



User's Guide

SPSVT26xx-10x

Stand Alone Device

- High-Speed Serial
- V.35/X.21/RS449/RS530/RS232
- Copper to Fiber

Transition Networks SPSVT26xx-10x series high-speed serial copper-to-fiber Device connect V.35, X.21, RS-449, RS-530, or RS-232 signals on copper cable, at speeds up to 10 Mb/s, through a universal 26-pin serial interface connector to fiber-optic cable. Transition Networks also supplies cables for connecting network equipment to the SPSVT26xx-10x series Device.

| Part Number | Port One - Copper | Port Two - Duplex Fiber-Optic |
|----------------------|------------------------------------|---|
| SPSVT2611-100 | Universal 26-pin serial interface* | ST, 1300 nm multimode 2 km (1.2 miles)** |
| SPSVT2613-100 | Universal 26-pin serial interface* | SC, 1300 nm multimode 2 km (1.2 miles)** |
| SPSVT2614-100 | Universal 26-pin serial interface* | SC, 1310 nm single mode 20 km (12.4 miles)** |
| SPSVT2615-100 | Universal 26-pin serial interface* | SC, 1310 nm single mode 40 km (24.9 miles)** |

* For typical maximum cable distance, see Cable Specifications section.

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

The chassis version of this Device is CPSVT26xx-10x. For more information, see the user's guide for the CPSVT26xx-10x on-line at www.transition.com

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SPSVT26xx-10x

| Part Number | Port One - Copper | Port Two - Single Fiber-Optic |
|---|------------------------------------|---|
| SPSVT2629-100 | Universal 26-pin serial interface* | SC, single mode 1310 TX / 1550nm RX 20 km (12.4 miles)** |
| SPSVT2629-101 | Universal 26-pin serial interface* | SC, single mode 1550 TX / 1310nm RX 20 km (12.4 miles)** |
| The SPSVT2629-100 and the -101 are intended to be installed in the same network where one is the local Device and the other is the remote Device. | | |
| SPSVT2629-102 | Universal 26-pin serial interface* | SC, single mode 1310 TX / 1550nm RX 40 km (24.8 miles)** |
| SPSVT2629-103 | Universal 26-pin serial interface* | SC, single mode 1550 TX / 1310nm RX 40 km (24.8 miles)** |
| The SPSVT2629-102 and the -103 are intended to be installed in the same network where one is the local Device and the other is the remote Device. | | |

* For typical maximum cable distance, see the Cable Specifications section in this manual.

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

Optional Accessories (sold separately)

| Part Number | Description |
|-------------|--|
| SPS-2460-SA | Optional External Power Supply; 24-60VDC Stand-Alone Output: 12.25VDC @ 1.0 A |
| SPS-2460-PS | Optional External Power Supply; 24-60VDC Piggy-back Output: 12.25VDC @ 1.0 A |
| E-MCR-05 | 12-Slot Device Rack (includes universal internal power supply) 19.0" x 15.0" x 4.75" (483 mm x 381 mm x 121 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) |

Cable Options

Supported Cable Options

The table below lists the interface standards and the cable options that are supported for the SPSVT26xx-10x Device.

Each cable (available from Transition Networks) is 3 meters in length and has a male universal 26-pin serial connector at one end. The connector at the other end is listed in the table.

| Part Number | Function | Connector Type |
|-----------------|------------|---------------------------|
| 35DTE-3 | V.35 DTE | 34-pin Rectangular Male |
| 35DCE-3 | V.35 DCE | 34-pin Rectangular Female |
| 21DTE-3 | X.21 DTE | 15-pin D-sub Male |
| 21DCE-3 | X.21 DCE | 15-pin D-sub Female |
| 232DTE-3 | RS-232 DTE | 25-pin D-sub Male |
| 232DCE-3 | RS-232 DCE | 25-pin D-sub Female |
| 449DTE-3 | RS-449 DTE | 37-pin D-sub Male |
| 449DCE-3 | RS-449 DCE | 37-pin D-sub Female |
| 530DTE-3 | RS-530 DTE | 25-pin D-sub Male |
| 530DCE-3 | RS-530 DCE | 25-pin D-sub Female |

Maximum Cable Lengths

The table below lists the recommended maximum cable lengths for each of the cable options at various data rates.

