

S4TEF10xx-1xx

User Guide

Stand-Alone Point System Device

- 4x RJ-48 T1/E1 ports
- 1x RJ-45 Ethernet 10/100Base-TX Port
- Fiber Port(s)
- 1x USB Serial Port
- Extended Temperature



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Introduction

The S4TEF10xx-1xx Device is designed to extend signals from a 10Base-T Ethernet/100Base-TX Fast Ethernet port, a USB data port, and up to four (4) T1/E1/J1 network ports over fiber. The Ethernet, and T1/E1/J1 interfaces are independent of each other and the signals from these ports can be sent over the fiber interface simultaneously.

The S4TEF10xx-1xx is designed to be installed in pairs. For example, install one S4TEF10xx-1xx as the local Device and another S4TEF10xx-1xx as the remote Device.

Model Numbers

Part Number	Duplex Fiber-Optic - 100Base-FX
S4TEF1011-120/125	ST, 1300 nm multimode, 2 km (1.2 miles)*
S4TEF1013-120/125	SC, 1300 nm multimode, 2 km (1.2 miles)*
S4TEF1014-120/125	SC, 1310 nm single mode, 20 km (12.4 miles)*
S4TEF1015-120/125	SC, 1310 nm single mode, 40 km (24.8 miles)*
S4TEF1016-120/125	SC, 1310 nm single mode, 60 km (37.2 miles)*
S4TEF1017-120/125	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. The chassis version of the Device is C4TEF10xx-1xx. For more information, see the online user's guide at: www.transition.com then click Product/Product Finder.

Model Descriptions

Part Number	Fiber-Optic - Single Fiber, Single Mode, 100Base-FX
S4TEF1029-120/125	SC, 1310 nm TX/1550 nm RX, 20 km (12.4 miles)*
S4TEF1029-121/126	SC, 1550 nm TX/1310 nm RX, 20 km (12.4 miles)*
Note: S4TEF1029-120/125 and S4TEF1029-121/126 are intended to be installed in the same link where one is the local Device and the other is the remote Device.	
S4TEF1029-122 /127	SC, 1310 nm TX/1550 nm RX, 40 km (24.8 miles)*
S4TEF1029-123/128	SC, 1550 nm TX/1310 nm RX, 40 km (24.8 miles)*
Note: S4TEF1029-122/127 and S4TEF1029-123/128 are intended to be installed in the same link where one is the local Device and the other is the remote Device.	
S4TEF1035-120/125	SC, 1550 nm single mode, 120 km (74.6 miles)*
S4TEF1040-120/125	1 SFP Port (empty)
S4TEF1040-140/145	2 SFP Ports (empty)

*Typical maximum cable distance. Actual distance depends on the physical characteristics of the network. (TX) = transmit, (RX) = receive

Port Descriptions

Port	No. of Ports	Port Description
Ethernet	1	RJ-45, 100 Mb/s, 100 m (328 ft.)*
USB	1	57600 bps 8-N-1 serial port
RJ-48	4	T1/E1/J1
Fiber	2	SFP/ST/SC

*Typical maximum cable distance. Actual distance depends on the physical characteristics of the network.

Optional accessories

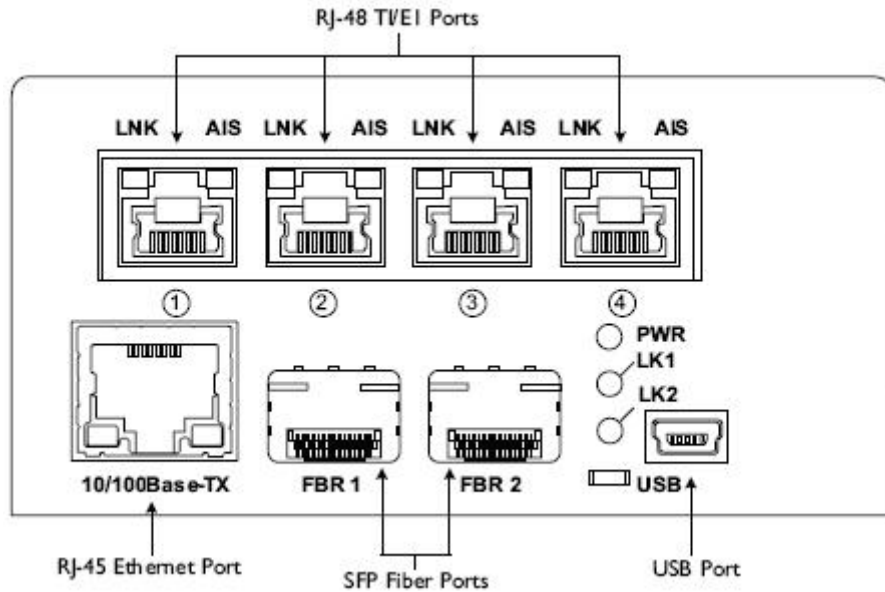
Part Number	Description
WMBL	Optional Wall Mount Bracket; 4.0 in. (102 mm)
WMBV	Optional Vertical Mount Bracket; 5.0 in. (127 mm)
WMBD	Optional DIN Rail Mount Bracket; 5.0 in. (127 mm)

Installation

Note: Due to proprietary communications over fiber, the S4TEF10xx-1xx series must be installed in pairs, where one is the local Device and the other is the remote Device.

