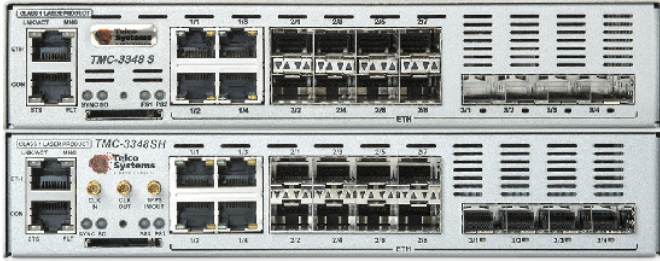


T-Marc 3348S/SH

10 Gigabit Ethernet/MPLS/IP Aggregation and Demarcation Device



The T-Marc 3348S/SH 10GE ETHERNET/MPLS/IP demarcation device offers an all-in-one solution that meets the increasing challenges of service providers to cost effectively connect business customers and business sites. The product enables L2/L3 managed services to be offered by CSPs and hence leverage the business serviceability at the edge of the network. The device supports IEEE 802.1q, Q-in-Q, and MPLS transport technologies, increasing network flexibility and future-proofing the network while reducing technological risks. The T-Marc 3348S/SH is an advanced 10GE demarcation device, incorporating high capacity in a compact size (1RU by ½RU width), with 4 x 1GE/10GE SFP+ ports (two active ports and two ports which require license activation), 8 x dual-speed. (100Mbps/1GE) fiber ports and 4 x 10/100/1000Mbps copper ports, it offers one of the densest capacity demarcation devices in the industry. The T-Marc 3348S/SH supports redundant power supplies, including wide range DC power input, making it optimal for mobile cell site deployments.

Assuring SLAs using Enhanced Traffic Engineering

As the demand for bandwidth increases, service providers want to differentiate their services and provide a proper quality of experience (QoE) for various application requirements. A wide set of QoS and HQoS features enable service providers to have granular control over the behavior of traffic and services in their networks, including WRED, multi-level queues, rate limiters and shapers. The T-Marc 3348S/SH supports multiple traffic engineering and dynamic signaling technologies, like LDP, BGP and RSVP-TE, so that providers are able to engineer data paths based on multiple attributes, while assuring that the requested paths can meet defined SLA requirements.

services that best support IP (Internet Protocol) environment requirements– including Virtual Routing and Forwarding (VRF) support, which enables L3VPN, IP static routing and dynamic routing protocols like OSPF and BGP. T-Marc 3348S/SH also supports Dynamic Host Configuration Protocol (DHCP) for dynamically distributing network configuration parameters, and Virtual Router Redundancy Protocol (VRRP).

Advanced Hardware-based OAM over Carrier Ethernet & MPLS

By embedding a comprehensive set of OAM and SLA monitoring and testing tools in its hardware, the T-Marc 3348S/SH provides real-time accurate network measurements and service turn-up testing and verification, reducing truck rolls and shortening time for activation and management. The device supports a range of industry OAM standards, including link level IEEE 802.3ah EFM, 802.1ag Connectivity Fault Management (CFM) protocols and ITU-T Y.1731 loss and delay measurement, as well as Y.1731 SLM for E-LAN testing, and RFC2544 and Y.1564 and MEF46 Latching Loopback for service activation testing.

