



## Reaching Subscribers with High-bandwidth Triple-play Services

- Complete ADSL2+/2+ Standard Compliance
- ADSL2+ Port Bonding (\*)
- SIP v2 and H.248 v2 (\*) Media Gateway Signaling
- Voice Codec of G.711 a/μ law, G.726, G.729 a/b and G.723.1
- Fax/Modem Signal Pass Through
- Supplementary Service Support
- Local Dial Available (\*)
- Loop Diagnostic
  - SELT (Single End Loop Test)
  - DELT (Dual End Loop Test)
  - MLT (Metallic Loop Test)
  - Test Out/Test In Terminals



**48-port Remote MSAN  
for ADSL and VoIP  
Services**

**IES-1248-51V**

### Benefits

#### Temperature Harden and Friendly Remote-Installation Design

The ZyXEL IES-1248-51V can operate in the environment with temperature from -40°C to 65°C, which meets various Fiber-to-the-Node and Fiber-to-the-Curb environment conditions worldwide. A side-slip plug-in and pull-out mesh filter, which is cleanable and reusable, is equipped to make it dust-proof and suitable for open-air installations.

Moreover, the rotational speed of the fan module is automatically adjusted according to the system temperature. The feature not only extends the lifespan of the module, but also has lower audible noise, which is important if the IES-1248-51V is installed in a residential neighborhood. The fan module is swappable in order to reduce the maintenance cost in the field.

#### Complete ADSL2+ Services

The IES-1248-51V provides state-of-the-art ADSL2+ connectivity to subscribers. The latest technologies like various line coding, power spectral mask fitting, dual latency path selection, loop diagnostic and power management capabilities, Seamless Rate Adaptation (SRA) and Impulse Noise Protection (INP) are all supported. Up to 24 Mbps (downstream) and 2.3 Mbps (upstream) per port facilitates high-bandwidth services such as streaming video, online gaming and IP TV. ADSL2+ port bonding is also provided for subscribers who need even more bandwidth or located with loop length longer than 5000 ft.

#### VoIP Media Gateway Embedded

The IES-1248-51V has a built-in POTS splitter and can act as the media gateway of a packet voice network. Through the communication with the softswitch or media gateway controller, the IES-1248-51V digitalizes and encapsulates the POTS voice into VoIP packets and delivers them to the IP network with higher priority in SIP or H.248 signal protocols. Telco operators can provide voice over broadband (VoBB) service without changing existing customer premises network and keep the OAM&P as usual.

#### Sophisticated Features for Triple-Play Services

The IES-1248-51V comes with complete ATM and Ethernet QoS, as well as various IP QoS features (Packet classification/Rate Limitation/Queue Scheduling). The seamless QoS-mapping not only allows consistent and appropriate traffic treatment of packets, but also enables fulfillment of triple-play services.

The number of the supported multicast groups is 512, while each group can have 50 members. At least 30 multicast IGMP join/leave requests can be processed in one second and the maximum channel processing time is less than 250 ms. For security, anti MAC address spoofing, broadcast storm prevention, MAC count limiting and packet filtering features are provided. With these features provided, Telco operators can easily offer Triple-play services like high-speed Internet access, VoIP, Near VOD, Broadcast TV and TV on Demand.

## Target Market of the System

- FTTB: Remote MSAN installed in the basement of the building
- FTTC: Remote MSAN installed in the street cabinet
- FTTN: mini MSAN installed in the remote PoP
- MxU: mini MSAN installed in the telecom room of the hotel, hospital, community and factories

## Specifications

### Network Interface

- IEEE 802.3u 100Base-TX
- IEEE 802.3ab 1000Base-T
- IEEE 802.3z 1000Base-ZX/LHX/LX/SX
- SFP mini GBIC