Copper and fiber ports

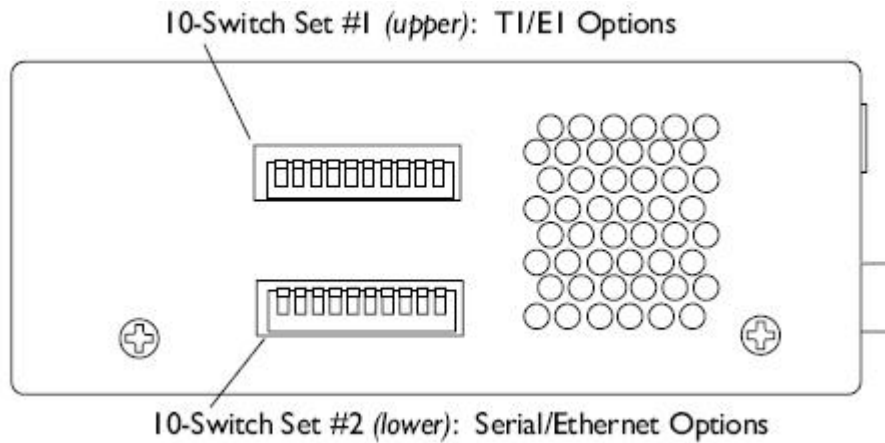
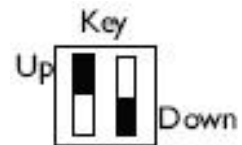
The figure below show the locations of the fiber, Ethernet, USB, and four (4) T1/E1/J1 ports.



Configuration switches

The S4TEF10xx-1xx Device has two (2) sets of configuration switches.

- Set #1 (upper) sets the T1/E1/J1 options.
- Set #2 (lower) sets the Ethernet options.



Note: Use a small device to set the switches as shown:

Switch set #1 - T1/E1/J1 options

1, 2, 3, 4 - Line settings

Switches 1, 2, 3, and 4 are used to setup the line settings for the T1/E1/J1 ports. The selected setting applies to all four (4) T1/E1/J1 ports.

Top Board DIP Switches

Switch Position 1, 2, 3, 4	Mode	Distance
UP,UP,UP,UP	DSX-1,100Ω	0 - 133ft
UP,UP,UP,DN	DSX-1,100Ω	133 - 266ft
UP,UP,DN,UP	DSX-1,100Ω	266 - 399ft
UP,UP,DN,DN	DSX-1,100Ω	399 - 533ft
UP,DN,UP,UP	DSX-1,100Ω	533 - 665ft
UP,DN,UP,DN	JI, 110Ω	0 – 665ft
UP,DN,DN,UP	DS1, 100Ω	0 db LBO
UP,DN,DN,DN	DS1, 100Ω	-7.5 db LBO
DN,UP,UP,UP	DS1, 100Ω	-15db LBO
DN,UP,UP,DN	DS1, 100Ω	-22.5db LBO
DN,DN,DN,DN	E1, 120Ω	
All Others	DSX-1,100Ω	0 - 133ft

5, 6, 7, 8 - Loopback settings

The loopback settings are used for installation and network debugging procedures. Each T1/E1/J1 port can be individually set for loopback mode:

- SW 5 controls T1/E1/J1 port 1
- SW 6 controls T1/E1/J1 port 2
- SW 7 controls T1/E1/J1 port 3
- SW 8 controls T1/E1/J1 port 4

When the loopback switch for a particular T1/E1/J1 port is enabled, the port loops the signal from the receive port back to the transmit port. The T1/E1/J1 loopback test scenarios are illustrated in the Troubleshooting section.

- SW 5 TDM P1 Loopback, Up = disable; Down = enable
- SW 6 TDM P2 Loopback, Up = disable; Down = enable
- SW 7 TDM P3 Loopback, Up = disable; Down = enable
- SW 8 TDM P4 Loopback, Up = disable; Down = enable

9 - Transmit AIS

Up - Enable the transmit AIS (Alarm Indication Signal) on loss of the carrier signal. This function is unframed and applies to ALL channels, both copper and fiber.

Down - Disable the transmit AIS function.

10 - Not used

Switch set #2 - Ethernet options

1 - Twisted-pair Auto-Negotiation

Up (*Enabled*) - The Device “advertises” ALL rate and mode capabilities to the network:

- 100 Mb/s full or half-duplex
- 10 Mb/s full or half-duplex

The Device raises the Ethernet link to the highest speed and mode possible for all the attached network devices.

When selected, Auto-Negotiation allows a twisted-pair link to become operational only after the Auto-Negotiation function matches network speed capabilities at both ends of the twisted-pair copper segment.

Down (*Disabled*) - The bridging Device does not “advertise” its rate and mode capabilities to the network. Switch 2 and switch 3 are then used to set the speed and duplex for the Ethernet link.

2 - Ethernet speed

Up (*100Base-TX*) - Sets the Ethernet port to 100Base-TX (100 Mb/s).

Down (*10Base-T*) - Sets the Ethernet port to 10Base-T (10 Mb/s).

3 - Ethernet duplex

Up (*Full-Duplex*) - Sets the Ethernet port to full-duplex mode. The twisted-pair cable distances are constrained by the cable requirements (see Cable Specifications for the various S4TEF10xx-1xx models).

Down (*Half-Duplex*) - Sets the Ethernet port to half-duplex mode. The twisted-pair cable distances are constrained by the 512-bit rule:

In a half-duplex network, the maximum cable length is determined by the round trip delay limitations of each Fast Ethernet collision domain. (A collision domain is the longest path between any two terminal devices, e.g. a terminal, switch, or router.)

The 512-bit rule determines the maximum cable length permitted by calculating the round-trip delay in bit-times (BT) of a particular collision domain. If the result is less than or equal to 512 BT, the path is good.

For more information on the 512-bit rule, see the white paper titled “Collision Domains” on the Transition Networks website at: www.transition.com/.

