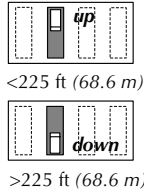Switch 1 – Select DS3 or E3

up - Supports a DS3 interface.

down - Supports a E3 interface.

DS3

E3

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

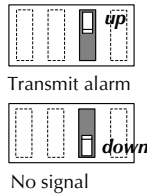**up** - The DS3 line is setup to operate at distances up to 225 ft. *(68.6 m)*.

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

<225 ft *(68.6 m)*

>225 ft *(68.6 m)*

Switch 3 – Signal on Loss of Carrier

up - Transmits an Alarm Indication Signal (AIS) on the loss of the input carrier *(unframed)*.
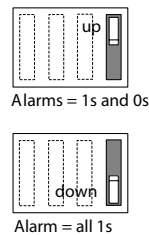
down - No signal is transmitted on the loss of the input carrier *(unframed)*.

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

Installation — Continued

Set the loop-back switch

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

To set the switch, use a small flat-blade screwdriver or a similar device *(see the drawing)*.

CL   FL

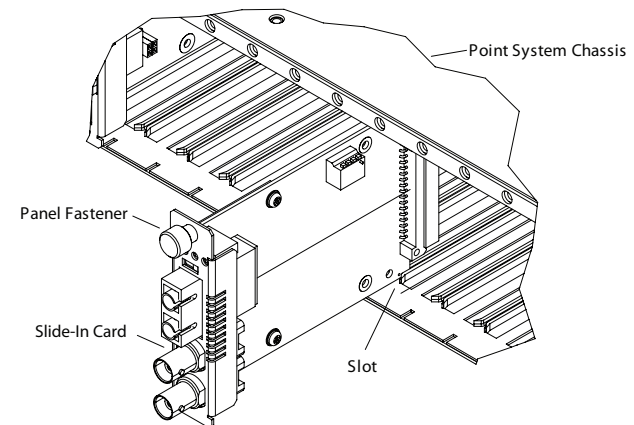| CL | *(Coax loop-back)* | Enable loop-back on the local coax interface. |
| -- | *(Center Position)* | Normal operation. |
| FL | *(Fiber loop-back)* | Enable loop-back on the local fiber interface. |

Note: Three loop-back test scenarios are described in detail in this manual.

Install the CCSCF30xx-11x SIC

CAUTION: Wear a grounding device and observe electrostatic discharge precautions when installing the SIC. Failure to observe this caution could result in damage to the SIC.

To install the SIC into the Transition Networks *PointSystem* chassis:
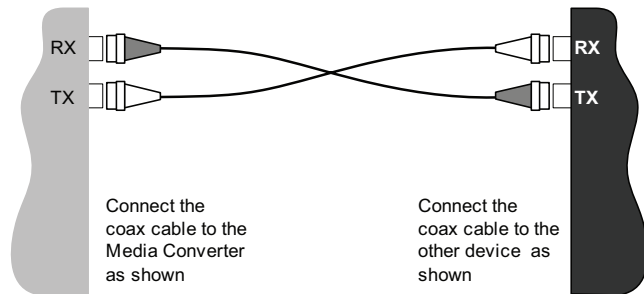
1. Locate an empty slot on the chassis.

