TRANSITION
NETWORKS®

User's Guide
S4TEF10xx-11x
Stand-Alone Media Converter
- **Twisted-Pair Copper to Fiber**
- **10/100Base-TX to 100Base-FX**
- **RS-232 to Fiber**
- **(4) T1/E1 to Fiber**

The S4TEF10xx-11x media converter is designed to extend signals from a 10Base-T Ethernet/100Base-TX Fast Ethernet port, an RS-232 data port, and up to four (4) T1/E1 network ports over fiber. The Ethernet, RS-232, and T1/E1 interfaces are independent of each other and the signals from these ports can be sent over the fiber interface simultaneously.

The S4TEF10xx-11x is designed to be installed in pairs. For example, install one S4TEF1011-110 as the local media converter and another S4TEF1011-110 as the remote media converter. All S4TEF10xx-11x models have the following copper connectors.

Connector Type	Number	Description
Ethernet	1	RJ-45, 100 Mb/s, 100 m *(328 ft.)**
RS-232	1	6-pin, DIN serial 3.2 m *(10 ft.)**
T1	4	RJ-48

The various fiber connectors are available on separate models. Both duplex and single mode fiber optic converters are available:

Part Number	Duplex Fiber-Optic - 100Base-FX
S4TEF1011-110	ST, 1300 nm multimode, 2 km *(1.2 miles)**
S4TEF1013-110	SC, 1300 nm multimode, 2 km *(1.2 miles)**
S4TEF1014-110	SC, 1310 nm single mode, 20 km *(12.4 miles)**
S4TEF1015-110	SC, 1310 nm single mode, 40 km *(24.8 miles)**
S4TEF1016-110	SC, 1310 nm single mode, 60 km *(37.2 miles)**
S4TEF1017-110	SC, 1550 nm single mode, 80 km *(49.7 miles)**
S4TEF1018-110	MT-RJ, 1300 nm multimode, 2 km *(1.2 miles)**
S4TEF1029-11x	*(Single mode, single fiber models are listed on page 2.)*

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

The chassis version of the media converter is C4TEF10xx-11x. For more information, see the user's guide on-line at: www.transition.com.

Part Number	Fiber-Optic - *Single* Fiber, Single Mode, 100Base-FX
S4TEF1029-110	SC, 1310 mn TX/1550 nm RX, 20 km *(12.4 miles)**
S4TEF1029-111	SC, 1550 mn TX/1310 nm RX, 20 km *(12.4 miles)**
Note:	S4TEF1029-110 and S4TEF1029-111 are intended to be installed in the same link where one is the local converter and the other is the remote converter.
S4TEF1029-112	SC, 1310 mn TX/1550 nm RX, 40 km *(24.8 miles)**
S4TEF1029-113	SC, 1550 mn TX/1310 nm RX, 40 km *(24.8 miles)**
Note:	S4TEF1029-112 and S4TEF1029-113 are intended to be installed in the same link where one is the local converter and the other is the remote converter.
S4TEF1035-110	SC, 1550 nm single mode, 120 km *(74.6 miles)**

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

The information in this user's guide is subject to change. For the most up-to-date information on the S4TEF10xx-11x media converter, see the user's guide on-line at: www.transition.com.

Installation

Note: Because of proprietary communication over fiber, the S4TEF10xx-11x is required to be installed in pairs, where one is the local converter and the other is the remote converter.

Copper and fiber ports

The figure below illustrates the locations of the fiber port, the Ethernet port, the RS-232 port, and the four (4) T1/E1 ports.
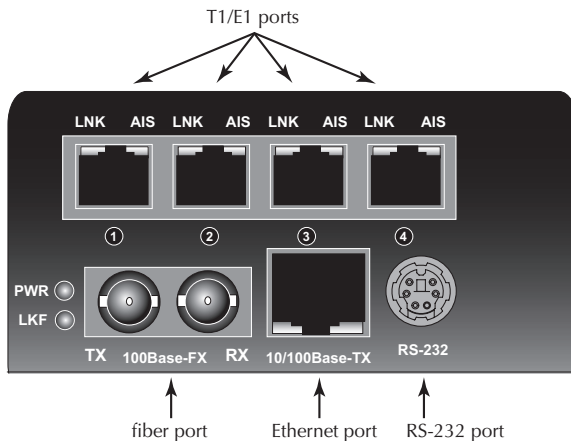
Note: An RS-232 cable with a 6-pin DIN connector and a DB-9 connector is included with the S4TEF10xx-11x media converter.
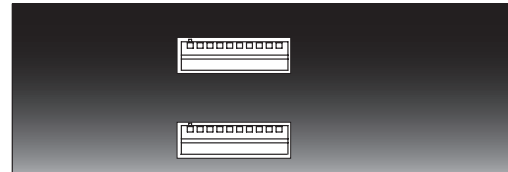
Installation -- Continued

Configuration switches

The S4TEF10xx-11x media converter has two (2) sets of configuration switches.

