TRANSITION NETWORKS

SRS4F31xx-10x

USER'S GUIDE

SRS4Fxxxx-10x

Stand-Alone Media Converter

RS485/422 Copper to Fiber

SRS4F32xx-10x

Transition Networks SRS4Fxxxx-10x series media converters connect RS485/422 copper cable to fiber-optic cable at asynchronous data rates up to 1.25 Mb/s.

The **SRS4F31xx-10x** media converters use a male DB-9 port for the copper link:

Part Number	Port One - Copper DB-9 port	Port Two - Fiber-Optic
SRS4F3111-100	RS485/422 1200 m *(4000 ft)**	ST, 1300 nm multimode 2 km *(1.2 miles)***
SRS4F3113-100	RS485/422 1200 m *(4000 ft)**	SC, 1300 nm multimode 2 km *(1.2 miles)***
SRS4F3114-100	RS485/422 1200 m *(4000 ft)**	SC, 1310 nm single mode 20 km *(12.4 miles)***
SRS4F3115-100	RS485/422 1200 m *(4000 ft)**	SC, 1310 nm single mode 40 km *(24.8 miles)***
SRS4F3116-100 (LH)	RS485/422 1200 m *(4000 ft)**	SC, 1310 nm single mode 60 km *(37.3 miles)***
SRS4F3117-100 (LW)	RS485/422 1200 m *(4000 ft)**	SC, 1550 nm single mode 80 km *(49.7 miles)***

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

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

SRS4F3xxx-10x

The SRS4F32xx-10x 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
SRS4F3211-100	RS485/422 1200 m *(4000 ft)**	ST, 1300 nm multimode 2 km *(1.2 miles)***
SRS4F3213-100	RS485/422 1200 m *(4000 ft)**	SC, 1300 nm multimode 2 km *(1.2 miles)***
SRS4F3214-100	RS485/422 1200 m *(4000 ft)**	SC, 1310 nm single mode 20 km *(12.4 miles)***
SRS4F3215-100	RS485/422 1200 m *(4000 ft)**	SC, 1310 nm single mode 40 km *(24.8 miles)***

The SRS4F3129-10x media converters use a male DB-9 port for the copper link:

Part Number	Part One - Copper DB-9 Port	Port Two - Fiber Optic
SRS4F3129-100	RS485/422 1200 m *(4000 ft)**	SC, 1310TX/1550RX nm, single mode 20 km *(12.4 miles)***
SRS4F3129-101	RS485/422 1200 m *(4000 ft)**	SC, 1550TX/1310RX nm, single mode 20 km *(12.4 miles)***
SRS4F3129-102	RS485/422 1200 m *(4000 ft)**	SC, 1310TX/1550RX nm, single mode 40 km *(24.8 miles)***
SRS4F3129-103	RS485/422 1200 m *(4000 ft)**	SC, 1550TX/1310RX nm, single mode 40 km *(24.8 miles)***

The SRS4F32xx-10x media converters use a 6-position terminal block for the copper link:

Part Number	Part One - Copper -6-position terminal block	Port Two - Fiber Optic
SRS4F3229-100	RS485/422 1200 m *(4000 ft)**	SC, 1310TX/1550RX nm, single mode 20 km *(12.4 miles)***
SRS4F3229-101	RS485/422 1200 m *(4000 ft)**	SC, 1550TX/1310RX nm, single mode 20 km *(12.4 miles)***
SRS4F3229-102	RS485/422 1200 m *(4000 ft)**	SC, 1310TX/1550RX nm, single mode 40 km *(24.8 miles)***
SRS4F3229-103	RS485/422 1200 m *(4000 ft)**	SC, 1550TX/1310RX nm, single mode 40 km *(24.8 miles)***

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

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

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.

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.

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.

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

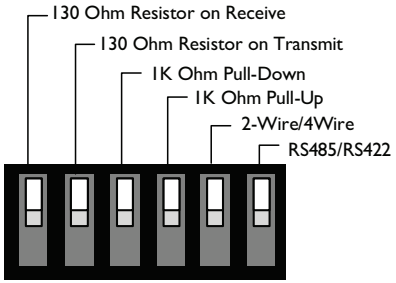
Transition Networks
10900 Red Circle Drive
Minneatonka MN 55343, U.S.A.
telephone: 952-941-7600
toll free: 800-526-9267
fax: 952-941-2322

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) RS485 4-wire, receive (-) RS422
- Receive (+) (A) RS485 4-wire, receive (+) RS422

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) RS485 2-wire, transmit (-) RS422
- Transmit/Receive (+) (A) RS485 2-wire, transmit (+) RS422

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) RS485 2-wire, transmit (+) RS422

Installation -- Continued

Set the 6-Position Switch -- continued

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) RS485 2-wire, transmit (+) RS422

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) RS485 2-wire, transmit (-) RS422
- Transmit/Receive (+) (A) RS485 2-wire, transmit (+) RS422
  for RS422 2-wire, half-duplex operation

Set switch 5 to 4-wire *(down)* to enable the wire pair:
- Receive (-) (B) RS485 4-wire, transmit (-) RS422
- Receive (+) (A) RS485 4-wire, transmit (+) RS422
  for RS422 4-wire, full-duplex operation

Switch 6 - RS485 / RS422

up = RS485
down = RS422

Set switch 6 to RS485 *(up)* to prevent echo in the 2-wire mode.

