

JumboSwitch® Main/Management "Combo" Card

TC3840-3

- Provides Layer 2 Switching Functionality
- Fully Managed via CLI, Telnet & SNMP
- 4-Port 10/100/1000 Copper, 2-Port SFP Gigabit
- Ethernet Rate Limiting, VLAN, QoS
- Built-In Power/Temperature Sensors
- Industrial Hardened & IEC 61850-3, IEEE 1613 & NEMA TS-2 Compliant



JumboSwitch "Combo Card" for the 2S & 1U Chassis

In addition to the deal for small chassis options (1U & 2S), the JumboSwitch Main/Management "Combo" Card, Model TC3840-3, provides layer 2 switching functionalities and is the central switching fabric for JumboSwitch Interface cards. The TC3840-3 offers 4 x 10/100/1000 Copper Ports and 2 x SFP Gigabit Ports for connecting up and down nodes to form a fiber/copper ring or bus topology.

Interface cards communicate with the "Combo" card through the backplane, which contains both Data & Control buses. The core of the combo card is a powerful gigabit Ethernet switch chip and ARM microprocessor. It serves as both the JumboSwitch's central processing unit and as the control bus access point for JumboSwitch management.

It is fully compliant with pertinent IEEE standards such as 802.1x, 802.1w, 802.1s, 802.3x, 802.1D, 802.1p, 802.1Q, 802.3, 802.3u, 802.3z, 802.3ab, 802.3ad and 802.3ah. It also supports pertinent Protocols such as TFTP, SNMP, RMON, Telnet, SSH/SSL, Syslog and SNMPv1/v2c/v3, etc.

Diagnostics include unique features such as built-in Power and Temperature monitoring sensors and remote optical measurements for Transmit Power & Receive Power. Additional diagnostics include monitoring traffic statistics, fiber ring status, alarm conditions, etc. Security features include Password Protection.

Management is accessed via, SNMP, Telnet or Serial Console. Configuration settings can be saved and loaded to simplify network administration, and firmware upgrades can be remotely uploaded. Virtual LAN (VLAN), QoS and Network Time Protocol (SNTP) are supported.

Optical and Power redundancy with automatic switchover are standard. Power options include 12 VDC, 24VDC, -48VDC or 115/230VAC.

Applications

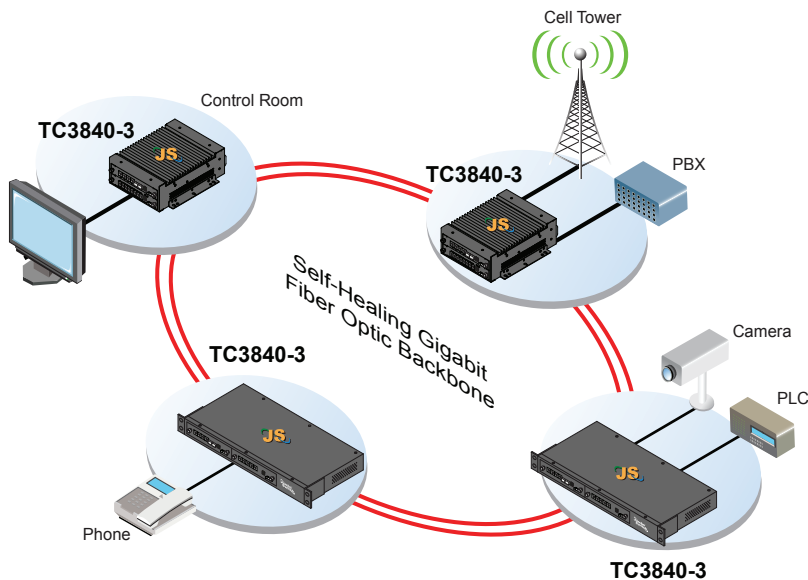
The JumboSwitch Main/Management "Combo" Card is typically used by Utilities to connect substation RTUs/PLCs and telephones or T1/E1 links to a central control center.

It is also used by Data Service Providers for its modular multi-interface, rate limiting, one-fiber-bi-directional and media conversion capabilities.

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 Application Using TC3840-3 Housed in a JumboSwitch 2S & 1U to form a Ring Network

Data Rates

10/100/1000 Mbps with Rate Control

Optical

- Transmitter.....ELED/LASER*
- Receiver.....PIN Diode
- Wavelength
-SFP: 850nm MM
-SFP: 1300/1550nm SM
- SFP Optic
- Connectors.....LC
- Port.....2
- Interface.....1000SX/LX

Electrical

- Ethernet
- Connector.....RJ45 Female
- Ports.....4
- Interface.....10/100/1000M

System

- Bit Error Rate.....1 in 10¹⁰ or Better

Regulatory Approval

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

Diagnostic Functions

-Traffic Statistics
-Transmit Power & Receive Power
-Temperature

LEDs

- PWR (A,B), V_{CC}, ALM, SHR, MSTR, BP, MGM

Power

- Standard.....15W
- Option.....12, 24, -48 VDC or 115/230 VAC, 50/60Hz (with external cube)

Operating Temperature

- 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 (Rackmount Card)

- Height.....(3.2 cm) 1.25"
- Width.....(17.8 cm) 7.0"
- Depth.....(23.5 cm) 9.25"
- Weight.....(0.5 kg) 1 lbs*

*Contact factory for higher requirements



ISO 9001
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Note: Information contained in this data sheet is subject to change without prior notice.



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