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

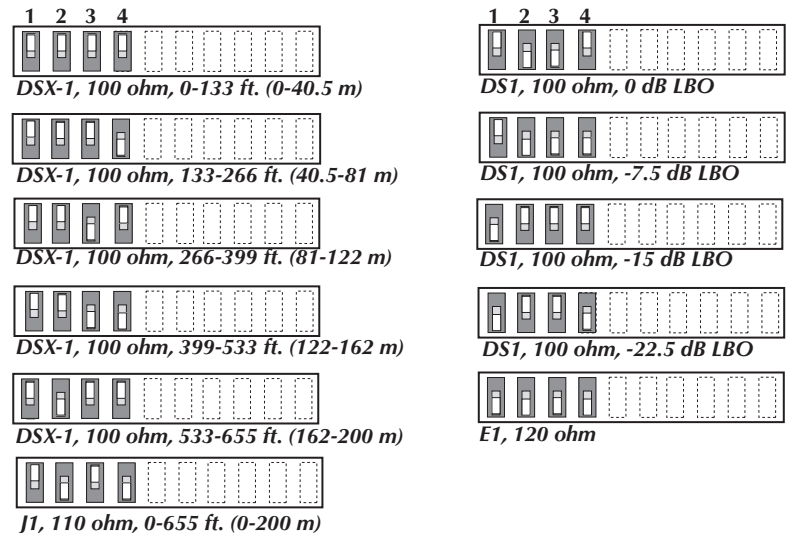Switch Set #1 (upper): T1/E1 Options

Switch Set #2 (lower): Serial / Ethernet Options

Use a flat blade screwdriver to set the switches as shown: Key:

up   down

Switch set #1 - T1/E1 options

1, 2, 3, 4 - Line settings

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

DSX-1, 100 ohm, 0-133 ft. (0-40.5 m)

DSX-1, 100 ohm, 133-266 ft. (40.5-81 m)

DSX-1, 100 ohm, 266-399 ft. (81-122 m)

DSX-1, 100 ohm, 399-533 ft. (122-162 m)

DSX-1, 100 ohm, 533-655 ft. (162-200 m)

J1, 110 ohm, 0-655 ft. (0-200 m)

DS1, 100 ohm, 0 dB LBO

DS1, 100 ohm, -7.5 dB LBO

DS1, 100 ohm, -15 dB LBO

DS1, 100 ohm, -22.5 dB LBO

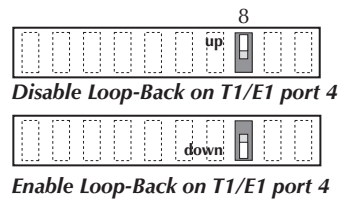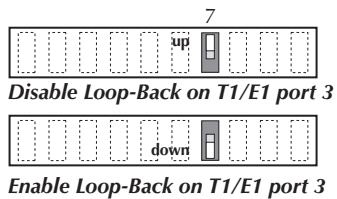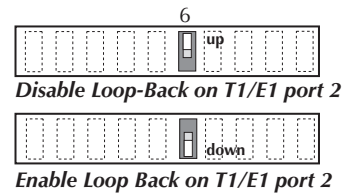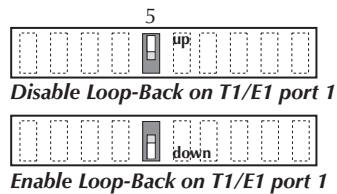*E1, 120 ohm*

Installation -- Continued

Switch set #1 - T1/E1 options

5, 6, 7, 8 - Loop-Back settings

The loop-back setting is used for installation and network debugging procedures. Each of the T1/E1 ports can be individually set for loop-back mode:

• Switch 5 controls T1/E1 port 1
• Switch 6 controls T1/E1 port 2
• Switch 7 controls T1/E1 port 3
• Switch 8 controls T1/E1 port 4

When the loop-back switch for a particular T1/E1 port is enabled, the port loops the signal from the receive port back to the transmit port. The T1/E1 loop-back test scenarios are described in detail in under Troubleshooting, on page 24.

Disable Loop-Back on T1/E1 port 1

Enable Loop-Back on T1/E1 port 1

Disable Loop-Back on T1/E1 port 2

Enable Loop Back on T1/E1 port 2

Disable Loop-Back on T1/E1 port 3

Enable Loop-Back on T1/E1 port 3

Disable Loop-Back on T1/E1 port 4

Enable Loop-Back on T1/E1 port 4

9 - Transmit AIS

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

down - Disable the transmit AIS function.

Data Mode

Local Management Mode
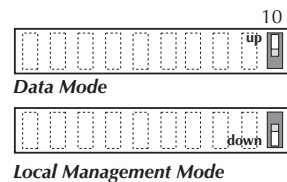
10 - RS-232 Port Mode

up - Data port mode *(normal operation)*. Transmits data to a desk top computer or other data collection device

down - Local (auxiliary) management mode. See the SNMP section *(page 12)* for the commands that are supported via the RS-232 connector.

Installation -- Continued

Switch set #2 - serial and ethernet options

1, 2, 3 - Serial connection speed line settings

Switches 1, 2, and 3 on switch set #2 are used to set the serial connection speed.