Carrier Grade Resiliency

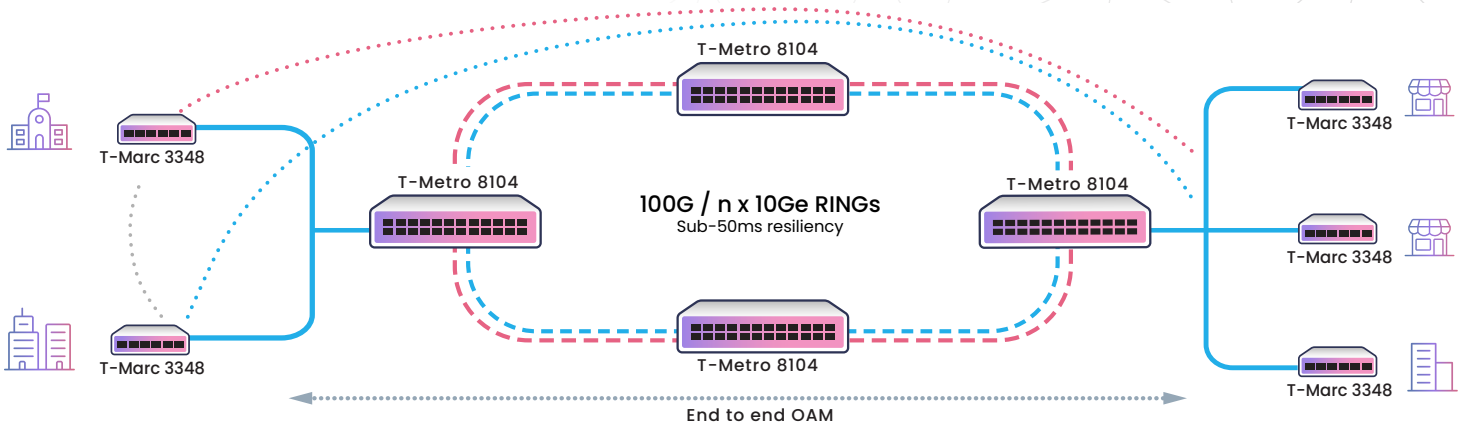
Telco Systems' T-Marc 3348S/SH provides carrier grade resiliency. It is one of few 10GE devices that can provide a protected 10GE ring design (2x10GE east, 2x10GE west). With a high port count, the T-Marc 3348S/SH offers link-level protection mechanisms (Resilient link, LAG/MC-LAG, FRR, dual homing and BFD), and network-wide mechanisms (xSTP, G.8032).

Synchronization and Timing

T-Marc 3348S/SH provides Synchronous Ethernet (SyncE) optimized for the needs of mobile operators and mobile backhaul wholesale providers. T-Marc 3348SH offers additional BITS in/out clock interfaces and hardened temperature of -40°C to 65°C / -40°F to 149°F often needed for mobile backhaul applications.

SDN Support

T-Marc 3348S/SH provides full SDN support with comprehensive adoption of NETCONF, the network configuration protocol, and YANG, its data modeling language. language. language. 10GE aggregation and demarcation