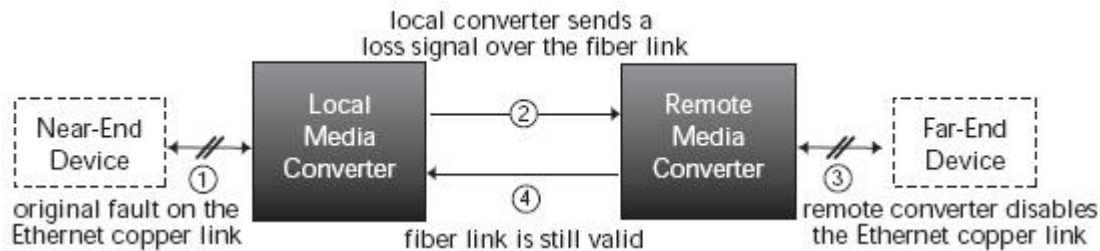
4 - Transparent Link Pass-Through

Up - Enable Link Pass-Through

Down - Disable Link Pass-Through

The Transparent Link Pass-Through feature allows the Device to monitor the Ethernet copper RX (receive) ports for loss of signal. For example, when the Ethernet copper link on the near-end device is lost (1), the local Device transmits a signal to the remote Device (2), thus, “passing through” the link loss. The remote Device disables the Ethernet copper link to the far-end device (3), which prevents the loss of valuable data unknowingly transmitted over an invalid link.

It is important to remember that although the Ethernet copper link has been disabled, the fiber link is still valid (4). Thus, there is no disruption to the transfer of T1/E1/J1 data signals over the fiber link.



5 - Fiber loopback

Up - Disable fiber loopback

Down - Enable fiber loopback

The loopback setting is used for installation and network debugging procedures. When the fiber loopback function is enabled, the fiber port loops all T1/E1/J1 and Ethernet signals from the receive port back to the transmit port.

6 - In-Band loopback detection

Up - Disable in-band loopback

Down - Enable in-band loopback

The remote in-band loopback (IBL) detection is based on NIU Facility 1 (FAC1), (FAC2) or (FAC3), or user-defined loopback codes. When enabled and a tester like the T-Berd 2310 sends IBL codes to a particular local TDM TP port (e.g., CH1), which are transmitted to the remote through the fiber. The remote Device can detect and react to this activate by de-activating the loopback codes. The corresponding remote TP port (CH1) is in loopback mode via fiber.

7 - Fiber redundancy mode

Up - Revertive Fiber Redundancy

Down - Non-Revertive Fiber Redundancy

Fiber Redundancy either “Revertive Mode” or “Non-Revertive Mode”

Note: When in Revertive Mode and the primary port loses connectivity, the secondary port takes over and when the primary port comes back up the connectivity returns to the primary port. In Non-Revertive Mode the connectivity remains on the secondary port even after the primary port regains connectivity.

8 - In-band loopback timer

Up - Enable

Down - Disable

Note: The loopback timer provides a fixed 20 minute loopback timeout when enabled. Normally, after 20 minutes, the loopback state will timeout and release. While the Device is in loopback, a reapplication of any loopback activation will reset the timer to 20 minutes.

9-10 - Not used

Hardware/Software Mode jumper (J11)

The 3-pin header (J11) is located on the top circuit board of the Device.

Hardware mode:

The Device mode is determined by the switch setting.

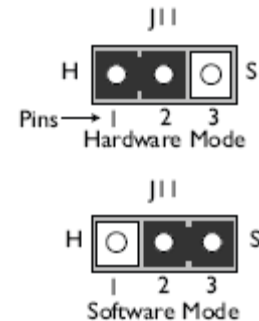
Software mode:

The Device mode is determined by the most-recently saved, on-board microprocessor settings.

To set the jumper:

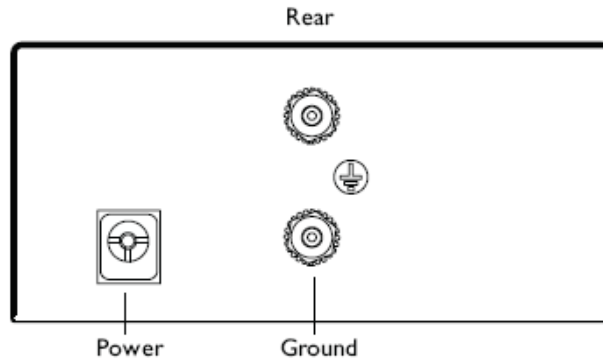
1. Using a small screwdriver, remove the four (4) screws that secure the cover and carefully remove it.
2. Locate the jumper near the back end on the upper circuit board.
3. Move the jumper to the desired position (see above).
4. Carefully replace the cover on the Device and replace the four (4) screws to secure the cover to the Device.

Jumper J11 is on the top daughter board of the two-board set. Software mode is set when the 2-position shunt is positioned on Pins 2 and 3 of Jumper J11. Software mode is the S4TEF10xx-1xx factory default setting.



Connecting power

1. Connect the barrel connector on the power adapter to the power port (located rear of Device).
2. Connect the power adapter plug into AC power.
3. Verify that the Device is powered ON by looking at the illuminated LED power indicator light on the front panel; also, the fan should be running.

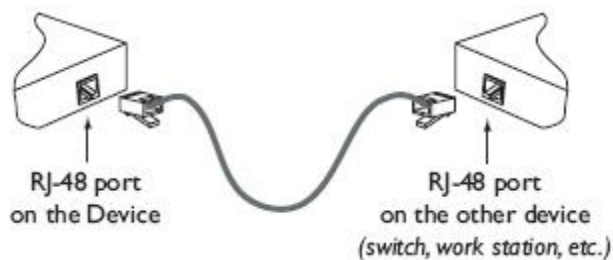


Grounding

The Device comes equipped with grounding screws, which are provided for a grounding conductor wire terminated with a two-hole, compression-type grounding connector (not provided). The grounding wire must be a copper conductor (not provided).

