Your PDF Guides

You can read the recommendations in the user guide, the technical guide or the installation guide for ZYXEL MES-3528. You'll find the answers to all your questions on the ZYXEL MES-3528 in the user manual (information, specifications, safety advice, size, accessories, etc.). Detailed instructions for use are in the User's Guide.

**User manual ZYXEL MES-3528**
**User guide ZYXEL MES-3528**
**Operating instructions ZYXEL MES-3528**
**Instructions for use ZYXEL MES-3528**
**Instruction manual ZYXEL MES-3528**

# MES-3528

*Layer 2+ Metro Ethernet Switch*

## User's Guide

**Default Login Details**

| | |
|---|---|
| IP Address | http://192.168.1.1 |
| User Name | admin |
| Password | 1234 |

Firmware Version 3.90
Edition 1, 3/2009

www.zyxel.com

ZyXEL

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***Manual abstract:***

*This is a collection of answers to previously asked questions about ZyXEL products. · Forum This contains discussions on ZyXEL products. Learn from others who use ZyXEL products and share your experiences as well. Customer Support Should problems arise that cannot be solved by the methods listed above, you should contact your vendor. If you cannot contact your vendor, then contact a ZyXEL office for the region in which you bought the device. See http://www.zyxel.com/web/contact_us.php for contact information. @@ · Product model and serial number.*

*· Warranty Information. · Date that you received your device. @@@@@@ · "Enter" means for you to type one or more characters and then press the [ENTER] key. "Select" or "choose" means for you to use one of the predefined choices. · A right angle bracket ( > ) within a screen name denotes a mouse click.*

*For example, Maintenance > Log > Log Setting means you first click Maintenance in the navigation panel, then the Log sub menu and finally the Log Setting tab to get to that screen. · Units of measurement may denote the "metric" value or the "scientific" value. For example, "k" for kilo may denote "1000" or "1024", "M" for mega may denote "1000000" or "1048576" and so on. · "e.g.*

*," is a shorthand for "for instance", and "i.e.," means "that is" or "in other words". MES-3528 User's Guide 5 Document Conventions Icons Used in Figures Figures in this User's Guide may use the following generic icons. The Switch icon is not an exact representation of your device. The Switch Computer Notebook computer Server DSLAM Firewall Telephone Router 6 MES-3528 User's Guide Safety Warnings Safety Warnings · 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.*

*· Do not obstruct the device ventillation slots as insufficient airflow may harm your device. · Connect ONLY suitable accessories to the device. · Do NOT open the device or unit. Opening or removing covers can expose you to dangerous high voltage points or other risks. ONLY qualified service personnel should service or disassemble this device. Please contact your vendor for further information. · 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 it to the right supply voltage (for example, 110V AC in North America or 230V AC in Europe). · Use ONLY power wires of the appropriate wire gauge (see Chapter 41 on page 335 for details) for your device. Connect it to a power supply of the correct voltage (see Chapter 41 on page 335 for details). · 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 device and the power source. · Do NOT attempt to repair the power adaptor or cord. Contact your local vendor to order a new one. · Fuse Warning! Replace a fuse only with a fuse of the same type and rating. · The length of exposed (bare) power wire should not exceed 7 mm.*

*Your product is marked with this symbol, which is known as the WEEE mark. WEEE stands for Waste Electronics and Electrical Equipment. It means that used electrical and electronic products should not be mixed with general waste. Used electrical and electronic equipment should be treated separately. MES-3528 User's Guide 7 Safety Warnings 8 MES-3528 User's Guide Contents Overview Contents Overview Introduction and Hardware .....*

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*.... 355 20 MES-3528 User's Guide PART I Introduction and Hardware Getting to Know Your Switch (23) Hardware Installation and Connection (29) Hardware Overview (33) 21 22 CHAPTER 1 Getting to Know Your Switch This chapter introduces the main features and applications of the Switch.*

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*1.1 Introduction The Switch is a layer-2 standalone Ethernet switch with additional layer-2, layer-3, and layer-4 features suitable for metro ethernets. The Switch has twenty-four 10/ 100 Mbps Ethernet ports. It also has four GbE dual personality interfaces with each interface comprising one mini-GBIC slot and one 100/1000 Mbps RJ-45 port, with either port or slot active at a time. With its built-in web configurator, managing and configuring the Switch is easy. In addition, the Switch can also be managed via Telnet, any terminal emulator program on the console port, or third-party SNMP management. See Chapter 41 on page 335 for a full list of software features available on the Switch. This section shows a few examples of using the Switch in various network environments. 1.1.*

*1 Backbone Application The Switch is an ideal solution for small networks where rapid growth can be expected in the near future. The Switch can be used standalone for a group of heavy traffic users. You can connect computers and servers directly to the Switch's port or connect other switches to the Switch. MES-3528 User's Guide 23 Chapter 1 Getting to Know Your Switch In this example, all computers can share high-speed applications on the server. To expand the network, simply add more networking devices such as switches, routers, computers, print servers etc.*

*Figure 1 Backbone Application 1.1.2 Bridging Example In this example, the Switch connects different company departments (RD and Sales) to the corporate backbone. It can alleviate bandwidth contention and eliminate server and network bottlenecks. All users that need high bandwidth can connect to high-speed department servers via the Switch. You can provide a super-fast uplink connection by using a Gigabit Ethernet/mini-GBIC port on the Switch. Moreover, the Switch eases supervision and maintenance by allowing network managers to centralize multiple servers at a single location. Figure 2 Bridging Application 24 MES-3528 User's Guide Chapter 1 Getting to Know Your Switch 1.1.3 High Performance Switching Example The Switch is ideal for connecting two networks that need high bandwidth.*

