



## Advanced Asymmetrical and Symmetrical High Bandwidth Services

- Multi-service IP DSLAM, 1U, AC or DC power input, and two slide-in slots for various DSL line cards.
- 12-port ADSL/ADSL2/ADSL2+ line card with a splitter built-in for MTU application
- 8-port G.SHDSL or 16-port G.SHDSL.bis with M-pair bonding line card for business applications with long reach
- One or two Fast Ethernet uplink interfaces
- 802.1p QoS, priority queuing, 802.1q VLAN tagging and multicasting support
- 802.1x authentication, MAC/Packet filtering and ACL filtering support
- Manageable with the Windows-based Element Management System (EMS)



1U IP DSLAM with  
AC/DC Power

IES-1000

### Benefits

#### Comprehensive Broadband IP DSLAM Services

IP-based DSLAM terminates all ATM circuits and converts traffics directly to deliver the most popular broadband IP services. It also provides a distinctive advantage over typical ATM-based DSL access system since IP is the natural approach for data transmission. It offers better bandwidth utilization, ease of use and low-cost advantages. With the highly compact design (1U height), simple installation and easy adaptation to lease line services or local POTS/ISDN splitter requirements, the IES-1000 can be deployed using indoor or outdoor enclosures with different modules simultaneously, such as ADSL2/2+ (AAM1212-51/53), G.SHDSL (SAM1008) and G.SHDSL.bis (SAM1216-22) services.

#### Robust ADSL2+ Solution for Multiple Tenant Unit (MTU) Services

With ADSL2+ IP DSLAM, service providers can offer residential and business user access to high-bandwidth, on-demand services such as streaming video, online gaming, multimedia applications and multiple video channels on a single network connection. The IES-1000 also offers medium/small businesses and home offices IP connectivity, VPNs, VLANs, high-quality video conferencing, long-reach Ethernet and legacy service interconnection, as well as asymmetric connectivity as fast as 24Mbps. The IES-1000 DSL solution for POTS/ISDN is a sophisticated ADSL2+ device wielding full compliance to existing standards, the latest DSL technology, compactness, low power consumption, integration with existing platforms and network manageability. The combination of a superior line code, modern signal processing techniques and state-of-the-art ASIC design add up to a compact, energy-saving ADSL2+ modem with excellent performance, transparent backward ADSL/ADSL2 compatibility, robust interference resistance and flexible configurability.

#### Lease Line G.SHDSL Service for Enterprise

With G.SHDSL technology, the IES-1000 is also applicable for lease line replacement. Using the TC-PAM modulation technique, the IES-1000 is compatible with other existing transmission technologies, allowing service providers to deploy at locations where broadband services already exist.

## M-Pair Bonding G.SHDSL.bis Solution

The IES-1000 supports the new-generation G.SHDSL.bis service at up to 4096kbps symmetrically in a single pair to serve end customers, and it comes with two 100Mbps Ethernet interfaces toward Ethernet aggregation network. One IES-1000 can accommodate two SAM1216-22 modules to support up to 32 SHDSL connections. In addition, the SAM1216-22 supports ITU G.991.2 m-pair bonding in a physical layer manner. The m-pair bonding can be 2 or 4 pairs and the aggregated maximum payload rate is around 16Mbps.

## Extensive Management Capabilities

The entire IES-1000 system can be administrated remotely with the Windows-based NetAtlas Access EMS (Element Management System) based on the SNMP-manageable SNMPc platform. NetAtlas Access EMS provides powerful advanced remote management capabilities that help service providers minimize daily operational costs. Its loop-back design helps isolating network problems while the new firmware and IP Express configuration features allow changes to be done remotely, eliminating the need for “truck rolls” in order to provision new customers or to reconfigure services for existing customers.