Set switch 6 to RS422 (down) to allow "transmit only" for the wire pair:
- Transmit/Receive (-) (B) RS485 2-wire, transmit (-) RS422
- Transmit/Receive (+) (A) RS485 2-wire, transmit (+) RS422

Declaration of Conformity

TRANSITION NETWORKS

Declaration of Conformity

Name of Mfg:	Transition Networks 10900 Red Circle Drive, MinneatonkaMN 55343 U.S.A.
Model:	SRS4Fxxxx-10x Series Media Converter
Part Number:	SRS4F3111-100, SRS4F3113-100, SRS4F3114-100, SRS4F3115-100, SRS4F3116-100, SRS4F3117-100, SRS4F3211-100, SRS4F3213-100, SRS4F3214-100, SRS4F3215-100, SRS4F3129-100, SRS4F3129-101, SRS4F3129-102, SRS4F3129-103, SRS4F3229-100, SRS4F3229-101, SRS4F3229-102, SRS4F3229-103
Regulation:	EMC Directive 89/336/EEC

Purpose: To declare that the SRS4Fxxxx-10x to which this declaration refers is in conformity with the following standards:

EMC Directive 2004/108/EC; EN 55022:2006+A1:2007 Class A; EN55024:1998+A1:2001+A2:2003; EN61000-3-2; EN61000-3-3; CFR Title 47 Part 15 Subpart B Class A; Low Voltage Directive: 2006/95/EC; CFR Title 21 Section 1040.10 Class I

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

August 2010
Date

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 power adapter the proper type of voltage and cycle frequency for the AC outlet? *(See "Power Supply DC Output.")*
   - Is the power adapter properly installed in the media converter 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 RS485/422 copper link?
   NO
   - Check the RS485/422 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.

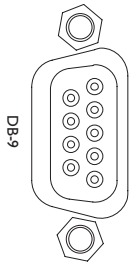
4. Does the data fail to move across the link, even though both RXC and RXF LEDs are illuminated?
   YES
   - Check switches 5 and 6 (page 3) for proper configuration and check the the RS485/422 cables for proper connection.
   - Contact Technical Support: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

   NO
   - Contact Technical Support: US/Canada: 1-800-260-1312, International: 00-1-952-941-7600.

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 *(SRS4F31xx-10x models)*.



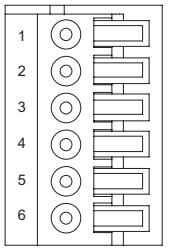
Note: Shielded RS485/422 cables are required for EMC compliance.

1. Locate or build RS485/422 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 SRS4F31xx-10x 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 *(SRS4F32xx-10x models)*.

Note: Shielded RS485/422 cables are required for EMC compliance.

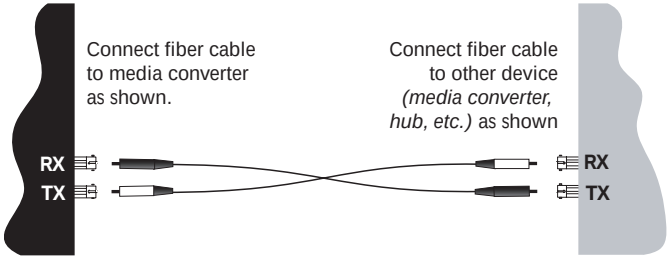


1. Locate or build RS485/422 cables with the six individual wires stripped at both ends.
2. Insert the individual wires at one end of cable into the six terminal block ports on the SRS4F32xx-100 media converter.
3. Insert the individual wires at the other end of the cable into the six terminal block ports on the other device, matching the same color of cable with the number of the port.

Installation -- Continued

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 SRS4Fxxxx-100 media converter 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 other device *(another media converter, hub, etc.)* 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 Media Converter

AC

1. Install the power adapter cord to the back of the media converter.
2. Connect the power adapter plug to AC power.
3. Verify that the media converter is powered by observing the illuminated LED power indicator light.

DC

Consult the user's guide for the Transition Networks SPS1872-xx DC external power supply for powering the media converter.

