Token Ring Product Options

TFC

Token Ring Fiber Optic Converter

FEATURES

- Provides conversion between electrical and optical Token Ring signals
- Compatible with IEEE 802.5
- Operates at 4 and 16 Mbps
- Typical optical distances supported:
  – 3 km (1.9 miles) multimode
  – 20 km (12.4 miles) single mode
- Two versions:
  – Stand-alone
  –Card version for S-TAU
- Wide range of applications:
  – RI/RO mode for optical trunk
  – Lobe mode for optical lobes
  – Station mode for station connection over fiber optic
  – Satellite mode for workgroups
- Partitions the network upon cable break
- Provides noise immunity, electrical isolation and security
- Supports UTP (100Ω) and STP (150Ω)

TFC

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DESCRIPTION

- TFC, *Token Ring Fiber Optic Converter*, provides electrical-to-optical and optical-to-electrical conversion of an IEEE 802.5 signal, for communication over an optical link. Transmission distance can be up to 3 km (1.9 miles) for multimode and 20 km (12.4 miles) for single mode.
- An infrared LED transmitter converts the IEEE 802.5 electrical signal into an optical signal. At the receiver end, the optical signal is converted back into an electrical signal.
- TFC can be operated in various modes:
  – RI/RO mode: connects between adjacent Token Ring access units, such as S-TAUs via a fiber optic link
  – Lobe mode: converts the copper lobes of any access unit/hub to fiber lobes
  – Station mode: connects station to the optical lobes of the RADring TL-2/F module
  – Satellite mode: connects workgroups over a single fiber connection.
- In Station mode, the insert/bypass command, originating at the Token Ring Adapter card in the form of a "phantom" current, is carried through the fiber using special signaling.
- TFC is available in two versions:
  – Stand-alone unit (**TFC-SA**)
  – Card for installation in S-TAU (**TFC**)
  TFC can also be installed as a module in the RADring hub (RR-TFC). (See the *RR-TFC data sheet* for additional details).

