



# Your PDF Guides

You can read the recommendations in the user guide, the technical guide or the installation guide for ZYXEL IES-1248-51A. You'll find the answers to all your questions on the ZYXEL IES-1248-51A in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

**User manual ZYXEL IES-1248-51A**  
**User guide ZYXEL IES-1248-51A**  
**Operating instructions ZYXEL IES-1248-51A**  
**Instructions for use ZYXEL IES-1248-51A**  
**Instruction manual ZYXEL IES-1248-51A**

**IES-1248-51/51A/53**

*ADSL2+ IP DSLAM*

**User's Guide**

Version 3.52 (ABO.0), (ABR.0)  
Edition 1  
7/2006

**ZyXEL**



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**Manual abstract:**

@@@@ZyXEL further reserves the right to make changes in any products described herein without notice. This publication is subject to change without notice. Trademarks ZyNOS (ZyXEL Network Operating System) is a registered trademark of ZyXEL Communications, Inc. Other trademarks mentioned in this publication are used for identification purposes only and may be properties of their respective owners. Copyright 3 IES-1248-51/51A/53 User's Guide Certifications Federal Communications Commission (FCC) Interference Statement This device complies with Part 15 of FCC rules. Operation is subject to the following two conditions: · This device may not cause harmful interference. · This device must accept any interference received, including interference that may cause undesired operations. FCC Warning This device has been tested and found to comply with the limits for a Class A digital switch, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial environment. This device generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. CE Mark Warning: This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures. Taiwanese BSMI (Bureau of Standards, Metrology and Inspection) A Warning: Notices Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada. Viewing Certifications 1 Go to <http://www.zyxel.com>. 2 Select your product from the drop-down list box on the ZyXEL home page to go to that product's page. 3 Select the certification you wish to view from this page. 4 Certifications IES-1248-51/51A/53 User's Guide Safety Warnings For your safety, be sure to read and follow all warning notices and instructions. . . . . Do NOT use this product near water, for example, in a wet basement or near a swimming pool. Do NOT expose your device to dampness, dust or corrosive liquids. Do NOT store things on the device. Do NOT install, use, or service this device during a thunderstorm. There is a remote risk of electric shock from lightning. Connect ONLY suitable accessories to the device. ONLY qualified service personnel should service or disassemble this device. Make sure to connect the cables to the correct ports.

Place connecting cables carefully so that no one will step on them or stumble over them. Always disconnect all cables from this device before servicing or disassembling. Use ONLY an appropriate power adaptor or cord for your device. Connect the power adaptor or cord to the right supply voltage (for example, 110V AC in North America or 230V AC in Europe). Do NOT allow anything to rest on the power adaptor or cord and do NOT place the product where anyone can walk on the power adaptor or cord. Do NOT use the device if the power adaptor or cord is damaged as it might cause electrocution. If the power adaptor or cord is damaged, remove it from the power outlet. Do NOT attempt to repair the power adaptor or cord. Contact your local vendor to order a new one. Do not use the device outside, and make sure all the connections are indoors.

There is a remote risk of electric shock from lightning. CAUTION: RISK OF EXPLOSION IF BATTERY (on the motherboard) IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS. Dispose them at the applicable collection point for the recycling of electrical and electronic equipment. For detailed information about recycling of this product, please contact your local city office, your household waste disposal service or the store where you purchased the product.

Do NOT obstruct the device ventilation slots, as insufficient airflow may harm your device. Use only No. 26 AWG (American Wire Gauge) or larger telecommunication line cord. Fuse Warning! Replace a fuse only with a fuse of the same type and rating. Warning! To avoid risk of electric shock, remove only one card at a time and do not place fingers or objects inside the chassis.

