

LoopStar® EtherNID™ LoopStar® MetroNID™

ADC's network interface devices for Ethernet and IP networks



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

EtherNID™

Designed to define the edge of your network, LoopStar® EtherNID™ offers 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™

High-performance LoopStar® 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.

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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

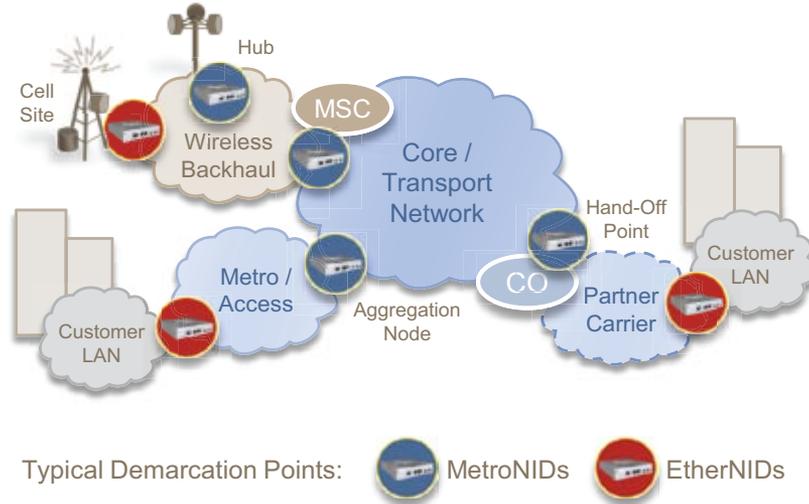
Test Set & Monitoring System Support



LoopStar EtherNID EE



12 unit 4U Rackmount



Defining Intelligent Demarcation

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 a patent-pending 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, these units' proprietary silicon design provides wire-speed pass-through performance without adding jitter or delay, while at the same time providing microsecond measurement resolution and real-time processing for every packet flowing through the unit. With transparent fail-over, NEBS Level 3 certification, no fans or moving parts, and 3-way redundant power, EtherNID and MetroNID units are truly carrier-grade. A variety of mounting options mean flexible installation at customer premises, cell sites, central offices and aggregation nodes



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Product Family Feature Matrix

ADC has launched 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.



		Model				
		EtherNID™ EE	EtherNID™ GE	MetroNID™ TE	MetroNID™ TE-R	MetroNID™ TE-S
Interfaces	EE: Electrical-Electrical	•	•	•	•	•
	OE: Electrical-Optical		•	•	•	•
	OO: Optical-Optical		•	•	•	•
	10/100 Mbps	•	•	•	•	•
	1000 Mbps - Wirespeed GbE		•	•	•	•
	Electrical Interfaces	5	3	3	3	1
	SFP Interfaces		3	3	2	4
Service Assurance	PAA™ & SLA Performance Monitoring	•	•	•	•	•
	Multicast PAA (L2 & 3)	•	•	•	•	•
	Layer 2 & 3 Throughput Testing	•	•	•	•	•
	Layer 2 & 3 In-Service Throughput Testing		•	•	•	•
	RFC-2544 Automated Test Suite and Reports			•	•	•
	Intelligent Layer 1-4 Loopbacks	•	•	•	•	•
	Per-Flow Traffic Statistics	•	•	•	••	•
	802.1ag, 802.3ah, Y.1731 OAM Functionality	•	•	•	•	•
	Tapping and Monitoring	•	•	•	•	•
Service Creation	Ethernet Service Mapping	•	•	•	•	•
	Zero-Latency Traffic Saping			•		•
	Bandwidth Policing	•	•	•	••	•
	Traffic Filtering	•	•	•	•	•
	4-to-1 Multi-Port Aggregation (4x100 to GbE)			•		•
General and Management	Embedded GPS Option			•	•	•
	SNM v1 v2c	•	•	•	•	•
	Radius Authentication and Security Support	•	•	•	•	•
	Jumbo Frames Support	•	•	•	•	•
	3-Way Redundant Power	•	•	•	•	•
	NEBS Level 3 Certified	•	•	•	•	•
	Temperature Hardened Option			•	•	•
	Dual-Protected Optical Uplinks			•	•	•
	Copper Failover Bypass Circuit	•	•	•	•	

• = with Electrical SFP

•• = high capacity

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Service Assurance Functionality

Performance Assurance Agent™ (PAA) and SLA Monitoring

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 and Monitoring

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



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Service Creation and 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 without added delay or jitter while other traffic is buffered until capacity is available.

Wire-speed Filtering

Filter wire-speed traffic at layer 1-2-3-4 (L2CP, BDPU, per VLAN, Ethertype, Protocol type, MAC, IP, User Defined).

4-to-1 Multi-Port Aggregation

Latency-free, multi-port aggregation from 4 Fast Ethernet ports to a single GbE. De-aggregate by VLAN, or any combination of Layer 2 -4 frame criteria.

