Packet Assurance Demarcation Units

Network interface devices for Ethernet & IP networks

Key features

- Proprietary Hardware Design
  - 1 μs measurement resolution
  - Ultra-low pass-through jitter & latency
  - Ideal for assuring real-time services
- Service Assurance & Creation Features
  - Establish SLA-backed Ethernet services, point-to-point & multi-point
  - Monitor in-service: no effect on traffic
  - 1-way delay & jitter, throughput, packet loss, continuity and usage statistics
- Test Set & Monitoring System Support

Packet Performance Assurance™
Define the boundaries of your network, establish assured, end-to-end SLAs and standards-based management to deliver carrier-grade Ethernet & IP services.

Defining Intelligent Demarcation
Powered by the advanced functionality of JDSU’s ESAP™ Ethernet Service Assurance Platform, EtherNID™ and MetroNID™ demarcation units define the boundaries of your network, enabling end-to-end service provisioning and assurance with carrier-grade performance.
The EtherNID and MetroNID units are built on the patent-pending Fast-Thru™ architecture, a unique hardware-based design that provides advanced performance testing and service creation capabilities in a compact, cost efficient, carrier-grade in-line element.
Unlike store-and-forward architectures, Fast-Thru’s proprietary silicon design provides wire-speed pass-through performance without adding jitter or delay, while at the same time providing micro-second measurement resolution and real-time processing for every packet flowing through the unit.
With MEF 9+14 & NEBS Level 3 certification, no moving parts, 3-way redundant power, 1+1 protection and failover-bypass circuitry, EtherNID and MetroNID units are truly carrier-grade. A variety of mounting options ease installation at customer premises, cell sites, central offices and aggregation nodes.

EtherNID™ Units
Designed to demarc the edge of your network, EtherNIDs offer advanced Packet Performance Assurance™ and service creation directly from customer premises and cell-sites. With a full range of Ethernet rates and interfaces, the comprehensive EtherNID family fits your network from end-to-end.

MetroNID™ Units
High-performance MetroNID units provide carrier-grade demarcation within metro and access networks. Designed for cellular hubs, aggregation nodes, and carrier hand-offs, MetroNIDs segment, monitor and bridge diverse networks, delivering pervasive OAM and performance monitoring visibility.
Product Family Feature Matrix

JDSU has developed a wide range of packet assurance demarcation units, each adapted and optimized for popular demarcation, service assurance and creation applications. All units are interoperable where common functionality is supported. Our technical specialists can help you determine the right combination of units to provide complete Packet Performance Assurance™ for your network and services.

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<th>EtherNID™ EE</th>
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<th>MetroNID™ TE-R</th>
<th>MetroNID™ TE-S</th>
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<td>EE: Electrical-Electrical</td>
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<td>OE: Electrical-Optical</td>
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<td>OC: Optical-Optical</td>
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<td>10/100 Mbps</td>
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<td>1000 Mbps – Wirespeed GbE</td>
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<td>Electrical interfaces (including monitoring port)</td>
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<td>PAA™ &amp; SLA-Meter™ Performance Monitoring</td>
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<td>Layer 2 &amp; 3 In-Service Throughput Testing</td>
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<td>Service Creation</td>
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<tr>
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<td>UNI Type II compliant (MEF 26)</td>
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<td>Ring Support (RSTP)</td>
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<tr>
<td>Zero-Latency Traffic Shaping</td>
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<td>Traffic Filtering</td>
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<td>4, 3, 2 : 1 Switch-Free Aggregation Modes</td>
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<td>SNMP v1 &amp; v2c</td>
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<tr>
<td>Plug &amp; Go™ Instant Provisioning</td>
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<td>RADIUS Authentication &amp; Security Support</td>
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<td>Jumbo Frames Support (to 10,240 bytes)</td>
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<td>3-Way Redundant Power</td>
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<td>MEF 9+14 &amp; NEBS Level 3 Certified</td>
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<tr>
<td>Temperature Hardened Option</td>
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<td>Protected Links (1+1) with LACP / LAG</td>
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<tr>
<td>Copper Failover Bypass Circuit</td>
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</tbody>
</table>

*= with electrical SFP  
*= high capacity
Feature Highlights
Please refer to the ESAP™ solution overview brochure for complete functionality details.