Cover empty slots with slot covers. The length of exposed (bare) power wire should not exceed 7mm. Fan Module Warning! Use the fan module handle when pulling out or pushing in the fan module. Be careful not to put fingers or objects inside the fan module. . . . . Safety Warnings 5 IES-1248-51/51A/53 User's Guide This product is recyclable. Dispose of it properly. 6 Safety Warnings IES-1248-51/51A/53 User's Guide ZyXEL Limited Warranty ZyXEL warrants to the original end user (purchaser) that this product is free from any defects in materials or workmanship for a period of up to two years from the date of purchase. During the warranty period, and upon proof of purchase, should the product have indications of failure due to faulty workmanship and/or materials, ZyXEL will, at its discretion, repair or replace the defective products or components without charge for either parts or labor, and to whatever extent it shall deem necessary to restore the product or components to proper operating condition. Any replacement will consist of a new or re-manufactured functionally equivalent product of equal or higher value, and will be solely at the discretion of ZyXEL. This warranty shall not apply if the product has been modified, misused, tampered with, damaged by an act of God, or subjected to abnormal working conditions.

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451 List of Tables 37 IES-1248-51/51A/53 User's Guide 38 List of Tables IES-1248-51/51A/53 User's Guide Preface Congratulations on your purchase of the IES-1248. This preface introduces you to the IES-1248 and discusses the conventions of this User's Guide. It also provides information on other related documentation. About This User's Guide This manual is designed to guide you through the configuration of your IES-1248 for its various applications.

Related Documentation · ZyXEL Glossary and Web Site Please see [www.zyxel.com](http://www.zyxel.com) for an online glossary of networking terms and additional support documentation. Syntax Conventions · "Enter" means for you to type one or more characters. "Select" or "Choose" means for you to use one of the predefined choices. · Command and arrow keys are enclosed in square brackets.

[ENTER] means the Enter, or carriage return key; [ESC] means the Escape key and [SPACE BAR] means the Space Bar. · Mouse action sequences are denoted using a comma. For example, "In Windows, click Start, Programs, Acrobat Reader" means first click the Start button, then move your mouse pointer to Programs and then click Acrobat Reader. · "e.g.

," is a shorthand for "for instance", and "i.e.," means "that is" or "in other words". · The IES-1248 may be referred to as the "IES-1248", the "IES", the "device" or the "system" in this User's Guide. · "IES-1248" refers to the IES-1248-51 for ADSL over POTS (Annex A), the IES-1248-51A for ADSL over POTS that uses AC power, and the IES-1248-53 for ADSL over ISDN (Annex B).

Differentiation is made where needed. Preface 39 IES-1248-51/51A/53 User's Guide Graphics Icons Key IES-1248 Computer Server Computer DSLAM Gateway Central Office/ ISP Internet Hub/Switch Firmware Naming Conventions A firmware version includes the model code and release number as shown in the following example. Firmware Version: V3.52 (ABQ.0) "ABQ" is the model code. · "ABQ" denotes the IES-1248-51 for ADSL over POTS (Annex A).



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· "ABR" denotes the IES-1248-53 for ADSL over ISDN (Annex B). "0" is this firmware's release number. This varies as new firmware is released. Your firmware's release number may not match what is displayed in this User's Guide.

User Guide Feedback Help us help you. E-mail all User Guide-related comments, questions or suggestions for improvement to [techwriters@zyxel.com.tw](mailto:techwriters@zyxel.com.tw) or send regular mail to The Technical Writing Team, ZyxEL Communications Corp., 6 Innovation Road II, Science-Based Industrial Park, Hsinchu, 300, Taiwan. Thank you. 40 Preface IES-1248-51/51A/53 User's Guide CHAPTER 1 Getting to Know the IES-1248 This chapter describes the system features, specifications and applications of your IES-1248. The IES-1248 is an IP-based DSLAM (Internet Protocol Digital Subscriber Line Access Multiplexer) that connects ADSL subscribers to the Internet. As a high-performance but yet compact platform, it can conveniently deliver broadband Internet access to telephone company central offices, multi-tenant units (MTUs), hospitals, hotels, schools, university campuses and ISPs. The IES-1248's low cost and easy management make it a perfect DSL-provider solution.

