



T-METRO 200

CARRIER ETHERNET MULTI-SERVICE CES AGGREGATION

The T-Metro 200 is a feature-rich multiservice access device designed to increase service provider revenues and deliver a complete portfolio of voice, data and video services. The T-Metro family of products supports a wide variety of technologies including Ethernet, circuit emulation services (CES), MPLS, OAM (operations, administration and maintenance) tools and hierarchical quality of service (HQoS). This rich combination of technologies allows service providers to deliver an enhanced service offering while maintaining competitive pricing.

The T-Metro 200 provides access to advanced data services such as virtual private LAN services (VPLS), virtual private wire services (VPWS) and IP virtual private network (IP-VPN) services. In addition, the T-Metro product line enables service providers to carry native TDM traffic transparently across packet switched networks (PSN), using various circuit emulation techniques. The TDM traffic is encapsulated in Ethernet or IP frames to emulate the functionality of a TDM circuit, ensuring that all original feature-sets are preserved.

Designed for Metro Ethernet Services

Convergence of voice, data and video services over a single Ethernet-based infrastructure is transforming the way enterprises and service providers conduct their businesses. The T-Metro 200's versatility, advanced feature-set, wire speed performance and robust design makes it an ideal convergence platform for metro applications, either in a bridged metro Ethernet or MPLS environment. The T-Metro 200 allows service providers to offer seamless access to converged service networks, enhancing their competitiveness.

Bringing Service Intelligence to the Customer's Doorstep

The HQoS functionality provided by the T-Metro 200 allows service providers to deploy versatile and innovative service offerings. HQoS provides maximal control over bandwidth shared by multiple services, and guarantees isolation and fairness between services and customers. Combined with a rich set of OAM features and elaborate MPLS capabilities, the T-Metro 200 allows service providers to extend intelligent services to the customer's edge and offer higher-margin SLA-based services.

Compact, Cost-Effective Metro Ethernet Access Rings

Deployment of metro Ethernet rings has become increasingly popular due to its efficiency, costs savings, and flexibility. Ring architecture allows for multiple services to be consolidated, transported, and inserted as needed. The inherent redundancy, resiliency and re-routing capabilities of ring technologies results in increased reliability and high network availability.

The T-Metro 200 offers an Ethernet ring solution with recovery time in less than 50ms, in either bridged metro Ethernet environments or MPLS environments. T-Metro 200's Ethernet ring implementation is fully standards-based, therefore it is fully interoperable with other standards-based products deployed in the same ring.



PRODUCT HIGHLIGHTS

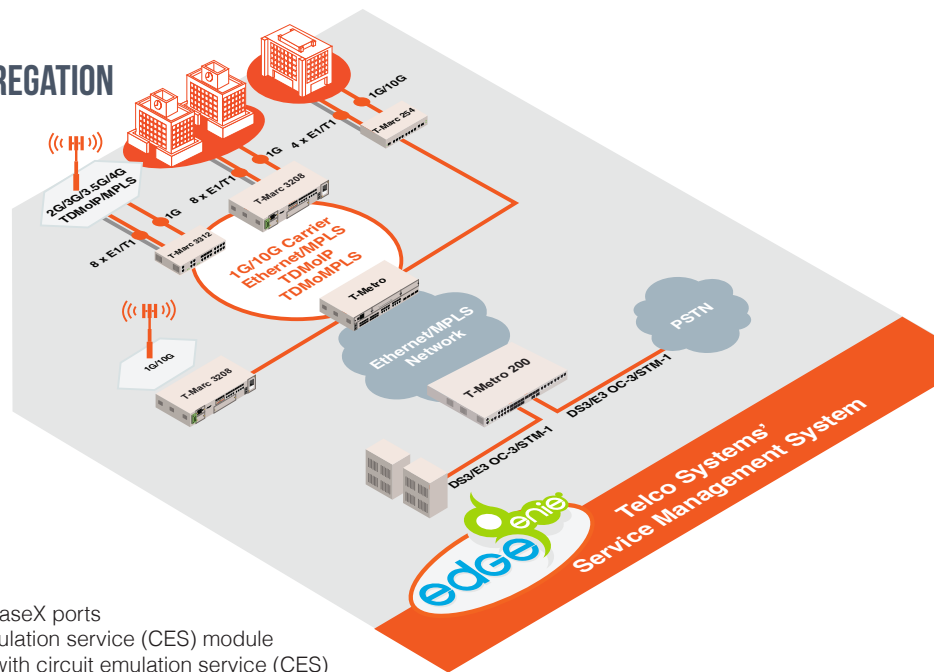
- Enhanced Ethernet services, features and capabilities
 - 802.1ad provider bridges for Ethernet based L2VPN services
 - Super VLAN for traffic isolation
 - Fast-Ring with sub 50ms recovery
 - IEEE 802.3ad link aggregation
- Circuit Emulation Services deliver traditional voice or leased line services
 - Structured agnostic traffic over packet (SAToP)
 - CES over packet switched networks (CESoPSN)
 - T1/E1; DS3/T3, OC-3/STM-1
- MPLS capabilities provide access to HVPLS and VPWS
 - HVPLS spokes
 - Ethernet and TDM pseudowire emulation (PWE3) using Martini tunnels
 - Dual homing with active and guarded LSPs
 - LSR functionality including FRR
 - RSVP-TE and OSPF-TE
- HQoS functionality for advanced SLA-based services
 - Provides per customer-site, per service and per EVC queuing
 - Hierarchical dual-rate bidirectional shaping
 - Support for multi-application SLA, multi-site SLA and multiservice SLA
- Simplified management and minimized OPEX with a broad set of OAM tools
- NEBS Level 3 compliant