*In the following example, use trunking to connect these two networks. Switching to higher-speed LANs such as ATM (Asynchronous Transmission Mode) is not feasible for most people due to the expense of replacing all existing Ethernet cables and adapter cards, restructuring your network and complex maintenance. The Switch can provide the same bandwidth as ATM at much lower cost while still being able to use existing adapters and switches. Moreover, the current LAN structure can be retained as all ports can freely communicate with each other. Figure 3 High Performance Switched Workgroup Application 1.1.4 IEEE 802.1Q VLAN Application Examples A VLAN (Virtual Local Area Network) allows a physical network to be partitioned into multiple logical networks. Stations on a logical network belong to one group. A station can belong to more than one group.*

*With VLAN, a station cannot directly talk to or hear from stations that are not in the same group(s) unless such traffic first goes through a router. For more information on VLANs, refer to Chapter 9 on page 91. 1.1.4.*

*1 Tag-based VLAN Example Ports in the same VLAN group share the same frame broadcast domain thus increase network performance through reduced broadcast traffic. VLAN groups can be modified at any time by adding, moving or changing ports without any recabling. MES-3528 User's Guide 25 Chapter 1 Getting to Know Your Switch Shared resources such as a server can be used by all ports in the same VLAN as the server. In the following figure only ports that need access to the server need to be part of VLAN 1. Ports can belong to other VLAN groups too.*

*Figure 4 Shared Server Using VLAN Example 1.1.5 Metro Ethernet The Switch is ideal for connecting users to an Ethernet network that spans a metropolitan area. In the following example, the Switch is one of many switches that connect users in the metropolitan area to the Internet. The metro ethernet is based on a star (or hub-and-spoke) topology, though other topologies, such as ring or mesh, are also 26 MES-3528 User's Guide Chapter 1 Getting to Know Your Switch possible. The Switch is connected to the backbone and the metropolitan servers over an optical network that provides higher bandwidth than copper. Figure 5 Metro Ethernet 1.2 Ways to Manage the Switch Use any of the following methods to manage the Switch. · Web Configurator. This is recommended for everyday management of the Switch using a (supported) web browser.*

*See Chapter 4 on page 45. · Command Line Interface. Line commands offer an alternative to the web configurator and in some cases are necessary to configure advanced features. See the CLI Reference Guide. · FTP. Use FTP for firmware upgrades and configuration backup/restore. See Section 32.8 on page 281. · SNMP. The Switch can be monitored by an SNMP manager.*

*See Section 33.3 on page 286. · Cluster Management. Cluster Management allows you to manage multiple switches through one switch, called the cluster manager. See Chapter 36 on page 313.*

*MES-3528 User's Guide 27 Chapter 1 Getting to Know Your Switch 1.3 Good Habits for Managing the Switch Do the following things regularly to make the Switch more secure and to manage the Switch more effectively. · Change the password. Use a password that's not easy to guess and that consists of different types of characters, such as numbers and letters. · Write down the password and put it in a safe place.*

*· Back up the configuration (and make sure you know how to restore it). Restoring an earlier working configuration may be useful if the device becomes unstable or even crashes. If you forget your password, you will have to reset the Switch to its factory default settings. If you backed up an earlier configuration file, you would not have to totally re-configure the Switch. You could simply restore your last configuration. 28 MES-3528 User's Guide CHAPTER This chapter shows you how to install and connect the Switch. 2 Hardware Installation and Connection 2.1 Installation Scenarios The Switch 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. Note: 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 Switch. This is especially important for enclosed rack installations. 2.2 Desktop Installation Procedure 1 2 Make sure the Switch is clean and dry. Set the Switch on a smooth, level surface strong enough to support the weight of the Switch and the connected cables. Make sure there is a power outlet nearby. Make sure there is enough clearance around the Switch to allow air circulation and the attachment of cables and the power cord.*

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*3 2.3 Mounting the Switch on a Rack The Switch 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 Switch on a standard EIA rack using a rack-mounting kit.*

*MES-3528 User's Guide 29 Chapter 2 Hardware Installation and Connection 2.3.1 Rack-mounted Installation Requirements · Two mounting brackets. · Eight M3 flat head screws and a #2 Philips screwdriver. · Four M5 flat head screws and a #2 Philips screwdriver.*

*Failure to use the proper screws may damage the unit. 2.3.1.1 Precautions · Make sure the rack will safely support the combined weight of all the equipment it contains.*

*· Make sure the position of the Switch does not make the rack unstable or topheavy. Take all necessary precautions to anchor the rack securely before installing the unit. 2.3.2 Attaching the Mounting Brackets to the Switch 1 Position a mounting bracket on one side of the Switch, lining up the four screw holes on the bracket with the screw holes on the side of the Switch. Figure 6 Attaching the Mounting Brackets 2 Using a #2 Philips screwdriver, install the M3 flat head screws through the mounting bracket holes into the Switch. Repeat steps 1 and 2 to install the second mounting bracket on the other side of the Switch. You may now mount the Switch on a rack. Proceed to the next section. 3 4 30 MES-3528 User's Guide Chapter 2 Hardware Installation and Connection 2.*

*3.3 Mounting the Switch on a Rack 1 Position a mounting bracket (that is already attached to the Switch) on one side of the rack, lining up the two screw holes on the bracket with the screw holes on the side of the rack. Figure 7 Mounting the Switch on a Rack 2 Using a #2 Philips screwdriver, install the M5 flat head screws through the mounting bracket holes into the rack. Repeat steps 1 and 2 to attach the second mounting bracket on the other side of the rack. 3 MES-3528 User's Guide 31 Chapter 2 Hardware Installation and Connection 32 MES-3528 User's Guide CHAPTER 3 Hardware Overview This chapter describes the front panel and rear panel of the Switch and shows you how to make the hardware connections. 3.1 Front Panel The following figure shows the front panel of the Switch. Figure 8 Front Panel LEDs Console Port Power Connection Ethernet Ports ALARM slot Dual Personality Interfaces The following table describes the port labels on the front panel. Table 1 Front Panel Connections LABEL Power Connection 24 10/100 Mbps RJ-45 Ethernet Ports DESCRIPTION Connect an appropriate power supply to this port. Connect these ports to a computer, a hub, an Ethernet switch or router.*

