Managed 5+2 Gigabit Ethernet Switch TC3345

Features

- 2 ports GbE SFP (optional 2.5G)
- 5 ports GbE RJ45
- Ethernet Redundancy
- Built-in temperature sensor
- Built-in optic measurements
- Supports single mode, multimode & bi-direction optics
- IEC 61850-3, IEEE 1613 & NEMA TS-2
- Extreme operating temp (-40˚C to +80˚C) option

TC3345 Front

TC3345 Rear

Description

Ideal for mission critical networks, the TC3345 Managed Gigabit Ethernet Switch provides maximum reliability through standard Ethernet redundancy protocols. It offers 2x Gigabit SFP ports (with 2.5G capability) for connecting up and down nodes to form a ring or bus topology. Advanced networking features include:

- **Complies with Carrier Ethernet 2.0** including IEEE 802.3ah MAC Layer OAM, IEEE802.1ag Ethernet CFM, ITU-T Y.1731 Ethernet OAM, ITU-T G.8031 Ethernet Linear Protection Switching, ITU-T G.8032v2 Ethernet Ring Protection Switching (ERPS) and IEEE 1588v2 PTP.
- **VLAN, QoS and Rate Control** which allows network segregation, isolation, prioritization and bandwidth control.
- **Diagnostics** include Temperature, SFP Monitoring, and RMON.
- **Management** via Web, SNMP, or Command Line Interfaces. Settings can be saved and loaded to simplify network administration, and firmware can be remotely upgraded.
- **Security** features such as 802.1X, RADIUS/TACACS+, AAA, SNMPv3 and SSL provide both network and management security.
- The industrial hardened version supports temperature ranges from -40°C to 80°C and meets or exceeds all pertinent industrial environmental specifications including IEC 61850-3, IEEE 1613, NEMA TS-2, etc. Standard temperature range is -10°C to 50°C; high temperature version is -20°C to 70°C. Power redundancy is standard and source options include 12VDC, 24VDC, -48VDC or 100-240VAC. The TC3345 is available in a standalone or wallmount version.

Applications

The TC3345 is a compact Gigabit Ethernet Switch solution for both industrial automation and commercial networks because it offers a wide range of advanced networking features including Redundancy, Rate Limiting, Diagnostics, Security and Industrial Hardened capability.

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

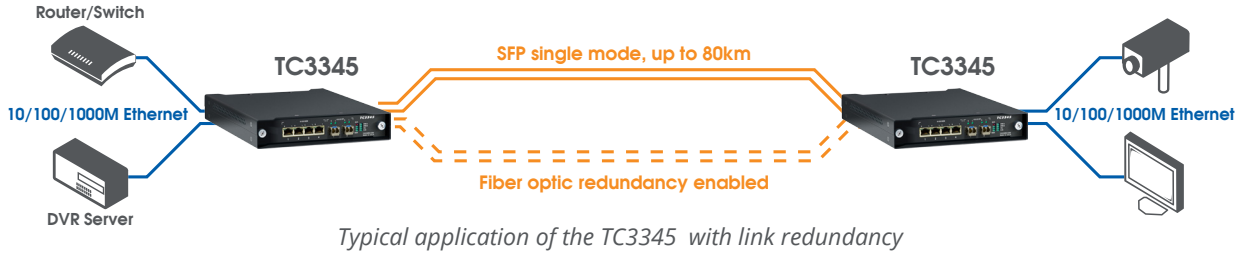
Feature	Description
Ethernet	
MAC Table	Up to 32K MAC addresses
Spanning Tree	• Spanning Tree Protocol (STP) IEEE 802.1D • Rapid Spanning Tree Protocol (RSTP) IEEE 802.1w/802.1D-2004 • Multiple Spanning Tree Protocol (MSTP) IEEE 802.1s/802.1Q-2005
Aggregation	Link Aggregation Control Protocol (LACP) IEEE 802.3ad
Virtual LAN (VLAN)	Support for up to 4094 IEEE 802.1Q VLANs simultaneously • Port-based VLAN • MAC-based VLAN • Protocol-based VLAN • Private VLAN
Voice VLAN	Voice traffic is automatically assigned to a voice-specific VLAN and treated with appropriate levels of QoS
Generic VLAN Registration Protocol (GVRP)	Dynamic VLAN for automatically propagating and configuring VLANs in a network
IGMP v1/v2/v3 Snooping	Provides IGMP (IPv4 multicast group) support on Layer 2 switches
MLD v1/v2 Snooping	Provides MLD (IPv6 multicast group) support on Layer 2 switches
Link Layer Discovery Protocol (LLDP)	IEEE 802.1AB standard for advertising their identity, capabilities, and neighbors of network devices
Quality of Service	
Hardware Priority Queue	8 QoS class queues per port
Scheduling	Strict priority and deficit weighted round-robin (DWRR)
Classification	• Port based; 802.1p Class of Service (CoS) • Port Tag Remarking • DSCP based; Differentiated Services (DiffServ) • DSCP translation and remarking
Rate Limiting	Ingress policing and egress shaping per port and per CoS
Carrier Ethernet Protocol and Features	
Ethernet CFM	IEEE 802.1ag standard that provides connectivity fault management
Service OAM	ITU-T Y.1731 Ethernet OAM standard for dividing a network into maintenance domains in the form of hierarchy levels
Provider Bridging	VLAN stacking (Q-in-Q) IEEE 802.1ad
Bandwidth Profile	Policing with leaky bucket (CIR/CBS & EIR/EBS) are supported per service
Ethernet Ring Protection Switching (ERPS)	ITU-T G.8032v2 provides sub-50 ms protection switching for Ethernet ring topologies
Precision Time Protocol (PTP)	IEEE 1588v2 protocol provides sub-microsecond range network timing and synchronization for Ethernet networks