2. Carefully slide the SIC into the chassis slot, aligning it with the installation guides.

3. Ensure that the SIC is firmly seated to the backplane of the chassis.

4. Push in and rotate the panel-fastener screw clockwise to secure the card to the chassis frame.

Point System Chassis

Panel Fastener

Slide-In Card
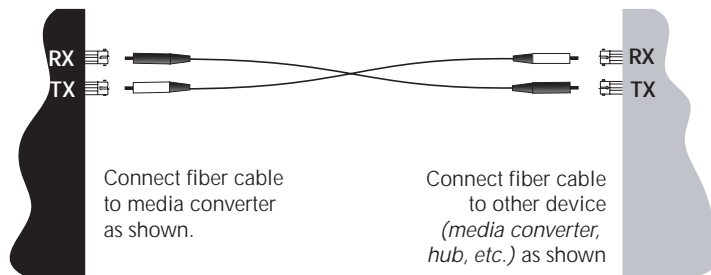
Slot

Installation — Continued

Install the coax cable

1. Locate a coax cable with female connectors installed at both ends.

2. Connect the coax cables to the SIC 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.

RX

TX

RX

TX

Connect the
coax cable to the
Media Converter
as shown

Connect the
coax cable to the
other device as
shown

Install the fiber cable

1. Locate a fiber cable with male, two-stranded TX to RX connectors installed at both ends.

2. Connect the fiber cables to the local SIC 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 SIC as described:
   - Connect the male TX cable connector to the female RX port.
   - Connect the male RX cable connector to the female TX port.

RX
TX

RX
TX

Connect fiber cable
to media converter
as shown.

Connect fiber cable
to other device
*(media converter,
hub, etc.)* as shown
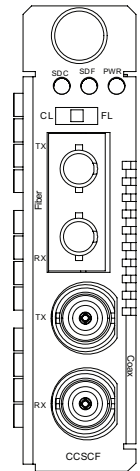
Installation — Continued

Powering the SIC

The CCSF30xx-11x SIC is powered by Transition Network's *PointSystem* chassis.

Operation

After installation, the SIC should function without operator intervention. Use the status LEDs to monitor SIC 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 SIC is connected to power via the chassis backplane.

SNMP

See the on-line documentation for Transition Networks' *FocalPoint*™ software for applicable commands and usage:
http://www.transition.com/TransitionNetworks/Products2/Static/focalpoint2.aspx

Use SNMP at an attached terminal or at a remote location to monitor the following:

- Power
- Line build out
- DS3/T3/E3 /STS-1 modes
- Coax link and fiber link status
- Coax loop-back and fiber loop-back status
- AIS detected on coax link and fiber link
- Hardware/software modes

Also, use SNMP to enter network commands to do the following:
- Enable/disable loop-back on the copper link
- Enable/disable loop-back on the fiber link

Cable Specifications

Coax cable

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

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

Fiber cables

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

CCSCF3011-110 — 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

CCSCF3013-110 — 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

CCSCF3014-110 — 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

CCSCF3015-110 — 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

CCSCF3016-110 — 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

CCSCF3017-110 — 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

Cable Specifications — Continued

Fiber cables — *continued*

CCSCF3029-110 — 1310 nm (TX) / 1550 nm (RX)
CCSCF3029-111 — 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

CCSCF3029-112 — 1310 nm (TX) / 1550 nm (RX)
CCSCF3029-113 — 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

CCSCF3029-114 — 1310 nm (TX) / 1550 nm (RX)
CCSCF3029-115 — 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

CCSCF3029-116 — 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

CCSCF3029-117 — 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 CCSCF30xx-11x or equivalent.

Data Rates:	DS3/T3 = 44.7 Mbps E3 = 34.4 Mbps STS-1 = 51.8 Mbps
Dimensions:	3.4" x 5" x 0.87" *(86 mm x 182 mm x 22 mm)*
Weight:	3 oz. *(91 g)* approximately
Power Consumption:	3.0 Watts
MTBF:	Greater than 250,000 *hours (MIL-HDBD-217F)* Greater than 687,500 hours *(Bellcore)*
Environment:	Tmra*: 0 to 60°C *(32° to 140°F)* Storage Temp: -20° to 85°C *(-4° to 185°F)* Humidity: 5 to 95%, non condensing Altitude: 0 to 10,000 feet
Warranty:	Lifetime

*Manufacturer's rated ambient temperature: Tmra range for this SIC depends on the physical characteristics and the installation configuration of the Transition Networks PointSystem™ chassis in which this slide-in card will be installed.

The information in this user's guide is subject to change. For the most up-to-date information, see the user's guide on-line at: www.transition.com.

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.