Service Assurance Functionality

PAA™ & SLA-Meter™
High-precision, hardware assisted, latency + jitter-free demarcation, monitoring and measurement of latency, jitter, frame loss and continuity, including 1-way performance validation with microsecond resolution. Multi-flow, multi-service, multi-site performance assurance enables real-time SLA assurance over any network. Supports point-to-point, multipoint & mesh topologies, unicast & multicast testing.

In-Service Throughput Testing
Verify the throughput of EVCs in-service, without affecting customer traffic. EtherNID™ & MetroNID™ units generate & analyze traffic flows up to full wire-speed at both layer 2 & 3.

RFC-2544 Automated Test Suite & Reports
Advanced tool based on the RFC-2544 standard that can be used to measure and diagnose throughput, delay, jitter (delay variation), frame loss, and back to back efficiency.

Intelligent Loopbacks
In-service layer 1-2-3-4 loopbacks per-flow, defined by VLAN, Service-Level, MAC / IP addresses or any combination of layer 2-4 header criteria. Units respond to in-band loop-up commands from most third-party Ethernet test sets and monitoring systems, as well as via Y.1731 standards.

Per-Flow Statistics
Real-time statistics of live traffic at layer 1-2-3-4 (per VLAN, Ethertype, ToS, CoS, MAC, IP, etc.).

Tapping & Monitoring
Single or dual monitor ports providing filtered, real-time access to unidirectional or bidirectional traffic.

Service Creation & Traffic Conditioning

Service Mapping
Create E-Line, E-LAN & E-Tree services directly at the demarc point -service mapping applies C/V-LAN tags (selective push) and/or configurable service class to traffic meeting detailed layer 2,3 & 4 criteria.

Bandwidth Policing
Limit upstream and downstream CIR/EIR by filtering criteria or for all traffic. Facilitates Carrier Ethernet service provisioning and on-demand/incremental service upgrades.

Zero-Latency Traffic Shaping
Pre-conditioning of traffic to accelerate services and optimize access link bandwidth use. Passes highest-priority traffic Fast-Thru™ without added delay or jitter while other traffic is buffered until capacity is available.

Wire-speed Filtering
Filter wirespeed traffic at layer 1-2-3-4 (L2CP, BDPU, per VLAN, Ethertype, Protocol type, MAC, IP, user defined).

Switch-Free Aggregation
Latency-free, multi-port aggregation from 4 ports to a single GbE, or from 2 GbE’s to a single GbE or protected pair. De-aggregate by VLAN, or any combination of Layer 2 - 4 frame criteria.

Ring support - blazing-fast RSTP ring connectivity (802.1w)
Specifications

General Functionality

Jumbo Frames Support: All functions support jumbo frames up to 10,240 bytes at all rates (10/100/1000 Mbps).

3-Way Redundant Power: Units can be powered using 5 VDC, or dual-48V feeds, all mutually redundant.

Plug & Go™: Full automated customer-level install, auto-configuration & inventory tracking capabilities.

SNMP v1 & v2c: Support SNMP v1 and v2c for monitoring, alarms, OSS integration and unit configuration.

Interfaces

EtherNID™ EE

<table>
<thead>
<tr>
<th>Client</th>
<th>Network</th>
<th>Monitor A/B port:</th>
<th>Management port:</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/100 Mbps RJ-45</td>
<td>10/100 Mbps RJ-45</td>
<td>2 x 10/100 Mbps RJ-45</td>
<td>10/100 Mbps RJ-45</td>
</tr>
</tbody>
</table>

EtherNID GE, MetroNID™ TE & MetroNID TE-R

<table>
<thead>
<tr>
<th>Client</th>
<th>Network</th>
<th>Monitor A/B port:</th>
<th>Management port:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 x 10/100/1000 Mbps RJ-45</td>
<td>Mix &amp; Match with Client/Network ports</td>
<td>10/100 Mbps RJ-45</td>
<td></td>
</tr>
</tbody>
</table>

Notes

(1) 10/100 Mbps (10/100 Base TX) RJ-45 connectors: supports auto-negotiation and auto MDIX
(2) 100 Mbps (100 Base FX/LX/SX/ZX/BX) SFP connector: supports a wide range of SFPs
(3) 10/100/1000 Mbps (10/100/1000 Base TX) RJ-45 connectors: supports auto-negotiation and Aut MDIX
(4) 10/100/1000 Mbps (10/100/1000 Base TX/FX/LX/SX) SFP connectors: supports a wide range of SFPs including copper SFPs