1200 baud

2400 baud

4800 baud

9600 baud

19200 baud

38400 baud

57600 baud

115200 baud
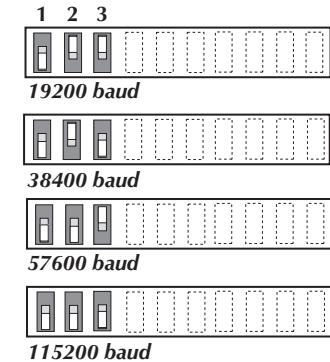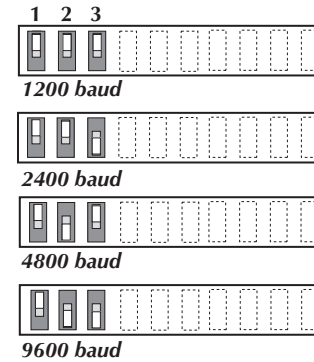
4. Enable/disable parity

When parity is enabled, an additional bit is added to the 8-bit signal to identify whether the signal is sent successfully. Use switch 5 to send odd or even signal parity.

Up - Disable parity.
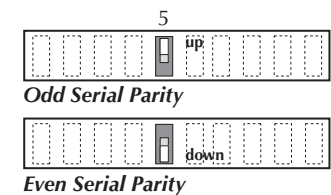
Down - Enable parity.

Disable Parity
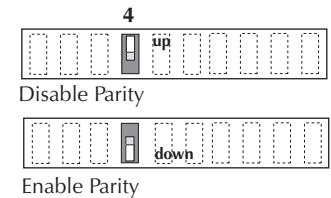
Enable Parity

5. Parity select

Up - Select odd serial parity.

Down - Select even serial parity.

This switch is inactive if switch 4 is *(up)*.

Odd Serial Parity

Even Serial Parity

Installation — Continued

Switch set #2 - serial and ethernet options

6 - Twisted-pair Auto-Negotiation

Up *(Enabled)* - The media converter "advertises" ALL rate and mode capabilities to the network:
  • 100 Mb/s full- or half-duplex
  • 10 Mb/s full- or half-duplex

The media converter brings up the Ethernet link to the highest speed and mode possible for all the attached network devices.

*Enable Auto-Negotiation*

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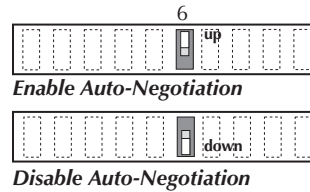
When selected, Auto-Negotiation allows a twisted-pair link to become operational only after the Auto-Negotiation function matches network speed capabilities at both ends of the twisted-pair copper segment.

down *(Disabled)* - The bridging media converter does not "advertise" the rate and mode capabilities to the network. Switch 7 and switch 8 are then used to set the speed and mode for the Ethernet link.

Note: Switch 7 and 8 are inactive if switch 6 is enabled *(up)*.

7 - Ethernet speed

up *(100Base-TX)* - Sets the Ethernet port to 100Base-TX *(100 Mb/s)*.
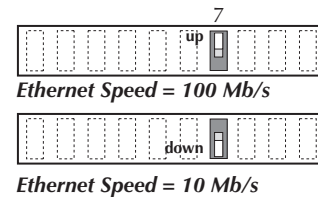
down *(10Base-T)* - Sets the Ethernet port to 10Base-T *(10 Mb/s)*.

Ethernet Speed = 100 Mb/s

Ethernet Speed = 10 Mb/s

8 - Ethernet node

up *(Full-Duplex)* - Sets the Ethernet port to full-duplex mode. The twisted-pair cable distances are constrained by the cable requirements *(see pages 1 and 2 for the cable specifications for the various S4TEF10xx-11x 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 lengths are 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.)*

Full-Duplex

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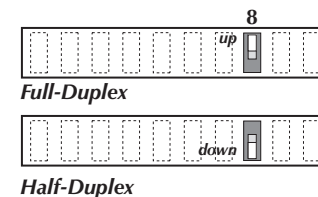
The 512-bit rule determines the maximum length of cable permitted by calculating the round-trip delay in bit-times (BT) of a particular collision domain. If the result is less than or equal to 512 BT, the path is good.

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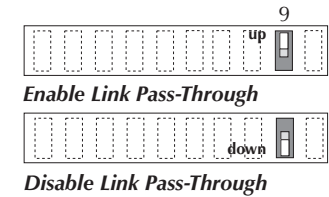
Installation -- Continued

Switch set #2 - serial and ethernet options

9 - Transparent Link Pass-Through

Up - Enable Link Pass-Through

Down - Disable Link Pass-Through

Enable Link Pass-Through

Disable Link Pass-Through

The Transparent Link Pass-Through feature allows the media converter 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 media converter transmits a signal to the remote media converter (2), thus, "passing through" the link loss. The remote media converter 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 or RS-232 data signals over the fiber link.

local converter sends a
loss signal over the fiber link

Near-End Device ① | Local Media Converter | ② Remote Media Converter | ③ Far-End Device

original fault on the Ethernet copper link

fiber link is still valid

remote converter disables the Ethernet copper link
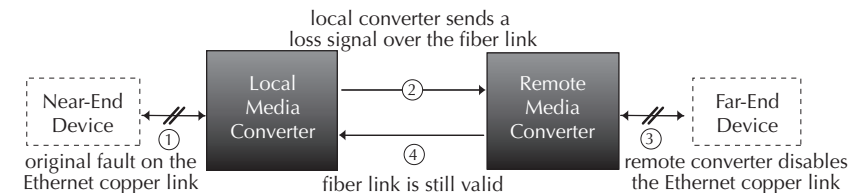
10 - Fiber Loop-Back

Up - Disable fiber loop-back.