APPLICATION

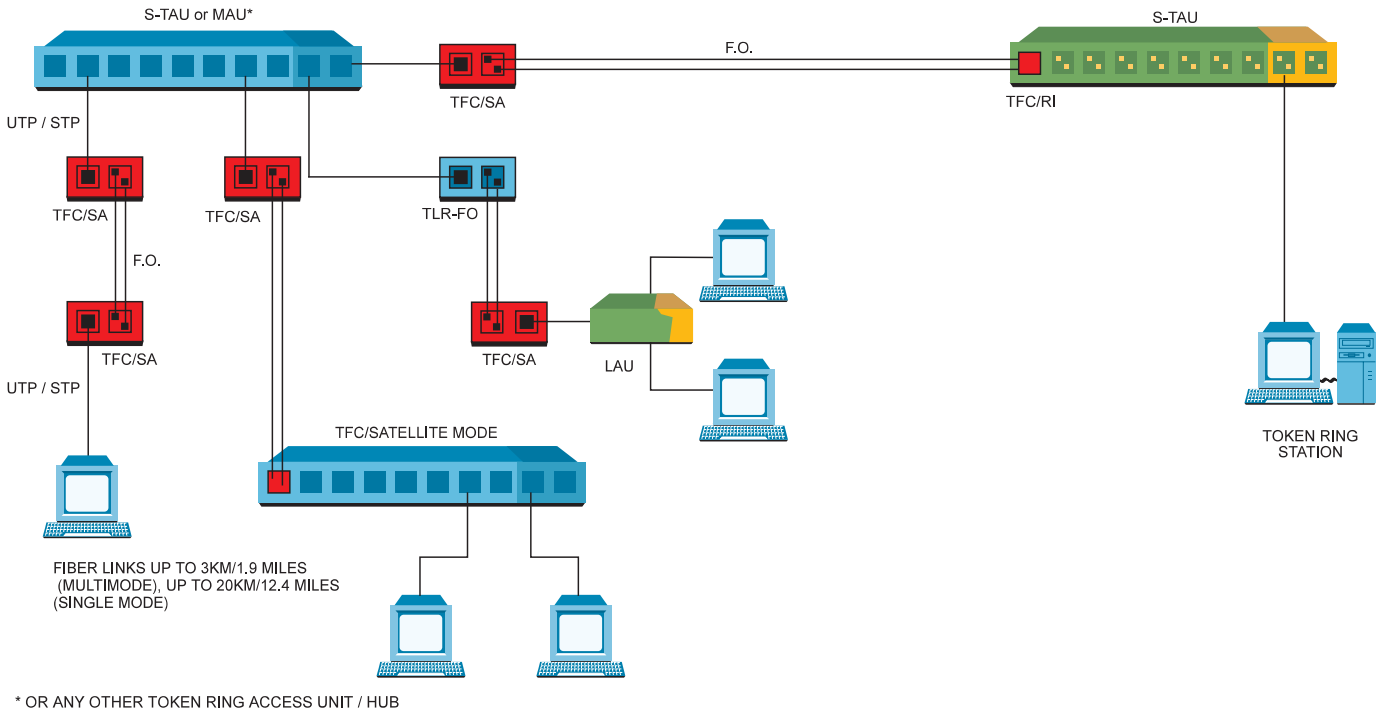

Figure 1. TFC Application in Conjuction with S-TAU

TFC

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- The stand-alone model has an integral power supply. The stand-alone unit is wall-mountable using the TR-WM brackets, or can be mounted in a 19” rack using the TR-RM hardware. This hardware can support up to four TFC units (see *Ordering*).
- Multimode or single mode fiber optic options are available for both the stand-alone and the S-TAU card versions. In addition, an internal media filter is provided for the UTP option.
- The TFC card for S-TAU is installed in the Ring In or Ring Out port of the Access Unit. The card is powered by a wall-mounted, external power supply. TFC provides an optical link between two S-TAUs. Alternatively, for start topology, the TFC card can provide an optical link between the lobe of a RADring and the Ring In port of another S-TAU.
- Where retiming and jitter attenuation are required, the TFC operates with the TLR-FO for lobe conversion.
- Fail-safe operation is provided by performing an automatic loop to the backup path, upon power off detection or optical signal loss detection.
- Indicators include power on and fault indication for optical signal loss condition.