*MES-3528 User's Guide 33 Chapter 3 Hardware Overview Table 1 Front Panel Connections (continued) LABEL Four Dual Personality Interfaces DESCRIPTION Each interface has one 1000BASE-T RJ-45 port and one Small Form-Factor Pluggable (SFP) slot (also called a mini-GBIC slot), with one port or transceiver active at a time. · Four 100/1000 Mbps RJ-45 Ports: Connect these ports to high-bandwidth backbone network Ethernet switches using 1000BASE-T compatible Category 5/5e/6 copper cables. Four Mini-GBIC Slots: Use mini-GBIC transceivers in these slots for connections to backbone Ethernet switches. · Console Port Alarm The console port is for local configuration of the Switch. Connect the alarm input pins to alarm output terminals on other pieces of equipment.*

*Connect the alarm output pins to an alarm input terminal on another piece of equipment. See Chapter 41 on page 335 for details on the pin assignments required. 3.1.1 Console Port For local management, you can use a computer with terminal emulation software configured to the following parameters: · VT100 · Terminal emulation · 9600 bps · No parity, 8 data bits, 1 stop bit · No flow control Connect the male 9-pin end of the console cable to the console port of the Switch.*

*Connect the female end to a serial port (COM1, COM2 or other COM port) of your computer. 3.1.2 Gigabit Ethernet Ports The Switch has 1000Base-T auto-negotiating, auto-crossover Ethernet ports. In 10/100/1000 Mbps Fast Ethernet, the speed can be 10 Mbps, 100 Mbps or 1000 Mbps and the duplex mode can be half duplex or full duplex. An auto-negotiating port can detect and adjust to the optimum Ethernet speed (10/100/1000 Mbps) and duplex mode (full duplex or half duplex) of the connected device. 34 MES-3528 User's Guide Chapter 3 Hardware Overview An auto-crossover (auto-MDI/MDI-X) port automatically works with a straightthrough or crossover Ethernet cable. Four 1000Base-T Ethernet ports are paired with a mini-GBIC slot to create a dual personality interface. The Switch uses up to one connection for each mini-GBIC and 1000Base-T Ethernet pair. The mini-GBIC slots have priority over the Gigabit ports.*

*This means that if a mini-GBIC slot and the corresponding GbE port are connected at the same time, the GbE port will be disabled. When auto-negotiation is turned on, an Ethernet port negotiates with the peer automatically to determine the connection speed and duplex mode. If the peer Ethernet port does not support auto-negotiation or turns off this feature, the Switch determines the connection speed by detecting the signal on the cable and using half duplex mode. When the Switch's auto-negotiation is turned off, an Ethernet port uses the pre-configured speed and duplex mode when making a connection, thus requiring you to make sure that the settings of the peer Ethernet port are the same in order to connect. 3.1.2.1 Default Ethernet Negotiation Settings The factory default negotiation settings for the Gigabit ports on the Switch are: · Speed: Auto · Duplex: Auto · Flow control: Off · Link Aggregation: Disabled 3.1.2.*

*2 Auto-crossover All ports are auto-crossover, that is auto-MDIX ports (Media Dependent Interface Crossover), so you may use either a straight-through Ethernet cable or crossover Ethernet cable for all Gigabit port connections. Auto-crossover ports automatically sense whether they need to function as crossover or straight ports, so crossover cables can connect both computers and switches/hubs. 3.1.3 Mini-GBIC Slots These are slots for mini-GBIC (Gigabit Interface Converter) transceivers.*

*A transceiver is a single unit that houses a transmitter and a receiver. The Switch does not come with transceivers. You must use transceivers that comply with the Small Form-factor Pluggable (SFP) Transceiver MultiSource Agreement (MSA). See the SFF committee's INF-8074i specification Rev 1.0 for details. You can change transceivers while the Switch is operating. You can use different transceivers to connect to Ethernet switches with different types of fiber-optic or even copper cable connectors. MES-3528 User's Guide 35 Chapter 3 Hardware Overview To avoid possible eye injury, do not look into an operating fiberoptic module's connectors.*

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· Type: SFP connection interface · Connection speed: 1 Gigabit per second (Gbps) 3.1.3.1 Transceiver Installation Use the following steps to install a mini-GBIC transceiver (SFP module). 1 Insert the transceiver into the slot with the exposed section of PCB board facing down. Press the transceiver firmly until it clicks into place. The Switch automatically detects the installed transceiver.

Check the LEDs to verify that it is functioning properly. Close the transceiver's latch (latch styles vary). Connect the fiber optic cables to the transceiver. 2 3 4 5 Figure 9 Transceiver Installation Example Figure 10 Connecting the Fiber Optic Cables 3.1.3.2 Transceiver Removal Use the following steps to remove a mini-GBIC transceiver (SFP module). 1 2 Remove the fiber optic cables from the transceiver. Open the transceiver's latch (latch styles vary). 36 MES-3528 User's Guide Chapter 3 Hardware Overview Pull the transceiver out of the slot.
3 Figure 11 Removing the Fiber Optic Cables Figure 12 Opening the Transceiver's Latch Example Figure 13 Transceiver Removal Example 3.1.4 Power Connector Note: Make sure you are using the correct power source as shown on the panel. To connect power to the Switch, insert the female end of the power cord to the AC power receptacle on the front panel. Connect the other end of the supplied power cord to a power outlet.
Make sure that no objects obstruct the airflow of the fans (located on the side of the unit). See Chapter 41 on page 335 for information on the Switch's power supply requirements. 3.1.5 ALARM Slot The ALARM slot (fitted with the alarm connector) allows you to connect devices to the Switch, such as smoke or movement detectors, sensors, or even other ZyXEL switches which support the external alarm feature.
This feature is in addition to the system alarm, which detects abnormal temperatures, voltage levels and fan speeds on the Switch. Your Switch can respond to an external alarm in five ways. · The ALM LED shows an alert. MES-3528 User's Guide 37 Chapter 3 Hardware Overview · The ALARM slot can send an external alarm on to another device such as an alarm bell. · By daisy-chaining the alarm sensor cables from one Switch to another ZyXEL switch which supports this feature, the external alarm alert (but not the system alarm) is received on each Switch. · The Switch can be configured to send an SNMP trap to the SNMP server. See Section 33.3 on page 286 for more information on using SNMP. · The Switch can be configured to create an error log of the alarm. See Section 35.