Down - Enable fiber loop-back.

The loop-back setting is used for installation and network debugging procedures. When the fiber loop-back function is enabled, the fiber port loops all T1/E1 and Ethernet signals from the receive port back to the transmit port. The fiber loop-back test scenarios are described in detail on page 18.

Disables Loop-Back

Enables Loop-Back
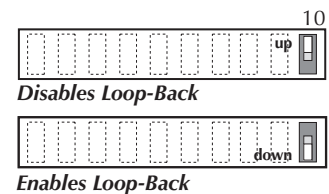
Installation — Continued

Hardware/software jumper

The jumper is located on the circuit board, inside the media converter housing.

S [○ ○ ●] **H**

Software Mode

Hardware:

The media converter mode is determined by the switch setting *(see pages 3 - 7)*.

S [● ○ ○] **H**

Hardware Mode

Software:

The media converter 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 the cover from the media converter.

2. Locate the jumper near the back end on the upper circuit board.

3. Using small needle-nosed pliers or similar device, move the jumper to the desired position *(see above)*.

4. Carefully replace the cover on the media converter and replace the four (4) screws that secure the cover to the media converter.

Power the media converter

1. Connect the barrel connector on the power adapter to the media converter's power port (*located on 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.

Note: For DC power, consult the user's guide for the Transition Networks SPS1872-xx DC external power supply.

Install the T1/E1 cable

1. Locate or build ITU-compliant copper cable with straight-through RJ-48 connectors installed at both ends. *(See pages 19 thru 21 for the proper cable specifications for your network application.)*.

2. Connect the RJ-48 connector at one end of the cable to one of the T1/E1 ports on the S4TEF10xx-11x media converter.

3. Connect the RJ-48 connector at the other end of the cable to the T1/E1 port on the other device.

Installation -- Continued

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 S4TEF10xx-11x 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 remote S4TEF10xx-11x media converter as described:
   • Connect the male TX cable connector to the female RX port.
   • Connect the male RX cable connector to the female TX port.

Connect the fiber cable to the local media converter as shown.

Connect the fiber cable to the remote media converter as shown
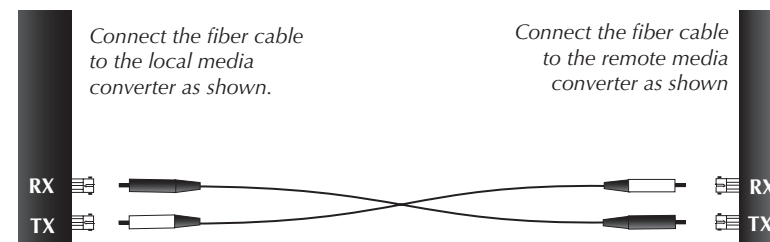
Install the ethernet cable

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

1. Locate or build IEEE 803.2™ compliant 10Base-T or 100Base-TX cables, with straight-through RJ-45 cable, and 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-11x media converter.

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: The MDI *(straight-through)* or MDI-X *(crossover)* cable connection is configured automatically, according to the network conditions.

RJ-45 port on the media converter

RJ-45 port on the other device (switch, work station, etc.)

Installation -- Continued

Install the RS-232 data cable *(included)*

1. Use the enclosed RS-232 data cable with a male, DIN 6-pin connector on one end and a DB-9 connector installed on the other end.

2. Connect the DIN 6-pin connector to the RS-232 port on the S4TEF10xx-11x media converter.

3. Connect the DB-9 connector at the other end of the cable to the RS-232 port on a computer or other device that is used to collect and display data.

Operation

Fiber network LEDs

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

LKF *(fiber link)*

ON = Fiber link connection.

PWR *(power)*

ON = Connection to external AC or DC power.

T1/E1 LEDs

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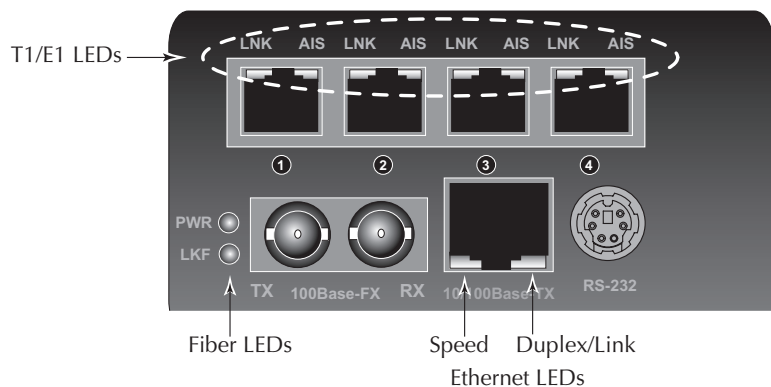
LNK LED

ON = T1/E1 link detected.