### ADSL/ADSL2/ADSL2+ Interface

- G.992.1 Annex A
- G.992.3 Annex A, Annex L, Annex M
- G.992.5 Annex A, Annex M
- G.994.1 G.hs
- G.992.3, G.992.5, G.997.1 Spectral Mask
- G.992.3 and G.992.5 ATM Transmission Convergence (ATM-TC) function
- EOC defined in ITU-T G.992.3 and ITU-T G.997.1
- Latency path function specified in ITU-T G.992.3 and G.992.5
- Loop diagnostic function (SELT & DELT) specified in ITUT G.992.3 and G.992.5
- Power management capability specified in ITU-T G.992.3 and G.992.5
- Seamless Rate Adaptation (SRA) on-line configuration
- Impulse Noise protection (INP) specified in ITU-T G.992.3 and G.992.5

### ATM Functionality

- 8 VPC/VCC per DSL port
- UBR, CBR, rt-VBR, nrt-VBR, ABR QoS Mechanisms
- ATM Forum TM 4.0 peak cell rate traffic parameter
- Downstream traffic shaping per ATM PVC
- ATM F5 OAM cells for End-to-End Loop back test (ITU-T Rec. I.610)
- G.998.1 multi-pair ATM bonding (\*)
- Support 64k PVC

### L2 Bridging

- 802.1d and 802.w RSTP
- Max MAC address per system: 14 K
- Max MAC address per port: 128
- Auto MAC address learning
- Block duplicate MAC address (MAC address spoofing)
- Configurable MAC aging-out time
- Limiting number of MACs per port
- Static MAC address filtering
- User Isolation (per system)

### VLAN & VLAN Bridge Functions

- Provide 1024 configurable VLANs with 4 K VLAN tagging
- The VLAN tagging complies with IEEE 802.1Q
- GVRP function
- 128 VLAN +MAC per DSL port
- VLAN bridge function (multiple PVCs to one VLAN)
- VLAN cross connect (PVC to VLAN one to one mapping)
- VLAN trunking (single PVC join multiple VLAN)
- IEEE 802.1ad provider bridge (Q-in-Q)

### QoS

- Configurable IEEE 802.1p priority queue function and support 4 levels
- Configurable mapping function between ATM PVC and 802.1p priority queue
- TOS/DSCTP to IEEE 802.1p p-bit mapping in the network interface
- Upstream rate limiting by ACL in the DSL port
- Strict Priority queuing in the network interface

### IP Functionality

- RFC2684 bridged mode multicast service
- RFC2684 routing mote support
- ICMP function support
- PPPoA forwarding
- DHCP relay agent option 82 (circuit ID and Remote ID)
- DHCP snooping
- IEEE 802.1x
- IPSec/L2TP/PPTP VPN pass-through function
- RFC2516 PPPoE packet forwarding function

### Packet Filtering

- Discard downstream broadcast
- Control downstream broadcast
- Source MAC address filtering (pass or deny)
- PPPoE filtering
- Layer 3 filtering based on IP header: Src addresses, dest addresses, protocol ID, UDP/TCP port number
- ARP broadcast Filtering
- Downstream broadcast enable/disable (per-VLAN, per-port)
- NetBIOS filtering
- DHCP broadcast filtering
- IGMP filtering
- Block BPDU/ARP/LACP/GMRP/upstream pause frame on DSL side

## Multicast Capability

- Internet Group Management Protocol (IGMP) version 2 specified in RFC2236
- VLAN-aware IGMP snooping/IGMP proxy
- Multicast VLAN support
- 512 multicast groups
- 50 copies for each multicast group
- Number of zap per second per system: >30
- Expedite leave: <250 ms
- Multicast bandwidth control
- IGMP membership report
- Static multicast forwarding
- Multicast address filtering profile
- Load protection for IGMP

## VoIP Services

- SIP v2 singling protocol and H.248 version 2 (\*)
- Voice CODEC: G.711 a/μ, G.726, G.729 a/b, G.723.1
- Configurable jitter buffer
- Generation of dial tone, second dial tone, ringing tone (ring-back tone), busy tone, off-hook warning tone
- DTMF detection and generation (bi-directional)
  - In-Band and Out-of-Band (RFC 2833), (SIP INFO)
- FAX/Modem pass through (T.38) via RTP
- Call waiting, call hold, call transfer
- Local dial available (\*)
- MLT (Metallic loop testing for subscriber lines)—GR909 and GR844