1 on page 309 for more information on using the system log. 3.1.5.1 Connect a Sensor to the ALARM Slot This section shows you how to connect up to four sensors to the ALARM slot and to let a bell signal the alarm, as shown in the diagram below. Figure 14 Connecting Sensors to the ALARM connector Smoke Flooding Forced Entry Movement Alarm bell ALARM Slot Follow these steps to connect an external sensor device to the Switch. 1 Use a connector to connect wires of the correct gauge to the sensor's power output pins. See Chapter 41 on page 335 for the wire specifications. Check the sensor's documentation to identify its two power output pins. Connect these two wires to any one of the following pairs of power input pins on the Switch's ALARM connector--(4,5) (6,7) (8,9) (10,11).
The pin numbers run from the right side of the connector to the left. 2a Connect each of the sensor's two power output wires to the ALARM connector by depressing the spring clip corresponding to the pin you are connecting to. Insert the wire and release the spring clip. Repeat the process for the sensor's other power output wire. A total of four sensors may be connected to the ALARM connector in this way using the remaining power input pins.
2 2b 2c 38 MES-3528 User's Guide Chapter 3 Hardware Overview Insert the alarm connector into the ALARM slot. 3 Figure 15 Connecting a Sensor to the ALARM Slot Smoke Detector ALARM Connector Spring Clip 11 10 9 8 7 6 5 4 3 2 1 Alarm Input Pins Alarm Output Pins 4 To connect an output device such as an alarm bell, repeat the previous steps but this time connect to either pins (1,2) or (2,3) on the ALARM connector. You can also daisy-chain the external alarm to another ZyXEL Switch which supports the external alarm feature. If daisy-chaining to a ZyXEL switch that is a different model, check your switch's documentation for the correct pin assignments. 1 Use wires of the correct gauge to connect either of the power output pin pairs (1normal close, 2-common) or (2-common, 3-normal open) on the ALARM connector to the input power pin pairs of an ALARM connector on another ZyXEL Switch.
MES-3528 User's Guide 39 Chapter 3 Hardware Overview When daisy-chaining further Switches ensure that the output power pins you use are the same as those you used when connecting to the first switch, as shown in the diagram below. 2 Figure 16 Daisy-chaining an External Alarm Sensor to Other Switches of the Same Model 11 10 .....

3 21 11 10 ..... 3 21 11 10 .
.....
... 3 21 Pin Assignments 3.2 LEDs After you connect the power to the Switch, view the LEDs to ensure proper functioning of the Switch and as an aid in troubleshooting.
Table 2 LED Descriptions LED PWR SYS COLOR Green Green STATU S On Off On Blinking Off DESCRIPTION The system is turned on. The system is off. The system is on and functioning properly. The system is rebooting and performing self-diagnostic tests. The power is off or the system is not ready/ malfunctioning. A hardware failure is detected, or an external alarm is active. The system is functioning normally. ALM Red On Off Ethernet Ports 40 MES-3528 User's Guide Chapter 3 Hardware Overview Table 2 LED Descriptions (continued) LED 1 ~ 24 COLOR Green STATU S Blinking on DESCRIPTION The system is transmitting/receiving to/from a 10 Mbps Ethernet network. The link to a 10 Mbps Ethernet network is up. The system is transmitting/receiving to/from a 100 Mbps Ethernet network.

The link to a 100 Mbps Ethernet network is up. The link to an Ethernet network is down. The link to this port is up. The link to this port is not connected. This port is receiving or transmitting data. The system is transmitting/receiving to/from a 10 Mbps or a 1000 Mbps Ethernet network. The link to a 10 Mbps or a 1000 Mbps Ethernet network is up. The system is transmitting/receiving to/from a 100 Mbps Ethernet network. The link to a 100 Mbps Ethernet network is up. The link to an Ethernet network is down.
The Gigabit port is negotiating in full-duplex mode. The Gigabit port is negotiating in half-duplex mode. Amber Blinking On Off Mini-GBIC Slots LNK ACT Green Green On Off Blinking Blinking On Amber Blinking On Off FDX Amber On Off 1000Base-T Ethernet Ports (in Dual Personality Interface) LNK/ACT Green MES-3528 User's Guide 41 Chapter 3 Hardware Overview 42 MES-3528 User's Guide PART II Basic Configuration The Web Configurator (45) Initial Setup Example (55) System Status and Port Statistics (71) Basic Setting (77) 43 44 CHAPTER 4 The Web Configurator This section introduces the configuration and functions of the web configurator.

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*4.1 Introduction The web configurator is an HTML-based management interface that allows easy Switch setup and management via Internet browser. Use Internet Explorer 6.0 and later or Netscape Navigator 7.0 and later versions. The recommended screen resolution is 1024 by 768 pixels. In order to use the web configurator you need to allow: · Web browser pop-up windows from your device.*
*Web pop-up blocking is enabled by default in Windows XP SP (Service Pack) 2. · JavaScript (enabled by default). · Java permissions (enabled by default). 4.2 System Login 1 2 Start your web browser. Type "http://" and the IP address of the Switch (for example, the default management IP address is 192.168.1.1) in the Location or Address field. Press [ENTER].*