The IES-1248 platform allows for convenient management and support of ADSL technology. Up to 48 ADSL subscribers can simultaneously utilize a wide range of powerful broadband services. 1.1 System Description Four Telco-50 Connectors There are four Telco-50 connectors for ADSL and POTS connections. 1000/100 Mbps Ethernet Ports The IES-1248 has two 1000/100Mbps auto-sensing Ethernet ports.

They allow you to: · Connect the IES-1248 to a second-level switch · Daisy-chain other IES-1248 Two Slots for Mini GBIC Modules The mini GBIC (Gigabit Interface Converter) module transceivers allow flexibility in connection options. You can use mini GBIC transceivers for fiber connections to backbone Ethernet switches. Stacking Daisy-chain up to three IES-1248 (or other Ethernet devices). Chapter 1 Getting to Know the IES-1248 41 IES-1248-51/51A/53 User's Guide Integrated Splitters The integrated DSL splitter eliminates the need to use external splitters that separate the voiceband and ADSL signals. Console Port Use the console port for local management of the IES-1248.

Fans The fans cool the IES-1248 sufficiently to allow reliable operation of the IES-1248 in even poorly ventilated rooms or basements. To conserve energy and reduce noise, the fan speed depends on the temperature. IP Protocols · IP Host (No routing) · Telnet for configuration and monitoring · SNMP for management · SNMP MIB II (RFC 1213) · SNMP v1 RFC 1157 · SNMPv2, SNMPv2c or later version · Bridge MIBs (RFC 1493, 2674) · SMI RFC 1155 · ADSL Line MIB (RFC 2662) · ADSL Extension Line MIB (RFC2449) · Private MIBs ADSL Encapsulation Multiple Protocols over AAL5 (RFC 1483) ADSL Compliance · Multi-Mode ADSL standard (some IES-1248 models do not support all of these) · G.dmt (ITU-T G.992.1) · G.lite (ITU-T G.992.2) · G.hs (ITU-T G.

994.1) · ETSI · ANSI T1.413 issue 2 · ADSL2: G.992.3, G.992.4 · ADSL2+: G.992.5 · Rate adaptation support 42 Chapter 1 Getting to Know the IES-1248 IES-1248-51/51A/53 User's Guide IEEE 802.1p Priority Your IES-1248 uses IEEE 802.

1p Priority to assign priority levels to individual PVCs. Multiple PVC and ATM QoS The IES-1248 allows you to use different channels (also called Permanent Virtual Circuits or PVCs) for different services or subscribers. Define channels 1 on each DSL port for different services or levels of service and assign each channel a priority. ATM Quality of Service (QoS) allows you to regulate the average rate and fluctuations of data transmission. This helps eliminate congestion to allow the transmission of real time data (such as audio and video).

IEEE 802.1x Port-based Authentication The IES-1248 supports the IEEE 802.1x standard for centralized user authentication and accounting management through an optional network authentication (RADIUS) server. 2684 Routed Mode The IES-1248 can handle 2684 routed mode traffic. Downstream Broadcast The IES-1248 can block downstream broadcast packets from being sent to specified VLANs on specified ports.

Management · · · Remote configuration backup/restore and firmware upgrade SNMP manageable Text-based management locally via console port and remotely via telnet Editable plain text based configuration file Security · Password protection for system management · VLAN MAC (Media Access Control) Filter Use the MAC filter to accept or deny incoming frames based on MAC (Media Access Control) address(es) that you specify. You may enable/disable the MAC filter on specific ports. You may specify up to ten MAC addresses per port. 1. Up to eight channels on each DSL port at the time of writing. Chapter 1 Getting to Know the IES-1248 43 IES-1248-51/51A/53 User's Guide MAC (Media Access Control) Count Filter You can limit the number of MAC addresses that may be dynamically learned on a port. You may enable/disable the MAC count filter on individual ports. Static Multicast Use static multicast to allow incoming frames based on multicast MAC address(es) that you specify. This feature can be used in conjunction with IGMP snooping and IGMP proxy to allow multicast MAC address(es) that are not learned by IGMP snooping or IGMP proxy. IGMP Proxy In a simple tree network, the system can proxy multicast traffic in order to improve network performance.

