T-Marc® 300 Series

ETHERNET SERVICE DEMARCATION DEVICES

The T-Marc® 300 Series Ethernet Service Demarcation and Extension devices deliver managed converged services (voice, video, and data) over virtual Ethernet, MPLS/VPLS, and IP networks.

This series of devices allows service providers to deliver multiple services on separate customer interfaces, including multiple services over a single customer interface. Since each service is isolated, providers can not only troubleshoot each individual service without impacting the others, but also have the ability to provide service extension, and remote management.

Using operations, administration, and maintenance (OAM) tools, service providers can measure and ensure provisioned service level agreements (SLA). The devices' embedded security controls ensure protection against denial of service attacks.

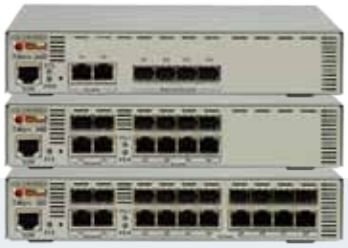
Advanced Layer 2 networking, using Telco Systems' access Ethernet, allows total flexibility in deployment and delivery of Ethernet services. Physical and virtual networking capabilities provide automated address management and discovery, bandwidth profiles, advanced traffic classes, and complete control over how subscriber traffic is transported across a service provider's network.

Telco Systems' EdgeGenie Orchestrator™ CE 2.0 & SDN/NFV Management System offers a modular and complete solution for the full life cycle of network deployment. EdgeGenie Orchestrator's modules include a Carrier Ethernet/MPLS end-to-end service management system with an SDN controller (TelcoController) module that manages OpenFlow switches, and an NFV Orchestrator (TelcoOrchestrator) module that directs distributed NFV deployments, including TelcoApps VM initiation, configuration and maintenance, service attachment and chaining, and VNF resiliency.

One Demarcation for Key Deployment Scenarios

The unique combination of OAM features, QoS features and embedded test heads, together with large resiliency mechanisms for protected services, including G.8031/G.8032, xSTP, Fast Ring and Resilient Link, makes these field-proven products a perfect fit for applications such as:

- One demarcation for multiple businesses in the same location – different services can be multiplexed onto one port and treated differently using Hierarchal QoS (HQoS) bandwidth profiles that includes: hierarchal scheduling, traffic shaping and policing the SLA of each business, and each service for each business – can be assured separately even if they are using the same port
- One demarcation for multiple mobile providers in one cell – in addition to service multiplexing, the large port density and HQoS supports high capacity while enforcing strict SLA requirements, and monitoring them with the extensive embedded OAM tools. Extended temperature and redundant wide range power options qualify this product for small cell site location for multiple providers' support, as well as multiple cell sites (e.g. small cells within macro cell)
- One demarcation for business and mobile backhaul – as service providers offer different services off the same network, one device can provide demarcation solutions for both business and mobile operators. The variety of port interfaces and optics supported couples with MEF features to allow deployment flexibility and the ability to grow the network and its services as more customers are being added onto the network per demarcation device.



PRODUCT HIGHLIGHTS

- High port density on a small foot-print
- Assured SLA using a sophisticated HQoS scheme
- Hardware-based embedded Y.1564 and RFC 2544 test heads for service turn up testing
- SLA monitoring using TWAMP and Y.1731 testing methods
- Redundant uplink for protected services with sub 50ms recovery time using G.8031/G.8032, xSTP, Fast Ring, Resilient Link
- Multi-layer control, monitoring, line testing and loopback for fail-safe operation using hardware-based OAM for enhanced service management, including IEEE 802.3ah EFM, IEEE 802.1ag CFM
- IEEE and ITU-T standards compliance for multi-vendor interoperability
- "Zero touch provisioning" for simple and fast deployment
- Extended temperature and extended wide range power models available
- MEF 9 and MEF 14 certified for Ethernet services at the UNI
- MEF CE 1.0 and MEF CE 2.0 complaint
- Outdoor operating temperature
- Combo fiber/copper Ethernet ports for deployment flexibility and reduced sparing
- NEBS Level 1 compliant
- Jumbo frames support

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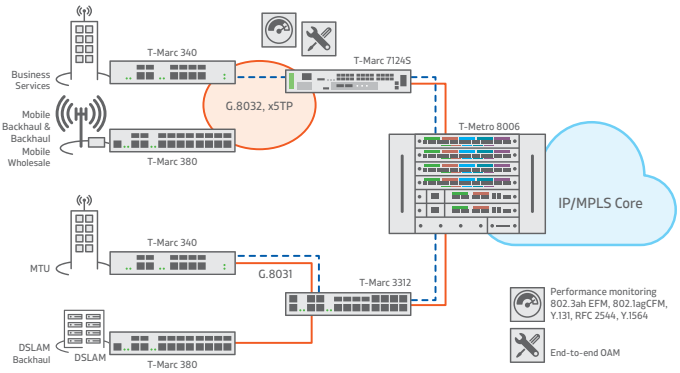
PRODUCT SPECIFICATIONS