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KEY APPLICATIONS

- Multi-tenant, multi-service HVPLS spoke (using MPLS or Q-in-Q)
- Virtual Private Wire Services (VPWS)
- Resilient, carrier class access rings
- Enhanced, SLA-based metro Ethernet services
- Cellular and PBX backhaul



PRODUCT SPECIFICATIONS

Hardware Characteristics	8 x 10/100BaseTX, 12 x 100BaseFX, 2 x 100BaseFX/1000BaseX + 2 x 1000BaseX ports <i>Optional:</i> 3 x T3/E3 ports with circuit emulation service (CES) module <i>Optional:</i> 1 + 1 OC-3/STM-1 protection with circuit emulation service (CES) aggregation module Non-blocking 7.4Gbps FD platform
Services	All MEF services, IEEE 802.1Q bridging, IEEE 802.1ad Q-in-Q (TLS), SAToP, CESoPSN, MPLS L2VPN - MTU HVPLS, VPWS
Resiliency	Sub-50ms RSVP-TE FRR, HVPLS dual homing, Secondary LSP xSTP, resilient link, LAG (Static/IEEE 802.3ad LACP) Hot swappable, redundant AC/DC power supply
Timing	BITS and Phase Clock for TDMoPSN services, ACR (Adaptive Clock Recovery), ITU-T G.823/G.824 synchronization
Quality of Service	Per port/EVC/flow single/dual rate limiting HQoS - 24 hardware queues per EVC, Multi-level SP, WRR and hybrid frames scheduling, CoS marking and mapping per EVC
Multicast Management	IGMP snooping v1/v2, IGMP proxy Multicast VLAN registration (MVR)
OAM	IEEE 802.3ah EFM, IEEE 802.1ag CFM
Testing & Monitoring	ITU-T Y.1731 SM
Management	Console, Telnet, SSHv2, Radius, TACACS+, SNMP v1/v2/v3, xFTP, NTP, DNS resolver, DHCP client
Security	ACLs, RADIUS, SSHv2, SNMPv3, SFTP, port security, broadcast storm prevention, secured access
General Specifications	Dimensions (W x H x D): 440 mm (17.4") x 44 mm (1.73") x 419 mm (16.5") Weight: 3.7 kg (8.2 lbs) (without PSU) Each AC or DC Power Supply: 0.6 kg (1.3 lbs) Operating Temperature: 0°C to 45°C (32°F to 104°F) Short Term Extended Temperature: -20°C to 60°C (-4°F to 140°F) Storage Temperature: 25°C to 70°C (-13°F to 158°F) Operating Humidity: 0%-95% non-condensing Relative Humidity: 5% to 90% at 45°C (104 °F) non-condensing Storage Humidity: 95% maximum relative humidity, non-condensing Power: Input: 5 V DC @1.0 A, 5.0 W DC: -48V DC (-42V to -56V) AC: 100~240V 50~60Hzs AC power source: Voltage: 100-120 VAC @ 5A / 200-240V @ 2.5A Frequency: 50/60Hz DC power source: Voltage: -48VDC typical / -36V to -60VDC @ 3A
Regulatory Compliance	NEBS Level 3 compliant, IETF and IEEE compliant Safety and EMC Compliance: FCC class A, VCCI class 1, UL/CUL, VE (EMI, EMS, LVD) Safety: EN/IEC 60950, EN60825, UL1950, CSA 22.2 EMC: EN55022 Immunity: EN61000

ORDERING INFORMATION

Part Number	Description
TM-200	T-Metro base platform plus enhanced HQoS (MPLS/ HVPLS) 2-port Gigabit Ethernet unpopulated SFP-based uplinks. T-Metro base platform includes eight (8) 10/100BaseTX ports, twelve (12) unpopulated SFP-based 100BaseFX ports and two (2) unpopulated SFP-based 1000BaseX ports. Two (2) unpopulated access slots and two (2) unpopulated power supply slots. At least one (1) power supply module is required for operation. Optical ports require SFP. BiNOS ML support + CES + HQoS+ Enhanced M
TM-CES-AGGR-DS3	T-Metro DS3/T3/E3 CES module, high performance IEEE-1588v2 clock recovery, 3 x DS3 (44.736 Mbps) or 3xE3 (34.368 Mbps) (coaxial in/out ports) 6 x "1.0/2.3 R/A" to miniBNC connectors (unbalanced), 3 x coaxial sync clock ports (2 in, 1 out) x "1.0/2.3" R/A to miniBNC connectors (unbalanced), 2 x framed T1 1.544MHz / E1 2.048 MHz sync clock ports RJ45 BITS interfaces (balanced). A single module can be assembled in a single T-Metro platform. 6 x coaxial cables 5ft (1.5m) length are included
TM-CES-AGGR-155	T-Metro CES aggregation module, high performance clock recovery, dual unpopulated pluggable OC-3/STM-1 SPF LC optical interface
BTI-SFP-FSM-LC	OC-3/STM-1 SFP

Notes:

- All T-Metro models are available with single/dual AC/DC PSU configurations
- Unpopulated SFP ports.
- additional coaxial cables can be ordered separately.



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