IGMP Snooping With IGMP snooping, group multicast traffic is only forwarded to ports that are members of that group. IGMP Snooping generates no additional network traffic, allowing you to significantly reduce multicast traffic passing through your IES-1248. System Monitoring · System status (link status, rates, statistics counters) · Temperatures, voltage reports and alarms. System Error Logging The IES-1248's system error log will record error logs locally. These logs may be viewed again after a warm restart. Alarm LED An ALM (alarm) LED lights when the IES-1248 is overheated, the fans are not working properly, the voltage readings are outside the tolerance levels or an alarm has been detected on the ALARM input pins. Bandwidth Control The IES-1248 supports rate limiting in 32 Kbps increments allowing you to create different service plans Quality of Service · Four priority queues for ENET and eight priority queues for downstream PVC so you can ensure mission-critical data gets delivered on time. · Follows the IEEE 802.1p priority setting standard. 44 Chapter 1 Getting to Know the IES-1248 IES-1248-51/51A/53 User's Guide STP (Spanning Tree Protocol) / RSTP (Rapid STP) (R)STP detects and breaks network loops and provides backup links between switches, bridges or routers.



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It allows a switch to interact with other (R)STP -compliant switches in your network to ensure that only one path exists between any two stations on the network. 1.2 Applications These are the main applications for the IES-1248: · Internet access and multimedia services for Multiple Tenant Units (MTU). ·

Other applications include telemedicine, surveillance systems, remote servers systems, cellular base stations and high-quality teleconferencing. 1.

2.1 MTU Application The following diagram depicts a typical application of the IES-1248 with ADSL modems, in a large residential building, or multiple tenant unit (MTU), that leverages existing phone line wiring to provide Internet access to all tenants. Note that ADSL service can coexist with voice service on the same line. Figure 1 MTU Application Chapter 1 Getting to Know the IES-1248 45 IES-1248-51/51A/53 User's Guide 1.2.

2 Curbside Application The IES-1248 can also be used by an Internet Service Provider (ISP) in a street cabinet to form a "mini POP (Point-of-Presence)" to provide broadband services to residential areas that are too far away from the ISP to avail of DSL services. Residents need an ADSL modem, connected as shown in the previous figure. Figure 2 Curbside Application 46 Chapter 1 Getting to Know the IES-1248 IES-1248-51/51A/53 User's Guide CHAPTER 2 Hardware Installation This chapter explains how to install the IES-1248. 2.1 General Installation Instructions Before you begin, read all the safety warnings in Safety Warnings on page 5, and make sure you follow them. Perform the installation as follows: 1 Make sure the IES-1248 power switch is in the OFF position. 2 Install the hardware. See Section 2.2 on page 47. 3 Connect the frame ground.

See Section 2.3 on page 50. 4 See Chapter 3 on page 53 for instructions on making front panel connections. 5 See Chapter 4 on page 61 for instructions on connecting the Telco-50 connectors. 6 See Chapter 5 on page 69 for instructions on making power connections and turning on the IES-1248. 2.2 Installation Scenarios The IES-1248 can be placed on a desktop or rack-mounted on a standard EIA rack. Use the rubber feet in a desktop installation and the brackets in a rack-mounted installation. For proper ventilation, allow at least 4 inches (10 cm) of clearance at the front and 3.4 inches (8 cm) at the back of the IES-1248.

This is especially important for enclosed rack installations. 2.2.1 Desktop Installation Procedure 1 Make sure the IES-1248 is clean and dry. 2 Set the IES-1248 on a smooth, level surface strong enough to support the weight of the IES-1248 and the connected cables.

Make sure there is a power outlet nearby. 3 Make sure there is enough clearance around the IES-1248 to allow air circulation and the attachment of cables and the power cord. 4 Remove the adhesive backing from the rubber feet. Chapter 2 Hardware Installation 47 IES-1248-51/51A/53 User's Guide 5 Attach the rubber feet to each corner on the bottom of the IES-1248. These rubber feet help protect the IES-1248 from shock or vibration and ensure space between IES-1248 when stacking.