OFF= T1/E1 signal lost or no signal.

AIS LED

ON = AIS *(Alarm Indication Signal)* detected. Failure of the device connected to the T1/E1 port.

T1/E1 LEDs

Fiber LEDs   Speed   Duplex/Link
Ethernet LEDs

Operation -- Continued

Ethernet LEDs

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

Duplex/Link LED:

Amber = A link on the half-duplex twisted-pair copper link.

Flashing Amber = Activity on the half-duplex copper link.

Green = A link on the full-duplex twisted-pair copper link.

Flashing Green = Activity on the full-duplex copper link.

Speed LED:

Amber = 10 Mb/s operation.

Green = 100 Mb/s operation.

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.

Dry-contact relay

All four T1/E1 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 links are lost. The operational rating on pins 3 and 6 are 0-30 VDC, 100 mA *(maximum)*.

T1/E1 port

relay   3
          6   RJ-48C connector
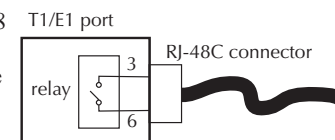
Optional accessories

The following items are available from Transition Networks

Part Number	Description
SPS-1872-SA	Optional External Power Supply; 18-72VDC Stand-Alone Output: 12.6VDC, 1.0 A
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)*

Operation — Continued

Remote management function

The S4TEF10xx-11x can be remotely managed when connected via fiber cable to a local C4TEF10xx-11x slide-in-module media converter that is installed in a managed Transition Networks *PointSystem*™ chassis. The SNMP section *(below)* lists the commands that can be used to monitor and manage a networked S4TEF10xx-11x media converter at a remote location. For more details, see the C4TEF10xx-11x user's guide on-line at: www.transition.com.

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 media converter by monitoring:

- Media converter power
- Fiber link status
- Copper link status for each T1/E1 *(AIS, link)*
- Copper link status for Ethernet *(link, speed, duplex)*
- RS-232 status *(speed, bits, parity, stop)*
- All hardware switch settings
- AIS detected copper link and fiber link
- Model #, serial #, PIC revision
- HW revision, group string, connectors

Also, use SNMP to enter network commands that:

- Local and remote fiber loop-back
- Local and remote T1/E1 loop-back for each channel
- T1/E1 line option*s (DS1, DSX-1, J1, D1, AIS)*
- Ethernet settings *(Auto-Negotiation, speed, duplex, Link Pass-Through*)
- RS-232 settings *(speed, bits, parity, stop)*
- T1/E1 monitor modes and loop-back modes
- Boot-load firmware *(local unit only)*

The local *(auxiliary)* factory maintenance interface via the RS-232 connector supports the following:

- Switch selection for the RS-232 interface
- Access to all local and remote status information
- Perform all local and remote commands
- Operate at selected baud rates

Operation -- Continued

Accessing the local RS232 factory maintenance interface

1. Make sure that this Device is configured for accessing the maintenance interface via the RS232 port *(Switch #10, on Bank #1, down. See page 4)*.

2. Attach RS232 cable from the terminal to the DIN6 plug. The settings for the baud rate and parity are the same as the settings for the Serial Transport.

3. To display the main screen, press the ENTER key and a header message will appear on the screen:

```
T1/E1x4 with Ethernet to Fiber Converter (S4TEF1011-110)
Version: C [ 050728LO] SN: 676.
Copyright (c) 2005 Transition Networks
Software Mode!

Type 'L' to login
```

4. To access the maintenance interface, press the letter 'L' key to login and a password prompt will appear:

   Password?

5. Type the password:

   a. If a password has been set, enter the password, then press the ENTER key to access the main menu.

Note: If you forget the password, contact techsupport.

   b. If no password has been set, press the ENTER key to access the main menu.

```
Main Menu:
p XXXXXXXX - Change password (Maximum of 8 characters)
d         - Display current configuration (Rev)
c [ l/r]  - Go to Configuration Menu (local/remote)
u         - Upgrade Remote Device's firmware via fiber
b         - Bypass hardware mode
r         - Reset Device
RETURN    - List of commands
q         - Logout
->
```

Accessing the menu commands:

1. At the prompt, press the letter key of the desired menu command.

2. Press the ENTER key and the screen will show the menu of the selected command.

Operation -- Continued

Setting the password:

1. At the prompt, press the letter "P" key.

2. At the prompt, type any alphanumeric combination *(8 characters maximum)*

3. Press the ENTER key: the password is set.

Important: After setting up or changing command parameter(s) you must save the change(s) before exiting the screen or the change(s) will not go into effect.

