



T-MARC WD SERIES

WEATHERPROOF SERVICE DEMARCATION SOLUTION

With the evolution of service providers' network technology to Advanced LTE, Telco Systems' T-Marc Weatherproof Demarcation family provides versatile and scalable solutions for business Ethernet, mobile backhaul and cloud networking services. More than ever, the tremendous growth of Ethernet network deployments across the world is driving the need for metro service switches that can be deployed outdoors or in unconditioned indoor environments. This requires an environmentally hardened, physically secured enclosure to house the metro service switches.

Telco Systems T-Marc WD series meets this need, and can be managed locally or remotely, offering support for a wide variety of service application scenarios and network topologies. The weatherproof T-Marc WD enclosure solution helps operators to eliminate associated costs of cabinets, enclosures, and site preparation. It was developed with extreme weather impacts in mind, and design considerations including an embedded chargeable backup battery providing power for up to 4 hours, and surge protection for the power inputs and copper connections. Optional accessories, like an internal optical add-drop multiplexer (OADM), a fiber splicing tray, Wi-Fi and Power over Ethernet (PoE) add flexibility for varying deployments. This makes T-Marc WD service reachable anywhere while dramatically reducing operating expenses (OPEX) and total cost of ownership (TCO).

The T-Marc WD enclosure is designed for Telco Systems' demarcation family, specifically the T-Marc 340, T-Marc 3312SC and T-Marc 3348S devices. The enclosure's internal switch module can be upgraded with any other Telco Systems demarcation module, without the need to upgrade the entire enclosure infrastructure system. BiNOX™, Telco Systems' field-proven, carrier-grade networking operating system, is built into our devices, offering superior control and security while delivering wire-speed networking capabilities.

Service assurance – Purpose-built for assured SLAs, T-Marc WD weatherproof service demarcation offers sub 50msec restoration over Ethernet and MPLS* in ring or mesh topologies (G.8031, G.8032, FRR) and combines with hardware-based OAM and embedded test tools (IEEE 802.3ah EFM-OAM, IEEE 802.1ag, RFC2544, Y.1731, Y.1564) to assure service delivery.

Service delivery – T-Marc WD supports all four MEF CE 2.0 services over Ethernet and IP/MPLS, built into the product and license free. With very powerful hardware-based HQoS support, T-Marc WD enables the deployment of very flexible service schemes. Integrated with EdgeGenie, Telco Systems' service management solution, the T-Marc WD enables providers to build custom service profiles and rapidly activate service monitoring.

Service management – T-Marc WD supports EdgeGenie and third party management systems, as well as NETCONF and YANG, making it future proof and SDN-upgradeable, while allowing for better utilization of available fiber using dynamic bandwidth management.

Service accuracy and timing – T-Marc WD supports synchronous Ethernet (SyncE), IEEE 1588v2, and clock distribution from one source to another*, enabling mobile operators to achieve a solution which can handle the current frequency synchronization requirements needed for 2G and 3G technologies, and future phase synchronization requirements needed for LTE-TDD.

Service transparently – T-Marc WD enables service providers to carry native TDM traffic transparently across packet-switched networks (PSN) using various circuit emulation techniques required when converging and migrating 2G and 3G to 4G and newer IP-based mobile technologies.

Service profitability – T-Marc WD helps operators to reduce TCO by simplifying the enclosure solution, lowering power consumption and network deployments through ZTP (Zero Touch Provisioning) and by offering extensive management tools such as OAM and EG NMS. Field technicians need only to mount the weatherproof service demarcation device, and hook up the power and cables in easily accessible ports and deployment sites.

