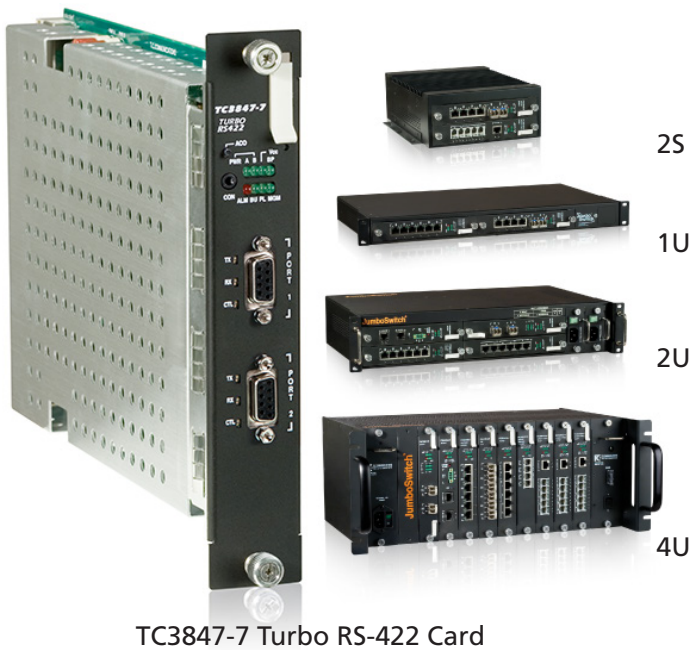
Turbo RS-422 over IP Gateway

TC3847-7 w/ Security

- **2 Channels of RS-422 Serial**
- **Data Rates up to 115200 bps**
- **Supports Handshaking or Synchronous Mode**
- **Increased Security Features**
- **Extremely Low Latency**
- **Protocol Transparent: Mirrored Bits*, DNP-3, Modbus, etc.**
- **Temperature & Power Consumption Monitoring**
- **Extreme Temp (-40°C to +80°C) Optional**
- **Meets or Exceeds IEC 61850-3, IEC 60834, IEEE 1613 & NEMA TS-2 Standards**
- **Member of JumboSwitch® Product Family**



TC3847-7 Turbo RS-422 Card

The TC3847-7 links or extends up to 2 channels of RS-422 serial (asynchronous with control or synchronous) across Layer 2/3 Ethernet/IP, CE, or MPLS networks. It is easy to configure, offers extremely low latency, and supports point-to-point and point-to-multipoint topologies.

Available as a standalone product or JumboSwitch interface card, the TC3847-7 is specifically designed to meet stringent real time requirements for protective relay communications in the power utility industry, this serial interface card can perform at less than 3ms latency, end-to-end, through an Ethernet network. This extremely low latency is irrespective of the protocol used, Mirrored Bits®* or otherwise, and is unaffected by the number of nodes in between.

The TC3847-7 supports baud rates up to 115200 bps, and achieves minimal end-to-end processing delay (latency) by using high-performance buffering and forwarding technology.

VLAN and QoS for packet prioritization ensure reliable communications. AAA, RADIUS and TACACS+ support, and NTP Authentication are some of the added security features for enhanced protection. Diagnostics include LED indicators, and local and remote loop back.

The TC3847-7 is available in industrial hardened versions (-40°C to +80°C) and exceeds all pertinent industry and environmental standards including IEC 61850-3, IEEE 1613 & NEMA TS-2.

Setup, diagnostics, and management are accessed via Web, SNMP, Serial Console, and Telnet/SSH. The TC3847-7 fits any JumboSwitch chassis option including 2S Standalone chassis and 1U/2U/4U card cages. Power supply options are 12VDC, 24VDC, -48VDC, 125VDC (available on 1U/2U/4U card cages only) or 115/230VAC.

Applications

Typical applications include extending serial data across IP networks.

For example, the TC3847-7 is often used to extend RS-422 signals from one protection relay to another across Layer 2/Layer 3 networks.