General Functionality

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

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

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

Embedded GPS: Optional feature, can be used as clock reference in place of the patent-pending synchronization method normally used for 1-way delay & jitter measurements.



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Features

INTERFACES

EtherNID EE

Client	10/100Mbps, RJ-45 ⁽¹⁾
Network:	10/100Mbps, RJ-45 ⁽¹⁾
Monitor A/B Port:	2 x 10/100Mbps RJ-45 ⁽¹⁾
	Management port: 10/100Mbps, RJ-45 ⁽¹⁾

EtherNID GE, MetroNID TE and MetroNID TE-R

Client/Network:	Mix & Match Assignable Ports for Client, Network and Monitoring Functions – 2 x 10/100/1000Mbps RJ-45 ⁽³⁾ – 2 x 10/100/1000Mbps SFP ⁽⁴⁾
Monitor A/B port:	Mix & Match with Client/Network Ports
Management Port:	10/100MBPS RJ-45 ⁽¹⁾
GPS Antenna Input	SMA Connector ⁽⁵⁾

MetroNID TE-S

Client/ Network:	Mix & Match Assignable Ports for Client, Network and Monitoring Functions ⁽¹⁾ – 4 x 10/100/1000Mbps SFP ⁽⁴⁾
Monitor A/B port:	Mix & Match with Client/Network Ports
Management Port:	10/100MBPS RJ-45 ⁽¹⁾
GPS Antenna Input	SMA Connector ⁽⁵⁾

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
- **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 100Mbps 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⁽⁵⁾**
- **Link loss return**

(1) 10/100Mbps (10/100 Base TX) RJ-45 Connectors: supports Auto-negotiation and Auto MDIX

(2) 100Mbps (100 Base FX/LX/SX/ZX/BX) SFP Connector: supports a wide range of SFPs

(3) 10/100/1000Mbps (10/100/1000 Base TX) RJ-45 Connectors: supports Auto-negotiation and Auto MDIX

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

(5) Optional, available on MetroNID models only.



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Features (Con't)

SERVICE ASSURANCE FEATURES (CON'T)

- **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)**
- **VLAN Tagging/De-tagging and VLAN Stacking (.1Q in .1Q)**
- **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

- **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 μ s resolution
- **Exclusive remote synchronization allows highly accurate one-way measurements over large geographical areas. Optional GPS not required for 1-way measurements, but may be used as a timing/sync source.**
- **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-SLA™ monitoring –up to 100 simultaneous instances**
- **User settable SLA threshold crossing alerts using SNMP traps**

RFC-2544 Testing & Traffic Generation

- **Wire-speed Traffic Generator and Analyzer**
 - Layer 2 or Layer 3 (IP)
- **In-Service Traffic Generator and Analyzer ⁽²⁾**
 - 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 Frame loss Back-to-Back
 - Delay (Latency)
 - Delay Variation (Jitter)
 - Supports all packet sizes including Jumbo Frames
 - Automatic report generation

(1) Available on MetroNID™ models only

(2) Available on EtherNID™ GE, MetroNID TE and MetroNID models only



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Features (Con't)

SERVICE CREATION & TRAFFIC CONDITIONING HARDWARE

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**
 - S-VLAN tagging (selective push)
 - CoS mapping (set C/S-VLAN tag priority based on DSCP, IP Precedence or PCP, Drop Eligibility)
 - Bandwidth Policing (based on DSCP, IP Precedence or PCP values)

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 to smooth insertion into lower speed transport tunnels. 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**

4-to-1 Multi-Port Aggregation

- **Latency-free, multi-port aggregation from 4 Fast Ethernet ports to a single GbE. De-aggregate by VLAN, or any combination of Layer 2 -4 frame criteria. No effect on other service creation or assurance functions. Client-side MTU limited to 1522 bytes.**

(1) Available on MetroNID™ models only

(2) Available on EtherNID™ GE, MetroNID TE and MetroNID models only

(3) Available on MetroNID TE and TE-S models only



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Specifications

HARDWARE & PERFORMANCE

Pure Hardware Data-Path

- **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**
- **Secure Web GUI via SSL**
- **Management VLAN**
- **Configuration import/export**
- **NTP Client (or source)**
- **DNS Client**
- **In-band remote management over the Ethernet customer line via network & client-side interface**
- **Local Management craft port: 10/100BaseT RJ-45 connector**
- **Serial RS-232 Management port: RJ-45 connector**
- **Zero-Touch provisioning to OSS systems & EchoVault™ SLA EMS**
- **Radius Authentication**
- **Secure CLI via SSH**
- **802.3ah EFM OAM**
- **FTP, TFTP, HTTP, HTTPS**
- **Remote and Local Syslog**
- **DHCP Client**

Redundant Power, Connectivity & Timing

- Power:** External AC/DC adapter (120-240Vac auto-sensing, 50-60Hz), 5VDC input to unit
Dual (A/B) -48Vdc Central Office Supply inputs
- Power Consumption:** 5-8 watts
- Cooling:** Convection cooled (no fans)
- Redundant Power:** Transparent fail-over bypass on electrical-to-electrical models
- Connectivity:** Dual Protected Uplink allows two redundant connections on the network side for increased reliability⁽¹⁾
- GPS:** Optional embedded GPS with front-panel SMA input⁽¹⁾