## Specifications

### System Specifications

- Delivery of Ethernet in the first mile using legacy LAN technologies
- End-to-end provisioning by offering DSL circuit configuration through NetAtlas Access EMS
- Support expandable configuration with plug-and-play line cards
- SNMP v1, v2 manageable
- Web management
- FTP/TFTP for firmware upload
- Console port configuration (RS-232)
- Telnet configuration and monitoring
- Spanning tree algorithm (802.1D) for loop free connection
- 802.1Q VLAN aware bridging
  - IGMP snooping supports multicast traffic
  - QoS support with 802.1p
  - DHCP relay agent option 82
  - Port isolation
  - 256 static VLAN entries (full-range VLAN ID 1 ~ 4094)
  - 4 K MAC address entries
- Packet prioritizing per 802.1p (QoS)
  - Static configuration—default priority setting
  - 4 priority queues per PVC (up to 4 PVCs)
- Multicast
  - IPv4 multicast forwarding (through L2 MAC)
  - Static multicast membership configuration
  - IGMP v1, v2 snooping & IGMP proxy mode support
  - Shared VLAN multicast
  - 256 multicast groups and each group can contain 18 members
  - IGMP filtering profile
- Management support
  - IGMP count limiting
  - MVLAN
  - DSL port multicast bandwidth control
  - CLI-based management from console/Ethernet port
  - SNMPV1, v2 and telnet through Inband Ethernet interface and NetAtlas Access, PC-based EMS management support
  - Web-based management through Inband Ethernet interface
  - Secured Host: configure remote host IP addresses for management
  - UNIX syslog
  - F/W upgrade, configuration backup & restore via FTP and Web
  - Text-based configuration file support
  - Port configuration
  - Alarm/Status Surveillance
  - Performance monitoring
  - Security and Memory Backup
  - Self diagnostics
  - Remote reset
  - EMS Management support
- MIB
  - SNMP MIB II (RFC1213)
  - SNMP v1
  - SNMP v2
  - RFC1493 Bridge MIB
  - RFC1643 Ethernet MIB
  - RFC1757 Four group of RMON
  - RFC2674
  - RFC2662 ADSL line MIB
  - RFC4319 (formerly RFC3276) SHDSL Line MIB

### Hardware Specifications

#### IES-1000M

- 19" 1U rack mountable, 2 card slots chassis
- 2 line cards to accommodate different types of DSL services as well as Ethernet traffic
- Fully hot-swappable design
- Support 8 to 32 ports in MDU/central office environment
- Temperature monitoring and alarm
- Auto-shutdown for over temperature
- Surge protection to prevent lightning damage

#### AAM1212-51

- One Telco 50 connectors for 12-port ADSL/ADSL2/ADSL2+ and splitter card over POTS
- One mini RJ11 console port for local management
- Two 10/100Base-TX for uplink
- DELT (Dual Ended Loop Test)
- SELT (Single End Loop Test)
- Power enhancement or ADSL power saving mode
- Rate adaptation
- Status LEDs: System Status, Ethernet 1 and 2 Link Status, Ethernet 1 and 2 Active Status, ADSL ports status, Alarm
- ADSL Compliance
  - DMT T1.413, issue 2
  - G.DMT (ITU G.992.1)
  - G.LITE (ITU G.992.2)
  - G.HS (ITU G.994.1)
  - Auto-negotiating rate adaptation
  - ADSL2: G.992.3 Annex A, G.992.3 Annex L (RE-ADSL), Annex M
  - ADSL2+: G.992.5 Annex A, Annex M

### AAM1212-53

- One Telco 50 connectors for 12-port ADSL/ADSL2/ADSL2+ and splitter card over ISDN
- One mini RJ11 console port for local management
- Two 10/100Base-TX for uplink
- DELT (Dual Ended Loop Test)
- SELT (Single End Loop Tests)
- Power enhancement or ADSL power saving mode
- Rate adaptation
- Status LEDs: System Status, Ethernet 1 and 2 Link Status, Ethernet 1 and 2 Active Status, ADSL ports status, Alarm
- ADSL Compliance
  - DMT T1.413, issue 2
  - G.DMT (ITU G.992.1)
  - G.LITE (ITU G.992.2)
  - G.HS (ITU G.994.1)
  - Auto-negotiating rate adaptation
  - ADSL2: G.992.3 Annex B
  - ADSL2+: G.992.5 Annex B

