

# 4 Channel Serial-over-T1/E1 Multiplexer

# TC8610-1

- 4 ch. RS-232 or 4 ch. RS-422/RS-485
- 2-Wire or 4-Wire RS-485
- ESF Framing Support for T1
- PCM31C Framing Support for E1
- Very Low Latency – 600µs
- Individually Isolated Ground for each Serial Port
- Supports 120Ω & 75Ω E1
- Built-in Power Redundancy
- Rack Mount or Stand Alone



TC8610-1 Front Panel



TC8610-1 Rear Panel

The TC8610-1 is a 4 Channel Serial-over-T1/E1 multiplexer with built-in power redundancy.

TC8610-1 can support either T1 or E1 upon the order. For serial input, four options are available:

- TC8610-1-1: 4 Channel RS-232
- TC8610-1-3: 4 Channel RS-422
- TC8610-1-4: 4 Channel RS-485, 4-wire
- TC8610-1-5: 4 Channel RS-485, 2-wire\*

The device requires no additional equipment for T1/E1 link and device verification. Extensive diagnostics are available to quickly identify issues with your serial or digital lines. Three different types of loopbacks: local, remote, and T1/E1 loopback assist in isolating whether an issue lies on your serial line or your T1/E1 line. CSU Loop Code Up/Down is also supported. Each unit provides TX/RX LEDs for verifying signals on each serial channel, Power LEDs for verifying power inputs, Alarm LEDs for verifying T1/E1 signal, and a Remote LED to monitor the remote unit.

All products part of the Mini Channel Bank series are equipped with the "R2" button. The "R2" button, was developed to isolate causes of disruptions, leveraging the Alarm LEDs and allows users to clear the history on the local unit and mirror and reset the Alarm LEDs on the remote unit. Each of the Alarm LEDs have the ability to show current T1/E1 errors and a history of up to 3 errors.

The TC8610-1 is compatible with standard 100Ω T1 for copper line lengths up to 6000ft and up to 2.5km for 75Ω / 120Ω E1 (copper line length is the distance between the TC8610 and the T1/E1 cross-connect). The T1/E1 uses an RJ48 connector and the serial channels use RJ-11 connectors. Optional BNC adapter cable is available for 75 Ohm E1. Power is 12VDC standard or optional 24VDC, -48VDC, 125VDC, or 115/230VAC with an external power cube. Optionally, a high temperature version (-20°C to 70°C) and extreme temperature version (-40°C to 80°C) are also available.

\* Check factory for availability

\*\*NOTE - Mirrored Bits® is a registered trademark of Schweitzer Engineering Laboratories Inc.



## Applications

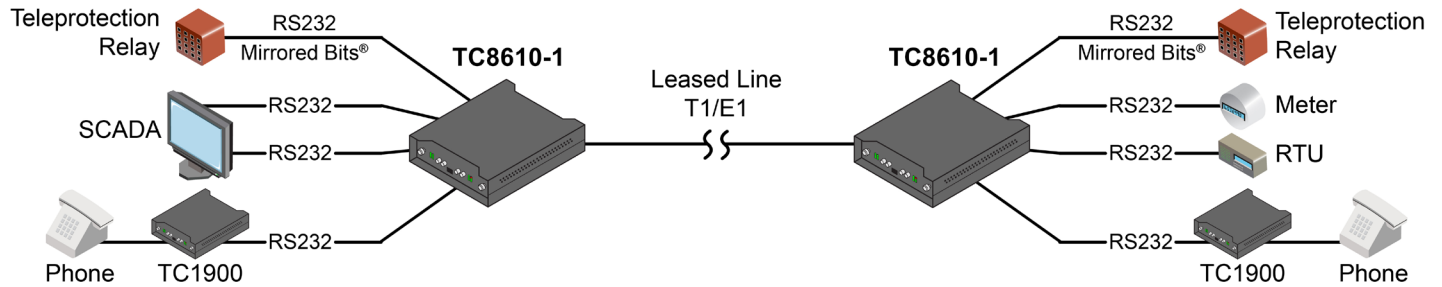
The TC8610-1 offers an inexpensive, plug and play method for connecting up to four serial devices over existing T1/E1 links. Popular applications include:

- Transport of asynchronous RS-232/RS-422/RS-485
- Transport of SCADA communications
- Protocol-transparent
- Support for SEL Mirrored Bits®\*\*
- Connection for two Power Utility teleprotection relays

The TC8610-1 can also convert the RS-232 Async to RS-422/RS-485 signals running from the local side to the remote side or vice-versa.

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Serial Tunneling Application Using TC8610-1 Serial-over-T1/E1 Multiplexer

**Serial**

Standard.....RS-232/RS-422/RS-485  
 Ports.....4  
 Data Rate  
 RS-232 Async w/ Control...Up to 64 Kbps  
 RS-422 Async.....Up to 64 Kbps  
 RS-485 2 or 4-wire....4.8 Kbps, 9.6Kbps,  
 .....19.2Kbps, 38.4Kbps

**T1/E1**

**T1**  
 Receiver sensitivity.....0dB to -36dB  
 Line Code.....AMI / B8ZS  
 Framing.....ESF  
**E1**  
 Receiver sensitivity.....0dB to -43dB  
 Line Code.....AMI / HDB3  
 Framing.....PCM31C

**Electrical**

Connector.....RJ11F  
 Interface.....RS-232  
 .....2 or 4-wire RS-485, RS-422

**Visual Indicators**

Channel Status (each ch.).....Tx, Rx  
 System.....PWR A, PWR B, Vcc,  
 .....ALM, RMT  
 T1/E1.....BPV, LOS, SYNC, AMI,  
 .....RAI, AIS, CRC

**System**

Bit Error Rate.....1 in 10<sup>9</sup> or better

**Alarm**

Dry Contact.....Normal Open/Closed

**Power**

Standard.....12VDC @300mA  
 Optional.....24VDC, -48VDC, 125VDC,  
 .....or 115/230VAC w/ power cube

**Temperature**

Operating.....-10°C to 50°C  
 Hi-Temp (optional).....-20°C to 70°C  
 Extreme (optional).....-40°C to 80°C  
 Storage.....-40°C to 90°C  
 Humidity.....95% non-condensing

**Physical (Standalone Unit)**

Height.....(3.53cm) 1.40"  
 Width.....(18.14cm) 7.20"  
 Depth.....(24.89cm) 9.80"  
 Weight.....(907g) 2.0lbs



SAI GLOBAL  
 ISO 9001  
 Quality

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Note: Information contained in this data sheet is subject to change without prior notice.