*MES-3528 User's Guide 45 Chapter 4 The Web Configurator The login screen appears. The default username is admin and associated default password is 1234. The date and time display as shown if you have not configured a time server nor manually entered a time and date in the General Setup screen. 3 Figure 17 Web Configurator: Login 4 Click OK to view the first web configurator screen. 4.3 The Status Screen The Status screen is the first screen that displays when you access the web configurator. 46 MES-3528 User's Guide Chapter 4 The Web Configurator The following figure shows the navigating components of a web configurator screen. Figure 18 Web Configurator Home Screen (Status) B C DE A A - Click the menu items to open submenu links, and then click on a submenu link to open the screen in the main window. B, C, D, E - These are quick links which allow you to perform certain tasks no matter which screen you are currently working in. B - Click this link to save your configuration into the Switch's nonvolatile memory.*
*Nonvolatile memory is the configuration of your Switch that stays the same even if the Switch's power is turned off. C - Click this link to go to the status page of the Switch. D - Click this link to logout of the web configurator. E - Click this link to display web help pages. The help pages provide descriptions for all of the configuration screens.*
*MES-3528 User's Guide 47 Chapter 4 The Web Configurator In the navigation panel, click a main link to reveal a list of submenu links. Table 3 Navigation Panel Sub-links Overview BASIC SETTING ADVANCED APPLICATION IP APPLICATION MANAGEMENT The following table describes the links in the navigation panel. Table 4 Navigation Panel Links LINK Basic Settings System Info General Setup Switch Setup IP Setup This link takes you to a screen that displays general system information. This link takes you to a screen where you can configure general identification information about the Switch. This link takes you to a screen where you can set up global Switch parameters such as VLAN type, GARP and priority queues.*
*This link takes you to a screen where you can configure the IP address, subnet mask (necessary for Switch management) and DNS (domain name server) and set up to 64 IP routing domains. This link takes you to a screen where you can configure settings for individual Switch ports. This link takes you to screens where you can configure port-based or 802.1Q VLAN (depending on what you configured in the Switch Setup menu). You can also configure a protocol based VLAN or a subnet based VLAN in these screens. DESCRIPTION Port Setup Advanced Application VLAN 48 MES-3528 User's Guide Chapter 4 The Web Configurator Table 4 Navigation Panel Links (continued) LINK Static MAC Forwarding Static Multicast Forwarding Filtering Spanning Tree Protocol Bandwidth Control Broadcast Storm Control Mirroring DESCRIPTION This link takes you to a screen where you can configure static MAC addresses for a port. These static MAC addresses do not age out. This link takes you to a screen where you can configure static multicast MAC addresses for port(s). These static multicast MAC addresses do not age out. This link takes you to a screen to set up filtering rules.*

*This link takes you to screens where you can configure the RSTP/MRSTP/ MSTP to prevent network loops. This link takes you to a screen where you can configure bandwidth limits on the Switch. This link takes you to a screen to set up broadcast filters. This link takes you to screens where you can copy traffic from one port or ports to another port in order that you can examine the traffic from the first port without interference. This link takes you to screens where you can logically aggregate physical links to form one logical, higher-bandwidth link. This link takes you to a screen where you can configure IEEE 802.1x port authentication for clients communicating via the Switch. This link takes you to screens where you can activate MAC address learning and set the maximum number of MAC addresses to learn on a port. This link takes you to a screen where you can configure the Switch to group packets based on the specified criteria. This link takes you to a screen where you can configure the Switch to perform special treatment on the grouped packets.*
*This link takes you to a screen where you can configure queuing with associated queue weights for each port. This link takes you to screens where you can configure VLAN stacking. This link takes you to screens where you can configure various multicast features, IGMP snooping and create multicast VLANs. This link takes you to a screen where you can configure authentication, authorization and accounting services via external servers. The external servers can be either RADIUS (Remote Authentication Dial-In User Service) or TACACS+ (Terminal Access Controller Access-Control System Plus).*
*This link takes you to screens where you can configure filtering of unauthorized DHCP and ARP packets in your network. This link takes you to a screen where you can configure protection against network loops that occur on the edge of your network. This link takes you to a screen where you can configure L2PT (Layer 2 Protocol Tunneling) settings on the Switch. Link Aggregation Port Authentication Port Security Classifier Policy Rule Queuing Method VLAN Stacking Multicast AAA IP Source Guard Loop Guard Layer 2 Protocol Tunneling IP Application MES-3528 User's Guide 49 Chapter 4 The Web Configurator Table 4 Navigation Panel Links (continued) LINK Static Routing DESCRIPTION This link takes you to a screen where you can configure static routes. A static route defines how the Switch should forward traffic by configuring the TCP/IP parameters manually.*
*This link takes you to screens where you can enable DiffServ, configure marking rules and set DSCP-to-IEEE802.1p mappings. This link takes you to screens where you can configure the DHCP settings. This link takes you to screens where you can perform firmware and configuration file maintenance as well as reboot the system. This link takes you to screens where you can change the system login password and configure SNMP and remote management.*

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*This link takes you to a screen where you can view system logs and test port(s). This link takes you to screens where you can setup system logs and a system log server. This link takes you to screens where you can configure clustering management and view its status. This link takes you to a screen where you can view the MAC addresses (and types) of devices attached to what ports and VLAN IDs. This link takes you to a screen where you can view the MAC addresses IP address resolution table.*