Physical Specifications

- Dimensions (H x W x D):** 1.60" x 5.34" x 5.80" (4.06 cm x 13.56 cm x 14.73cm)
- Weight:** 625 g or 1.37 lb
- MTBF:** 52-66 years (at 25 degree C ambient)
- Mounting Options:** Desktop, Wall-mount, Rack-mount: 1 or 2 units side-by-side in 1U
EtherSHELF™: High density, 12-unit, 19" Central Office shelf in 4U
(23" adapter available)

Regulatory and Certification

- **IEC 60950**
- **FCC Part 15 Class A**
- **Industry Canada CS-03**
- **CE Mark**
- **NEBS Level 3**
- **MEF9 Service Certification**
- **MEF14 Traffic Management**

Environmental

- Standard operating temperature:** -5° to +65°C (23° to 149°F)
- Hardened operating temperature (-H):** -40° to +65°C (-40° to 149°F)
- Storage temperature:** -40° to +70°C (-40° to 149°F)
- Operating/storage humidity:** 5-95 %RH non-condensing

(1) Available on MetroNID™ models only

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EtherNID and MetroNID Configurator

Catalog Number
LPS-EN[xxxx]-[yyy]

xxxx **Model**

EE	EtherNID 10/100 Mbps Electrical
GE	EtherNID 10/100/1000Mb/s Electrical/Optical
TE	MetroNID TE 10/100/1000Mb/s
TEH	MetroNID TE 10/100/1000Mb/s (Hardened)
TER	MetroNID TR 10/100/1000Mb/s
TERH	MetroNID TR 10/100/1000Mb/s (Hardened)
TES	MetroNID TS 10/100/1000Mb/s
TESH	MetroNID TS 10/100/1000Mb/s (Hardened)

yyy **Power**

NA	North America Power AC/DC
EU	European Power AC/DC
UK	United Kingdom Power AC/DC
JP	Japan Power AC/DC
IN	India Power AC/DC
AU	Australia/N-Z Power AC/DC
TB	48V Power with Terminal Block
CBL	48V Power with Cable
BLANK	48V w/No Accessories

Ordering Information

Description	Model
EtherNID EE: 10/100 Mb/s Demarcation Device	LPS-ENEE-yyy
EtherNID GE: 10/100/1000 Mb/s Demarcation Device	LPS-ENGE-yyy
MetroNID TE-R 10/100/1000 Mb/s Unit with enhanced multi-flow processing and statistics	LPS-ENTER-yyy
MetroNID TE : 10/100/1000 Mb/s Unit with advanced trafficshaping and packet processing functionality	LPS-ENTE-yyy
MetroNID TE-S: 4 SFP port version of the MetroNID TE0	LPS-ENTES-yyy

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SFP Modules



Ordering Information

Description	Model
100 Mb/s SFPs	
SFP 1310nm SM (2Km) for FE Interface	LPS-SFP1310-FX-2
SFP 1310nm SM (15Km) for FE Interface - Hardened	LPS-SFP1310-FX-15H
SFP 1310nm SM (40Km) for FE/OC3 I/F	LPS-SFP1310-FXOC3-40
SFP 1310nm SM (40Km) for FE Interface - Hardened	LPS-SFP1310-FX-40H
SFP 1550nm SM (80Km) for FE/OC3 I/F	LPS-SFP1550-FXOC3-80
SFP 1550nm SM (80Km) for FE Interface - Hardened	LPS-SFP1550-FX-80H
Gigabit SFPs	
SFP 850nm MM (500m) for GE Interface - Hardened	LPS-SFP85H
SFP 1310nm SM (10km) for GE Interface	LPS-SFP1310
SFP 1310nm SM (10km) for GE Interface - Hardened	LPS-SFP1310H
SFP 1310nm SM (40km) for GE Interface	LPS-SFP1340
SFP 1310nm SM (40km) for GE Interface - Hardened	LPS-SFP1340H
SFP 1550nm SM (100km) for GE Interface	LPS-SFP1550-GE-100
SFP 1550nm SM (70km) for GE Interface	LPS-SFP1570
SFP 1550nm SM (80km) for GE Interface - Hardened	LPS-SFP1580H

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Mounting Options

Description	Model
Rackmount 1U Horizontal Mounting Bracket, fits 1 EtherNID™ unit	LPS-ENAES-1-1U
Rackmount 1U Horizontal Mounting Bracket, fits 2 EtherNID™ unit	LPS-ENAES-2-1U
Rackmount 4U Vertical Mounting Shelf, fits 12 EtherNID™ units, individually fused, -48VDC Power feeds	LPS-ENAES-12-4U
Adapter Wallmount Kit	LPS-ENAES-1-WALL



Wallmount



12 unit 1U Rackmount



12 unit 4U Rackmount

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