



Total Access 5000 Optical Networking Edge

Carrier Ethernet Transport Optical Switch (ETOS-10 / ETOS-10N)

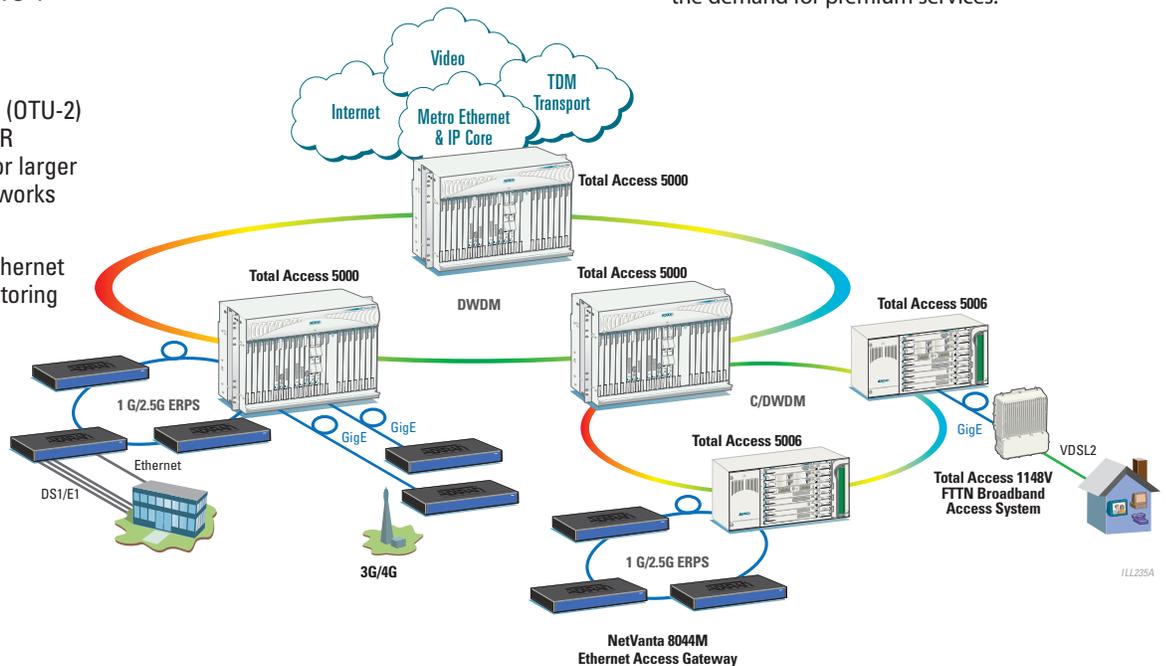
Systems at the core are increasingly more elaborate and complex and are being developed to handle even more data. The requirements at the edge are entirely different; simplicity, multiservice, integration, and cost rule. Typically, only a few wavelengths are required to start. Space is often a premium, especially in huts and street cabinets. In some cases, the equipment needs to be environmentally and temperature hardened.

ADTRAN's Optical Networking Edge (ONE) delivers an innovative right-sized Packet Optical Solution integrated with access and transport. It is optimized for tier 2/3 service provider markets. It supports a variety of applications including mobile backhaul, business ethernet, residential broadband, and data centers. ONE delivers low initial cost, smaller footprint, and lower power as compared to core systems designed for high initial capacity and very long site distances.

The ADTRAN® Total Access® 5000 offers a versatile Carrier Ethernet Transport Optical Switch (ETOS) as part of the Optical Networking Edge (ONE™) product line. The addition of the ETOS-10 module to the ADTRAN Total Access 5000 allows service providers the ability to deliver as well as aggregate both 1 GigE and 10 GigE carrier grade services. Services which can then be transported on a per wavelength basis, using only a single fiber uplink to aggregate and transport multiple services whether for residential triple play, mobile backhaul or business Ethernet services. The core Ethernet features of this product include a flexible Ethernet processor and a leading density of 10 Gigabit Ethernet SFP+ standard or DWDM fiber interfaces. The ETOS-10 supports flexible traffic management; Ethernet flow mapping, prioritization, tagging; and versatile management options which are required to respond to the demand for premium services.

Product Features

- Eliminates multi-box complexity with converged access, aggregation and packet optical transport via a single platform
- Premium service scalability with multi 10GE aggregation and transport with subtended rings
- Over 200 Gbps throughput per slot
- Carrier class resiliency and redundancy with cross slot Ethernet access and transport ring ERPS topology via ITU-T G.8032v2
- MEF compliant
- Optional OTN interfaces (OTU-2) for improved Optical SNR performance required for larger Metro and Regional networks (ETOS-10N)
- SLA Management via Ethernet OAM performance monitoring tool sets
- Extreme temperature hardened for street cabinet deployments



Smart Solutions for a Connected World.