*This link takes you to a screen where you can copy attributes of one port to other ports. DiffServ DHCP Management Maintenance Access Control Diagnostic Syslog Cluster Management MAC Table ARP Table Configure Clone 50 MES-3528 User's Guide Chapter 4 The Web Configurator 4.3.1 Change Your Password After you log in for the first time, it is recommended you change the default administrator password. Click Management > Access Control > Logins to display the next screen. Figure 19 Change Administrator Login Password 4.4 Saving Your Configuration When you are done modifying the settings in a screen, click Apply to save your changes back to the run-time memory. Settings in the run-time memory are lost when the Switch's power is turned off. Click the Save link in the upper right hand corner of the web configurator to save your configuration to nonvolatile memory. Nonvolatile memory refers to the Switch's storage that remains even if the Switch's power is turned off.*
*Note: Use the Save link when you are done with a configuration session. MES-3528 User's Guide 51 Chapter 4 The Web Configurator 4.5 Switch Lockout You could block yourself (and all others) from managing the Switch if you do one of the following: 1 2 Delete the management VLAN (default is VLAN 1). Delete all port-based VLANs with the CPU port as a member. The "CPU port" is the management port of the Switch.*
*Filter all traffic to the CPU port. Disable all ports. Misconfigure the text configuration file. Forget the password and/or IP address. Prevent all services from accessing the Switch.*
*Change a service port number but forget it. 3 4 5 6 7 8 Note: Be careful not to lock yourself and others out of the Switch. 4.6 Resetting the Switch If you lock yourself (and others) from the Switch or forget the administrator password, you will need to reload the factory-default configuration file or reset the Switch back to the factory defaults. 4.6.1 Reload the Configuration File Uploading the factory-default configuration file replaces the current configuration file with the factory-default configuration file. This means that you will lose all previous configurations and the speed of the console port will be reset to the default of 9600 bps with 8 data bits, no parity, one stop bit and flow control set to none. The password will also be reset to "1234" and the IP address to 192.168.*

*1.1. To upload the configuration file, do the following: 1 Connect to the console port using a computer with terminal emulation software. 52 MES-3528 User's Guide Chapter 4 The Web Configurator Disconnect and reconnect the Switch's power to begin a session. When you reconnect the Switch's power, you will see the initial screen. When you see the message "Press any key to enter Debug Mode within 3 seconds ..." press any key to enter debug mode. Type atlc after the "Enter Debug Mode" message.*
*Wait for the "Starting XMODEM upload" message before activating XMODEM upload on your terminal. After a configuration file upload, type atgo to restart the Switch. 2 3 4 5 6 Figure 20 Resetting the Switch: Via the Console Port Bootbase Version: V1.04 \ 12/15/2008 15:42:13 RAM: Size = 65536 Kbytes DRAM POST: Testing: 65536K OK FLASH: AMD 64M *2 ZyNOS Version: V3.90(BHR.*
*0)b0 \ 12/24/2008 21:56:57 Press any key to enter debug mode within 3 seconds. ras> atlc Starting XMODEM upload (CRC mode)....*
*CCCCCCCCCCCCCCCC Total 573440 bytes received. Erasing.. .....*

*.....*
*.....*
*.....*
*.....*

*.....*
*.....*
*.....*
*..... OK ras> atgo The Switch is now reinitialized with a default configuration file including the default password of "1234". 4.7 Logging Out of the Web Configurator Click Logout in a screen to exit the web configurator.*

*You have to log in with your password again after you log out. This is recommended after you finish a management session for security reasons. Figure 21 Web Configurator: Logout Screen MES-3528 User's Guide 53 Chapter 4 The Web Configurator 4.8 Help The web configurator's online help has descriptions of individual screens and some supplementary information. Click the Help link from a web configurator screen to view an online help description of that screen. 54 MES-3528 User's Guide CHAPTER This chapter shows how to set up the Switch for an example network. 5 Initial Setup Example 5.1 Overview The following lists the configuration steps for the initial setup: · Create a VLAN · Set port VLAN ID · Configure the Switch IP management address 5.1.1 Creating a VLAN VLANs confine broadcast frames to the VLAN group in which the port(s) belongs.*
*You can do this with port-based VLAN or tagged static VLAN with fixed port members. In this example, you want to configure port 1 as a member of VLAN 2. Figure 22 Initial Setup Network Example: VLAN MES-3528 User's Guide 55 Chapter 5 Initial Setup Example Click Advanced Application > VLAN in the navigation panel and click the Static VLAN link. 1 2 In the Static VLAN screen, select ACTIVE, enter a descriptive name in the Name field and enter 2 in the VLAN Group ID field for the VLAN2 network. Note: The VLAN Group ID field in this screen and the VID field in the IP Setup screen refer to the same VLAN ID.*
*3 Since the VLAN2 network is connected to port 1 on the Switch, select Fixed to configure port 1 to be a permanent member of the VLAN only. To ensure that VLAN-unaware devices (such as computers and hubs) can receive frames properly, clear the TX Tagging check box to set the Switch to remove VLAN tags before sending. Click Add to save the settings to the run-time memory. Settings in the run-time memory are lost when the Switch's power is turned off. 4 5 56 MES-3528 User's Guide Chapter 5 Initial Setup Example 5.*
*1.2 Setting Port VID Use PVID to add a tag to incoming untagged frames received on that port so that the frames are forwarded to the VLAN group that the tag defines. In the example network, configure 2 as the port VID on port 1 so that any untagged frames received on that port get sent to VLAN 2. Figure 23 Initial Setup Network Example: Port VID 1 Click Advanced Applications > VLAN in the navigation panel. Then click the VLAN Port Setting link. Enter 2 in the PVID field for port 1 and click Apply to save your changes back to the run-time memory. Settings in the run-time memory are lost when the Switch's power is turned off.*

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2 MES-3528 User's Guide 57 Chapter 5 Initial Setup Example 5.2 Configuring Switch Management IP Address The default management IP address of the Switch is 192.168.

1.1. You can configure another IP address in a different subnet for management purposes. The following figure shows an example. Figure 24 Initial Setup Example: Management IP Address 1 Connect your computer to any Ethernet port on the Switch. Make sure your computer is in the same subnet as the Switch. Open your web browser and enter 192.168.1.1 (the default IP address) in the address bar to access the web configurator.
See Section 4.2 on page 45 for more information. Click Basic Setting > IP Setup in the navigation panel. Configure the related fields in the IP Setup screen. For the VLAN2 network, enter 192.
168.2.1 as the IP address and 255.255.255.
0 as the subnet mask. In the VID field, enter the ID of the VLAN group to which you want this management IP address to belong. This is the same as the VLAN ID you configure in the Static VLAN screen. 2 3 4 5 6 58 MES-3528 User's Guide Chapter 5 Initial Setup Example Click Add to save your changes back to the run-time memory. Settings in the runtime memory are lost when the Switch's power is turned off. 7 MES-3528 User's Guide 59 Chapter 5 Initial Setup Example 60 MES-3528 User's Guide CHAPTER · How to Use DHCP Snooping on the Switch · How to Use DHCP Relay on the Switch 6 Tutorials This chapter provides some examples of using the web configurator to set up and use the Switch. The tutorials include: 6.1 How to Use DHCP Snooping on the Switch You only want DHCP server A connected to port 5 to assign IP addresses to all devices in VLAN network (V). Create a VLAN containing ports 5, 6 and 7. Connect a computer M to the Switch for management.