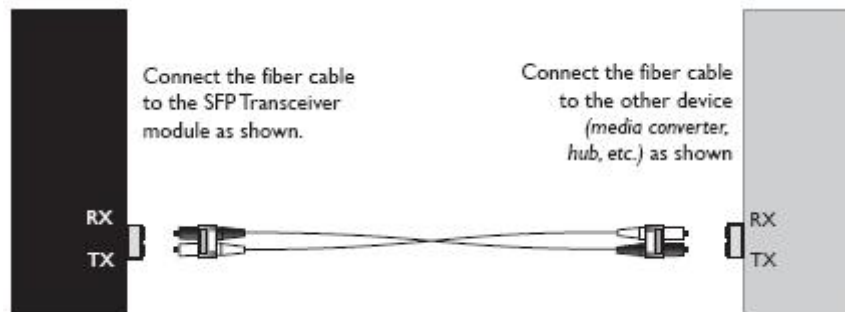
Install the T1/E1/J1 cable

1. Locate or build an ITU-compliant copper cable with straight-through RJ-48 connectors installed at both ends. (See Cable Specifications section for your network application.)
2. Connect the RJ-48 connector at one end of the cable to one of the T1/E1/J1 ports on the S4TEF10xx-1xx Device.
3. Connect the RJ-48 connector at the other end of the cable to the T1/E1/J1 port on the other device.



Install the fiber cable

1. Locate or build ITU-compliant fiber cable with male, two-stranded TX to RX connectors installed at both ends.
2. Connect the fiber cables to the local 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 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.

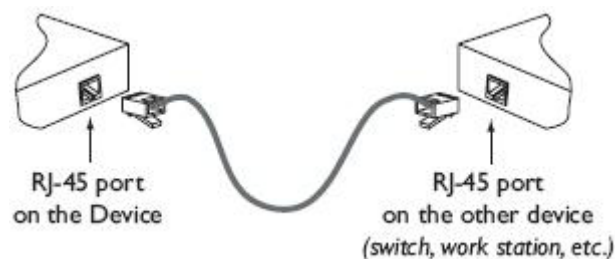


Install the Ethernet cable

Ensure that the correct cable type is installed to support the highest speed and mode of operation to be selected.

1. Locate or build an IEEE 803.2™ compliant 10Base-T or 100Base-TX cables with straight-through RJ-45 connectors installed at both ends.
2. Connect the RJ-45 connector at one end of the cable to the RJ-45 port on the S4TEF10xx-1xx Device.
3. Connect the RJ-45 connector at the other end of the cable to the RJ-45 port on the other device (switch, workstation, etc.).

Note: Straight-through (MDI) or crossover cable (MDI-X) may be used.



Operation

Fiber network LEDs

Use the status LEDs next to the fiber port to monitor the Device and the fiber network connections.

- Top, Power: Green - Power
- Middle, Fiber #2 Link: Green - ON link, Active interface
Amber - ON link, Standby mode
- Bottom, Fiber #1 Link: Green - ON link, Active interface
Amber - ON link, Standby mode

T1/E1/J1 LEDs

Each T1/E1/J1 link has a pair of LEDs embedded in the RJ-48 connector that monitors the status of the link.

- LNK LED (green) On = T1/E1/J1 link detected
Off = T1/E1/J1 signal lost or no signal
- AIS LED (amber) On = AIS (Alarm Indication Signal) detected failure of the device connected to the T1/E1/J1 port.

Ethernet LEDs

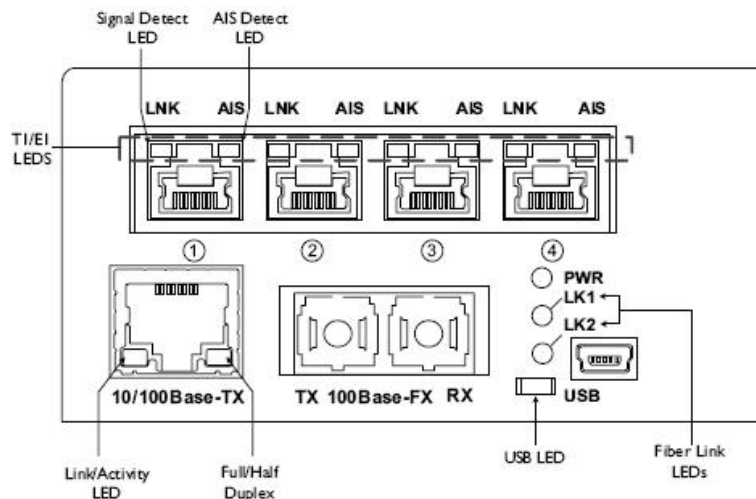
Use the bi-color status LEDs (embedded in the 10/100Base-TX RJ-45 connector) to monitor the Ethernet connections.

Speed/Link LED

- Amber = A link on the 10 twisted-pair copper link
- Flashing Amber = Activity on the 10 copper link
- Green = A link on the 100 twisted-pair copper link
- Flashing Green = Activity on the 100 copper link

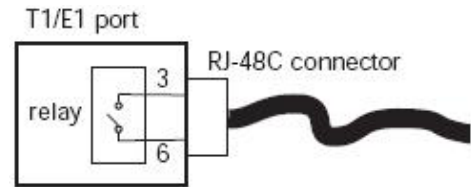
Duplex LED

- Amber = Half duplex
- Green = Full duplex



Dry-contact relay

All four T1/E1/J1 ports are equipped with an RJ-48 dry-contact relay. The relay closes if the power is lost or if any of the individual T1/E1/J1 links are lost. The operational rating on pins 3 and 6 are 0-30 VDC, 100 mA (maximum).



