

T-Marc

Ethernet and Circuit Emulation Service Demarcation Solution

Compact, cost-effective Ethernet/TDM demarcation switch support



▶ T-Marc-250 with Gigabit Ethernet uplink

▶ T-Marc-254 with Gigabit Ethernet uplink and CES



The T-Marc is a family of fully managed 10/100/1000 Ethernet demarcation gateway units. Some models have integrated pseudowire (PWE3) 4 ports T1/E1 circuit emulation (CES) modules.

The T-Marc has several unique features that make him "best of breed".

- One unit "does all". No need for separate switches and CES units. Saves space and cost.
- Guaranteed recovery time <50 mSec (average 15 mSec) based on M/RSTP (Multiple Rapid Spanning Tree).

With the T-Marc IP networks have better recovery time than traditional SDH/Sonet networks.

All latest standards supported:

- T-Marc provides service termination and demarcation over service providers' packet-based networks utilizing 802.3ah EFM (Ethernet First Mile), 802.3ag (IEEE, ITU, MEF) and IEEE802.1aj.
- Standards-based features provide extensive end-to-end **Operation Administration and Maintenance (OAM)** capabilities, such as performance monitoring, fault propagation, loopback, and remote

failure indications. This extensive OAM significantly lower OPEX costs.

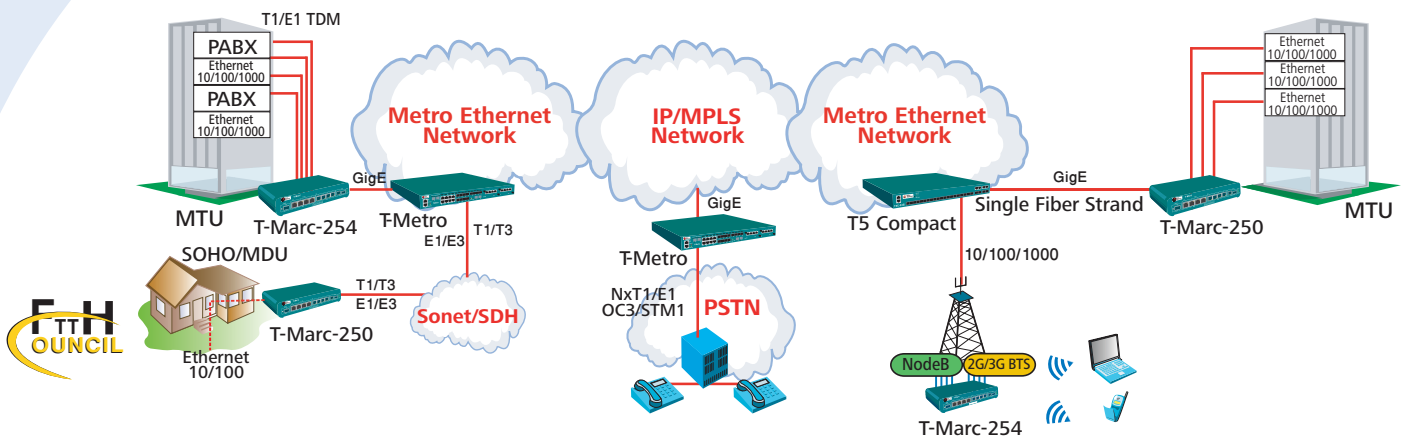
- T-Marc's **CES functionality** helps to reduce CAPEX by deploying this single device to deliver new and legacy services. Up to 4 x T1/E1 (or fractional T1/E1) Circuit Emulation Service (CES) Modules integrated into the unit. Special CES, modules that can carry precise cellular backhaul is available.
- Several advanced features of security and Quality of Service.
- The T-Marc is modular with 4 x 10/100BaseTX ports and 1 x 100BaseFX, 1 x 10/100/1000BaseTX and 2 x 1000BaseX that can be fitted with extensive array of SFP's: multi, single mode and bidirectional (CWDM).
- The T-Marc is powered by the Telecom grade multi layer BiNOSCenter™ - EMS software that is used as standard by several Telecoms (TL-1 version available as well).
- The BiNOSCenter™ - EMS is available with all models. Yet, the BiNOSCenter™ can operate with several NMS/OSS systems.