| Data Rate | V.35, RS-449, or RS-530 | X.21 | RS232C |
|-----------|-------------------------|------------------|---------------|
| 10 Mb/s | 10 m (35 ft.) | N/A | N/A |
| 6 Mb/s | 19 m (65 ft.) | N/A | N/A |
| 2 Mb/s | 45 m (150 ft.) | 15 m (50 ft.) | N/A |
| 1 Mb/s | 90 m (300 ft.) | 30 m (100 ft.) | N/A |
| 512 Kb/s | 180 m (600 ft.) | 60 m (200 ft.) | N/A |
| 256 kb/s | 365 m (1200 ft.) | 120 m (400 ft.) | N/A |
| 128 Kb/s | 730 m (2400 ft.) | 240 m (800 ft.) | N/A |
| 56 Kb/s | 910 m (3000 ft.) | 480 m (1600 ft.) | 3 m (10 ft.) |
| 1.2 Kb/s | 910 m (3000 ft.) | 910 m (3000 ft.) | 15 m (50 ft.) |

N/A = Not Applicable. The rates are not specified for the interface in question.

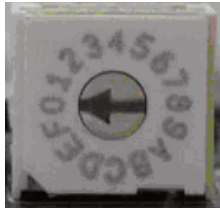
Installation

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

Set the Terminal Timing Switch

The 16-position terminal timing switch, located on the side of the Device, allows the network administrator to configure the Device for various network conditions.

To set the terminal timing switch, insert a small, flat-blade screwdriver or a similar device into the recessed arrow on the switch. Gently rotate the switch to the position required for the site installation.



This table lists the conditions for each setting of the terminal timing switch:

| Terminal Timing Switch Setting | |
|--------------------------------|------------------------|
| 0 - TT = Receive CLK | 8 - 768 Kb/s |
| 1 - 56 Kb/s | 9 - 1024 Kb/s |
| 2 - 64 Kb/s | A - 1544 Kb/s |
| 3 - 112 Kb/s | B - 2048 Kb/s |
| 4 - 128 Kb/s | C - 3072 Kb/s |
| 5 - 256 Kb/s | D - 4096 Kb/s |
| 6 - 384 Kb/s | E - 6144 Kb/s |
| 7 - 512 Kb/s | F - Asynchronous Mode* |

* Setting "F" overrides the software mode and sets the Device to asynchronous mode.

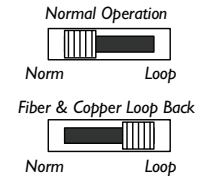
Installation — Continued

Set the Loop-Back Switch

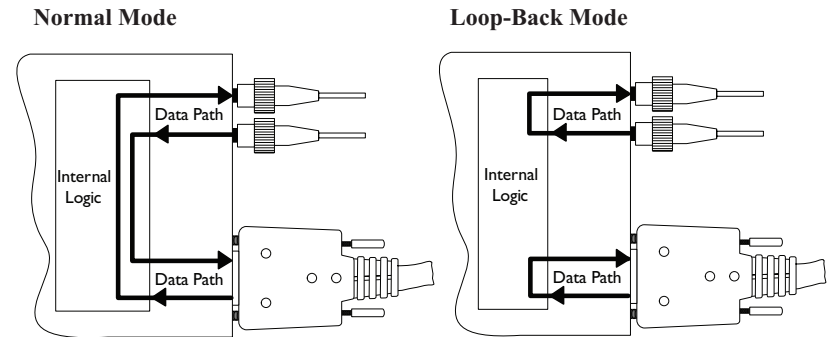
The loop-back switch is located on the front panel of the Device and is used to debug network faults. (See "Troubleshooting" section for examples.)

To set the switch, use a small flat-blade screwdriver or a similar device.

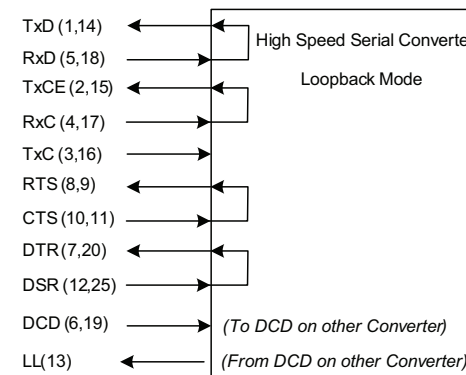
- Normal Set the switch to "Norm" for normal operation.
- Loop-back Set the switch to "Loop" to enable both fiber and copper loop-back.



The two drawings below illustrate the data path for both normal mode and loop-back mode:



The drawing below indicates the data path during loop-back mode for each of the pins on the copper 26-pin connector.