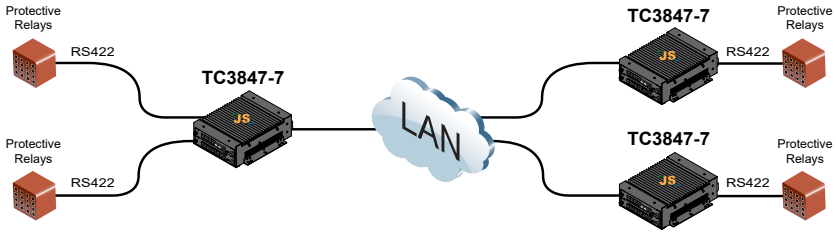
- Railroad Microlock**
- Airport Digital Radar
- Utility SCADA
- Any RS-422 Communication via IP

** "Mirrored Bits®" is a registered trademark of Schweitzer Engineering Laboratories Inc.*
***MicroLok® is a trademark for ANSALDO STS USA, INC.*

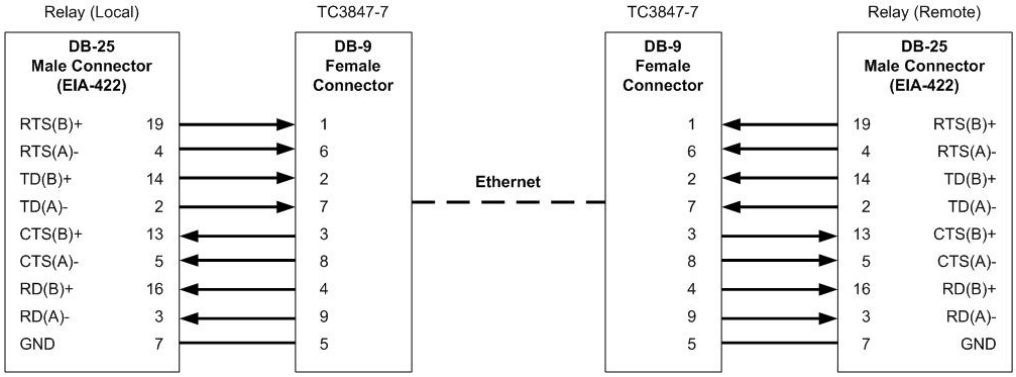
Environmental & EMI Compliance

The JumboSwitch product family meets all pertinent industry-specific standards for environmental, performance and security requirements including IEC 61850-3, IEEE 1613, NEMA TS-2 and NERC CIP. Furthermore, future JumboSwitch family products will continue to be compliant with both existing and emerging industry standards and requirements, including developing Ethernet standards. Please refer to the charts below for specific standards compliance information.