Service Assurance Features

- Thru-traffic per-flow statistics
  Stats per VLAN, per Ethertype, per ToS, per CoS, per MAC, per IP, etc.
  Stores up to 7 days of local and remote historical packet statistics in user configurable history buckets (typically set from 1-15 minutes).
  Monitor up to 60 concurrent flows on MetroNID TE-R, 16 flows on other units
- Dual monitor access ports providing individual access to both signal directions, combined access to both directions and intelligent filtering.
  Up to 100 Mbps of traffic can be monitored from each port
- Fast fault propagation, <50 ms on all interfaces, client & network ports
- Transparent fail-over bypass on electrical-to-electrical models
- Dual protected uplink option for network side optical connection
  Standard 1+1 protection (<20ms) or LACP/LAG active / standby modes (< 50ms)
- Link Loss Return
- OAM functionality
  IEEE 802.3ah Ethernet OAM
  IEEE 802.1ag service layer OAM (Connectivity Fault Management)
  ITU-T Recommendation Y.1731
  • Dying Gasp (via 802.3ah or SNMP traps)
  • Integrated Copper TDR cable integrity testing
  • Optical digital diagnostics (SFF-8472) with threshold crossing alerts via SNMP traps
  • Jumbo frames support for all features (up to 10,240 bytes)

Performance Assurance Agent (PAA™)

- Continuous in-service monitoring of Layer 2 & 3 SLA parameters, unicast or multicast
  One-way and round-trip latency (delay)
  One-way and round-trip jitter (delay variation)
  One-way packet loss
  Continuous end-to-end path continuity check, availability (SES)
  IGMP group join / leave delays
- High precision measurements: 1 μs resolution
- Exclusive remote synchronization allows highly accurate one-way measurements over large geographical areas.
- Large-scale performance assurance works in multiple topologies:
  - Point-to-Point  • Multipoint-to-Multipoint  • Mesh
- Assures SLAs per VLAN/per CoS/per ToS/per EVC
- Multi-ILA™ monitoring – up to 100 simultaneous instances
- User settable SLA threshold crossing alerts using SNMP traps

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(4) 10/100/1000 Mbps (10/100/1000 Base TX/FX/LX/SX) SFP connectors: supports a wide range of SFPs including copper SFPs

Service Assurance Features

- Loopback functionality
  Layer 1, Layer 2 (MAC Swap), Layer 3 (IP Swap), Layer 4 (TCP/UDP Port Swap)
  Automatically reacts to in-band loopback requests sent from popular 3rd party Ethernet test sets, as well as 802.3ah / Y.1731 OAM loopback commands.
  Loopback on specific VLANs, source/destination MAC/IP address(es), Ethertype, protocol type, service class, or any logical combination.
  Loopback on specific MAC/IP source and/or destination address
Specifications

RFC-2544 Testing & Traffic Generation
- Wire-speed traffic generator and analyzer
  Layer 2 or Layer 3 (IP)
- In-service traffic generator and analyzer (3)
  Layer 2 or Layer 3 (IP); unidirectional or bidirectional
  Seamless operation, does not affect customer traffic
  Up to full service or wire-speed; 1 or 2 test streams
- RFC-2544 automated test suite with reports (1)
  Throughput
  Delay (latency)
  Delay variation (jitter)
  Frame loss
  Back-to-Back
  Supports all packet sizes including jumbo frames
  Automatic report generation

Service Creation & Traffic Conditioning

Service Mapping
- Create E-line, E-LAN & E-Tree ethernet virtual circuits
- Identify traffic flows based on frame characteristics
  Source or destination MAC or IP addresses, masks
  Ethertype, port(s), DSCP, IP precedence or PCP
  Customer & providers VLAN ID (C-VLAN, S-VLAN)
- Applies one or more actions
  C/S-VLAN tagging (selective push), VLAN overwrite
  CoS mapping (set C/S-VLAN tag priority based on DSCP, IP precedence or PCP, drop eligibility)
  Bandwidth policing (based on L2-4 filters)
  Q-in-Q (802.1Q), VLAN stacking (up to 3 levels)

Bandwidth Policing
- Limit upstream and downstream CIR/EIR by filtering criteria or for all traffic.
  Allows enforcement of MEF-compliant services.
- Regulate up to 64 flows (MetroNID TE-R), 15 on other models

Zero-Latency Traffic Shaping (3)
- Pre-conditioning of traffic by using buffer queues to delay and prioritize packets. No delay added to highest-priority traffic.