Installation — Continued

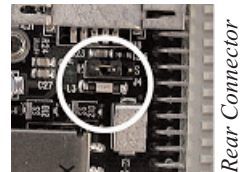
Set the Jumpers

The SPSVT26xx-10x has three jumpers located on the circuit board inside the Device housing. To set any of the three jumpers:

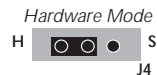
1. Using a small screwdriver, remove the four (4) screws that secure the cover and carefully remove the cover from the Device.
2. Locate the jumper(s) on the circuit board.
3. Using small needle-nosed pliers or similar device, move the jumper(s) to the desired position(s).
4. Carefully replace the cover on the Device and replace the four (4) screws that secure the cover to the Device.

Hardware/Software Jumper (J4)

The Hardware/Software jumper (J4) is located on the circuit board and is the jumper that is nearest the rear connector of the Device (*see the photo to the right*).



Hardware The terminal timing switch controls the terminal timing function. The loop-back switch controls the loop-back function.



Software The terminal timing switch and the loop-back switch are disabled. These two functions are controlled by the most-recently saved, on-board microprocessor settings.



Note: Setting the terminal timing switch to “F” overrides the software mode and sets the Device to asynchronous mode.

Remote Management

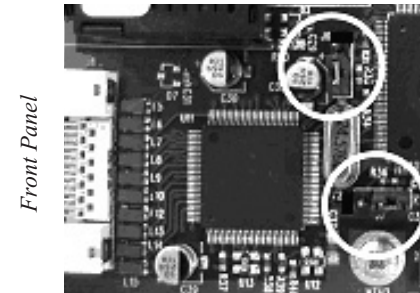
The SPSVT26xx-10x stand-alone Device can be remotely managed by the CPSVT26xx-10x, the chassis version of the Device.

For example, a local CPSVT2611-100 Device (that is installed in a managed Transition Networks PointSystem™ chassis) is connected, via fiber, to a remote SPSVT2611-100 Device. An example of a managed single-fiber network has a local CPSVT2629-100 Device connected, via fiber, to a remote SPSVT2629-101.

Note: In a managed network, both the local and remote Devices must be set to “software” mode (*see above*).

For more information, see the SNMP section in the CPSVT26xx-10x user’s guide on-line at: www.transition.com.

Installation — Continued



J6- RX Clock Polarity Jumper

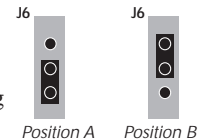
J7- TX Clock Polarity Jumper

Receive (RX) Clock Polarity Jumper (J6)

The RX Clock Polarity jumper (J6), located near the front panel of the circuit board, selects the polarity of the receive clock.

Position A The receive data is sampled on the rising edge of the receive clock.

Position B The receive data is sampled on the falling edge of the receive clock.

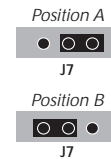


Transmit (TX) Clock Polarity Jumper (J7)

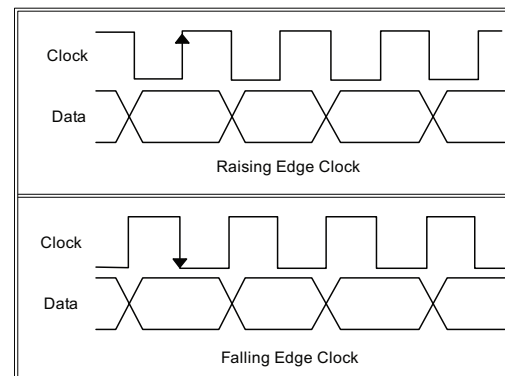
The TX Clock Polarity jumper (J7), also located near the front panel of the circuit board, selects the polarity of the transmit clock.

Position A The transmit data is sampled on the rising edge of the receive clock.

Position B The transmit data is sampled on the falling edge of the receive clock.



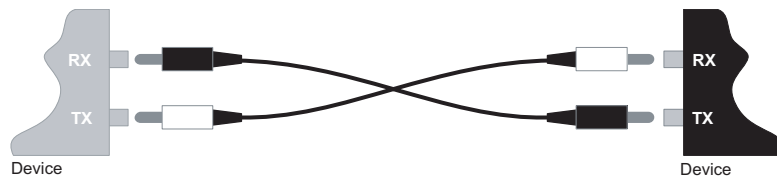
This drawing illustrates “rising edge” and “falling edge” for clock polarity.



Installation — Continued

Install the Fiber Cable

1. Locate or build fiber optic cable with male, two-stranded TX to RX connectors installed at both ends.
2. Connect the fiber cables to the SPSVT26xx-10x 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 other device (*another Device, 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.