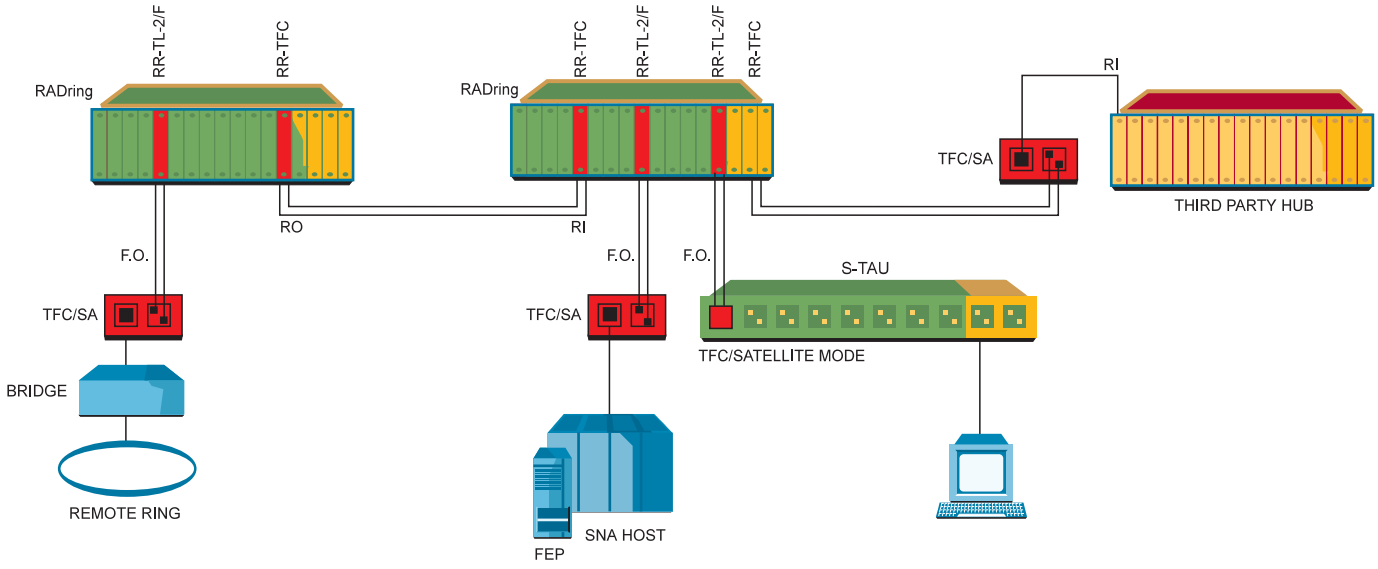

Figure 2. TFC Application in Conjuction with RADring Hub

TFC

Token Ring Fiber Optic Converter

SPECIFICATIONS

OPTICAL CHANNEL

- **Transmission Line**
  Dual fiber optic cable
- **Transmission Mode**
  Full duplex
- **Data Rate**
  4/16 Mbps
- **Transmission Range**
  Multimode option:
  Up to 3 km (1.9 miles)
  Single mode option:
  Up to 20 km (12.5 miles)
- **Wavelength**
  Standard: 850 nm
  Optional: 1300 nm
- **Optical Output Power**
  -22 dBm into 50/125 fiber
  -18 dBm into 62.6/125 fiber
  -14 dBm into 100/140 fiber
  -18 dBm into 9/125 fiber
- **Receiver Sensitivity**
  -32 dBm minimum
- **Dynamic Range**
  20 dB minimum
- **Optical Power Budget**
  For 50/125 fiber = 10 dB
  For 62.5/125 fiber = 14 dB
  For 100/140 fiber = 18 dB
  For 9/125 fiber = 14 dB
- **Fiber Optic Connector**
  Standard: SMA (for 850 nm only)
  Optional: ST
- **Command Modes**
  X.28, X.29

ELECTRICAL INTERFACE

- **Transmission Line**
  4-wire (dual twisted pair)
- **Transmission Range (16 Mbps)**
  50m (164 feet) on IBM (Type 1) cable between TFC and previous workstation or repeater
- **Data Rate**
  4/16 Mbps
- **Data Format**
  Balanced bipolar, Differential Manchester encoded
- **Output Level (nominal)**
  3-4V ptp (on 150Ω)
- **Connector (stand-alone model)**
  STP: IBM data connector
  RJ-45: data connector for UTP

GENERAL

- **Power**
  Stand-alone:
  115 or 230 VAC (+10%)
  47 - 63 Hz, 5W
  S-TAU Card:
  550 mA, 7.5 VDC

Note: An external power supply should be ordered separately (see *Ordering*)

- **Physical**
  Stand-alone:
  Height: 4.4 cm / 1.7 in (1U)
  Width: 10.8 cm / 4.3 in
  Depth: 24.0 cm / 9.4 in
  Weight: 1.2 kg / 2.6 lb
  S-TAU Card:
  To be installed within the S-TAU
- **Environment**
  Temperature: 0-40°C (32-104°F)
  Humidity: Up to 90%, non-condensing

ORDERING

TFC/#/@

Fiber Optic Converter card plus installation kit (for integration in S-TAU)

TFC-SA/*/#/$/@

Stand-alone unit

* Specify power supply:
115 for 115V supply
230 for 230V supply

\# Specify optical connector:
ST for ST optical connectors
(default is SMA)

$ Specify electrical interface:
RJ for RJ-45 connector (UTP)
(default is IDC connector for STP)

@ Specify wavelength:
1300 nm for single mode
(default is 850 nm multimode)

Note: The TFC card may be ordered as an integral part of the S-TAU (see *S-TAU data sheet* for ordering)

TR-RM

Hardware for mounting up to four stand-alone units in a 19" rack

TR-WM

Brackets for mounting a single stand-alone unit on a wall. For the S-TAU card version, two wall-mounted external power supply models are available:
PS-230/7.5/800 for 230 VAC

PS-115/7.5/800 for 115 VAC

RAD
data communications

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