To show the current configuration:

1. At the prompt, press the letter "D" key.

2. Press the ENTER key and the current configuration will appear as shown below:

```
---- Local Device ---- SN: 676.
Mode:  Software
Ethernet: AutoNeg, 100Mbs, HD, LPT
T1/E1 #1: DSX-1 0-133, Xmit AIS, AMI,
T1/E1 #2: DSX-1 0-133, Xmit AIS,
T1/E1 #3: DSX-1 0-133, Xmit AIS, AMI,
T1/E1 #4: DSX-1 0-133, Xmit AIS,
Serial  : 9600, No Parity
DMI: Not Detected. VLAN: Disabled

---- Remote Device ---- SN: 676.
Mode:  Software
Ethernet: AutoNeg, 100Mbs, FD, LPT
T1/E1 #1: DSX-1 0-133, Xmit AIS,
T1/E1 #2: DSX-1 0-133, Xmit AIS,
T1/E1 #3: DSX-1 0-133, Xmit AIS,
T1/E1 #4: DSX-1 0-133, Xmit AIS,
Serial  : 9600, No Parity
DMI: Not Detected.

->
```

Operation -- Continued

To show the configuration menu for the local device:

1. At the prompt, type the letter "C," press the spacebar, then type the letter "L."

2. Press the ENTER key and the local device configuration menu will appear as shown below:

Note: In this menu, the T1/E1/J1 commands for local loopback, for example, type the command this way: LL, press the spacebar, then type the port number, press spacebar, then type the number of the command, in this case *(1= enable or 2 = disable)*.

The command sequence IS NOT case sensitive.

```
Local Device Configuration Menu:

*T1/E1/J1:
LL x 1 - Local Loopback on T1/E1/J1 Port x ENABLE
LL x 2 - Local Loopback on T1/E1/J1 Port x DISABLE
RL x 1 - Remote Loopback on T1/E1/J1 Port x ENABLE
RL x 2 - Remote Loopback on T1/E1/J1 Port x DISABLE
XE x   - Enable Transmit AIS on LOS for Port x
XD x   - Disable Transmit AIS on LOS for Port x
EB x   - Encoding set to B8ZS on Port x
EA x   - Encoding set to AMI on Port x
*RS-232:
B x    - Serial port baud rate
         (1=9600, 2=19200, 3=36400, 4=57600)
*Enet 10/100:
A1     - Autonegotiation ENABLE
A2     - Autonegotiation DISABLE
TLPT1  - Transparent Link Pass Through ENABLE
TLPT2  - Transparent Link Pass Through DISABLE
F10    - Force 10Mbps
F100   - Force 100Mbps
FF     - Force Full Duplex
FH     - Force Half Duplex

S      - Save new Configuration and Exit
Q      - Exit without saving Configuration
->
```

Operation -- Continued

To show the configuration menu for the remote device:

1. At the prompt, type the letter "C," press the spacebar, then type the letter "R."

2. Press the ENTER key and the remote device configuration menu will appear:

Note: In this menu, the T1/E1/J1 commands for remote loopback, for example, type the command this way: LL, press the spacebar, then type the port number, press spacebar, then type the number of the command, in this case (*1*= *enable or 2* = *disable)*.

The command sequence Is Not case sensitive.

```
Remote Device Configuration Menu:

*T1/E1/J1:
LL x 1 - Local Loopback on T1/E1/J1 Port x ENABLE
LL x 2 - Local Loopback on T1/E1/J1 Port x DISABLE
RL x 1 - Remote Loopback on T1/E1/J1 Port x ENABLE
RL x 2 - Remote Loopback on T1/E1/J1 Port x DISABLE
XE x   - Enable Transmit AIS on LOS for Port x
XD x   - Disable Transmit AIS on LOS for Port x
EB x   - Encoding set to B8ZS on Port x
EA x   - Encoding set to AMI on Port x
*RS-232:
B x    - Serial port baud rate (1=9600, 2=19200, 3=36400,
4=57600)
*Enet 10/100:
A1     - Autonegotiation ENABLE
A2     - Autonegotiation DISABLE
TLPT1  - Transparent Link Pass Through ENABLE
TLPT2  - Transparent Link Pass Through DISABLE
F10    - Force 10Mbps
F100   - Force 100Mbps
FF     - Force Full Duplex
FH     - Force Half Duplex

S      - Save new Configuration and Exit
Q      - Exit without saving Configuration
->
```

Operation -- continued

To update the PIC code of a remote device:

1. At the prompt, type the letter "U."

2. Press the ENTER key and the code will start to transfer. On the screen, the incrementing percent line shows the percent of the transferring code:

```
Fiber Load...Transferring of binary pic code to remote...
6 percent...
```

Note: This command will take several minutes to complete. Do Not power down the device or break the fiber connection during this code transfer.