Feature	Description
Security	
Secure Shell (SSH) Protocol	SSH secures Telnet traffic in or out of the switch, SSH v1 and v2 are supported
HTTPS	SSL encrypts the HTTP traffic, allowing secure access to the web based management GUI
Network Access Control	IEEE 802.1X defined: • Port based authentication • MAC based authentication • Single host mode • Multi host mode
AAA	Authentication, Authorization, and Accounting provides management security with a central RADIUS or TACACS+ server
RADIUS/TACACS+	Supports security through central RADIUS and TACACS+ servers
Port Security	Locks MAC Addresses to ports and limits the number of learned MAC addresses
DHCP Snooping	Provides security by filtering un-trusted DHCP messages, and by building and maintaining a dynamic IP address database
IP Source Guard	Prohibits IP packets with invalid IP addresses from accessing the network
ARP Inspection	Protects against Address Resolution Protocol (ARP) spoofing attacks
Access Control Lists (ACL)	Support for up to 256 entries for permitting or denying Ethernet packets based on multiple of parameters
Management	
Web GUI Interface	Built-in switch configuration utility for browser-based device configuration (HTTP/HTTPS). Supports configuration, system dashboard, maintenance, and monitoring.
SNMP	SNMP v1, v2c, and v3 with support for multiple traphosts
Remote Monitoring (RMON)	Supports RMON groups 1,2,3,9 (history, statistics, alarms, and events) for enhanced traffic management, monitoring and analysis
Network Time Protocol (NTP)	Protocol for providing clock synchronization. NTP Authentication is also supported.
IPv4 and IPv6 Support	Both IP version 4 and version 6 are supported
Firmware Upgrade	• Web browser upgrade (HTTP/HTTPS) • Upgrade through console port (TFTP) • TCView® to deploy the switch firmware
Dual Image	Dual image provides independent primary and secondary OS files for backup while upgrading
Diagnostics	Syslog, cable/link diagnostics, ping, chassis status