Accessing the maintenance interface

1. Make sure that the Device is configured for accessing the maintenance interface via the USB port (*baud rate is (57600), data bit (8), parity is (none), stop bit (1)*).
2. Connect a USB cable from the terminal to the USB connector on the Device.
3. In a Windows environment, click Start/All Programs/Accessories/Communications/HyperTerminal to launch the program.
4. Press the ENTER key and the screen shows the following Device options:
5. The only available options on the screen are the following:

```
l - Download FPGA firmware using XMODEM
o - Upgrade remote FPGA
p - Upgrade remote PIC
```

q - FPGA firmware version & status

“L” Download FPGA firmware using XModem

“Q” Get firmware version and status

Note: If you have questions about the FPGA firmware download, [Contact Us](#).

AutoCross™

The AutoCross feature allows either straight-through (MDI) or crossover (MDI-X) cables to be used when connecting to devices such as hubs, transceivers, or network interface cards (NICs). AutoCross determines the characteristics of the cable connection and automatically configures the unit to link up, regardless of the cable configuration. (Ethernet port only.)

Remote management function

The S4TEF10xx-1xx is remotely managed when connected via fiber cable to a local C4TEF10xx-1xx Device installed in a managed PointSystem™ chassis. The SNMP section (below) lists the commands that can be used to monitor and manage a networked S4TEF10xx-1xx Device at a remote location. For more details, see the online C4TEF10xx-1xx user guide at: www.transition.com and click on Product/Product Finder.

SNMP

See the on-line documentation that comes with Transition Networks FocalPoint™ software for applicable commands and usage.

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

- Device power
- Fiber link status
- Copper link status for each T1/E1/J1 (*AIS, link*)
- Copper link status for Ethernet (*link, speed, duplex*)
- All hardware switch settings
- AIS detected copper link and fiber link
- Model #, serial #, PIC revision/FPGA version
- HW revision, group string, connectors

Also, use SNMP to enter network commands that:

- Local and remote fiber loopback
- Local and remote T1/E1/J1 loopback for each channel
- T1/E1/J1 line options (*DS1, DSX-1, J1, D1, AIS*)
- Ethernet settings (*Auto-Negotiation, speed, duplex, Link Pass-Through*)
- T1/E1/J1 monitor modes and loopback modes

The local (*auxiliary*) factory maintenance interface via the USB connector supports the following:

- Download FPGA firmware using XModem
- Upgrade remote FPGA (from chassis device only)
- Upgrade remote PIC (from chassis device only)
- FPGA firmware version and status

Cable Specifications

The physical characteristics must meet or exceed ITU and IEEE802.3 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
S4TEF1011-120/125 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
S4TEF1013-120/125	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
S4TEF1014-120/125	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
S4TEF1015-120/125 (<i>long haul</i>)	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
S4TEF1016-120/125 (<i>extra long haul</i>)	1310 nm single mode
S4TEF1017-120/125 (<i>long wave length</i>)	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
S4TEF1029-120/125	1310 nm TX/1550 nm RX simplex
S4TEF1029-121/126	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
S4TEF1029-122/127	1310 nm TX/1550 nm RX simplex
S4TEF1029-123/128	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
S4TEF1035-120/125	1550 nm single mode
Fiber-optic Transmitter Power:	min: 0.0 dBm max: 5.0 dBm
Fiber-optic Receiver Sensitivity:	min: -36.0 dBm max: -3.0 dBm
Link Budget:	36.0 dB

Ethernet cable

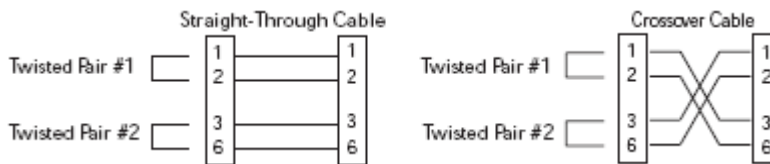
Category 3: (minimum requirement for 10 Mb/s operation)

Gauge 24 to 22 AWG
 Attenuation 11.5 dB/100m @ 5-10 MHz
 Maximum cable distance 100 meters

Category 5: (minimum requirement for 100 Mb/s operation)

Gauge 24 to 22 AWG
 Attenuation 22.0 dB /100m @ 100 MHz
 Maximum cable distance 100 meters

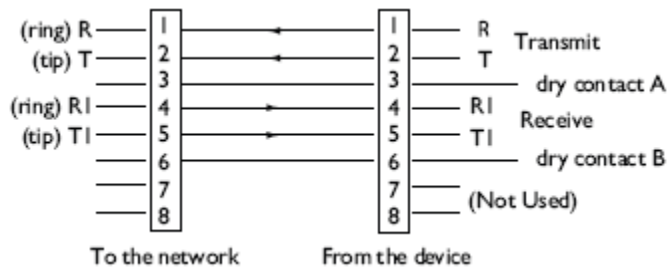
- Straight-through (MDI) or crossover (MDI-X) cable can be used.
- Shielded (STP) or unshielded (UTP) twisted-pair cable may be used.
- Pins 1&2 and 3&6 are the two active pairs in an Ethernet network.
- Use only dedicated wire pairs for the active pins: (e.g., blue/white & white/blue, orange/white & white/orange, etc.)
- Do not use flat or silver satin wire.