Hardware Characteristics	T-Marc 340: 6 x 10/100/1000BaseT or 100BaseFX/1000BaseX Combo SFP ports T-Marc 340E: Extended temperature model T-Marc 340EW: Extended temperature, wide range power model T-Marc340F: 2 x 10/100/1000BaseT access ports, 4x 1000BaseX* SFP ports T-Marc 380: 10 x 10/100/1000BaseT or 100BaseFX/1000BaseX Combo SFP ports Non-blocking 10Gbps FD platform 19" rack and wall-mounting options
Services	All MEF services, IEEE 802.1Q bridging, IEEE 802.1ad Q-in-Q (TLS)
Timing	IEEE 1588v2 PTP support for precise one-way measurement
Resiliency	Sub-50ms ITU-T G.8031 EPS, ITU-T G.8032v2 R-APS, MSTP Fast Ring xSTP, Resilient Link, LAG (static/IEEE 802.3ad LACP)
Quality of Service	Per port/EVC/flow single/dual rate limiting and shaping Hierarchical QoS – Multi-level SP, WRR and hybrid frames scheduling, CoS marking and mapping per EVC
Multicast Mgmt	IGMP snooping v1/v2, IGMP proxy; MVR support
OAM	Hardware-based IEEE 802.3ah EFM, IEEE 802.1ag CFM
Testing & Monitoring	Hardware-based ITU-T Y.1564 and RFC 2544 test head and service performance analyzer In-service testing capabilities TWAMP, ITU-T Y.1731 PM, SM and SLM support Per-port/EVC/VLAN/COS, Hardware-based flexible MAC-based loopbacks; Hardware-based per-EVC IOMetrix or LSL loopback mechanisms
Management	Console, Telnet, SSHv2, Radius, TACACS+, SNMP v1/2/3, xFTP, NTP, DNS resolver, DHCP client and Zero-Touch provisioning
Security	ACLs, RADIUS, SSHv2, SNMPv3, SFTP, port security, broadcast storm prevention, secured access
General Specifications	Dimensions: Height: 1RU 1.75" (44 mm) Width: 8.7" (221mm) Depth: 9.25" (235 mm) Weight: 2.42lbs (1.1 kg) Installation: Wall/Desk/Rack Mount
Power	Internal AC Power Source: 100-240V AC @ 0.5A, 50-60 Hz Optional External AC Power Source: 100-240V AC @ 1.5A, 50-60 Hz Output Power: 12V DC Nominal, @ 5A DC Power Source: 24V/48V DC @ 3A, reverse polarity power input Output Power: Nominal 45W Power Consumption: Typical: 25W, Maximum: 45W
Temperature	Operating temperature: 0°C - 50°C (32°F - 122°F) Short term extended temperature: -20°C - 60°C (-4°F to 140°F) Extended temperature models: TMC-340-x-E: -20°C - 65°C / -4°F - 149°F TMC-340-EW: -40°C - 65°C / -40°F - 149°F Storage temperature: -25°C – 70°C (-13°F – 158°F) Relative humidity: 10% to 90% non-condensing
Regulatory Compliance	NEBS Level 1 compliant **North America and Canada** EMI - FCC Part 15 Class B Safety - UL1950, cUL 60950 CSA 22.2 No. 950 **International** EMI - EN55022 Class B Immunity - EN50082-1 Safety - EN 60950 , AS/NZS 60950-1:2003/A1:2006/ RoHS and REACH compliant



TELCO SYSTEMS' MANAGEMENT & ORCHESTRATION SYSTEM

KEY APPLICATIONS

- MEF CE 2.0 certified (T-Marc 340)
- Managed premium business services
- Mobile backhaul and mobile backhaul wholesale
- SLA assurance demarcation, with both SLA monitoring and probing capabilities
- Exchange NNI demarcation

ORDERING INFORMATION

Model	Fiber/ copper ports	Power	Operating temp
TMC-340-x	6 x Fiber/Copper	AC + optional external PS	0°C to 50°C (32°F to 122°F)
TMC-340-2DC* **	6 x Fiber/Copper	Dual feed 48VDC (wide range)	0°C to 50°C (32°F to 122°F)
TMC-340-x-E	6 x Fiber/Copper	AC + optional external PS	-20°C to 65°C (-4° F to 149°F)
TMC-340-EW	6 x Fiber/Copper	Dual feed 24DC/48DC (wide range)	-40°C to 65°C (-40° F to 149°F)
TMC-340-x-F	2 x Copper 4 x Fiber	AC	0°C to 50°C (32°F to 122°F)
TMC-340-DC-F	2 x Copper 4 x Fiber	48VDC	0°C to 50°C (32°F to 122°F)
TMC-380-x	10 x Fiber/Copper	AC	0°C to 50°C (32°F to 122°F)
TMC-380-DC	10 x Fiber/Copper	48VDC	0°C to 50°C (32°F to 122°F)
TMC-380-2DC	10 x Fiber/Copper	Dual feed 48VDC	0°C to 50°C (32°F to 122°F)
TMC-3X0-EXTPS-x (Optional)	External redundant AC power supply for TMC-300 series devices		

Note: 'x' specifies power supply and cord types: NA for North America, EUR for Europe, UK: for United Kingdom, IL for Israel, DC for DC, AC for no power cord

*** All DC models have reverse polarity connectivity, and can be connected as positive (+) or negative (-)

** SFPs not included. Call Telco Systems Support for options.

* 100M can be supported using SGMII enabled 100M SFP

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