Traffic Filtering & Per-Flow Statistics
- Through traffic wire-speed filtering (L2CP, BPDU, per-VLAN, Ethertype, Protocol type, MAC, IP, user defined)
- Define policies for up to 60 flows (TE-R), 16 on other models

Switch-Free Aggregation (3)

<table>
<thead>
<tr>
<th>Client speeds</th>
<th>Shaping Queues</th>
<th>Real-Time Queue</th>
<th>H-QoS Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/100/GbE</td>
<td>3 total</td>
<td>✓</td>
<td>2</td>
</tr>
<tr>
<td>10/100/GbE</td>
<td>3 / port</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>10 / 100</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

(1) Available on MetroNID™ models
(2) Available on EtherNID™ GE, MetroNID TE, TE-R and TE-S models only
(3) Available on MetroNID TE and TE-S models only
(4) MTBF > 53 yrs at 25°C, > 15 yrs at 40°C per Telcordia SR-332 method
(5) MetroNID TE range is -5 to +60°C, all units with 24 VDC option: 0 to 50°C

Hardware & Performance

Pure Hardware Data-Path (Fast-Thru™ architecture)
- Inline transparent performance (all packet sizes):
  Throughput: wire-speed (1000 Mbps at 100% utilization)
  Intrinsic pass-through traffic latency < 3.3 µs
  Intrinsic pass-through traffic jitter < 0.1 µs
  Intrinsic latency for intelligent loopback < 0.8 µs
  Intrinsic jitter for intelligent loopback < 0.1 µs
- High-accuracy, hardware-assisted performance measurements with 1µs resolution.

Integrated Management
- SNMP v1, v2c Sets & Gets
- Secure web GUI via SSL
- Management VLAN
- Configuration import/export
- NTP client (or source)
- DNS client
- DHCP client
- Radius authentication
- Secure CLI via SSH
- 802.3ah EFM OAM
- FTP, TFTP, HTTP, HTTPS
- Remote and local Syslog
- Zero-Touch provisioning to OSS systems & EchoVault™ SLA EMS
- Plug & Go™ Instant Provisioning
- In-band remote management over the Ethernet customer line via network & client-side interface
- Local management craft port: 10/100 Base T RJ-45 connector
- Serial RS-232 management port: RJ-45 connector
- Zero-Touch provisioning to OSS systems & EchoVault™ SLA EMS

Redundant Power, Connectivity & Timing
- External AC/DC adapter (120-240 Vac auto-sensing, 50-60 Hz), 5 VDC input to unit
- Dual (A/B) -48 VDC or 24 VDC central office supply inputs
- Power consumption: 5-8 watts
- Cooling: convection cooled (no fans)
- Transparent fail-over bypass on electrical-to-electrical models
- 1+1 Protection, Client/Network (link status or LACP/LAG)
- MTBF 52-66 years (at 25° C ambient)
- 625 g or 1.37 lb
- 262-66 years (at 25° C ambient)
- Mounting options:
  Desktop, Wall-mount
  Rack-mount: 1 or 2 units side-by-side in 1U

EtherSHELF™: High density, 12-unit, 19" / 23" rack in 4U

Environmental
- Standard operating temperature -5 to +65°C
- Hardened operating temperature (-H -40 to +65°C
- Storage temperature -40 to +70°C
- Operating/storage humidity 5-95 % RH non-condensing

Regulatory and Certification
- CE & RoHS Compliant compliance: MEF22 (UNI Type II) & 26 (Backhaul)
- MEF service certification
- Industry Canada CS-03
- FCC part 15 class A
- IEC 60950
- IEC 60825-1
- Industry Canada CS-03
- MEF9 service certification
- MEF14 traffic management
- Industry Canada CS-03
- MEF22 (UNI Type II) & 26 (Backhaul)
- NEBS Level 3
# Ordering information