T1/E1/J1 cable

Category 3: (minimum requirement)

USOC: RJ-48C
 Electrical network connection: Single 4-wire (Tip/Ring - Tip1/Ring1)
 Mechanical arrangement: 8-position miniature modular jack
 Usage: 1.544 Mb/s access lines
 Interface codes: 04DU9 (any applicable)
 Cable type:
 Long Haul T1: 0db, -7.5dB, -15db, -22db
 E1: E1 3.0V, 120 ohm
 J1: 0-655', 120 ohm
 DSX-1: 0-133', 133-266', 266-399', 399-533', 533-655', 100 ohm



USB mini cable pinouts

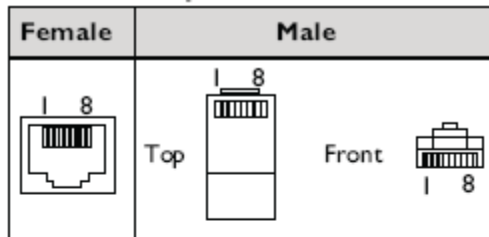


Pin	Name	Color	Description
1	VBus	Red	+5V
2	D-	White	Data-
3	D+	Green	Data+
4	ID	None	Permits distinction of A plug form B plug - A plug: Connected to signal ground - B plug: Not Connected
5	GND	Black	Signal ground

Maximum cable length: 5 meters (16.4 feet).

RJ-45 cable pinouts

RJ-45 Pinouts



Pin	Name	Description	One Side	Another Side
1	TX_D1+	Transceive data +		
2	TX_D1-	Transceive data -		
3	RX_D2+	Receive data +		
4	B1_D3+	Bi-directional Data+		
5	BX_D3-	Bi-directional Data-		
6	RX_D2-	Receive data -		
7	B1_D4+	Bi-directional Data+		
8	BX_D4-	Bi-directional Data-		

Technical Specifications

For use with Transition Networks Model S4TEF10xx-1xx or equivalent.

Data Rate - Copper:	10 Mb/s, 100 Mb/s
Data Rate - Fiber:	155 Mb/s
Dimensions	3.7" x 4.7" x 1.8" (93 x 120 x 47 mm)
Weight	2 lb. (0.90 kg) approximate
Power Consumption	4.4 watts
Power Supply	12VDC, 0.8A (North Am., Europe, Japan, Latin Am.) 12 VDC, 1.25A (UK, Australia, N.Z., South Africa) (The external power supply provided with this product is UL listed by the power supplier's manufacturer.)
Packet Size	Memory: 288 K bytes Maximum packet size: 1536 bytes Unicast MAC addresses: 1000
Environment	Operating Temperature: -40 to 70°C (-40 to 158°F) Storage Temperature: -40 to 85°C (-40 to 185°F) Humidity: 5 to 95% non condensing
Warranty	Lifetime

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

CAUTION: 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 intrabuilding (*inside plant*) link segments that are not subject to lightning 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 interbuilding (*outside plant*) link segments that are subject to lightning transients or power faults. Failure to observe this caution could result in damage to equipment.

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” LED illuminated?
NO
 - Ensure that the power adapter is the proper type (voltage and 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 fiber “LK 1 or 2” LED illuminated?
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 3.
3. Is the “Duplex/Link” LED illuminated?
NO
 - Check the copper cables for proper connection.
 - Contact Tech Support: 1-800-260-1312, Int'l: 00-1-952-941-7600.YES
 - Amber = The Device has selected half-duplex mode.
 - Green = The Device has selected full-duplex mode.
 - If the mode is not correct, disconnect and reconnect the twisted pair cable to restart the initialization process.
 - Proceed to step 4.
4. Is the “Speed” LED illuminated?
NO
 - Check the copper cables for proper connection.
 - Contact Tech Support: 1-800-260-1312, Int'l: 00-1-952-941-7600.YES
 - Amber = The Device has selected 10Mb/s operation.
 - Green = The Device has selected 100Mb/s operation.
 - If the speed is not correct, disconnect and reconnect the twisted pair cable to restart the initialization process.
 - Proceed to step 5.
5. Is the “LNK” on a T1/E1/J1 port (with a copper cable installed) illuminated?
NO
 - Check the copper cable connected to that T1/E1/J1 port for proper connection.
 - Contact Tech Support: 1-800-260-1312, Int'l: 00-1-952-941-7600.YES
 - Proceed to step 6.
6. Is the “AIS” on a T1/E1/J1 port (with a copper cable installed) illuminated?
YES
 - The Device connected to the T1/E1/J1 port has failed. Correct the device failure.
 - Contact Tech Support: 1-800-260-1312, Int'l: 00-1-952-941-7600.NO
 - Proceed to step 7.

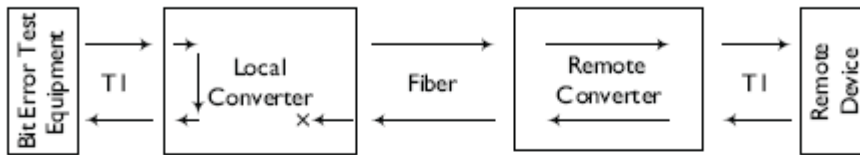
Manual loopback test

Note: Use Focal Point or the GUI to configure loopbacks.

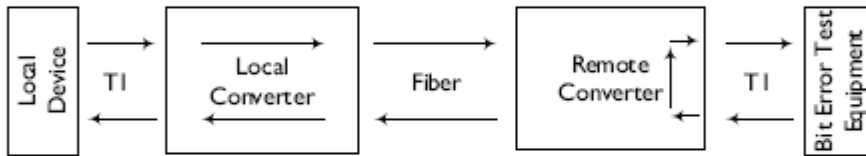
7. Is data transfer failing on one of the T1/E1/J1 ports?

YES

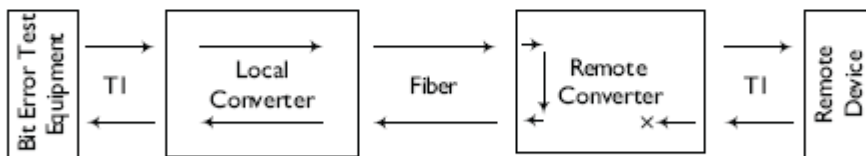
- In software mode only, verify the local T1/E1/J1 connection of the local Converter, by entering the TDM to TP loopback command at the local converter. See drawing below.