* T-Marc 3312SC and T-Marc 3348S only

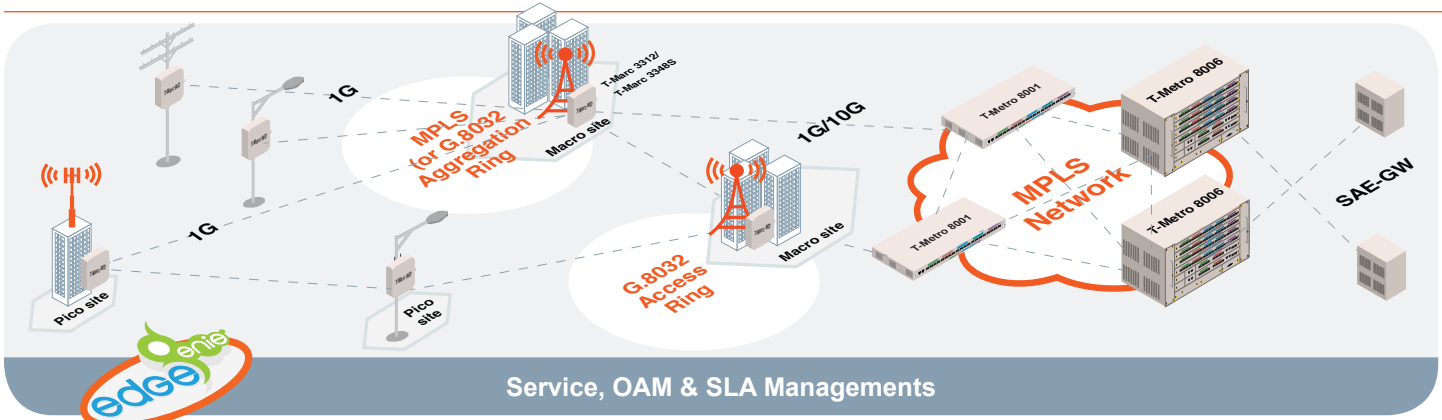


PRODUCT HIGHLIGHTS

- 1GE & 10GE uplink support
- Door alarm intrusion
- Carrier Ethernet & MPLS (VPWS, VPLS and HVPLS) transport technologies supported
- AC and DC Support
- Support for a large number of services using HQoS
- Up to 4 hours replaceable backup battery
- Multiple resiliency mechanisms
- Secured enclosure
- Upgradable switching modules
- Up to 8 x SFP/SFP+/RJ45 optional uplink configurations.
- Extensive, field-proven service OAM
- IP65/Nema 3.5
- Circuit Emulation Services (CES) for TDM over IP
- MEF, IEEE, ITU-T and IETF standards compliance for multi-vendor interoperability
- SDN ready
- Wall mount and pole mount
- POE support
- Internal CWDM Splicer and fiber tray
- Support for both Synchronous Ethernet (SyncE) and IEEE 1588v2

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PRODUCT SPECIFICATIONS

Hardware Characteristics	Up to 12 x 1GE or 10GE (optional 8xT1 for CES) IP65 (Similar to NEMA4) Up to 8 LC or RJ45 IP65 knock out connector for secured maintenance Optional accessories: POE, internal fiber splicer and tray Pole mount, optional wall mount or H-Frame mounting Door intrusion alarm, power and copper surge protection, 4 hour rechargeable backup battery, field recappable modules including AC PS and switch
Services	All MEF services, IEEE 802.1Q bridging, IEEE 802.1ad Q-in-Q (TLS), MPLS* L2VPN - VPWS, VPLS, HVPLS, dynamic routing and signaling utilizing OSPF, IS-IS, RSVP-TE and T-LDP for path computation and signaling, virtual OSPF support CES: SAToP, CESoP-SN, CESoMPLS
Timing	SyncE, IEEE 1588v2 PTP
Resiliency	Sub-50ms ITU-T G.8031 EPS, ITU-T G.8032v2 R-APS & MSTP FastRing Sub-50ms FRR, HVPLS dual homing, secondary LSP xSTP, Resilient Link, LAG (static/IEEE 802.3ad LACP) Redundant AC/DC power supply
Quality of Service	Per port/EVC/flow single/dual rate limiting, hierarchical rate limit per EVC Hierarchical QoS – Multi-level SP, WRR and hybrid frames scheduling, CoS marking and mapping per EVC, IPv6 data path support
Multicast Management	IGMP snooping v1/v2/v3, IGMP proxy, Multicast VLAN registration (MVR)
OAM	Hardware-based IEEE 802.3ah EFM, IEEE 802.1ag CFM, OAM over VPLS (OAMoVPLS)
Testing & Monitoring	Hardware-based ITU-T Y.1564 and RFC 2544 test head and service performance analyzer, ITU-T Y.1731 PM, SM and SLM support, per-port/EVC/VLAN/COS, hardware-based flexible MAC-based loopbacks*
Management	Console, Telnet, SSHv2, Radius, TACACS+, SNMP v1/2/3, xFTP, NTP, DNS resolver, SD card, DHCP client and Zero Touch provisioning*
Security	ACLs, RADIUS, SSHv2, SNMPv3, SFTP, port security, broadcast storm prevention, secured access, IS-IS authentication
General Specifications	Dimensions: (H) 15.74" (400 mm) x (W) 15.74" (400mm) x (D) 8.7" (250 mm) Weight: 51.8 lbs. (23.5 kg) Operating Temperature: -40°F to +149°F (-40°C to +65°C) Storage Temperature: -40°F to +158°F (-40°C to +70°C) Humidity: 5% to 95% non-condensing Input power: 100-240 VAC, 50/60 Hz, -24VDC to -72VDC
Standard Compliance	Safety: UL/CSA 60950-1, IEC/EN 60950-1, UL/CSA 60950-22, IEC/EN 60950-22 EMC: FCC 47CFR15, Class B, EN55022, Class B Immunity: EN/IEC61000-4-2,3,4,5,6 Environmental: IP65, IEC 60529:2001, IPX5 Code
Regulatory Compliance	Europe IEC 60950-1:05 + A1:09; EN 60950-1:06 + A11:09 + A1:10 + A12:11; IEC 60950-22:05; EN 60950-22:06+A11:08 USA/CAN UL 60950-1 2nd edition; CAN/CSA-C22.2 No. 60950-1:07; UL 60950-22: 1st edition