Figure 25 Tutorial: DHCP Snooping Tutorial Overview M C B A V Note: For related information about DHCP snooping, see Section 26.1 on page 223. The settings in this tutorial are as the following. Table 5 Tutorial: Settings in this Tutorial HOST DHCP Server (A) DHCP Client (B) DHCP Client (C) PORT VLAN CONNECTED 5 6 7 1 and 100 1 and 100 1 and 100 PVID 100 100 100 DHCP SNOOPING PORT TRUSTED Yes No No MES-3528 User's Guide 61 Chapter 6 Tutorials Access the Switch through http://192.168.1.1 by default. Log into the Switch by entering the username (default: admin) and password (default: 1234). Go to Advanced Application > VLAN > Static VLAN, and create a VLAN with ID of 100. Add ports 5, 6 and 7 in the VLAN by selecting Fixed in the Control field as shown.
Deselect Tx Tagging because you don't want outgoing traffic to contain this VLAN tag. Click Add. 1 2 Figure 26 Tutorial: Create a VLAN and Add Ports to It 62 MES-3528 User's Guide Chapter 6 Tutorials Go to Advanced Application > VLAN > VLAN Port Setting, and set the PVID of the ports 5, 6 and 7 to 100. This tags untagged incoming frames on ports 5, 6 and 7 with the tag 100. 3 Figure 27 Tutorial: Tag Untagged Frames 4 Go to Advanced Application > IP Source Guard > DHCP snooping > Configure, activate and specify VLAN 100 as the DHCP VLAN as shown.
Click Apply. Figure 28 Tutorial: Specify DHCP VLAN MES-3528 User's Guide 63 Chapter 6 Tutorials Click the Port link at the top right corner. 5 6 The DHCP Snooping Port Configure screen appears. Select Trusted in the Server Trusted state field for port 5 because the DHCP server is connected to port 5. Keep ports 6 and 7 Untrusted because they are connected to DHCP clients.
Click Apply. Figure 29 Tutorial: Set the DHCP Server Port to Trusted 7 Go to Advanced Application > IP Source Guard > DHCP snooping > Configure > VLAN, show VLAN 100 by entering 100 in the Start VID and End VID fields and click Apply. Then select Yes in the Enabled field of the VLAN 100 entry shown at the bottom section of the screen. If you want to add more information in the DHCP request packets such as source VLAN ID or system name, you can also select the Option82 and Information fields in the entry. See Section 26.1.1.3 on page 225. Figure 30 Tutorial: Enable DHCP Snooping on this VLAN 64 MES-3528 User's Guide Chapter 6 Tutorials Click Save at the top right corner of the web configurator to save the configuration permanently. Connect your DHCP server to port 5 and a computer (as DHCP client) to either port 6 or 7.

The computer should be able to get an IP address from the DHCP server. If you put the DHCP server on port 6 or 7, the computer will not able to get an IP address. 8 9 10 To check if DHCP snooping works, go to Advanced Application > IP Source Guard, you should see an IP assignment with the type dhcp-snooping as shown. Figure 31 Tutorial: Check the Binding If DHCP Snooping Works You can also telnet or log into the Switch's console. Use the command "show dhcp snooping binding" to see the DHCP snooping binding table as shown next. sysname# show dhcp snooping binding MacAddress IpAddress ---------- ----------00:02:00:00:00:1c 10.10.1.16 Total number of bindings: 1 Lease ----------6d23h59m20s Type ----------dhcp-snooping VLAN ---100 Port ----7 6.2 How to Use DHCP Relay on the Switch This tutorial describes how to configure your Switch to forward DHCP client requests to a specific DHCP server.
The DHCP server can then assign a specific IP address based on the information in the DHCP requests. 6.2.1 DHCP Relay Tutorial Introduction In this example, you have configured your DHCP server (192.168.
2.3) and want to have it assign a specific IP address (say 172.16.1.18) to DHCP client A based on MES-3528 User's Guide 65 Chapter 6 Tutorials the system name, VLAN ID and port number in the DHCP request.
Client A connects to the Switch's port 2 in VLAN 102. Figure 32 Tutorial: DHCP Relay Scenario DHCP Server 192.168.2.3 Port 2 PVID=102 A VLAN 102 172.16.1.18 6.2.2 Creating a VLAN Follow the steps below to configure port 2 as a member of VLAN 102.

1 2 Access the web configurator through the Switch's management port. Go to Basic Setting > Switch Setup and set the VLAN type to 802.1Q. Click Apply to save the settings to the run-time memory. Figure 33 Tutorial: Set VLAN Type to 802.1Q 66 MES-3528 User's Guide Chapter 6 Tutorials Click Advanced Application > VLAN > Static VLAN. In the Static VLAN screen, select ACTIVE, enter a descriptive name (VALN 102 for example) in the Name field and enter 102 in the VLAN Group ID field. Select Fixed to configure port 2 to be a permanent member of this VLAN. Clear the TX Tagging check box to set the Switch to remove VLAN tags before sending. Click Add to save the settings to the run-time memory.
Settings in the run-time memory are lost when the Switch's power is turned off. 3 4 5 6 7 Figure 34 Tutorial: Create a Static VLAN MES-3528 User's Guide 67 Chapter 6 Tutorials Click the VLAN Status link in the Static VLAN screen and then the VLAN Port Setting link in the VLAN Status screen.