Install the Copper Cable

1. Connect the high-speed serial cable to the Device by connecting the cable's copper connector to the Device's copper port.
2. Ensure that the cable screwlocks are tightened securely. Failure to observe this caution could cause data transfer to fail.
3. Connect the other end of the high-speed serial cable to the other network device (*cable router, CSU, etc.*).

Installation — Continued

Power the Device

AC

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

DC

Consult the user's guide for the Transition Networks SPS2460-xx DC external power supply for powering the Device.

Operation

Status LEDs

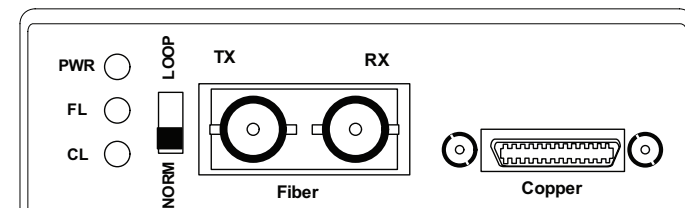
Use the status LEDs to monitor the SPSVT26xx-10x Device operation in the network.

PWR (on) The Device is connected to external power.

FL (on) The fiber link is up.
(flashing) The fiber link is in loop-back mode.

CL (on) The copper link is up.
(flashing) The copper link is in loop-back mode.

(In asynchronous mode, the CL LED may flash if the data rates fall below 300 cycles per second.)



Cable Specifications

Fiber Cable

| | | |
|---|-------------------------------------|----------------|
| Bit Error Rate: | <10 ⁻⁹ | |
| Single mode fiber (<i>recommended</i>): | 9 μm | |
| Multimode fiber (<i>recommended</i>): | 62.5/125 μm | |
| Multimode fiber (<i>optional</i>): | 100/140, 85/140, 50/125 μm | |
| SPSVT2611-100 | 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 | |
| SPSVT2613-100 | 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 | |
| SPSVT2614-100 | 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 | |
| SPSVT2615-100 | 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 | |
| SPSVT2629-100 | 1310 nm (TX) / 1550 nm (RX) simplex | |
| 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 | |
| SPSVT2629-101 | 1550 nm (TX) / 1310 nm (RX) simplex | |
| 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 | |
| SPSVT2629-102 | 1310 nm (TX) / 1550 nm (RX) simplex | |
| 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 | |
| SPSVT2629-103 | 1550 nm (TX) / 1310 nm (RX) simplex | |
| 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 | |

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.

Cable Specifications — Continued

Copper Cable

- Copper twisted-pair, 28 AWG, 120 Ohm, 12 pf/foot capacitance (*max*)
- Nominal DC resistance: 65.0 ohms per 1000 feet (*each conductor*)
- Shield type: Aluminum Foil-Polyester Tape/Braid Shield with drain wire
- Standard Cable length: 3 m (*10 ft.*)

The five high-speed serial cables (*available from Transition Networks*) that are compatible with the 26-pin copper port on the SPSVT26xx-10x Device are the following:

- RS-232
- RS-449
- V.35
- X.21
- RS-530

Note: Please refer to the cable specifications documentation on-line at www.transition.com.

Technical Specifications

For use with Transition Networks Model SPSVT26xx-10x or equivalent.

| | | |
|------------------------|--|---------------------------|
| Data Rate: | 1.2 Kb/s to 10 Mb/s | |
| Dimensions: | 3.25" x 1.0" x 4.8" (82mm x 25mm x 122mm) | |
| Weight: | 10 oz. (283 g) approximately | |
| Power Consumption: | 5.0 Watts | |
| MTBF (w/power supply): | 41,660 hours (MIL-HDBK-217F) 114,580 hours (Bellcore) | |
| Power Supply: | 12.25VDC @ 1.0A, 100-240 VAC (~1.0A), 15W max | |
| Environment: | Tmra*: | 0 to 50°C (32 to 122°F) |
| | Storage Temperature: | -15 to 65°C (5 to 149°F) |
| | Humidity: | 10 to 90%, 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 SPSVT26xx-10x Device, see 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.