## Management

- Local management through a craft terminal
- In-band IP interface for managing the Network
- SNMP (Simple Network Management Protocol) v1.0 & v2c (RFC1157)
- The management activities can be performed by SNMP operations
- Support SNMP MIB(s)
- Standard SNMP traps so that these traps can be reported to other NMSs
- Centralized Management Software—NetAtlas Access supporting

## MIB Support

- RFC1213 SNMP MIB II
- RFC1493 Bridge MIB
- RFC1643 Ethernet MIB
- RFC2674 Q MIB
- RFC2662 ADSL line MIB
- ADSLx line MIB
- RFC1757 RMON MIB, group 1, 2, 3, 9
- ZyXEL proprietary MIB

## Hardware Specifications

- Two TELCO-50 connectors for 48-port ADSL/ADSL2/ADSL2+
- One mini RJ11 console port for local management
- Two 100Base-TX/1000Base-T or two mini GBIC for uplink/subtending
- One DB9 for 3 in and 1 out alarm contact
- Hot-swappable fan module
- DC Input connector
- One power switch
- Two RJ-45 ports for loop test out and test in functionality

## Power Requirements

- Voltage: DC power input (-36 V DC ~ -72 V DC)
- Power consumption: max. 170 Watts

## Physical Specifications

- 19" and 23" Rack-mountable
- Dimensions: 439.8 (W) x 251 (D) x 66 (H) mm
- Weight: 8.2 Kg
- Swappable FAN module
- Built-in splitter
- Side-slip dust filter



## Environmental Specifications

- Operating Temperature: -40°C ~ 65°C
- Storage Temperature: -40°C ~ 70°C
- Operating Humidity: 10% ~ 95% (non-condensing)
- Storage Humidity: 5% ~ 95% (non-condensing)

## Certification

- EMC/ESD
  - FCC part 15 Class A
  - EN 55022, EN 55024 Class A; ETS 300 386
- Safety
  - ITU-T K.20, Appendix C
  - CSA 60950
  - EN 60950; IEC 60950; UL 60950
- Reliability: ETS 300 019
- NEBS Compliant (\*)