To enable hardware bypass mode for software control:

1. At the prompt, type the letter "B."

2. Press the ENTER key and a Reset message will appear on the screen.

3. Type the letter "Y" to Enable H/W Bypass.

4. Press the ENTER key. When the Reset completes, the "login" prompt will appear.

```
-> b
This command will cause reset. Are you SURE you wish to
reset device (y/n)?
Enable H/W Bypass...

Resetting Board!

Type 'L' to login
->
```

To disable the hardware bypass mode:

1. At the prompt, type the letter "B" again.

2. Press the ENTER key and a Reset message will appear on the screen.

3. Type the letter "Y" to Disable H/W Bypass.

4. Press the ENTER key. When the Reset completes, the "login" prompt will appear as show below.

```
-> b
This command will cause reset. Are you SURE you wish to
reset device (y/n)?
Disable H/W Bypass...

Resetting Board!

Type 'L' to login
->
```

Operation -- continued

To Reset the local device:

Caution: This command will interrupt T1/E1 and Ethernet traffic. It will take several seconds to restore the data path. Failure to observe this caution might cause data loss.

1. At the prompt, type the letter "R."

2. Press the ENTER key to send the Reset signal to the remote device. Look for the Type 'L' to login prompt, indicating success.

```
-> r
Reset

Exchanging Config and Serial Number with Remote
Card...wait...
Done.
Type 'L' to login
->
```

Cable Specifications

The physical characteristics must meet or exceed ITU and IEEE802.3 specifications.

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	
S4TEF1011-110	1300 nm multimode	
Fiber Optic Transmitter Power:	min: -19.0 dBm	max: -14.0 dBm
Fiber Optic Receiver Sensitivity:	min: -30.0 dBm	max: -14.0 dBm
Link Budget:	11.0 dB	
S4TEF1013-110	1300 nm multimode	
Fiber Optic Transmitter Power:	min: -19.0 dBm	max: -14.0 dBm
Fiber Optic Receiver Sensitivity:	min: -30.0 dBm	max: -14.0 dBm
Link Budget:	11.0 dB	
S4TEF1014-110	1310 nm single mode	
Fiber-optic Transmitter Power:	min: -15.0 dBm	max: -8.0 dBm
Fiber-optic Receiver Sensitivity:	min: -31.0 dBm	max: -8.0 dBm
Link Budget:	16.0 dB	
S4TEF1015-110 (long haul)	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	
S4TEF1016-110 (extra long haul)	1310 nm single mode	
S4TEF1017-110 (long wave length)	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	
S4TEF1018-110	1300 nm multimode	
Fiber-optic Transmitter Power:	min: -19.0 dBm	max: -14.0 dBm
Fiber-optic Receiver Sensitivity:	min: -30.0 dBm	max: -14.0 dBm
Link Budget:	11.0 dB	
S4TEF1029-110	1310 nm TX/1550 nm RX simplex	
S4TEF1029-111	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	
S4TEF1029-112	1310 nm TX/1550 nm RX simplex	
S4TEF1029-113	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	
S4TEF1035-110	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	

Cable Specifications -- Continued

The fiber optic transmitters on this device meet Class 1 Laser safety requirements per IEC-825/CDRH standards and complies with 21 CFR1040.10 and 21 CFR1040.11.

Ethernet cable

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

Gauge	24 to 22 AWG
Attenuation	11.5 dB/100m @ 5-11 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 may 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.

Straight-Through Cable   **Crossover Cable**
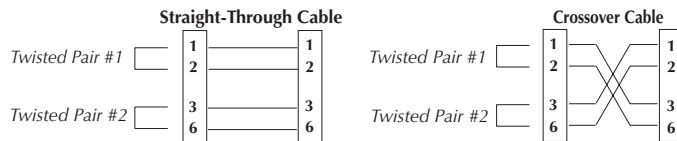
T1/E1 cable

Category 3: *(minimum requirement)*
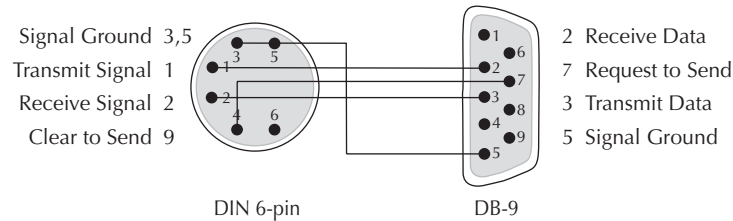
Connector:	RJ-48C
Electrical network connection:	Single 4-wire *(Tip/Ring - Tip1/Ring1)*
Mechanical arrangement:	8-position miniature modular jack
Usage:	1.544 Mb/s access lines
Interface codes:	04DU9 *(any applicable)*
Cable type:	
Long Haul T1:	0db, -7.5dp, -15db, -22db
E1:	E1 3.0V, 120 ohm
J1:	0-655', 110 ohm
DSX-1:	0-133', 133-266', 266-399', 399-533', 533-655', 100 ohm
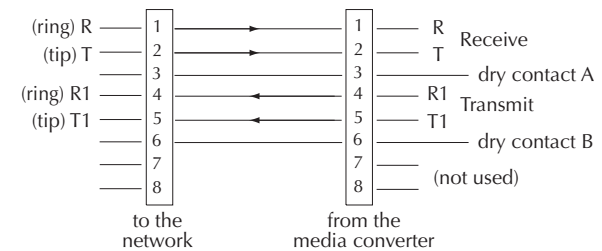
Cable Specifications —Continued

RS-232 cable *(included with the media converter)*

Connectors Gauge:	6-pin DIN and DB-9 / 24-22 AWG
Attenuation:	20 dB/1000 ft. @ 10 MHz
Differential characteristic impedance:	100 ohm +/- 10% @ 10 MHz
Maximum cable distance:	<10 ft (3.2 m) @ 56 kb/s or higher

Signal Ground 3,5
Transmit Signal 1
Receive Signal 2
Clear to Send 9

DIN 6-pin

2 Receive Data
7 Request to Send
3 Transmit Data
5 Signal Ground

DB-9

Technical Specifications

For use with Transition Networks Model S4TEF10xx-11x or equivalent.