CAUTION: Visible and invisible laser radiation when open. Do not stare into 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

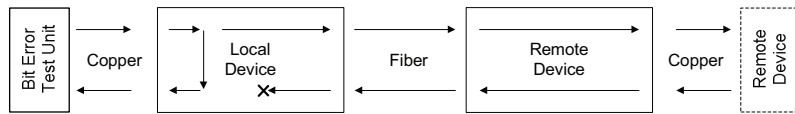
If the Device fails, isolate and correct the fault by determining the answers to the following questions and then taking the indicated action:

- Is the PWR LED on the Device illuminated?
 - NO
 - Is the power adapter the proper type of voltage and cycle frequency for the AC outlet?
 - Is the power adapter installed in the Device and in the outlet?
 - Contact Tech Support: 800-260-1312, Int'l: 00-1-952-941-7600.
 - YES
 - Proceed to step 2.
- Is the CL LED on the Device illuminated?
 - NO
 - Are the copper cables connected properly?
 - Is the device attached to the Device via the copper cable working properly?
 - Contact Tech Support: 800-260-1312, Int'l: 00-1-952-941-7600.
 - YES
 - Proceed to step 3.
- Is the FL LED on the Device illuminated?
 - NO
 - Check the fiber cables for proper connection.
 - Verify that the TX and RX cables on the Device are connected to the RX and TX ports, respectively, on the other device.
 - Are both Devices (connected via the fiber cables) in the same mode (synchronous or asynchronous)?
 - Contact Tech Support: 800-260-1312, Int'l: 00-1-952-941-7600.
 - YES
 - Proceed to step 4.
- Are the CL and FL LEDs on the Device flashing (indicating loop-back mode)?
 - NO
 - Disable the loop-back function. In hardware mode, set the loop-back switch to NORM (normal). In software mode, click "disable" in the loop-back function.
 - Contact Tech Support: 800-260-1312, Int'l: 00-1-952-941-7600.
 - YES
 - Proceed to step 5.
- Is data transfer failing?
 - YES
 - Are the clock input and output polarity correct?
 - Are the correct copper cables installed for the data format?
 - Is the mode on the other device correct (synchronous/asynchronous)?
 - Contact Tech Support: 800-260-1312, Int'l: 00-1-952-941-7600.
 - No
 - Proceed to step 6.

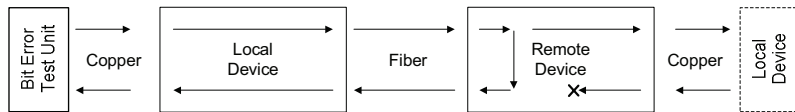
6. Is data transfer failing?

YES

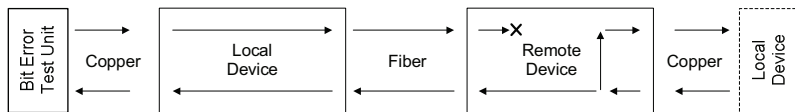
- Verify the local copper connection by starting a local copper loop-back (hardware mode: set the loop-back switch on the local Device to "loop", software mode: enter the local copper loop-back command) and then use a bit error test unit to run a bit error test.



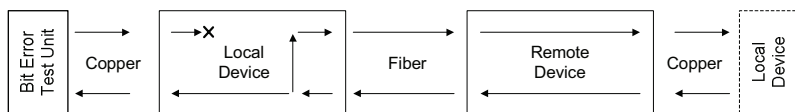
- Verify the local fiber connection by starting a remote fiber loop-back (hardware mode: set the loop-back switch on the remote Device to "loop", software mode: enter the remote fiber loop-back command) and then use a bit error test unit to run a bit error test.



- Verify the remote copper connection by starting a remote copper loop-back (hardware mode: set the loop-back switch on the remote Device to "loop", software mode: enter the remote copper loop-back command) and then use a bit error test unit to run a bit error test.



- Verify remote fiber connection by starting a local copper loop-back (hardware mode: setting the loop-back switch on the local Device to "loop", software mode: enter the local fiber loop-back command) and then use a bit error test unit to run a bit error test.



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

NO

- Contact Tech Support: 800-260-1312, Int'l: 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
 10900 Red Circle Drive Minnetonka, MN 55343, U.S.A.
 telephone: 952-941-7600
 toll free: 800-526-9267
 fax: 952-941-2322

| | | |
|--|---|--|
| | Declaration of Conformity | |
| | Name of Mfg: | Transition Networks 10900 Red Circle Drive, Minnetonka MN 55343 U.S.A. |
| Model Number(s): | SPSVT2611-100, SPSVT2613-100, SPSVT2614-100, SPSVT2615-100, SPSVT2629-100, SPSVT2629-101, SPSVT2629-102, SPSVT2629-103 | |
| 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 numbers listed in this declaration of conformity conform to the Directive(s) and Standard(s) herein. | | |
| Stephen Anderson, Vice-President of Engineering | January 2012 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.



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.

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