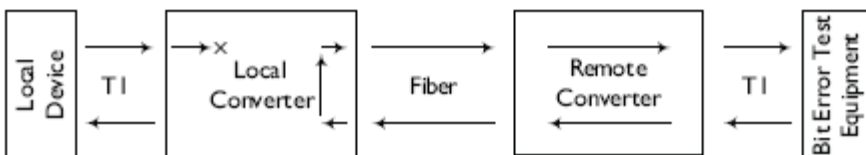
- In software mode only, verify the remote T1/E1/J1 connection of the remote Converter, by entering the TDM to TP loopback command at the local Converter. See drawing below.



- Verify the local T1/E1/J1 connection at the remote Converter:
 - In hardware mode, on SW set "1," set the remote Converter SW positions 5, 6, 7, 8 down (*enabled*).
 - In software mode, use the TDM to fiber loopback command at the remote Converter. In both cases, see drawing below.



- Verify the remote Converter T1/E1/J1 connection at the local Converter:
 - In hardware mode: on SW set "1," set the local Converter SW positions 5, 6, 7, 8 down (*enabled*).
 - In software mode: enter the TDM to fiber loopback command at the local Converter. In both cases, see drawing below.



In-band loopback code detection

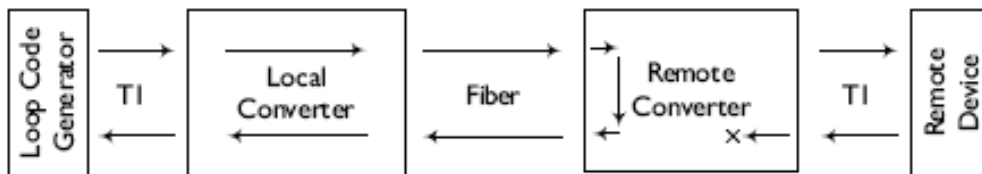
Enables detection and loopback of the fiber interface based on NIU Facility 2 (FAC2) loopback codes. Certain testers, e.g., T-BERD 2310 can send in-band loopback codes into the local TP interface, which are transmitted to the remote Device through the fiber. The remote Device can detect and react to this activity and de-activate the loopback codes. For detection, these codes must be sent for 5 seconds minimum.

Loopback Codes

FAC = Facility	Up	Down	# of Bits
FAC 1	1100	1110	4
FAC 2	11000	11100	5
FAC 3	1000000	000100	6

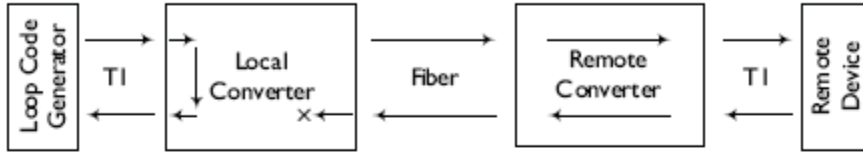
Note: Bit patterns are user selectable (all loop codes are generated at the local converter).

- Using the GUI, verify the local Converter T1/E1/J1 connection at the remote Converter:
 - In hardware mode, set loop code generator to FAC 2. On the remote Converter SW set "2," set SW position 6 down (in-band loopback detection enabled).
 - In software mode, enter the TDM in-band to fiber loopback command at the local Converter for the remote device. In both cases, see drawing below.

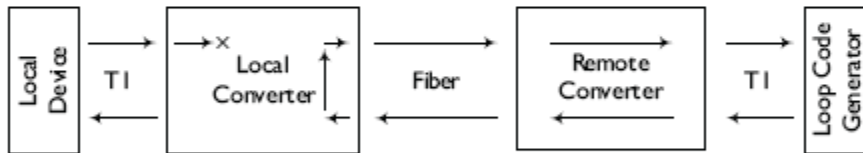


In-band loopback code detection — continued

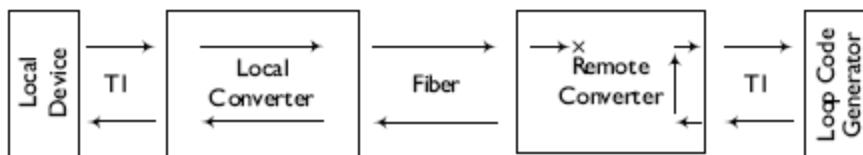
- Verify the local Converter T1/E1/J1 connection at the local Converter:
 - In software mode only, enter the TDM in-band to TP loopback command at the local Converter. See drawing below.



- Verify the remote Converter T1/E1/J1 connection on the local Converter with loop codes generated at the remote converter:
 - In hardware mode, set loop code generator to FAC 2. On the local Converter SW set “2,” set SW position 6 down (*in-band loopback detection enabled*).
 - In software mode: enter the TDM in-band to fiber loopback command at the local Converter. Select a FAC loop code from the drop-down menu on the interface: FAC 1, 2, 3, or FACU use selectable (*5, 6, 7, or 8 bits*). In both cases, see drawing below.



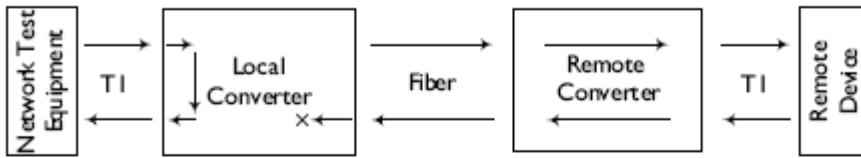
- Verify the remote Converter T1/E1/J1 connection on the remote Converter with loop codes generated at the remote converter:
 - In software mode only: Enter the remote TDM in-band to TP loopback command at the local Converter’s user interface. See drawing below.