(\*) Firmware upgradeable for future enhancement

## IES MSAN Family Matrix

Model	IES-612-51	IES-708-22A IES-708-22	IES-1000	IES-1248-51	IES-1248-51V	IES-5005	IES-5000	IES-6000
<b>System Overview</b>								
Dimensions W x D x H (mm)	270 x 350 x 44.45	270 x 350 x 44.45	440 x 320 x 44.45	440 x 251 x 66	440 x 251 x 66	440 x 250 x 152	440 x 289 x 249	440 x 281 x 544
Splitter	Built in	N/A	Built in	Built in	Built in	Separated	Separated	Separated
Rack Mountable	19" 1U	19" 1U	19" 1U	19" 1.5U	19" 1.5U	19" 4U	19" 6.5U	19" 12.5U
Total Slot No.	Standalone	Standalone	2	Standalone	Standalone	5	10	17
Max DSL Line Card Slot	N/A	N/A	2	N/A	N/A	4	8	16
Max DSL Port No.	12 (ADSL2+)	8 (G.SHDSL)	24	48	48	192/288	384/576	786/1152
Management & Switching Card Redundancy	N/A	N/A	N/A	N/A	N/A	N/A	Yes	Yes
Power Input	AC or DC	AC or DC	AC or DC	AC or DC	AC or DC	DC	DC	DC
Power Redundancy	N/A	N/A	N/A	N/A	N/A	Yes	Yes	Yes
Hot Swappable	N/A	N/A	Yes	N/A	N/A	Yes	Yes	Yes
<b>Interfaces</b>								
Uplink	2FE	2FE	2FE	2 100/1000Base-T or 2 Mini GBIC	2 100/1000Base-T or 2 Mini GBIC	4GE	4GE	8GE or 2 x 10G + 6 x GE
Subtending	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ADSL2/2+ Line Card	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes
G.SHDSL.bis Line Card	N/A	Yes	Yes	N/A	N/A	Yes	Yes	Yes
VDSL2 Line Card	N/A	N/A	Yes (Future)	N/A	N/A	Yes	Yes	Yes
VoIP Line Card	N/A	N/A	N/A	N/A	Built in	Yes	Yes	Yes
<b>ADSL2/2+ Features</b>								
Annex M	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes
SRA	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes
INP (Min=2)	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes
SELT	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes
DELT	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes
ADSL2+ Bonding	Yes (Future)	N/A	Yes	Yes	Yes (Future)	Yes	Yes	Yes
<b>G.SHDSL Features</b>								
G.SHDSL Bonding	N/A	Yes	N/A	N/A	N/A	Yes	Yes	Yes
<b>QoS Function</b>								
802.1p Priority Queuing	4 queue	4 queue	4 queue	4 queue	4 queue	8 queue	8 queue	8 queue
802.1q Tag-based VLAN	256 VLAN	256 VLAN	256 VLAN	1024 VLAN	1024 VLAN	4 K VLAN	4 K VLAN	4K VLAN
SPQ/WRR	SPQ	SPQ	SPQ	SPQ	SPQ	SPQ, WRR	SPQ, WRR	SPQ, WRR
ATM QoS to 802.1p Priority Mapping	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IP Bridge	N/A	N/A	N/A	Yes	Yes	Yes	Yes	Yes
<b>Security Function</b>								
IEEE 802.1x	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Multiple PVC per Port	Yes	Yes	8	8	8	8	8	8
Q in Q (VLAN Stacking)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DHCP Snooping	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DHCP Relay Option 82	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MAC/Packet Filtering	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MAC Count Filtering	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Packet Filtering	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IEEE 802.3ad Link Aggregation	N/A	N/A	N/A	N/A	N/A	Yes	Yes	Yes
<b>VoIP Function</b>								
Signaling Protocol	N/A	N/A	N/A	N/A	SIP, H.248	SIP, H.248	SIP, H.248	SIP, H.248
Voice Codec: G.711 a/μ law, G.726, G.729 a/b & G.723.1	N/A	N/A	N/A	N/A	Yes	Yes	Yes	Yes
Metallic Link Test	N/A	N/A	N/A	N/A	Yes	Yes	Yes	Yes
DTMF	N/A	N/A	N/A	N/A	Yes	Yes	Yes	Yes
Fax/Modem (T.38)	N/A	N/A	N/A	N/A	Yes	Yes	Yes	Yes
Call Waiting/Hold/Transfer	N/A	N/A	N/A	N/A	Yes	Yes	Yes	Yes
Dial Tone, Ringing Tone, Busy Tone	N/A	N/A	N/A	N/A	Yes	Yes	Yes	Yes
<b>Multicast Function</b>								
IGMP v1/v2/v3	Snooping	Yes (no v3)	Yes (no v3)	Yes	Yes	Yes	Yes	Yes
	Proxy	Yes (no v3)	Yes (no v3)	Yes	Yes	Yes	Yes	Yes
	Multicast Group	256	256	256	512	512	256	512
VLAN	Static Multicast Group	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Multicast VLAN	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Network Management</b>								
SNMP v1, v2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SNMP v3	No	No	No	No	No	Yes	Yes	Yes
Web Management	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CLI Management	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
EMS Management	NetAtlas Access	NetAtlas Access (Future)	NetAtlas Access	NetAtlas Access	NetAtlas Access	NetAtlas Access	NetAtlas Access	NetAtlas Access

For more product information, visit us on the web [www.DSL-Warehouse.com](http://www.DSL-Warehouse.com)



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