

# JumboSwitch-DR DIN Rail Ethernet Switch

## TC3840DR

- **Compact Chassis with Full Management**
- **Base Unit with 2x GigE SFP\*\* Ports +6x 10/100Base-T**
- **Optional Expansion Card with 6 10/100Base-T, 6 100FX or 4 Serial Channels**
- **Ethernet Rate Limiting, VLAN, QoS**
- **Built-In Power/Temperature Sensors**
- **Industrial Hardened & IEC 61850-3, IEEE 1613 & NEMA TS-2 Compliant**
- **Supports MicroLok®\* Railroad Applications**
- **Member of JumboSwitch Product Family**



TC3840DR DIN Rail Ethernet Switch  
(Serial, Copper Ethernet, GigE Versions Shown)

**T**he JumboSwitch-DR DIN Rail Ethernet Switch is a compact, efficient Industrial Ethernet switch solution with full JumboSwitch network compatibility and integrated Serial Server or Ethernet card expandability. It is compatible with all JumboSwitch product family chassis, management software, features and options, and guarantees maximum reliability and performance for industrial automation and mission critical redundant ring network applications.

The TC3840DR comes standard with two gigabit SFP ports and six 10/100Base-T ports. Additionally, it offers an integrated expansion card with six 100FX fiber or 10/100Base-T ports or four RS232, RS422 or RS485 channels. Serial channels are independent and can be mixed or matched. Point to point serial tunneling and serial server configurations are supported on a per-port basis. Railroad MicroLok applications are also supported.

The TC3840DR's industrial hardened version supports temperatures from -40°C to 80°C and meets IEC 61850-3, IEEE 1613 and NEMA TS-2 industry standards. It supports distances up to 100km (single mode laser) and offers a "one fiber, bi-directional" option.

Unique diagnostics include built-in power and temperature monitoring sensors and remote optical measurements for launch power and sensitivity. Additional diagnostics monitor traffic statistics, fiber ring status, alarm conditions, etc. Security features include password protection.

Management is accessed via web, SNMP, telnet, or serial console. Virtual LAN (VLAN), QoS and Network Time Protocol (NTP) are supported. Optical and power redundancy with automatic switchover is standard. Power options include 12VDC, 24VDC, -48VDC or 115/230VAC.

\*MicroLok® is a trademark for ANSALDO STS USA, INC.

\*\*SFP Transceiver not included

## Applications

An all-in-one connectivity solution for industrial automation and commercial network applications, the JumboSwitch-DR DIN Rail Ethernet Switch benefits users by offering an additional built-in 4-channel Serial Server or 6-port Ethernet card.

The TC3840DR is often used by Utilities to connect substation RTUs/PLCs, including older legacy units with serial interfaces, to a central control center. Transportation entities use the TC3840DR for traffic control and intelligent transportation system communication networks.

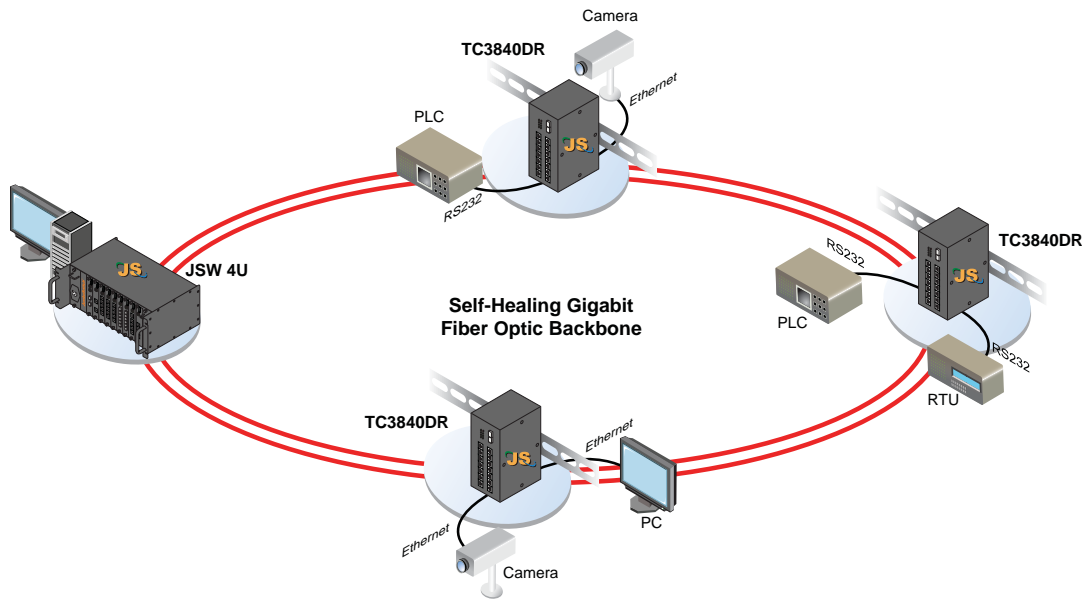
The TC3840DR's serial card is also used to support MicroLok devices over IP networks in railroad Positive Train Control (PTC) applications.



## 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 the TC3840DR in a Gigabit Ethernet Ring Network

**Data Rates**

RJ45.....10/100Mbps  
 SFP.....1000Mbps

**Connection Capacity**

Base (Ethernet)  
 RJ45.....6 Ports  
 SFP.....2 Ports  
 Expansion (Ethernet)  
 TC3841-2DR.....6x 10/100Base-T  
 TC3842-3DR.....6x 100FX (SFP)  
 Expansion (Serial-RS232/422/485)  
 TC3847-1DR.....8 Ports (RJ11)

(NOTE: Supports maximum of 4 channels of RS232 or RS422 or RS485 or Mix)

**Optical**

Transmitter.....LASER  
 Receiver.....PIN Diode  
 Wavelength (SFP)  
 .....850/1300nm MM  
 .....1300/1550nm SM  
 SFP Optic Connectors.....LC  
 Loss Budget - 1300/1550nm  
 Multimode @62.5/125µm.....15dB  
 Single Mode @9/125µm.....20dB

(NOTE: Contact factory for higher requirements)

**LEDs**

PWR A, PWR B, Vcc, EXP, DFLT, ALM, SHR, MSTR, MGM, etc.

(NOTE: Different expansion may have different LEDs)

**System**

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

**Alarm**

Dry Contact.....NO or NC (selectable)

**Diagnostic Functions**

.....Traffic Statistics  
 .....Launch Power  
 .....Temperature

**Power**

Standard.....12VDC  
 Optional.....24VDC, -48VDC or 115/230VAC (w/ external cube)

**Temperature**

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

**Physical**

Height.....(16.26 cm) 6.4"  
 Width.....(5.84 cm) 2.3"  
 Depth.....(13.21 cm) 5.2"  
 Weight.....(544 gm) 1.2 lbs

**Expansion Ordering Information**

TC3841-2DR.....6x 10/100Base-T  
 TC3842-3DR.....6x SFP 100FX  
 TC3847-1DR.....4x RS232/422/485



ISO 9001  
 QMI-SAI Global  
 #1045959



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



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