	Tests	Industrial Standards	TC Communications - JumboSwitch Type Test and Levels	
			Power Supply Unit (PSU)	RJ-45 & Signal
Temperature/Humidity	Low Temperature Use	IEC 61850-3, IEEE 1613, NEMA TS-2	IEC 60068-2-1; Ae; -40°C; 16 hour	
	Low Temperature Storage	IEC 61850-3, IEEE 1613, NEMA TS-2		
	High Temperature Use	IEC 61850-3, IEEE 1613, NEMA TS-2	IEC 60068-2-2; Be; +80°C; 16 hour	
	High Temperature Storage	IEC 61850-3, IEEE 1613, NEMA TS-2	IEC 60068-2-2; Bd; +85°C; 16 hour	
	Damp Heat	IEC 61850-3, IEEE 1613, NEMA TS-2	IEC 60068-2-30; Db; +55°C; 95%; 96 hours	
Mechanical	Vibration	IEC 61850-3, IEEE 1613, NEMA TS-2	IEC 60068-2-6; Fc; 3 - 150 Hz; 7.5 mm; 2 g; 10 sweeps per axis	
	Shock	IEC 61850-3, IEEE 1613, NEMA TS-2	IEC 60068-2-27; Ea; 30g; 11ms	
ElectroMagnetic Compatibility	Electrostatic Discharge Immunity	IEEE 1613	IEC 61000-4-2; 8kV contact; 15 kV air	
	Radiated RF Immunity	IEC 61850-3, IEEE 1613	IEC 61000-4-3; 80 MHz - 1000 MHz; 20 V/m; AM 80% 1 kHz	
	EFT/Burst Immunity	IEC 61850-3, IEEE 1613	IEC 61000-4-4; 4 kV CM	IEC 61000-4-4; 4 kV CM
	Surge Immunity	IEC 61850-3	IEC 61000-4-5; 4 kV LG; 2 kV LL	IEC 61000-4-5; 4 kV LG; 2 kV LL
	Conducted RF immunity	IEC 61850-3	IEC 61000-4-6; 150 kHz - 80 MHz; 10 V; AM 80% 1 kHz	IEC 61000-4-6; 150 kHz - 80 MHz; 10 V; AM 80% 1 kHz
	Magnetic Field Immunity	IEC 61850-3	IEC 61000-4-8; 50 Hz; 100 A/m cont.; 1000 A/m 1 s	
	Damped Oscillatory Magnetic Field Immunity	IEC 61850-3	IEC 61000-4-10; 100 kHz; 30 A/m	
	Damped Oscillatory Magnetic Field Immunity	IEC 61850-3	IEC 61000-4-10; 1 MHz; 30 A/m	
Power Supply Unit (PSU) Variations	AC Voltage Dips	IEC 61850-3	IEC 61000-4-11; 30% & 100%, 0.5s	NA
	DC Voltage Dips	IEC 61850-3	IEC 61000-4-29; 40% & 70%, 0.1s	NA
	Damped Oscillatory Wave	IEC 61850-3	IEC 61000-4-12; 2.5 kV CM, 1.0 kV DM @1MHz	IEC 61000-4-12; 2.5 kV CM, 1.0 kV DM @ 1MHz
	Conducted PF CM Voltage	IEC 61850-3	IEC 61000-4-16; 50 Hz; 30 V cont.; 300 V 1s	IEC 61000-4-16; 50 Hz; 30 V cont.; 300 V 1s
	Conducted Emission	IEC 61850-3	CE/FCC/CISPR22 class A	CE/FCC/CISPR22 class A
	Conducted emission	IEC 61850-3	CE/FCC/CISPR22 class A	CE/FCC/CISPR22 class A
	Radiated emission	IEC 61850-3	CE/FCC/CISPR22 class A	
Dielectric	Dielectric 50 Hz Test	IEEE 1613	IEC 60255-5; 2 kV	IEC 60255-5; 0.5 kV
	Impulse Voltage Test	IEEE 1613	IEC60255-5; 5 kV	IEC 60255-5; 5 kV



Typical "Serial Tunneling" Application Using TC3847-7 RS-422



Typical EIA-422 Interconnection

Connection Capacity

RS-422 ..... 2 Ports
Ethernet..... 1 Port

Electrical

RS-422 Interface
Baud Rate.....up to 115200 bps
Termination (optional)..... 200 Ohm
ESD Protection..... +/-15KV HBM
Connector DB9F
Ethernet Interface
Standards ..... IEEE 802.3, 802.3u
Connector RJ45
Console Interface
Console Port.....2.5mm Audio Jack

Standard Compliance

CE, FCC Part 15, CISPR (EN55022) CLASS A, IEC 61850-3, IEEE 1613, NEMA TS-2, IEC 60834

Diagnostic Functions

Local and Remote Loopback for Serial

LEDs

Unit Status.....PWR (A, B), Alarm, BU, ...PL, Vcc, BP, MGM
Serial ..... TX, RX, CTL

Power

Standard 12VDC
Optional .....24VDC, -48VDC ..... or 125VDC (1U/ 2U/ 4U only) .....90-260 VAC, 50/60Hz
Power Consumption .....<10W

Operating Temperature

Standard Temp..... -20°C to 70°C
Extreme Temp ..... -40°C to 80°C

Storage

Temperature..... -40°C to 90°C
Humidity.....95% non-condensing

Physical (rack mount card)

Height..... (3.15 cm) 1.24"
Width..... (17.78 cm) 7.0"
Depth..... (22.86 cm) 9.0"
Weight..... (0.3 kg) 0.75 lbs

TC COMMUNICATIONS®
FIBER OPTIC CONNECTIVITY

Certified System™
SAI GLOBAL
ISO 9001
Quality

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

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