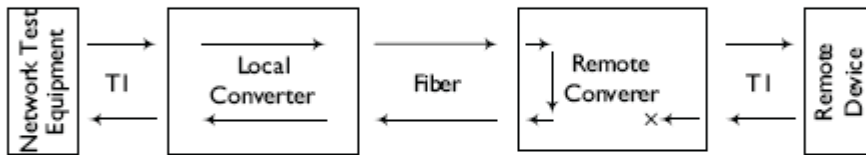
8. Is data transfer failing on the Ethernet port?

YES

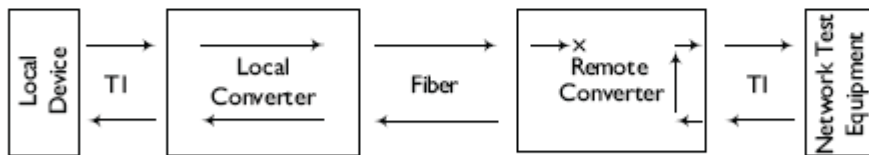
- In software mode only, verify the local Ethernet connection on the local Converter, by entering the Ethernet to TP loopback command at the local Converter. See drawing below.



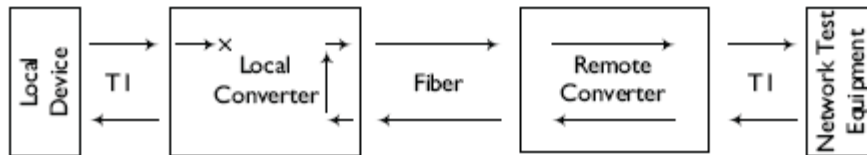
- In software mode only, verify the local fiber and RJ-45 connections on the remote Converter, by entering the Ethernet to fiber loopback command at the local Converter's user interface. See drawing below.



- In software mode only, verify the remote Ethernet connection on the remote Converter, by entering the Ethernet to TP loopback command on the remote converter's tab of the local Converter's user interface. See drawing below.



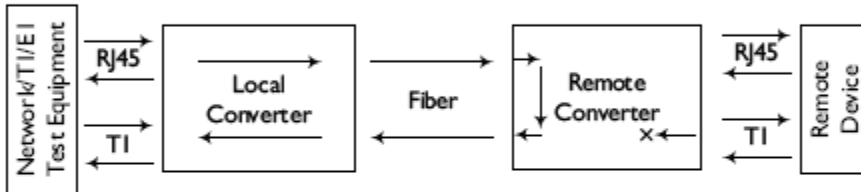
- In software mode only, verify the remote fiber and RJ-45 connections on the remote Converter, by entering the Ethernet to fiber loopback command on the remote converter's tab of the local Converter's user interface. See drawing below.



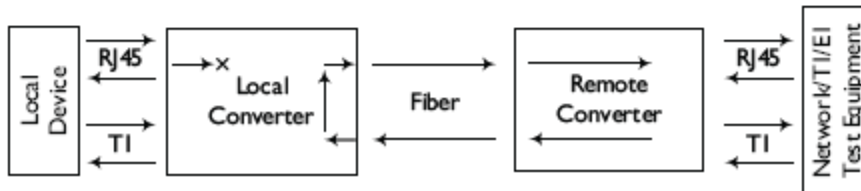
9. Is data transfer failing on the T1/E1/J1 ports or Ethernet port?

YES

- Verify the full fiber channel T1/E1/J1 and Ethernet connections on the local Converter from the remote Converter:
 - In hardware mode, on SW set “2,” set the local Converter SW position 5 down (*fiber loopback enabled*).
 - In software mode, use the TDM to fiber loopback command at the local Converter (*all channels*). In both cases, see drawing below.



- Verify the full fiber channel T1/E1/J1 and Ethernet connections on the remote Converter from the local Converter:
 - In hardware mode, on SW set “2,” set the remote Converter’s SW position 5 down (*fiber loopback enabled*).
 - In software mode, use the TDM to fiber loopback command at the remote Converter (*all channels*). In both cases, see drawing below.



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.


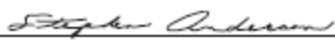
telephone: 952-941-7600

toll free: 800-526-9267

fax: 952-941-2322

Compliance Information

Declaration of Conformity

		Declaration of Conformity	
Name of Mfg:	Transition Networks 10900 Red Circle Drive, Minnetonka MN 55343 U.S.A.		
Model:	S4TEF10xx-1xx Series Devices		
Part Number(s):	S4TEF1011-120/125, S4TEF1013-120/125, S4TEF1014-120/125, S4TEF1015-120/125, S4TEF1016-120/125, S4TEF1017-120/125, S4TEF1029-120/125, S4TEF1029-121/126, S4TEF1029-122/127, S4TEF1029-123/128, S4TEF1035-120/125, S4TEF1040-120/125, S4TEF1040-140/145		
Purpose:	To declare that the S4TEF10xx-1xx to which this declaration refers is in conformity 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; EN61000-3-2; EN61000-3-3; CFR Title 47 Part 15 Subpart B Class A; 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		December, 2011 Date	

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 risqué de créer des interférences radioélectriques, il appartiendra alors à l'utilisateur de prendre les mesures 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.

VCCI Class 1 compliance

This equipment is in the 1st Class category (information equipment to be used in commercial and/or industrial areas) and conforms to the standards set by the Voluntary Control Council For Interference by Data Processing Equipment and Electronic Office Machines aimed at preventing radio interference in commercial and/or industrial areas. When used in a residential area or in an adjacent area thereto, interference may be caused to radio and TV receivers, etc. Read the instructions for correct handling.

Record of Revisions

Rev	Date	Notes
A	21/21/11	Initial release.
B	09/19/12	Updated with switch time, WTR, recovery time information.
C	04/23/13	Added J11 default mode information.

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