Product Specifications

Hardware Characteristics	4 x 1000FX/10000BaseX SFP+ ports 8 x 100FX/1000BaseX SFP ports 4 x 10/100/1000BaseT RJ45 ports 1 x Console RJ45 port Non-blocking 52Gbps FD platform 19" rack and wall-mounting options
Services	MEF Services: E-LINE, E-LAN, E-TREE, and E-ACCESS L2 Services: IEEE 802.1Q bridging, IEEE 802.1ad Q-in-Q and TLS MPLS Services: VPWS, VPLS and HVPLS MPLS Signaling: RSVP-TE, BGP, LDP/T-LDP and Static MPLS IP Services: VRF-Lite, DHCP client/server, VRRP IP Routing: Static routing, OSPFv2, IS-IS and BGPv4 L3 Services: MPLS L3VPN
Timing*	SyncE and clock BITS in/out interfaces**
Resiliency	Sub-50ms ITU-T G.8032, R-APS, STP/RSTP/MSTP, Sub-50ms Fast Ring, Sub-50ms FRR, HVPLS dual homing, secondary LSP, Resilient Link, LAG (static/IEEE 802.3ad LACP/Multi-Chassis), BFD, redundant AC/DC power supply
Quality of Service	Service classification per port/EVC/flow single/dual rate limiting, hierarchical rate limit per EVC. Hierarchical SP, DWRR and hybrid scheduling and shaping, with 8 queues per EVC / per port. CoS marking and mapping per EVC, flow control for congestion handling
Multicast Management	IGMP snooping v1/v2/v3, IGMP Proxy, Multicast VLAN registration (MVR)
OAM	IEEE 802.3ah EFM, Hardware-based IEEE 802.1ag CFM, OAM over VPLS, MPLS Ping
Testing & Monitoring	Hardware-based ITU-T Y.1564 and RFC 2544 test head, loopback and service performance analyzer, MEF46 Latching Loopback controller and responder, ITU-T Y.1731 PM, SM and SLM, Per-port/EVC/VLAN/COS, hardware-based MAC Swap loopbacks, TWAMP w/auto-testing
Management	ACLs, RADIUS, SSHv2, SNMPv3, SFTP, port security, broadcast storm prevention, secured access, ARP protection
Security	ACLs, RADIUS, SSHv2, SNMPv3, SFTP, port security, broadcast storm prevention, secured access, ARP protection
General Specifications	Dimensions: (H) 1RU 1.75" (W) 8.7" (D) 9.25" (44 mm x 221 mm x 235 mm) Weight: 2.42 lbs. (1.1 kg) Operating Temperature: T-Marc 3348S: 0°C to 50°C / 32°F to 122°F T-Marc 3348SH: -40°C to 65°C / -40°F to 149°F Humidity: 5% to 95% non-condensing Input power: 100-240 VAC, 50/60 Hz -24/48VDC to -72VDC
Regulatory and Environmental Compliance	Safety: NRTL certified: C-UL 60950, CSA 22.2 No. 950, EN/IEC 60950, TUV/GS (EN60950), CB, EN 60825-1/2 EMC: CE Mark: EN50081-1: EN55022 Class A, EN60555-2/3; North America: FCC 47 CFR Part 15 Class A; ICES-003 Issue 4 Class A (Canada); Japan: VCCI Class A; Australia/NZ: CISPR 22 Class A Immunity: EN50082-1, EN/IEC 61000-4-2/3/4/6/11 RoHS Compliant, NEBS Level 1 Compliant

Ordering Information

Part Number	Part Number
TMC-3348S-2AC-x	Ethernet/MPLS/IP 10G Demarcation: 4 x 10/100/1000Base-T UNI/NNI, 8 x 100Base-FX/1000Base-X UNI/NNI, 4 x 1000Base-FX/10000Base-X (SFP+) UNI/NNI (Activation license required for ports 3 & 4 by LIC-3348-10G-2PORT), 1 x RJ-45 ASCII management console port; 1 x RJ-45 ASCII out of band management port; 2 x Internal AC power supplies; SyncE support.
TMC-3348S-2DC	Ethernet/MPLS/IP 10G Demarcation: 4 x 10/100/1000Base-T UNI/NNI, 8 x 100Base-FX/1000Base-X UNI/NNI, 4 x 1000Base-X/10000Base-X (SFP+) UNI/NNI (Activation license required for ports 3 & 4 by LIC-3348-10G-2PORT), 1 x RJ-45 ASCII management console port; 1 x RJ-45 ASCII out of band management port; Dual feed 24/DC power supplies;
LIC-3348-10G-2PORT	Activation license for 2 x 1000/10000Base-FX/10000Base-X (SFP+) UNI/NNI
Only in 3348SH	SyncE support, with the addition of BITS in/out interfaces support clock and hardened temperature (-40°C to 65°C / -40°F to 149°F)

Key Applications

- L2/L3 managed service
- Pre-aggregation device with advance security separation
- Business services – MTU or high capacity site NID
- Private cloud demarcation gateway
- E-NNI for service providers' inter-connection & exchanges
- OAM monitored networks for SLA assurance
- Advanced automatic traffic engineered (TE) networks

ABOUT TELCO SYSTEMS

Telco Systems delivers a portfolio of Network Edge (Carrier Ethernet and MPLS) demarcation, aggregation, and uCPE solutions that enables service providers to create intelligent, service-assured, CE 2.0-compliant networks for mobile backhaul, business services, and cloud networking. Telco Systems end-to-end Ethernet, SDN/NFV-ready product portfolio delivers significant advantages to service providers, utilities, and city carriers competing in a rapidly evolving telecommunications market. Telco Systems is a wholly owned subsidiary of BATM Advanced Communications.

To learn more, visit Telco Systems at <http://www.telco.com>