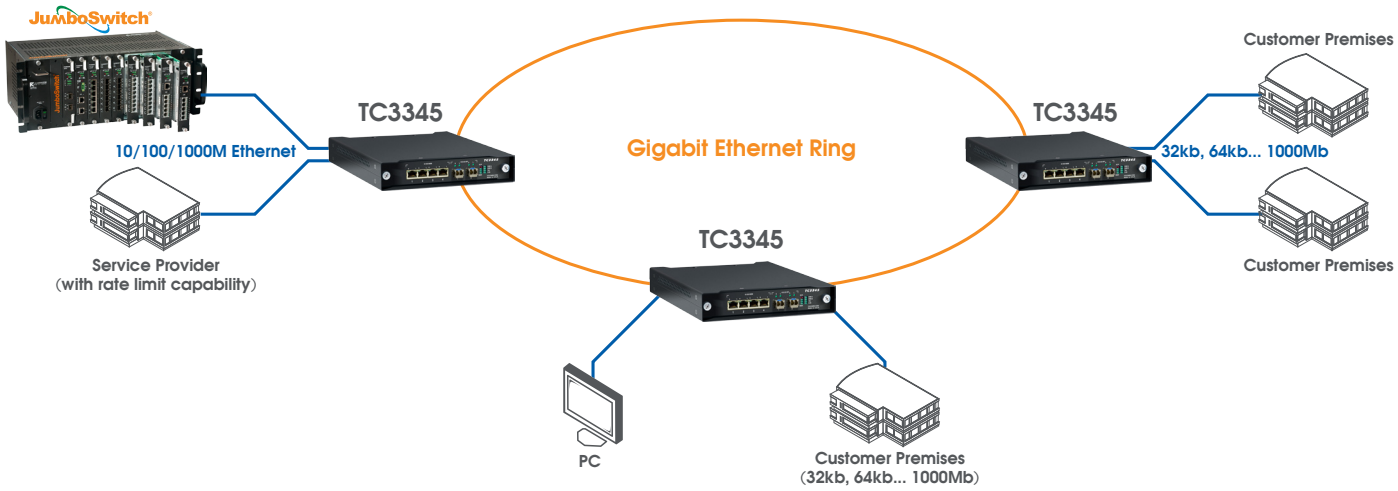
Environmental & EMC Compliance

The TC3345 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 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.

	Test	Industrial Standards	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	
	Free Fall	IEC 61850-3, IEEE 1613	25 cm	
ElectroMagnetic Compatibility	Electrostatic Discharge Immunity	IEC 61850-3, IEEE 1613 (C37.90.3)	IEC 61000-4-2; 8kV contact; 15 kV air	
	Radiated RF Immunity	IEC 61850-3, IEEE 1613 (C37.90.2)	IEC 61000-4-3; 80 MHz - 1000 MHz; 35 V/m (Peak); AM 80% at 1 kHz	
	EFT/Burst Immunity	IEC 61850-3, IEEE 1613 (C37.90.1)	IEC 61000-4-4; 4 kV CM; TM	IEC 61000-4-4; 4 kV CM; TM
	Surge Immunity	IEC 61850-3, IEEE 1613	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, IEEE 1613	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, IEEE 1613	IEC 61000-4-8; 50 Hz; 100 A/m cont.; 1000 A/m 1 second	
	Damped Oscillatory Magnetic Field Immunity	IEEE 1613	IEC 61000-4-10; 100 kHz; 30 A/m	
	Damped Oscillatory Magnetic Field Immunity	IEEE 1613	IEC 61000-4-10; 1 MHz; 30 A/m	
Power Supply Unit (PSU) Variations & Emissions	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
	Ripple on DC Power Supply	IEC 61850-3	IEC 61000-4-17; 10% Un	NA
	Conducted PF CM Voltage	IEC 61850-3, IEEE 1613	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/CISPR32 class A	CE/FCC/CISPR32 class A
	Radiated Emission	IEC 61850-3	CE/FCC/CISPR32 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 of the TC3345 with link redundancy



TC3345 using the one-fiber bi-directional option to form a ring network

Data Rates

SFP ..... up to 2.5 Gbps
RJ45 ..... 10/100/1000 Mbps

Optical

Wavelength
Multimode..... 850nm
Single Mode 1310/1550nm
SFP Optic
Connector LC
Port 2
SFP I/F..... 1000 BASE-LX/SX
.....100FX, 2.5G

Electrical

Ethernet
Connector RJ45
Port 5
Interface .....1000 Base-T
Console
Connector RJ45
Port 1
Interface RS-232

Regulatory Approval

CE, FCC Part 15, CISPR (EN55022)
CLASS A, IEC 61850-3, IEEE 1613,
NEMA TS-2, EN50155, AREMA

LEDs

PWR A, PWR B, VCC, MGM, ALARM,
LINK, SPEED

Power

Standard..... 12VDC
Optional .....24VDC, -48VDC, 125VDC
.....100-240VAC 50/60Hz
Power Consumption .....<10W

Operating Temperature

High Temp..... -20°C to 70°C
Extreme Temp (opt.).... -40°C to 80°C

Storage

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

Physical

Height..... (4.22 cm) 1.66"
Width..... (48.26 cm) 19"
Depth..... (30.5 cm) 12"
Weight..... (2.54kg) 5.6 lbs

*Contact factory for higher requirements

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TAA Compliant

TC Communications Quality Management System is certified as being in conformity with ISO 9001:2015 by Intertek

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