



EtherReach®

Ethernet over PDH NTE



EtherReach 2118

EtherReach 2210

EtherReach 2212



Telco Systems' EtherReach PDH Network Termination Equipment (NTE) offers carrier class Ethernet access and transport over legacy PDH technologies at Fast Ethernet line speeds.

EtherReach solutions allow service providers to extend standard Ethernet services to almost any customer including off-net and out-of-region locations enabling the provider to leverage its existing infrastructure, paving the way for a seamless and cost effective migration to Ethernet-based packet networks.

EtherReach 2000 series products are designed to deliver managed Ethernet services over single and bonded T1, /E1, DS3 and single E3 circuits or one or more groups. With up to 8 bonded T1s or E1s, using X.86 'like' or GFP, VCAT and LCAS these products allow providers to offer scalable Ethernet services, while allowing a smooth migration path as the networks evolve before fiber becomes ubiquitous.

Carrier-class Ethernet Services

While Carrier Ethernet is growing, it is critical for providers to keep equipment and operational costs down while deploying reliable and accurate methods to measure metrics and verify SLAs.

EtherReach enables the delivery of Ethernet services with intelligent demarcation, advanced standards-based VLAN functionality, Quality of Service and OAM for the delivery of differentiated, granular and scalable Ethernet services.

EtherReach supports Ethernet operations and management capabilities as defined by IEEE 802.3ah (EFM), 802.1ag (CCM), or ITU-T Y.1731 (ETHOAM). These individual standards define link level monitoring, customer edge to carrier edge connectivity and service level provider OAM functionality for end to end network monitoring, measurement and verification of SLA metrics.

RFC 2544 test suites provide network testing, troubleshooting and qualification further enhancing the advanced network testing capabilities.

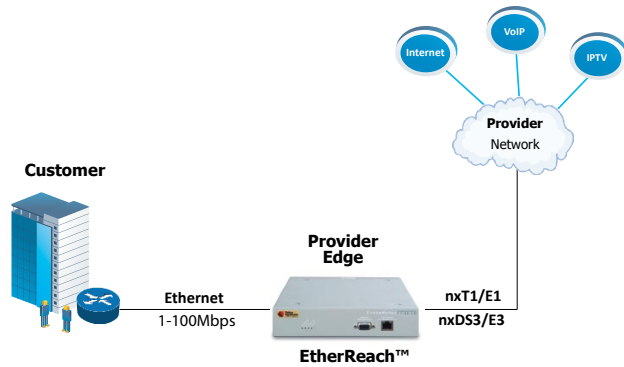
Telco Systems' EtherReach EoPDH solutions combined with the Company's fiber-based T-Marc and T-Metro products support a complete carrier grade Ethernet solution across all IP networks.

- **Ethernet over PDH Network Termination**
- **TDM Interfaces**
 - Nx T1/E1 with X.86 "like" or GFP w/ VCAT and LCAS (up to 8 T1/E1s)
 - Nx T3/E3 with X.86 "like" or GFP w/ VCAT and LCAS (up to 2 T3s or 1 E3)
- **Ethernet Interfaces**
 - 2 x 10/100Mbps access ports
- **GFP encapsulation with VCAT/LCAS support per ITU-T G.7041/G.8040, G.7042, G.7043**
- **Ultra low latency - Hardware-based packet forwarding, larger FPGA**
- **Software/firmware-based Ethernet OAM**
- **Port and flow level QoS**
- **Port and flow level rate limiting**
- **MEF 9 and MEF 14 Certified**
- **NEBS Level 3, Verizon and Qwest Certifications**
- **RoHS 5/6 Certified**



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Ethernet over PDH



Key Applications

- WiMAX/WiFi Backhaul
- Commercial/Business Ethernet
- Ethernet Private Line using TDM technology
- Virtual Private Line
- Utility Applications