### SAM1008

- One console port: Mini-RJ-11 (4P4C)
- One Ethernet port: RJ45 10/100 Mbps
- 8-port G.SHDSL- RJ-11 connector
- Status LEDs: System Status, Ethernet Link Status, Ethernet Active Status, G.SHDSL ports status, Alarm
- Compliant with ITU-T G.991.2
- TC-PAM modulation
- Transmission rate: 192 k ~ 2.3 Mbps, 64 kbps increments over single copper pair
- All front access
- Hot-swappable

### SAM1216-22

- One Telco 50 connectors for 16-port G.SHDSL.bis
- One mini RJ11 console port for local management
- Two 10/100Base-TX for uplink
- In-band Ethernet management

- Status LEDs: System Status, Ethernet Link Status, Ethernet Active Status, G.SHDSL.bis ports status, Alarm
- Line coding: TC-PAM
- Transmit power: up to 16.8 dBm
- Density: 16 ports per chip
- SHDSL payload format: ATM
- Rate Adaptation Mode: fixed, line probing
- Up to 4096 kbps in single pair, m-pairs (2/4 pairs mode) bonding support up to 16.384 Mbps
- Annex A and annex B PSD mask
- SHDSL line profile
- SHDSL alarm profile
- Power backoff
- Standard Compliant
  - ETSI SDSL (ETSI TS 101 524 V 1.2.1)
  - ITU G.shdsl (ITU-T G.991.2 (2001))
  - ITU G.shdls.bis (ITU-T G.991.2 (2004))
  - RFC4319 (formerly RFC3276) SHDSL Line MIB

### Physical Specifications

#### IES-1000M

- Dimensions: 440 (W) x 320 (D) x 46 (H) mm
- Weight: 3.7 Kg

#### AAM1212-51

- Dimensions: 170 (W) x 320 (D) x 35 (H) mm
- Weight: 0.9 Kg

#### AAM1212-53

- Dimensions: 170 (W) x 320 (D) x 35 (H) mm
- Weight: 0.9 Kg

#### SAM1008

- Dimensions: 170 (W) x 320 (D) x 35 (H) mm
- Weight: 0.9 Kg

#### SAM1216-22

- Dimensions: 170 (W) x 320 (D) x 35 (H) mm
- Weight: 0.9 Kg

### Environmental Specifications

- Operating Temperature: 0°C ~ 50°C
- Storage temperature: -40°C ~ 70°C
- Operating Humidity: 10% ~ 90% (non-condensing)
- Storage Humidity: 10% ~ 95% (non-condensing)
- Power supply (AC/DC)
  - AC Power: 100 ~ 240 VAC, 50 ~ 60 Hz
  - DC Power: -36 ~ -72 V DC
- Power consumption
  - AAM1212-51: 25 W
  - AAM1212-53: 25 W
  - SAM1008: 8.59 W
  - SAM1216-22: 25 W

### Certification

- Safety
  - UL 60950-1
  - CSA 60950-1
  - EN60950-1
  - IEC 60950-1
- EMC
  - FCC Part 15B Class A
  - EN55022 Class A
  - EN55024 Class A
  - ETSI 300 386
- Reliability
  - ETSI 300 019
- Telecom
  - ITU-T K20



