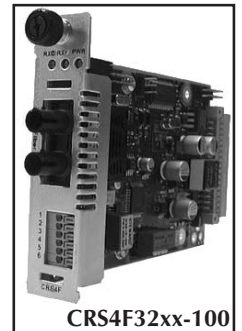


CRS4F31xx-100

USER'S GUIDE

CRS4Fxxxx-100 Slide-in-Module Media Converter RS-485/422 Copper to Fiber

Transition Networks CRS4Fxxxx-100 series media converters are designed to be installed in the *PointSystem™* chassis and connect RS-485/422 copper cable to fiber-optic cable at asynchronous data rates upto 1.25 Mb/s



CRS4F32xx-100

The **CRS4F31xx-100** media converters use a male DB-9 port for the copper link:

Part Number	Port One - Copper DB-9 port	Port Two - Fiber-Optic
CRS4F3111-100	RS-485/422 1200 m (4000 ft)*	ST, 1300 nm multimode 2 km (1.2 miles)**
CRS4F3113-100	RS-485/422 1200 m (4000 ft)*	SC, 1300 nm multimode 2 km (1.2 miles)**
CRS4F3114-100	RS-485/422 1200 m (4000 ft)*	SC, 1310 nm single mode 20 km (12.4 miles)**
CRS4F3115-100	RS-485/422 1200 m (4000 ft)*	SC, 1310 nm single mode 40 km (24.8 miles)**

The **CRS4F32xx-100** media converters use a 6-position terminal block for the copper link:

Part Number	Port One - Copper 6-position terminal block	Port Two - Fiber-Optic
CRS4F3211-100	RS-485/422 1200 m (4000 ft)*	ST, 1300 nm multimode 2 km (1.2 miles)**
CRS4F3213-100	RS-485/422 1200 m (4000 ft)*	SC, 1300 nm multimode 2 km (1.2 miles)**
CRS4F3214-100	RS-485/422 1200 m (4000 ft)*	SC, 1310 nm single mode 20 km (12.4 miles)**
CRS4F3215-100	RS-485/422 1200 m (4000 ft)*	SC, 1310 nm single mode 40 km (24.8 miles)**

* Maximum cable distance is 1200m (4000') @ <90 kb/s decreasing logarithmically to 92m (300') @ 500 kb/s.

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

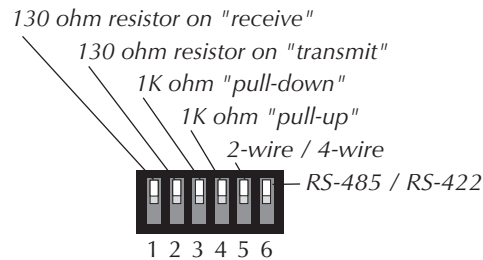
Installation	2
Operation	6
Cable Specifications	7
Technical Specifications	9
Troubleshooting	10
Contact Us	11
Compliance Information	12

Installation

CAUTION: Wear a grounding device and observe electrostatic discharge precautions when setting the switches. **Failure to observe this caution could result in damage to, and subsequent failure of, the media converter.**

Set the 6-Position Switch

The 6-position switch is located on the side of the media converter. Use a small flat-blade screwdriver or a similar device to set the recessed switches. Refer to the drawing for the locations of the six individual switches.



Switch 1 - 130 ohm resistor on "receive"

up = Disable.
down = Enable. (Switch 5 must also be set to "4-wire" (down).)

When enabled, switch 1 inserts a 130 ohm resistor on the wire pair:

- Receive (-) (B) RS-485 4-wire, receive (-) RS-422 and
- Receive (+) (A) RS-485 4-wire, receive (+) RS-422.

Switch 2 - 130 ohm resistor on "transmit"

up = Disable.
down = Enable. (Switch 5 must also be set to "2-wire" (up).)

