4-Ch. Turbo Serial-over-IP Card

TC3847-3

- **Transports 4 Channels of RS-232 or RS-422 / RS-485 over Ethernet/IP**
- **Extremely Low Latency (Supports Teleprotection Relays)**
- **RS-232 Ports Support Hardware Handshaking or Synchronous Mode**
- **Data Rates up to 115kbps**
- **VLAN & QoS Support**
- **Temperature & Power Consumption Monitoring**
- **Extreme Temp (-40°C to +80°C) Optional**
- **Meets or Exceeds IEC 61850-3, IEEE 1613 & NEMA TS-2 Standards**
- **Member of JumboSwitch® Product Family**

TC3847-3 with Various JumboSwitch Cages and Chassis

Featuring support for teleprotection relays, the TC3847-3 Turbo Serial Card transports four channels of RS-232 or RS-422/RS-485 or mix of both serial data over existing Layer 2/Layer 3 networks.

Specially designed to meet stringent real time requirements for protective relay communications in the power utility industry, this Turbo Serial interface card can perform at less than 3msec. latency, end-to-end, through an Ethernet network. This extremely low latency is irrespective of the protocol used, mirror bit* or otherwise, and is unaffected by the number of nodes in between. In short, it's the fastest serial-over-IP solution for tele-protection currently available in the industrial marketplace today.

The TC3847-3 achieves minimal end-to-end processing delay (latency) by using high-performance buffering and forwarding technology. For reliable communications, the TC3847-3 supports VLAN and QoS for packet prioritization.

Key features include Traffic Monitoring and Statistics, Network Time Server (NTP Server), Remote Firmware Upgrade, Temperature and Power Consumption Monitoring.

Setup, diagnostics, and management are accessed via Web, SNMP, Serial Console, and Telnet. Diagnostics include LED indicators and local and remote loop back to assist with troubleshooting and maintenance.

The TC3847-3 interface card can fit into any available JumboSwitch housing option including 2S and 1U Standalone chassis and 2U/4U card cages. Power supply options are 12VDC, 24VDC, -48VDC or 115/230VAC. Standard operating temperature is -20°C to +70°C and the extreme temperature version is -40°C to +80°C.

**NOTE - the term "Mirror Bit®" is a registered trademark of Schweitzer Engineering Laboratories Inc.*

Applications

Typical applications include extending serial data across IP networks.

For example, the TC3847-3 is often used to extend RS-232/RS-422/ RS-485 signals from one protection relay to another across Layer 2/ Layer 3 Networks.

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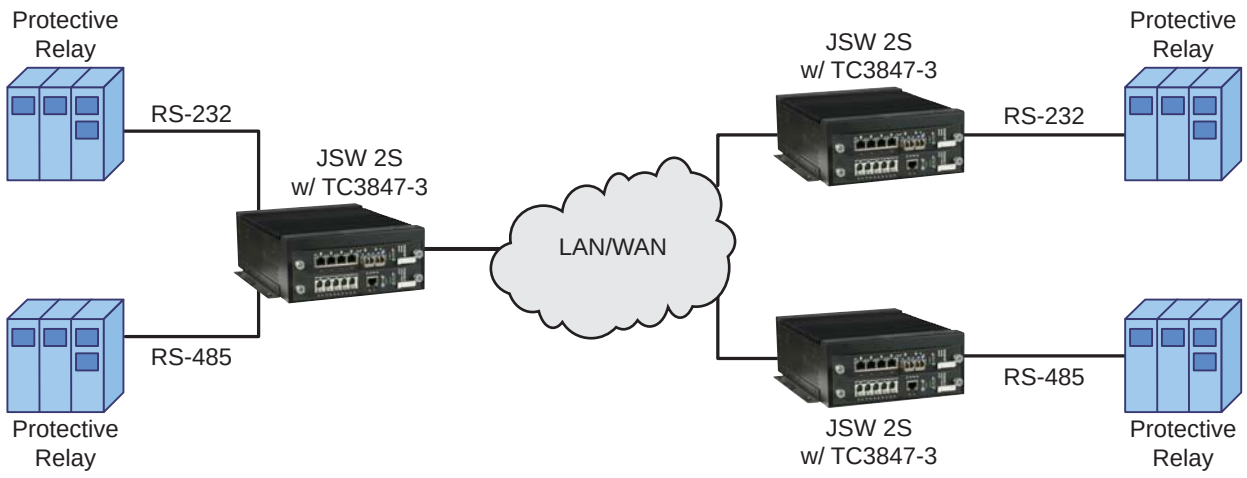
Environmental & EMI Compliance

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 Teleprotection Application using TC3847-3 4-Ch. Turbo Serial Card.

Data Rates

RS-232.....Up to 115.2Kbps
RS-422/RS-485.....Up to 115.2Kbps
Ethernet .....10/100Mbps Full Duplex
Console 9.6K

Connection Capacity

RS-232 or RS-422/RS-485.....4 Ports
Ethernet.....1 Port

Electrical

RS-232 Interface
ESD Protection.....+/-15KV HBM
Connector RJ11
RS-422 Interface
Termination (optional)....100 Ohm
ESD Protection.....RJ11
Connector.....RJ11
RS-485 Interface
Termination (optional)....100 Ohm
ESD Protection.....+/-15KV HBM
Connector.....RJ11
Ethernet Interface
Standards .....IEEE 802.3,
.....802.3u, 802.1p&Q
Connector.....RJ45
Console Port.....RJ45

Regulatory Approval

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

System

Bit Error Rate .....1 in 10^{10} or Better

Diagnostic Functions

Local and Remote Loopback for Serial and Ethernet

LEDs

Unit Status.....PWR (A, B), Alarm, BU,
.....PL, Vcc, BP, MGM
Channel..... Status
Ethernet.....Link/Act

Power

Standard.....12VDC
Optional.....24, -48 VDC
.....90-260 VAC, 50/60Hz
Power Consumption.....<10W

Operating Temperature

Bit Error Rate .....1 in 10^{10} or Better
High 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™
ISO 9001
QMI-SAI Global
#1045959

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Note - Information contained in this data sheet is subject to change without prior notice. 010F