Standards	IEEE 802.3™, G.703, AMI/B8Z3/HDB3
Data Rate	Copper: 10 Mb/s, 100 Mb/s; Fiber: 100 Mb/s
Dimensions	3.7" x 4.7" x 1.8" *(93 x 120 x 47 mm)*
Weight	1 lb. *(0.45 kg)* approximate
Power Consumption	6.0 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: 256 K bytes
	Maximum packet size: 1536 bytes
	Unicast MAC addresses: 1000
Power Consumption	6.0 watts
Operating temp:	0°C to 50°C *(32°F to 122°F)*
Storage Temperature:	-40°C to 85°C *(-40°F to 185°F)*
Humidity:	5% to 95%, non-condensing
Altitude:	0 to 10,000 feet
Warranty:	Lifetime

*Manufacturer's rated ambient temperature.

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.

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" LED illuminated?
    NO
    - Ensure that the power adapter is the proper type of voltage and cycle frequency for the outlet (See "Power Supply" on page 15.)
    - Ensure the power adapter is properly installed in the media converter 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 "LKF" LED illuminated?
    NO
    - Check the fiber cables for proper connection.
    - Verify that the TX and RX cables on the local media converter are connected to the RX and TX ports, respectively, on the remote media converter.
    - 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 media converter has selected half-duplex mode.
    - Green = The media converter 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 media converter has selected 10Mb/s operation.
    - Green = The media converter 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.

Troubleshooting -- Continued

5. Is the "LNK" LED on a T1/E1 port *(with a copper cable installed)* illuminated?
    NO
    - Check the copper cable connected to that T1/E1 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" LED on a T1/E1 port *(with a copper cable installed)* illuminated?
    YES
    - The device connected to the T1/E1 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.

7. Is data transfer failing on the fiber port?
    YES
    - Verify the local fiber connection by starting a remote fiber loop-back:
       - HW mode: set the remote converter to fiber loop-back.
       - SW mode: enter the remote fiber loop-back command.
    - Use a bit error test unit to run a bit error test.
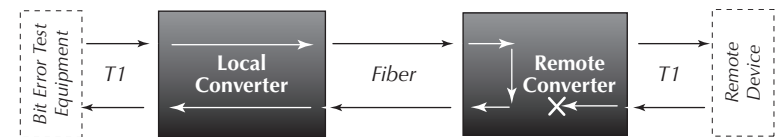
    - Verify the remote fiber connection by starting a local fiber loop-back:
       - HW mode: set the local converter to fiber loop-back.
       - SW mode: enter the remote fiber loop-back command.
    - Use a bit error test unit to run a bit error test.
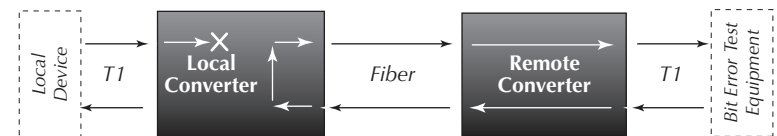
    - Contact Tech Support: 1-800-260-1312, Int'l: 00-1-952-941-7600.
    NO
    - Contact Tech Support: 1-800-260-1312, Int'l: 00-1-952-941-7600.

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, U.S.A.
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 U.S.A.

Model: S4TEF10xx-11x Series Media Converters

Part Number(s):   S4TEF1011-110, S4TEF1013-110, S4TEF1014-110, S4TEF1015-110,
                              S4TEF1016-110, S4TEF1017-110, S4TEF1018-110, S4TEF1029-110,
                              S4TEF1029-111, S4TEF1029-112, S4TEF1029-113, S4TEF1035-110

Regulation: EMC Directive 89/336/EEC

Purpose: To declare that the S4TEF10xx-11x to which this declaration refers is in
conformity with the following standards.

EN 55022:1994 + A1:1995 + A2:1997; EN 55024:1998 + A1+A13546:20002

I, the undersigned, hereby declare that the equipment specified above conforms to the above
Directive(s) and Standard(s).

Stephen Anderson   May, 2007
Stephen Anderson, Vice-President of Engineering   Date

Compliance Information

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 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 öffentliches 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.

Compliance -- continued

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.

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置）で商工業地域での電波障害防止を目的とした情報処理装置等電波障害自
主規制協議会（ＶＣＣＩ）基準に適合しております。

従って，住宅地域またはその隣接した地域で使用すると，ラジオ，テレビ
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