Carrier Ethernet Transport Optical Switch (ETOS-10 / ETOS-10N)

Product Specifications

Front Panel Interfaces

- Eight High Speed (HS) 10 Gigabit Ethernet interfaces via SFP+ modules
- Four HS interfaces can be provisioned as OTN OTU-2 (ETOS-10N)
- Two 1/2.5 Gigabit Ethernet interfaces via SFP cages
- All Ethernet ports may be used for either network NNI or customer-side UNI connections
- 1000Base-T Copper SFP supported for RJ45 copper connection
- 100BaseX SFP also supported to allow Fast Ethernet fiber lease
- 100BaseT copper SFP support
- Support either 10 Gbps or 1 Gbps ITU-T G.8032v2 Ethernet Ring Protection Switching (ERPS)

Wavelength-Division Multiplexing Interfaces

- Dense WDM support (CWDM)
 - The High Speed (HS) 10 Gig SFP+ and the Mid Speed (MS) GE SFP interfaces support 44/88 DWDM wavelengths for interfacing the optical DWDM layer and delivery of high bit rate multi wavelengths network connection
- Coarse WDM support (CWDM)
 - The Mid Speed (MS) GE SFP interfaces support eight CWDM wavelengths for interfacing the optical WDM layer and delivery of multi wavelengths over a single fiber

Physical Dimensions

- Standard TA5000 single slot width, standard height card
- Rack mountable solution in 19" (482.6mm) or 23" (584.2 mm) wide telecom racks

Power Considerations

- Redundant, Dual A and B fed -48 VDC
- TA5000 chassis provides power connection
- Typical power consumption is 69W

Environmental Hardening

- **Operating Temperature:** -40 F to 149 F (-40°C to 65 °C)
(Note: Not all SFP+ options are currently extreme temperature rated)
- **Storage Temperature:** -40 F to 185 F (-40°C to 85 °C)
- **Relative Humidity:** GR-63-CORE 5% to 95%, non-condensing
- **Operating Altitude Range**
 - At 30°C: -197 to 13000 feet (-60 to 4000 meters)
 - At 40°C: -197 to 6000 feet (-60 to 1800 meters)

Regulatory Agency Approvals

- FCC Part 15 Class A
- FCC Part 68
- UL 60950, CAN/CSA C22.2 No. 60950
- EN 60950, IEC 60950, AS 3260/ AS NZS60950
- GR-63-CORE
- NEBS Level 3
- RoHS 2002/95/EC
- ITU-T K21:2000 Basic

Ethernet Services Support

- Classification of Traffic based on:
 - Per UNI port, CE VLAN ID (C-Tag) and/or CE VLAN P-bits, DSCP fields
- Single stack VLAN and double stack VLANs (Q-in-Q)
 - Manipulation based on 802.1p and DSCP fields
 - STAG TPID provisioning supports 802.1ad and 802.1Q standards
 - Port based service support
- Services Scale and Flexibility
 - MEF 9, 14 compliant EPL, EVPL
 - MEF 9, 14 compliant ELAN
 - 8 Queues, Strict Priority and Weighted Round Robin Schedulers
 - Configurable EtherType and TPID for service flexibility
 - VLAN IDs 0 – 4095; EVC configurable in the range of 2–4094
 - MTU of 10k Jumbo frames
 - 32k active MAC address
 - 4k EVC per device
 - Up to 1536 ingress policers (trTCM) per device, CIR and EIR settings to 64kbps granularity, Configurable Burst through EBS, CBS settings
 - Egress shaping per port

Fault and Performance Management

- IEEE 802.3ah Link OAM
- IEEE 802.1ag Connectivity Fault Management (CFM)
- ITU-T Y.1731 Layer 2 Performance Monitoring

Clock Synchronization/Recovery

- Synchronous Ethernet defined by ITU-T G.8261/8262

Facilities Protection

- Ethernet Ring Protection Switching (ERPS) ITU-T G.8032v2
 - 50ms failover
- Link Aggregation Control Protocol (LACP)
- Equipment Redundancy Option
 - 50ms switchover based on fault detection or craft initiated command

Device Management

- Common operational model (i.e. FCAPS) used for every Ethernet access method
- Standard TA5000 Management via the TA5000 SCM card and connections
- Telnet via an IP-based connection to SCM
 - Inband management on any VLAN from 2 to 4094
- ADTRAN Operational Environment (AOE) Network Management
 - SNMPv1/2

Ordering Information

Equipment	Part #
ONE ETOS-10 Module	1174130F2
ONE ETOS-10N Module	1174130F1



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