When enabled, switch 2 inserts a 130 ohm resistor on the wire pair:

- Transmit/Receive (-) (B) RS-485 2-wire, transmit (-) RS-422 and
- Transmit/Receive (+) (A) RS-485 2-wire, transmit (+) RS-422.

Switch 3 - 1K ohm "pull-down"

up = Disable.
down = Enable. (Switch 5 must also be set to "2-wire" (up).)

When enabled, switch 3 enables a 1K ohm pull-down on the wire:

- Transmit/Receive (-) (B) RS-485 2-wire, transmit (+) RS-422.

Switch 4 - 1K ohm "pull-up"

up = Disable.
down = Enable. (Switch 5 must also be set to "2-wire" (up).)

When enabled, switch 4 enables a 1K ohm pull-up on the wire:

- Transmit/Receive (+) (A) RS-485 2-wire, transmit (+) RS-422.

Installation -- Continued

Switch 5 - 2-wire / 4-wire

up = 2-wire.
down = 4-wire.

Set switch 5 to **2-wire** (up) to enable the wire pair:

- Transmit/Receive (-) (B) RS-485 2-wire, transmit (-) RS-422 and
 - Transmit/Receive (+) (A) RS-485 2-wire, transmit (+) RS-422.
- for RS-422 2-wire, half-duplex operation.

Set switch 5 to **4-wire** (down) to enable the wire pair:

- Receive (-) (B) RS-485 4-wire, transmit (-) RS-422 and
 - Receive (+) (A) RS-485 4-wire, transmit (+) RS-422.
- for RS-422 4-wire, full-duplex operation.

Switch 6 - RS-485 / RS-422

up = RS-485.
down = RS-422.

Set switch 6 to **RS-485** (up) to prevent echo in the 2-wire mode.

Set switch 6 to **RS-422** (down) to allow "transmit only" for the wire pair:

- Transmit/Receive (-) (B) RS-485 2-wire, transmit (-) RS-422 and
- Transmit/Receive (+) (A) RS-485 2-wire, transmit (+) RS-422.

Installation -- Continued

Install the Slide-In-Module

CAUTION: Wear a grounding device and observe electrostatic discharge precautions when installing the media converter. **Failure to observe this caution could result in damage to, and subsequent failure of, the media converter.**

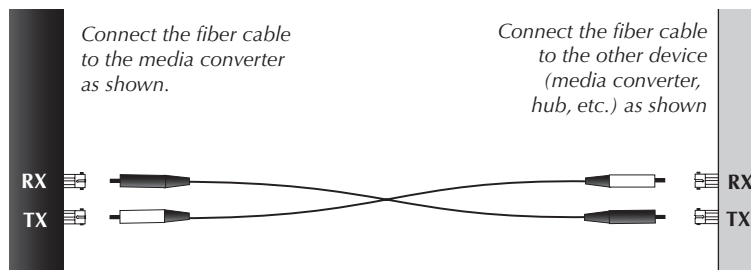
To install the CRS4Fxxx-100 media converter slide-in-module:

1. Locate an empty installation slot on the *PointSystem*™ Chassis.
2. Carefully slide the slide-in-module into the installation slot, aligning the module with the installation guides.
3. Ensure that the module is firmly seated inside the chassis.
4. Push in and rotate the attached panel fastener screw to secure the module to the chassis front.



Install the Fiber Cable

1. Locate or build fiber cable with male, two-stranded TX to RX connectors installed at both ends.
2. Connect the fiber cables to the CRS4Fxxx-100 media converter as described:
 - Connect the male **TX** cable connector the female **TX** port.
 - Connect the male **RX** cable connector to the female **RX** port.
3. Connect the fiber cables to the other device (another media converter, hub, etc.) as described:
 - Connect the male **TX** cable connector the female **RX** port.
 - Connect the male **RX** cable connector to the female **TX** port.



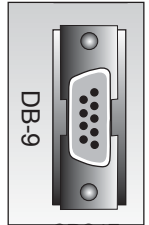
Installation -- Continued

Install the Copper Cable (DB-9 port)

Install the copper cable as instructed if the media converter has a DB-9 copper port (CRS4F31xx-100 models).