Technical Specifications

For use with Transition Networks Model SRS4Fxxxx-10x or equivalent

Data Rate	0 to 1.25 Mb/s	
Dimensions	3.25" x 4.7" x 1.0" *(83 mm x 119 mm x 25 mm)*	
Shipping Weight	1lb. *(454 g)* approximately	
Power Consumption	5 Watts	
MTBF	250,000 hours *(MIL-HDBK-217F)* 687,500 hours *(Bellcore)*	
Power Supply	12VDC, 0.8 Amp *(North. Am., EU, Japan, South Am.)* 12VDC, 1.25 Amp *(UK, Australia, N.Z., South Africa)*	
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
	Warranty	Lifetime

*Manufacturer's rated ambient temperature.

The information in this user's guide is subject to change. For the most up-to-date information on the SRS4Fxxxx-10x media converter, view the user's guide on-line at: www.transition.com

Note: The chassis version of the media converter is SRS4Fxxxx-100. For mor 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.

Optional Accessories *(sold separately)*.

Part Number	Description
SPS-1872-SA	Optional External Power Supply; 18-72VDC Stand-Alone Output: 12.6VDC, 1.0 A
SPS-1872-PS	Optional External Power Supply; 18-72VDC Piggy-back; Output: 12.6VDC, 1.0 A
E-MSR-04	12-Slot media converter Rack *(includes universal internal power supply)* 17 x 15 x 5 in. *(432 x 381 x 127 mm)*
WMBL	Length: 4.0 in. *(102 mm),* Fits converter length: 4.7in *(119mm)*
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)*

Cable Specifications -- Continued

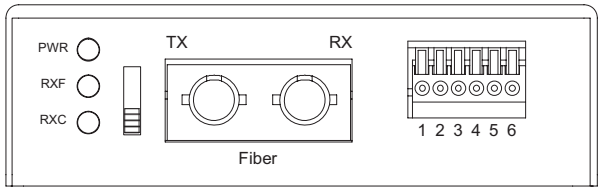
SRS4F3129-100	1310TX/1550TR nm single mode	
SRS4F3129-101	1550TX/1310TR nm single mode	
Fiber Optic Transmitter Power:	min: -13.0 dBm	max: -6.0 dBm
Fiber Optic Receiver Sensitivity:	min: -32.0 dBm	max: -3.0 dBm
Link Budget:	19.0 dB	
SRS4F3129-102	1310TX/1550TR nm single mode	
SRS4F3129-103	1550TX/1310TR nm single mode	
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	

SRS4F3229-100	1310TX/1550TR nm single mode	
SRS4F3229-101	1550TX/1310TR nm single mode	
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	
SRS4F3229-102	1310TX/1550TR nm single mode	
SRS4F3229-103	1550TX/1310TR nm single mode	
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	

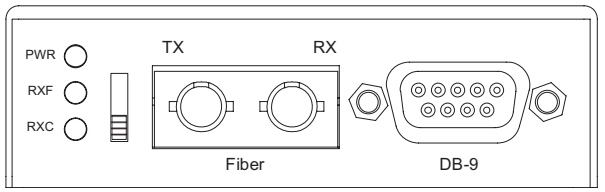
Operation

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

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



SRS4F32xx-100



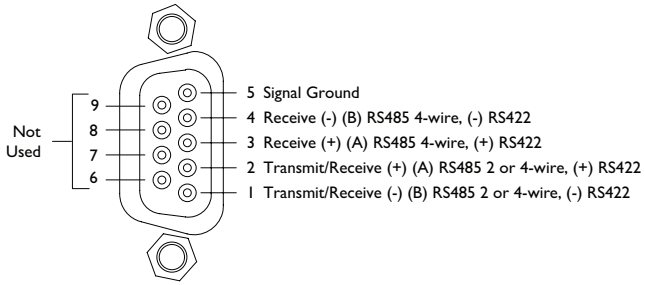
SRS4F31xx-100

Cable Specifications

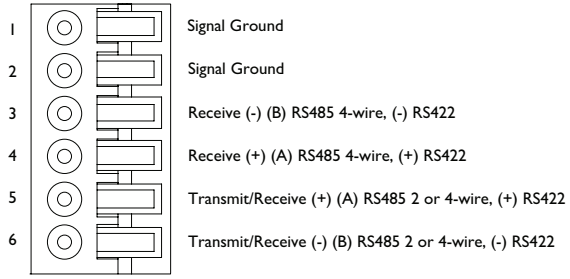
RS485/422 Copper Cable

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:



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

SRS4F3111-100	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	
SRS4F3113-100	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	

Cable Specifications -- Continued

Fiber Cable -- Continued

SRS4F3114-100	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	
SRS4F3115-100	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	
SRS4F3116-100(LH)	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	
SRS4F3117-100(LW)	1550 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	
SRS4F3211-100	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	
SRS4F3213-100	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	
SRS4F3214-100	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	
SRS4F3215-100	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	