KEY APPLICATIONS

- MEF CE 2.0 certified
- Mobile backhaul – MPLS/Ethernet cell site gateway
- Converged multi mobile generation TDM and IP demarcation
- Business services – MTU or site NID combining TDM services
- Multi-service multiplexing for different customers and services while ensuring service separation
- Scalable HQoS applications (Ethernet and MPLS)
- High resilience-based network
- OAM monitored networks for SLA assurance
- Macrocell tower demarcation
- Picocell switching

ORDERING INFORMATION

Part Number	Description
TMC-340WD-BAC-z*	Secured Outdoor Enclosure embedded with TMC-340, chargeable backup battery, AC input gland & PS. 3 default LC and 1 RJ45 IP67 knockout connectors for service and management pre-installed.
TMC-340WD-BDC-z*	Secured Outdoor Enclosure embedded with TMC-340, chargeable backup battery, DC input gland & PS (-24V/-48V). 3 default LC and 1 RJ45 IP67 knockout connectors for service and management pre-installed.
TMC-3312WD-BAC-z*	Secured Outdoor Enclosure embedded with TMC-3312SC, chargeable backup battery, AC input gland & PS. 3 default LC and 1 RJ45 IP67 knockout connectors for service and management pre-installed.
TMC-3312WD-BDC-z*	Secured Outdoor Enclosure embedded with TMC-3312SC, chargeable Backup battery, DC input gland & PS DC input gland & PS (-24V/-48V). 3 default LC and 1 RJ45 IP67 knockout connectors for service and management pre-installed. H-Frame mounting kit.
TMC-3348WD-BAC-z*	Secured Outdoor Enclosure embedded with TMC-3348S, chargeable backup battery, AC Input gland & PS. 3 default LC and 1 RJ45 IP67 knockout connectors for service and management pre-installed.
TMC-3348WD-BDC-z*	Secured Outdoor Enclosure embedded with TMC-3348S, chargeable backup battery, DC input gland & PS DC input gland & PS (-24V/-48V). 3 default LC and 1 RJ45 IP67 knockout connectors for service and management pre-installed. H-Frame mounting kit.

* Transceivers, internal FO cable, up to eight (8) additional knockout LC/RJ45 connectors, copper surge protection, POE injector should be ordered separately as accessory KIT

z Specify the mounting kit: H-Frame, Pole mount, wall mount.

* T-Marc 3312SC and T-Marc 3348S only



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