Specifications

Standards and Certifications

- MEF 9: EPL, EVPL, ELAN
- MEF 14: EPL
- IEEE 802.1D; IEEE 802.1Q; IEEE 802.1P
- IEEE 802.1p Priority Queuing; IEEE 802.1u-2001
- IEEE 802.3x PAUSE: flow control and back pressure
- IEEE 802.1x; IEEE 802.3ad
- IEEE 802.3; 802.3u; 802.3z Ethernet
- IEEE 802.3ah OAM; IEEE 802.1ag CFM; ITU-T Y.1731
- ITU-T G.7041/G.8040, G.7042, G.7043
- ITU-T G.704
- NEBS Level 3 and Verizon and Qwest certification

Interfaces

- 10/100BaseTX subscriber interfaces (model dependent)
- DS-1/E-1 CN50 (CHAMP?) Connector (optional RJ-45C Converter); single DS3/E3 with BNC, dual DS3 use mini-BNC (model dependent)
- Local craft access via 10/100BaseTX or DB9 RS-232

Ethernet Encapsulation

- Industry standard EoPDH
- Improved proprietary extensions to X.86 "like" framing
- GFP encapsulation with VCAT/LCAS support per ITU-T G.7041/G.8040, G.7042, G.7043

OAM and SLA Verification

- Operational parameter measurement and monitoring capabilities via IEEE 802.1ag or ITU-T Y.1731 as well as proprietary Performance Measurements
- Performance Monitoring via RFC 2819 RMON, ANSI T1.231, T1.403, and GR-820

Additional OAM&P Features

- Inband Management Option: Utilize dedicated VLAN to carry NM information concurrent with user data over Trunk and/or Subscriber Interfaces.
- Alarm Propagation Functions: Propagate alarm conditions from (TDM) Trunk to (Ethernet) Subscriber ports and vice versa

Traffic Management Features

Traffic Forwarding Modes

- Proprietary extensions for X.86 to support IMUX for multi-link and loop detection
- GFP (VCAT, LCAS)
- Automatic removal/restoration of DS1, E1, DS3 from bonded circuit
- Configurable automatic removal / restoration of E3's from link group
- MAC Bridging with priority queuing
- VLAN Bridging with priority queuing
- IEEE 802.1ad (Q-in-Q) Provider Bridges
- Transparent VLAN Forwarding, tag swapping and stacking
- Flow Control with PAUSE frames per IEEE 802.3x
- 128 VLAN supported per 10/100M port
- 128 Policers supported per 10/100M port

Traffic Classification and Flow Control

- Dynamic Flow Control for Ingress Policing with 64kb/s granularity
- 4 link layer traffic priority levels per IEEE 802.1d
- WRR and strict priority queue processing
- Traffic Classification and Priority via ToS/IP precedence/DSCP/802.1q&p

Management

- TDR for LAN copper cable diagnostics
- VLAN, Port and Queue statistics for SLAs
- DS1, E1, DS3, E3 Alarms
- System provisioning via Command Line Interface (CLI), WebView (HTTPS) and/or SNMP
- Inband management for remote telnet or HTTPS login
- Secure Shell Support
- Radius Authentication Support
- SNMP v1/v2c/v3 support

Safety and Regulatory Approvals*

FCC Part 15, subpart B Class A
ICES 003, Issue 2
EN 55022 Class A
UL 60950 / EN 60950
EN 61000
CE Mark
RoHS 5/6

*Call for country specific type approvals

Environmental

Operating temp: 0 to 45 degrees C
Storage temp: -10 to 85 degrees C
Operating humidity: 10% to 85% non-condensing
Power & Heat Dissipation

- 12 VDC via 115 VAC (90-240V) Power Adapter
- 12 VDC via 220 VAC (90-240V) Power Adapter (-e models)
- Optional -48VDC Power Adapter

Mechanicals

Width: 8 inches / 20.3 cm
Height: 1.75 inches / 4.45cm
Depth: 10 inches / 25.4 cm
Optional 19" or 23" rack and tray mount

Ordering Information

Part Number	Subscriber Interface Ports		Network Interface Ports			
	10/100BaseT	DS-1	E-1	DS-3	E-3	
EtherReach 2118	2	8				
EtherReach 2118e	2		8			
EtherReach 2210	2			1		
EtherReach 2210e	2				1	
EtherReach 2212	2			2		



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