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*8 Figure 35 Tutorial: Click the VLAN Port Setting Link 9 Enter 102 in the PVID field for port 2 to add a tag to incoming untagged frames received on that port so that the frames are forwarded to the VLAN group that the tag defines. 10 Click Apply to save your changes back to the run-time memory. Figure 36 Tutorial: Add Tag for Frames Received on Port 2 68 MES-3528 User's Guide Chapter 6 Tutorials 11 Click the Save link in the upper right corner of the web configurator to save your configuration permanently.*

*6.2.3 Configuring DHCP Relay Follow the steps below to enable DHCP relay on the Switch and allow the Switch to add relay agent information (such as the VLAN ID) to DHCP requests. 1 Click IP Application > DHCP and then the Global link to open the DHCP Relay screen. Select the Active check box. Enter the DHCP server's IP address (192.168.2.3 in this example) in the Remote DHCP Server 1 field. Select the Option 82 and the Information check boxes. Click Apply to save your changes back to the run-time memory. 2 3 4 5 Figure 37 Tutorial: Set DHCP Server and Relay Information 6 Click the Save link in the upper right corner of the web configurator to save your configuration permanently. The DHCP server can then assign a specific IP address based on the DHCP request. 7 6.2.*

*4 Troubleshooting Check the client A's IP address. If it did not receive the IP address 172.16.1.18, make sure: MES-3528 User's Guide 69 Chapter 6 Tutorials Client A is connected to the Switch's port 2 in VLAN 102. You configured the correct VLAN ID, port number and system name for DHCP relay on both the DHCP server and the Switch. You clicked the Save link on the Switch to have your settings take effect. 1 2 3 70 MES-3528 User's Guide CHAPTER 7 System Status and Port Statistics This chapter describes the system status (web configurator home page) and port details screens. 7.1 Overview The home screen of the web configurator displays a port statistical summary with links to each port showing statistical details.*

*MES-3528 User's Guide 71 Chapter 7 System Status and Port Statistics 7.2 Port Status Summary To view the port statistics, click Status in all web configurator screens to display the Status screen as shown next. Figure 38 Status The following table describes the labels in this screen. Table 6 Status LABEL Port Name Link DESCRIPTION This identifies the Ethernet port. Click a port number to display the Port Details screen (refer to Figure 39 on page 73).*

*This is the name you assigned to this port in the Basic Setting > Port Setup screen. This field displays the speed (either 10M for 10Mbps, 100M for 100Mbps or 1000M for 1000Mbps) and the duplex (F for full duplex or H for half). It also shows the cable type (Copper or Fiber) for the combo ports. If STP (Spanning Tree Protocol) is enabled, this field displays the STP state of the port (see Section 13.1 on page 121 for more information).*

*If STP is disabled, this field displays FORWARDING if the link is up, otherwise, it displays STOP. State LACP TxPkts RxPkts Errors Tx KB/s This fields displays whether LACP (Link Aggregation Control Protocol) has been enabled on the port. This field shows the number of transmitted frames on this port. This field shows the number of received frames on this port. This field shows the number of received errors on this port. This field shows the number of kilobytes per second transmitted on this port. 72 MES-3528 User's Guide Chapter 7 System Status and Port Statistics Table 6 Status (continued) LABEL Rx KB/s Up Time Clear Counter DESCRIPTION This field shows the number of kilobytes per second received on this port. This field shows the total amount of time in hours, minutes and seconds the port has been up. Enter a port number and then click Clear Counter to erase the recorded statistical information for that port, or select Any to clear statistics for all ports. 7.*

*2.1 Status: Port Details Click a number in the Port column in the Status screen to display individual port statistics. Use this screen to check status and detailed performance data about an individual port on the Switch. Figure 39 Status > Port Details MES-3528 User's Guide 73 Chapter 7 System Status and Port Statistics The following table describes the labels in this screen. Table 7 Status: Port Details LABEL Port Info Port NO. Name Link This field displays the port number you are viewing. This field displays the name of the port. This field displays the speed (either 10M for 10Mbps, 100M for 100Mbps or 1000M for 1000Mbps) and the duplex (F for full duplex or H for half duplex). It also shows the cable type (Copper or Fiber). If STP (Spanning Tree Protocol) is enabled, this field displays the STP state of the port (see Section 13.*

*1 on page 121 for more information). If STP is disabled, this field displays FORWARDING if the link is up, otherwise, it displays STOP. LACP TxPkts RxPkts Errors Tx KB/s Rx KB/s Up Time Tx Packet The following fields display detailed information about packets transmitted. TX Packet Multicast Broadcas t Pause Rx Packet The following fields display detailed information about packets received. RX Packet Multicast Broadcas t Pause TX Collision The following fields display information on collisions while transmitting.*

*Single Multiple This is a count of successfully transmitted packets for which transmission is inhibited by exactly one collision. This is a count of successfully transmitted packets for which transmission was inhibited by more than one collision. This field shows the number of good packets (unicast, multicast and broadcast) received. This field shows the number of good multicast packets received. This field shows the number of good broadcast packets received. This field shows the number of 802.3x Pause packets received. This field shows the number of good packets (unicast, multicast and broadcast) transmitted. This field shows the number of good multicast packets transmitted. This field shows the number of good broadcast packets transmitted. This field shows the number of 802.3x Pause packets transmitted. This field shows if LACP is enabled on this port or not. This field shows the number of transmitted frames on this port This field shows the number of received frames on this port This field shows the number of received errors on this port. This field shows the number kilobytes per second transmitted on this port.*

*This field shows the number of kilobytes per second received on this port. This field shows the total amount of time the connection has been up. DESCRIPTION Status 74 MES-3528 User's Guide Chapter 7 System Status and Port Statistics Table 7 Status: Port Details (continued) LABEL Excessiv e Late Error Packet RX CRC Runt Distribution 64 65-127 128-255 256-511 5121023 10241518 Giant This field shows the number of packets (including bad packets) received that were 64 octets in length.*

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