NOTE: Shielded RS-485/422 cables are required for EMC compliance.

1. Locate or build RS-485/422 cables with a female DB-9 connector on one end and a DB-9 connector that is compatible with the other device on the other end of the cable.
2. Connect the female DB-9 connector at one end of cable to the male DB-9 port on the CRS4F31xx-100 media converter.
3. Connect the DB-9 connector at the other end of the cable to the DB-9 port on the other device.

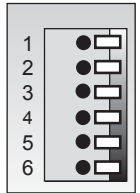


Install the Copper Cable (6-position terminal block)

Install the copper cable as instructed if the media converter has a 6-position terminal block (CRS4F32xx-100 models).

NOTE: Shielded RS-485/422 cables are required for EMC compliance.

1. Locate or build RS-485/422 cables with the six individual wires stripped at both ends.
2. Insert the individual wires at one end of cable into the six terminal block ports on the CRS4F32xx-100 media converter.
3. Insert the individual wires at the other end of the cable into the six terminal block ports on the other device, matching the same color of cable with the number of the port.



Power the Media Converter

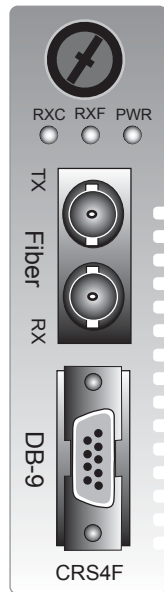
The media converter is powered through the *PointSystem*™ chassis.

Operation

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

PWR	<i>On</i>	The media converter is connected to external power.
RXF	<i>On</i>	A link has been established with the fiber link.
RXC	<i>On</i>	Data has been received on the copper link.
	<i>Flashing</i>	Data is transferring on the copper link.

CRS4F31xx-100



CRS4F32xx-100



SNMP

Use SNMP at an attached terminal or at a remote location to monitor the media converter by monitoring:

- Local fiber link status
- Receive data activity on the copper link
- Local switch settings

(Network commands cannot be entered via SNMP.)

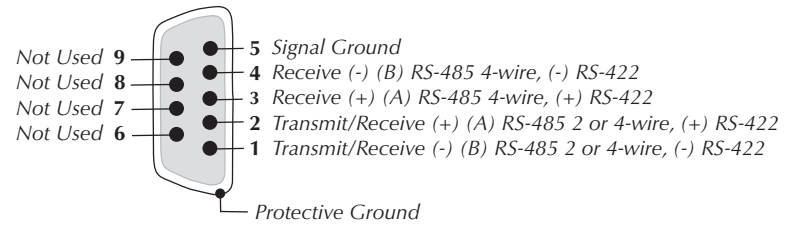
See the on-line documentation that comes with Transition Networks *FocalPoint™* software for applicable commands and usage on-line at: www.transition.com

Cable Specifications

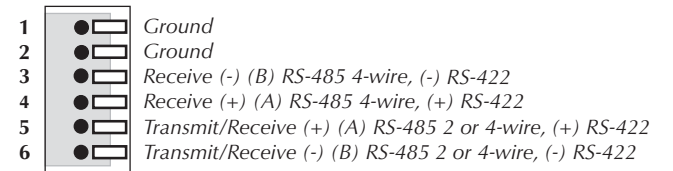
RS-485/422 Copper Cable

Maximum Data Rate:	1.25 Mb/s
Gauge:	24 to 22 AWG
Maximum Cable Distance:	1200m (4000 ft) @ <90 kb/s decreasing logarithmically to: 92m (300 ft) @ 500 kb/s

DB-9 port:



6-position terminal block:



Cable Specifications -- Continued

Fiber Cable

Bit Error Rate:	<10 ⁻⁹	
Single mode fiber (recommended):	9 μm	
Multimode fiber (recommended):	62.5/125 μm	
Multimode fiber (optional):	100/140, 85/140, 50/125 μm	
CRS4F3111-100	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	
CRS4F3113-100	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	
CRS4F3114-100	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	
CRS4F3115-100	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	
CRS4F3211-100	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	
CRS4F3213-100	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	
CRS4F3214-100	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	
CRS4F3215-100	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	

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

Technical Specifications

For use with Transition Networks Model CRS4Fxxxx-100 or equivalent

Data Rate	0 to 1.25 Mb/s	
Dimensions	3.4" x 5.0" x 0.86" (86 mm x 127 mm x 22 mm)	
Shipping Weight	3 oz. (91 g) (approximately)	
Power Consumption	5 Watts	
MTBF	671,957 hours (MIL217F2 V5.0) (MIL-HDBK-217F) 2,731,072 hours (Bellcore7 V5.0)	
Environment	Tmra*:	0 to 50°C (32° to 122° F)
	Storage Temp:	-40° to 85°C (-40° 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 slide-in-module depends on the physical characteristics and the installation configuration of the Transition Networks PointSystem chassis in which this slide-in-module will be installed.

The information in this user's guide is subject to change. For the most up-to-date information on the CRS4Fxxxx-100 media converter, view the user's guide on-line at: www.transition.com

NOTE: The **stand-alone version** of the media converter is SRS4Fxxxx-100. For more information, see the SRS4Fxxxx-100 user 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.

CAUTION: Visible and invisible laser radiation when open. Do not stare into the beam or view directly with optical instruments.

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

Troubleshooting

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 PWR (Power) LED on the media converter illuminated?

NO

- Is the media converter inserted properly into the chassis?
- Is the power cord properly installed in the chassis and in the grounded AC outlet?
- Does the grounded AC outlet provide power?
- Contact Technical Support: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

YES

- Proceed to step 2.

2. Is the RXC LED illuminated when data is sent across the RS-485/422 copper link?

NO

- Check the RS-485/422 copper cable for proper connection.
- Contact Technical Support: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

YES

- Proceed to step 3.

3. Is the RXF (fiber link) LED illuminated?

NO

- Disconnect and reconnect the fiber cables to restart the initialization process.
- Verify that the TX and RX cables on the media converter are connected to the RX and TX ports, respectively, on the other media converter.
- Contact Technical Support: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

YES

- Proceed to step 4.

4. Does the data fail to move across the link, even though both RXC and RXF LEDs are illuminated?

YES

- Check switches 5 and 6 (page 3) for proper configuration and check the the RS-485/422 cables for proper connection.
- Contact Technical Support: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

NO

- Contact Technical Support: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

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 the **Transition Now** link.

Web-Based Seminars


Transition Networks provides seminars via live web-based training. Log onto **www.transition.com** and click the **Learning Center** link.

E-Mail

Ask a question anytime by sending an e-mail to our technical support staff. **techsupport@transition.com**

Address

Transition Networks
6475 City West Parkway
Minneapolis, MN 55344, USA
telephone: 952-941-7600
toll free: 800-526-9267
fax: 952-941-2322

TRANSITION networks		Declaration of Conformity
Name of Mfg:	Transition Networks 6475 City West Parkway, Minneapolis MN 55344 USA	
Model:	CRS4Fxxx-100 Series Media Converter	
Part Number:	CRS4F3111-100, CRS4F3113-100, CRS4F3114-100, CRS4F3115-100, CRS4F3211-100, CRS4F3213-100, CRS4F3214-100, CRS4F3215-100	
Regulation:	EMC Directive 89/336/EEC	
Purpose: To declare that the CRS4Fxxx-100 to which this declaration refers is in conformity with the following standards. CISPR 22:1993; EN 55022:1998+A1:2000 Class A; EN 55024:1998; FCC Part 15 Subpart B; 21 CFR subpart J		
<i>I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).</i>		
 Stephen Anderson, Vice-President of Engineering		November 3, 2003 Date

Compliance Information

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 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.

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