## EtherNID™ & MetroNID™ Packet Assurance Demarcation Units

### Models

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Model</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>AI601-XXX</td>
<td>EtherNID™ EE</td>
<td>EtherNID™ EE : 10/100 Mb/s Ethernet demarcation device</td>
</tr>
<tr>
<td>AI603-XXX</td>
<td>EtherNID™ GE</td>
<td>EtherNID™ GE : 10/100/1000 Mb/s Ethernet demarcation device</td>
</tr>
<tr>
<td>AI615-XXX</td>
<td>MetroNID™ TE-R</td>
<td>MetroNID™ TE-R : 10/100/1000 Mb/s unit enhanced multi-flow processing &amp; statistics</td>
</tr>
<tr>
<td>AI616-XXX</td>
<td>MetroNID™ TE</td>
<td>MetroNID™ TE : 10/100/1000 Mb/s unit with advanced traffic shaping &amp; packet processing functionality</td>
</tr>
<tr>
<td>AI617-XXX</td>
<td>MetroNID™ TE-S</td>
<td>MetroNID™ TE-S: 4 SFP port version of the MetroNID TE</td>
</tr>
</tbody>
</table>

### Options

Example: AI615-109 is MetroNID™ TE-R with 48 Vdc Adapter

- **MM: Model**
  - AI601: EtherNID™ EE
  - AI603: EtherNID™ GE
  - AI615: EtherNID™ TE-R
  - AI616: MetroNID™ TE
  - AI617: MetroNID™ TE-S

- **H: Hardware options**
  - 0: Base Product
  - 1: Hardened (+H)

- **PP: Power options**
  - 00: AC/DC adapter North America
  - 01: AC/DC adapter Europe
  - 02: AC/DC adapter U.K.
  - 03: AC/DC adapter Japan
  - 04: AC/DC adapter India
  - 06: AC/DC adapter Australia/N-Z
  - 09: 48 VDC adapter
  - 0A: No power accessory
  - 08: 48 VDC cable
  - 0J: 24 VDC Adapter
  - 0K: 24 VDC Cable

*Please Note:*
- Hardware option 1 and 2 are only available on MetroNID™ models
- AC/DC adapters do not support hardened applications: only 24 & 48 VDC power options are supported
### Ordering Information

#### SFP modules

<table>
<thead>
<tr>
<th>PartNo.</th>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI7SA-000</td>
<td>AI7SA-100 SFP-100-SM-16DB-1310 (-H)</td>
<td>100 Mb/s SFP, SM, 1310 nm, 16 dB budget, 30 km, LC</td>
</tr>
<tr>
<td>AI7SB-000</td>
<td>AI7SB-100 SFP-100-SM-30DB-1310 (-H)</td>
<td>100 Mb/s SFP, SM, 1310 nm, 30 dB budget, 60 km, LC</td>
</tr>
<tr>
<td>AI7SE-000</td>
<td>AI7SE-100 SFP-100-SM-30DB-1550 (-H)</td>
<td>100 Mb/s SFP, SM, 1550 nm, 30 dB budget, 100 km, LC</td>
</tr>
<tr>
<td>AI7SF-000</td>
<td>AI7SF-100 SFP-100-BIDIR-18DB-1310 (-H)</td>
<td>100 Mb/s SFP, Bi-Dir, 1310-1550 nm, 18 dB budget, 20 km, LC</td>
</tr>
<tr>
<td>AI7SG-000</td>
<td>AI7SG-100 SFP-100-BIDIR-18DB-1550 (-H)</td>
<td>100 Mb/s SFP, Bi-Dir, 1550-1310 nm, 18 dB budget, 20 km, LC</td>
</tr>
<tr>
<td>AI7SH-000</td>
<td>AI7SH-100 SFP-100-BIDIR-26DB-1310 (-H)</td>
<td>100 Mb/s SFP, Bi-Dir, 1310-1550 nm, 26 dB budget, 40 km, LC</td>
</tr>
<tr>
<td>AI7SJ-000</td>
<td>AI7SJ-100 SFP-100-BIDIR-26DB-1550 (-H)</td>
<td>100 Mb/s SFP, Bi-Dir, 1550-1310 nm, 26 dB budget, 40 km, LC</td>
</tr>
<tr>
<td>AI7SK-000</td>
<td>AI7SK-100 SFP-100-MM-850 (-H)</td>
<td>100 Mb/s SFP, MM, 850 nm, VCSEL, 2 km, LC</td>
</tr>
</tbody>
</table>