All T-Marc family members are non-blocking and operate at wire speed. ■

Product Highlights

- ❖ Demarcation point between service provider's network and enterprise LAN
- ❖ Full support for voice, video, and data services
- ❖ Extensive Layer 2 functionality non-blocking with wire-speed switching capabilities
- ❖ Provides remote Ethernet, TDM demarcation and visibility
- ❖ Control, monitoring, line testing and loopback capabilities for fault isolation
- ❖ T1/E1 structured/unstructured CES support using state-of-the-art Pseudowire technology for 2G/3G cellular backhauling
- ❖ Comprehensive OAM and management functionality
- ❖ Powered by Telecom grade multi-layers EMS BiNOS Software
 - Flexible management options for remote alarms/provisioning
- ❖ Enhanced security and protection mechanisms
- ❖ Modular, scalable architecture
 - Up to 4 T1/E1s CES
 - Up to 2 Packetized T1/E1s
 - Up to 2 Packetized T3/E3s
 - Up to 4 x 10/100BaseTXs
 - Up to 1 x Combo 10/100/1000BaseTXs or 100/1000BaseFX
 - Up to 2 x 1000BaseX uplinks'
- ❖ Reduces CAPEX - compact, cost-effective solution is ideal for customer premises deployment
- ❖ Reduces OPEX - Minimizes unnecessarily expensive truck-rolls
- ❖ Works & Interoperable with many vendors NMS/OSS
- ❖ Compact 1RU x 1/2 19" pizza-box Desk, rack and wall-mounted

PABX backhaul to PSTN and Ethernet-based services over Metro Ethernet



Specifications

- Ethernet Demarcation with 10/100/1000, Gigabit Ethernet copper and fiber at wire speed with Circuit Emulation Service (CES)
- Advanced ring implementation using Multi/Rapid spanning tree (MSTP/RSTP) convergence < 50msec switch recovery
- Featuring Service Level Agreement (SLA) using Advanced OAM (IEEE-802.1ag, 802.1aj, 802.3ah) QoS, Fault and Performance monitoring tools
- TDM encapsulation over Packet using IETF-PWE3-SAToP, CESoPSN
- Rate-limiting and policy enforcement
- Transparent LAN services (Q-in-Q)
- Advanced Layer 2 Switching
- Advanced Video support (IGMP1/2 Snooping, PIM-SW/DM; IGMP quick zapping (22ms), Multicast VLAN Registration (MVR))
- Advanced Security features (IEEE 802.1x, RFC2138 RADIUS, Wire-speed ACL, DoS (Denial of Service) protection)
- Wide-range of management options and tools (Web Management, CLI Serial, TELNET, SNMPv3, SSH2, Syslog, RMON, TFTP)

General

Dimensions	(H x W x D) 1.75"x9.5"x6.1" 44 x 241 x 155 mm
Weight	2.42 lbs, 1.1 Kg max
Power	5VDC with external power adaptor (AC to DC, DC to DC converter)

Environmental

Operating temp:	0°C to 45°C (32°F to 113°F)
Short term extended temperature:	
T-Marc-250	(-20°C to 60°C)
T-Marc-254	(-15°C to 60°C)
Relative Humidity	Up to 95% non-condensing

Regulatory

North America and Canada

EMI - FCC Part 15 Class A
Safety - UL1950, cUL 60950 CSA 22.2 No. 950

International

EMI - EN55022 Class B
Immunity - EN50082-1

Features and Benefits

- Reduces OPEX and CAPEX
- Copper and fiber Ethernet wire-speed based demarcation point for:
 - Enterprise, multi-tenant (MTU), and multi-dwelling units (MDU)
 - Industrial parks, FTTx
 - Multi-service, multi-carrier
- Multi-layer transport, Ethernet and TDM service delivery – Pseudowire CES, services extension node, VPNs, E-Line, E-LAN, Internet access, Ethernet VPN, Transparent LAN Service (TLS) and more...
- Access platform OAM extension
- GSM/CDMA BTS and UMTS cellular backhaul over leased T1/T3 and E1/E3, Metro Ethernet or WiMAX
- T1/E1 CES for TDM leased-line replacement
- PBX-to-PSTN backhaul and PBX-to-PBX (tie-line) connectivity
- Media and/or rate conversion

Ordering Information

Chassis and Power Suppliers

Note: 'X' specifies power supply and cord types: **NA** for North America, **EUR**: for Europe, **UK**: for United Kingdom and **DC**: for -48V DC

Part Number	Description
TMC-250-x	T-Marc Managed Ethernet demarcation gateway with fixed (4) 10/100BaseTX ports, (1) unpopulated SFP-based 1000BaseSX port, (1) universal 100/1000BaseX unpopulated SFP-based or 10/100/1000BaseT port and external power supply. BINOS license and basic OAM support included.
TMC-254-x	T-Marc as above and (4) integrated T1/E1CES (RJ-45 balanced, distance 200m)
TMC-254-HPCR-x	T-Marc as above and (4) integrated T1/E1CES (RJ-45 balanced, distance 200m) with enhanced clock recovery (G.823/G.824 synchronization interface and 2G/3G cellular applications compliant).

*For full list of Optical and PDH modules, please contact our sales department, any of our branches or authorized distributors

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