1U IP DSLAM with AC/DC Power  
IES-1000



ADSL2+ Line Card  
AAM1212-51/53



G.SHDSL Line Card  
SAM1008



G.SHDSL.bis Line Card  
SAM1216-22

## IES Series IP DSLAM Family Matrix

Model	IES-1000	IES-1248	IES-2000	IES-2500	IES-3000	IES-5005	IES-5000
<b>System Overview</b>							
Dimensions W x D x H (mm)	440 x 320 x 44.5	440 x 251 x 66	443 x 268 x 178	443 x 268 x 178	443 x 268 x 483	440 x 250 x 152	440 x 289 x 249
Splitter	Built in	Built in	Separated	Separated	Separated	Separated	Separated
Rack Mountable	19" 1U	19" 1.5U	19" 4U	19" 4U	19" 10U	19" 4U	19" 6.5U
Total Slot No	2	NA	6	6	16	5	10
Max DSL line card slot	2	NA	5	5	14	4	8
Max DSL Port No.	24	48	120	120	360	192	384
Management & Switching card redundancy	-	-	NA	NA	Yes	NA	Yes
Power Input	AC or DC	AC or DC	DC	AC	DC	DC	DC
Power redundancy	NA	NA	NA	NA	Yes	Yes	Yes
Hot Swappable	Yes	NA	Yes	Yes	Yes	Yes	Yes
<b>Interfaces</b>							
Uplink	2FE	Two 100Base-TX/ 1000Base-T or two mini GBIC	4GE	4GE	4GE	4GE	4GE
Subtending	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ADSL2/2+ line card	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SHDSL line card	Yes	NA	Yes	Yes	Yes	Yes	Yes
G.SHDSL.bis	NA	NA	Yes	Yes	Yes	Yes	Yes
VDSL2 line card	NA	NA	NA	NA	NA	Yes	Yes
<b>QoS Function</b>							
802.1p priority queuing	4 queue	4 queue	8 queue	8 queue	8 queue	8 queue	8 queue
802.1q tag-based VLAN	256VLAN	256VLAN	4KVLAN	4KVLAN	4KVLAN	4KVLAN	4KVLAN
SPQ/WRR	SPQ	SPQ	SPQ	SPQ	SPQ	SPQ, WRR	SPQ, WRR
ATM QoS to 802.1p priority mapping	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DSCP to 802.1p mapping	Yes (future)	Yes (future)	NA	NA	NA	Yes	Yes
<b>Security Function</b>							
IEEE 802.1x	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Multiple PVC per port	8	8	8	8	8	8	8
Q in Q (VLAN stacking)	Yes (future)	Yes (future)	NA	NA	NA	Yes	Yes
DHCP snooping	NA	NA	NA	NA	NA	Yes	Yes
DHCP relay option 82	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MAC/Packet Filtering	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MAC count filtering	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Packet Filtering	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IEEE 802.3ad Link Aggregation	NA	NA	Yes	Yes	Yes	Yes	Yes
<b>ACL/Filtering</b>							
ACL filtering	Source MAC address filtering	Yes	Yes	Yes	Yes	Yes	Yes
	PPPoE filtering	Yes	Yes	Yes	Yes	Yes	Yes
	Layer 1~4 filtering	Yes (future)	Yes (future)	NA	NA	NA	Yes
	ARP broadcast filtering	Yes	Yes	Yes	Yes	Yes	Yes
	NetBIOS filtering	Yes	Yes	Yes	Yes	Yes	Yes
	DHCP broadcast filtering	Yes	Yes	Yes	Yes	Yes	Yes
IGMP filtering	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Multicast Function</b>							
IGMP v1, v2	Snooping	Yes	Yes	Yes	Yes	Yes	Yes
	Proxy	Yes (future)	Yes (future)	NA	NA	NA	Yes
	Filtering Profile	Yes	Yes	Yes	Yes	Yes	Yes
GVRP	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VLAN	Static Multicast Group	Yes	Yes	Yes	Yes	Yes	Yes
	Multicast VLAN	Yes (future)	Yes (future)	Yes	Yes	Yes	Yes
	Multicast VLAN registration (MVR)	Yes (future)	Yes (future)	NA	NA	NA	Yes
<b>Network Management</b>							
SNMP v1, v2	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SNMP v3	No	No	NA	NA	NA	Yes	Yes
Web management	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CLI management	Yes	Yes	Yes	Yes	Yes	Yes	Yes
EMS management	NetAtlas PC/UNIX version	NetAtlas PC/UNIX version	NetAtlas PC/UNIX version	NetAtlas PC/UNIX version	NetAtlas PC/UNIX version	NetAtlas PC/UNIX version	NetAtlas PC/UNIX version

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