WARNING: 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 SIC fails, isolate and correct the failure by determining the answers to the following questions and then taking the indicated action:
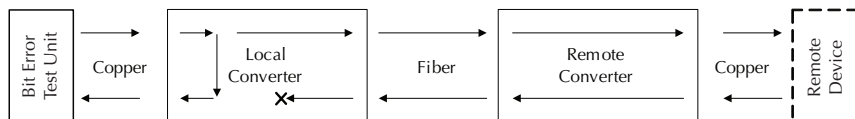
1. Is the PWR *(Power)* LED illuminated?
    NO
    - Ensure that the SIC is installed properly in the chassis.
    - Ensure that the power cord is properly installed in the chassis and at the external power source.
    - Ensure the external power source is providing power.
    - Contact Tech Support: 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 SIC are connected to the RX and TX ports, respectively, on the remote SIC.
    - 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.
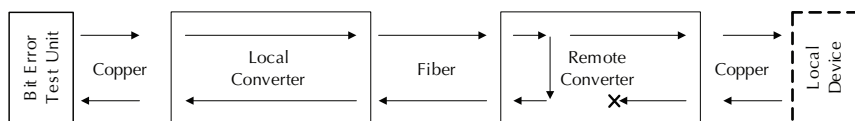
Troubleshooting — Continued
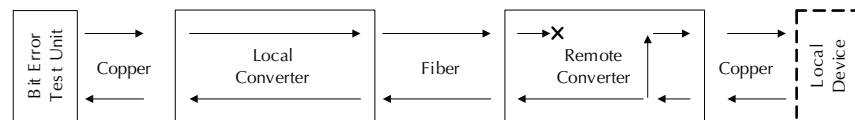
6.   Is Data Transfer Failing?

YES
*   Verify the local copper connection by starting a local copper loop-back *(set the loop-back switch on the local SIC 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 SIC 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 SIC 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.
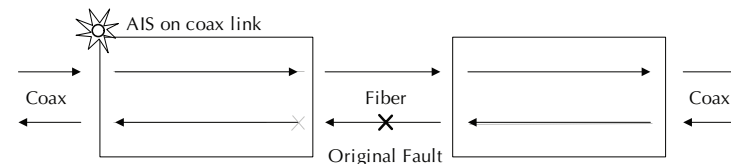

NO
*   Proceed to step 7.

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 AIS on the coax interface. Correct the remote unit failure.
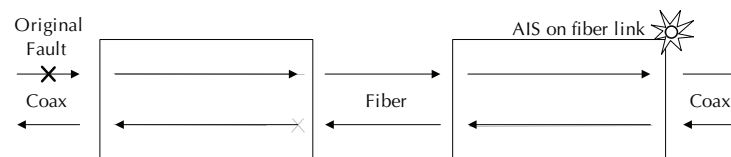*   Contact Tech Support: 1-800-260-1312, Int'l: 00-1-952-941-7600.

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.

Declaration of Conformity

TRANSITION NETWORKS®

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

Model Numbers: CCSCF3011-110, CCSCF3013-110, CCSCF3014-110,
CCSCF3015-110, CCSCF3016-110, CCSCF3017-110,
CCSCF3029-110, CCSCF3029-111, CCSCF3029-112,
CCSCF3029-113, CCSCF3029-114, CCSCF3029-115,
CCSCF3029-116, CCSCF3029-117, CCSCF3040-110

Purpose: To declare that the CCSCF30xx-11x Series SICs 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.

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   February 2010

Stephen Anderson, Vice-President of Engineering   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

Transition Now

Chat live via the Web with Transition Networks Technical Support.

Log onto www.transition.com and click Tech Support/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.
http://www.transition.com/TransitionNetworks/TechSupport/Contact.aspx

Address

Transition Networks
10900 Red Circle Drive,
Minnetonka, MN 55343, U.S.A.
telephone: 952-941-7600
toll free: 800-526-9267
fax: 952-941-2322

Compliance Information

CISPR22/EN55022 Class A + EN55024

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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