Figure 3 Attaching Rubber Feet Note: Do not block the ventilation holes. Leave space between IES-1248 when stacking. 2.2.2 Rack-Mounted Installation

2.2.2.1 Rack-mounted Installation Requirements The IES-1248 can be mounted on an EIA standard size, 19-inch rack or in a wiring closet with other equipment. Follow the steps below to mount your IES-1248 on a standard EIA rack using a rack-mounting kit. Note: Make sure the rack will safely support the combined weight of all the equipment it contains.

Note: Make sure the position of the IES-1248 does not make the rack unstable or topheavy. Take all necessary precautions to anchor the rack securely before installing the unit. · Use a #2 Philips screwdriver to install the screws. · See Appendix B on page 445 for the gauge of wire to use for the frame ground connections. · See Appendix B on page 445 for the hardware that is required to mount the IES-1248. Note: Failure to use the proper screws may damage the unit. Note: Do not block the ventilation holes. Leave space between IES-1248 when stacking. 48 Chapter 2 Hardware Installation IES-1248-51/51A/53 User's Guide 2.2.

2.2 Rack-Mounted Installation Procedure 1 Align one bracket with the holes on one side of the IES-1248 and secure it with the bracket screws smaller than the rack-mounting screws. 2 Attach the other bracket in a similar fashion. Figure 4 Attaching Mounting Brackets and Screws 3 After attaching both mounting brackets, position the IES-1248 in the rack by lining up the holes in the brackets with the appropriate holes on the rack. Secure the IES-1248 to the rack with the rack-mounting screws.

Chapter 2 Hardware Installation 49 IES-1248-51/51A/53 User's Guide Figure 5 Rack Mounting 2.3 Connecting the Frame Ground Follow the directions in this section for the IES-1248-51 and IES-1248-53. This section is not applicable for the IES-1248-51A. Note: See Appendix B on page 445 for the ground wire gauge. · The IES-1248 frame ground is on the lower left corner of the front panel.

· Connect the frame grounds to a building's protective earthing terminals using a greenand-yellow frame ground wire. Note: Warning! Connect the frame ground before you connect any other cables or wiring. 50 Chapter 2 Hardware Installation IES-1248-51/51A/53 User's Guide Figure 6 IES-1248 Frame Ground Frame Ground Chapter 2 Hardware Installation 51 IES-1248-51/51A/53 User's Guide 52 Chapter 2 Hardware Installation IES-1248-51/51A/53 User's Guide CHAPTER 3 Front Panel Connections The following table briefly describes the ports on the front panel. Then, the rest of this chapter explains how to make connections to the IES-1248's front panel. 3.1 Front Panel The following figure shows the front panel of the IES-1248. Figure 7 IES-1248 Front Panel Figure 8 IES-1248-51A Front Panel 3.1.1 Front Panel Ports The following table describes the ports on the front panel of the IES-1248. Table 1 IES-1248 Front Panel Ports CONNECTOR CONSOLE 1000/100 1/2 DESCRIPTION Connect this mini-RJ-11 port to a computer for local management.

Use these RJ-45 ports for subtending. You can daisy chain more IES-1248's or other Ethernet switches. This is an electrical Ethernet interface for use with the following copper Ethernet cables: · 100Base-Tx 2 pair UTP Cat. 5, up to 100m · 1000Base-T 4-pair UTP Cat. 5, up to 100m Note: For better performance and lower radiation noise, use shielded Ethernet cables. Chapter 3 Front Panel Connections 53 IES-1248-51/51A/53 User's Guide Table 1 IES-1248 Front Panel Ports (continued) CONNECTOR ALARM DESCRIPTION This DB9 connector has alarm input pins and alarm output pins. Connect the alarm input pins to alarm output terminals on other pieces of equipment.



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