#### 1000 Mb/s Gigabit SFPs

<table>
<thead>
<tr>
<th>PartNo.</th>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI7SM-000</td>
<td>AI7SM-100 SFP-1000-MM-850 (-H)</td>
<td>GigE SFP, MM, 850 nm, VCSEL, 550 m, LC</td>
</tr>
<tr>
<td>AI7SN-000</td>
<td>AI7SN-100 SFP-1000-SM-10KM-1310 (-H)</td>
<td>GigE SFP, SM, 1310 nm, FP, 12 dB, 10 km, LC</td>
</tr>
<tr>
<td>AI7SO-000</td>
<td>AI7SO-100 SFP-1000-SM-30KM-1310 (-H)</td>
<td>GigE SFP, SM, 1310 nm, DFB, 20 dB, 30 km, LC</td>
</tr>
<tr>
<td>AI7SP-000</td>
<td>AI7SP-100 SFP-1000-SM-50KM-1550 (-H)</td>
<td>GigE SFP, SM, 1550 nm, DFB, 20 dB, 50 km, LC</td>
</tr>
<tr>
<td>AI7SR-000</td>
<td>AI7SR-100 SFP-1000-SM-70KM-1550 (-H)</td>
<td>GigE SFP, SM, 1550 nm, DFB, 24 dB, 70 km, LC</td>
</tr>
<tr>
<td>AI7SS-000</td>
<td>AI7SS-100 SFP-1000-SM-110KM-1550 (-H)</td>
<td>GigE SFP, SM, 1550 nm, DFB, 30 dB, 110 km, LC</td>
</tr>
<tr>
<td>AI7ST-000</td>
<td>AI7ST-100 SFP-1000-BIDIR-10KM-1310 (-H)</td>
<td>GigE SFP, Bi-Dir, 1310-1490 nm, FP, 10 km, LC</td>
</tr>
<tr>
<td>AI7SU-000</td>
<td>AI7SU-100 SFP-1000-BIDIR-10KM-1490 (-H)</td>
<td>GigE SFP, Bi-Dir, 1490-1310 nm, DFB, 10 km, LC</td>
</tr>
<tr>
<td>AI7ST-002</td>
<td>AI7ST-102 SFP-1000-BIDIR-60KM-1310 (-H)</td>
<td>GigE SFP, Bi-Dir, 1310-1490 nm, 60 km, LC</td>
</tr>
<tr>
<td>AI7SU-002</td>
<td>AI7SU-102 SFP-1000-BIDIR-60KM-1490 (-H)</td>
<td>GigE SFP, Bi-Dir, 1490-1310 nm, 60 km, LC</td>
</tr>
<tr>
<td>AI7SW-000</td>
<td>n/a SFP-1000-CWDM-1470</td>
<td>GigE SFP, CWDM, 1470 nm, DFB, 27 dB, LC</td>
</tr>
<tr>
<td>AI7SX-000</td>
<td>n/a SFP-1000-CWDM-1490</td>
<td>GigE SFP, CWDM, 1490 nm, DFB, 27 dB, LC</td>
</tr>
<tr>
<td>AI7SX-001</td>
<td>n/a SFP-1000-CWDM-1510</td>
<td>GigE SFP, CWDM, 1510 nm, DFB, 27 dB, LC</td>
</tr>
<tr>
<td>AI7SX-002</td>
<td>n/a SFP-1000-CWDM-1530</td>
<td>GigE SFP, CWDM, 1530 nm, DFB, 27 dB, LC</td>
</tr>
</tbody>
</table>

#### Copper SFPs

<table>
<thead>
<tr>
<th>PartNo.</th>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI7SV-000</td>
<td>n/a SFP-1000-COPPER</td>
<td>10/100/1000 Copper SFP, RJ-48</td>
</tr>
</tbody>
</table>

### Mounting Options

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1705-000</td>
<td>Rackmount 1U horizontal mounting bracket, fits 1 demarc unit</td>
</tr>
<tr>
<td>A1706-000</td>
<td>Rackmount 1U horizontal mounting bracket, fits 2 demarc units</td>
</tr>
<tr>
<td>A1704-000</td>
<td>EtherSHELF™ rackmount 4U vertical mounting shelf, fits 12 demarc units, individually fused, -48 Vdc power feeds</td>
</tr>
<tr>
<td>A1707-000</td>
<td>Adapter: Rackmount 1U horizontal, 19° to 23°</td>
</tr>
<tr>
<td>A1708-000</td>
<td>Adapter: Rackmount 4U vertical, 19° to 23°</td>
</tr>
<tr>
<td>A1709-000</td>
<td>Adapter: Wallmount kit</td>
</tr>
</tbody>
</table>

*Hardened Temperature Range: -40° to +65°C