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Hardware Installation Guide

Mediatrix[®] LP Series Analog Access Devices LP16 / LP24 models (FXS)

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Mediatrix® LP Series Hardware Installation Guide

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About this Manual

Thank you for purchasing the Mediatrix LP Series from Media5 Corporation.

The Mediatrix LP Series FXS VoIP Integrated Access Devices are telephony adaptors that connect up to 24 conventional analog telephones or fax machines to a LAN or a WAN with access to an IP Packet Network to permit high-quality, full duplex, audio/fax communications. They offer features such as 60 VRMS ringing voltage, 2 kilometer loop distance and integrated secondary lightning protection, which allow them to be connected to external phone line cables.

The Mediatrix LP offers two Ethernet connectors switches enabling to establish two connections between conventional analog telephones or Group 3 fax machines and either a WAN, a LAN or a personal computer.

The Mediatrix LP Series are available in the following models:

Table 1: Mediatrix LP Series Models

Model	Interfaces
Mediatrix LP16	16 FXS ports
Mediatrix LP24	24 FXS ports

Document Objectives

The *Mediatrix LP Hardware Installation Guide* provides technical information on how to physically install the Mediatrix LP. It also describes the cabling required for the Mediatrix LP device.

The information included in this guide consists of:

- ▶ Hardware descriptions of the Mediatrix LP device
- ▶ Hardware installation instructions
- ▶ Installation scenarios examples
- ▶ LED indications
- ▶ Cabling and pin-out data



Note: There are many flavours of the Mediatrix LP device. Because of this, some of the information provided may not apply to your particular Mediatrix LP device model.

Please refer to the *Dgw v2.0 Software Configuration Guide* for software configuration information.

Use the *Mediatrix LP Hardware Installation Guide* in conjunction with the appropriate publications listed in [“Related Documentation” on page viii](#).

Intended Audience

This guide is intended for the following audiences:

- ▶ Technical staff who are familiar with electronic circuitry, networking theory and have experience as an electronic technician.
- ▶ System administrators with a basic networking background and experience, but who might not be familiar with the Mediatrix LP device.
- ▶ System administrators who are responsible for installing and configuring networking equipment and who are familiar with the Mediatrix LP device.

Related Documentation

In addition to this manual, the Mediatrix LP document set includes the following:

- ▶ *Dgw v2.0 Software Configuration Guide*
Describes how to configure and operate the Mediatrix LP.
- ▶ *Mediatrix LP Installation Guide*
This booklet allows you to quickly setup and work with the Mediatrix LP. The booklet for your specific platform is available at: <http://www.media5corp.com/quickstart>
- ▶ *Configuration Reference Guide*
Lists all the parameters, tables, and commands available in the Mediatrix LP.
- ▶ *Notification Reference Guide*
Lists and describes all syslog messages and notification messages that the Mediatrix LP may send.
- ▶ *Third Party Software Copyright Information*
This document lists the third-party software modules used in the Mediatrix LP along with any copyright and license information. This document is available at: http://www.media5corp.com/repository/common%20manuals/Third-Party_Software_Copyright_Information_Mediatrix.pdf.

Be sure to read any readme files, technical bulletins, or additional release notes for important information.

Document Structure

The Mediatrix LP *Hardware Installation Guide* contains the following information.

Table 2: Mediatrix LP Hardware Installation Guide Chapter/Appendices

Title	Summary
“Chapter 1 - Overview” on page 1	Provides a brief description of the Mediatrix LP.
“Chapter 2 - Installation” on page 5	Contains instructions for installing the Mediatrix LP and connecting the cables.
“Chapter 3 - Powering on the Mediatrix LP” on page 13	Leads you through the basic steps to start the Mediatrix LP.
“Appendix A - Standards Compliance and Safety Information” on page 21	Lists the various standards compliance of the Mediatrix LP.
“Appendix B - Cabling Considerations” on page 27	Describes the pin-to-pin connections for cables used with the Mediatrix LP.
“Appendix C - Standard Hardware Information” on page 31	Lists the technical hardware information of the Mediatrix LP.

Document Conventions

The following information provides an explanation of the symbols that appear on the Mediatrix LP and in the documentation for the product.

Warning Definition



Warning: Means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, you must be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.

Where to find Translated Warning Definition

For safety and warning information, see [“Appendix A - Standards Compliance and Safety Information” on page 21.](#)

This Appendix describes the international agency compliance and safety information for the Mediatrix LP. It also includes a translation of the safety warning listed in the previous section.

Other Conventions

The following are other conventions you will encounter in this manual.



Caution: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury and/or damage to the equipment or property.



Note: Indicates important information about the current topic.

Standards Supported

Indicates which RFC, Draft or other standard document is supported for a specific feature.

SCN vs PSTN

In Media5' and other vendor's documentation, the terms SCN and PSTN are used. A SCN (Switched Circuit Network) is a general term to designate a communication network in which any user may be connected to any other user through the use of message, circuit, or packet switching and control devices. The Public Switched Telephone Network (PSTN) or a Private Branch eXchange (PBX) are examples of SCNs.

Standards Supported

When available, this document lists the standards onto which features are based. These standards may be RFCs (Request for Comments), Internet-Drafts, or other standards.

The Mediatrix LP's implementations are **based** on the standards, so it's possible that some behaviour differs from the official standards.

For more information on and a list of RFCs and Internet-Drafts, refer to the IETF web site at <http://www.ietf.org>.

Obtaining Documentation

These sections explain how to obtain documentation from Media5.

Media5 Web Site

Media5 offers the latest version of its products' documentation on its web site. You will thus be able to access and download the most current Media5 documentation. Follow this link: <http://www.media5corp.com/en/documentation>.



Note: This site does not contain any firmware versions.

Media5 Download Portal

Media5 offers online documentation via a self register web-portal. You will thus be able to access and download the most current Media5 documentation. Follow this link to register: <http://www.media5corp.com/en/support-portal>.



Note: This site does not contain any firmware versions.

Documentation Feedback

Media5 welcomes your evaluation of this manual and any suggestions you may have. These help us to improve the quality and usefulness of our publications.

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We appreciate your comments.

End User Technical Support

In order to maximize technical support resources, Media5 works through its partners to resolve technical support issues. All end users requiring technical support are encouraged to contact their vendor directly.

This chapter describes the Mediatrix LP connectors and indicators.

Overview

Provider-specific profiles ensure that the Mediatrix LP is a genuine plug and play solution. It offers a low total cost of ownership as it reduces installation and maintenance costs. Moreover, the Mediatrix LP integrates features such as TLS, SRTP, and HTTPS designed to bring enhanced security for network management, SIP signaling and media transmission aspects.

The Mediatrix LP is a standalone Internet telephony access device that connects to virtually any business telephone system supporting standard analog lines. It offers features such as 60Vrms ringing voltage, 2 kilometer loop distance and integrated secondary lightning protection, which allow it to be connected to external phone line cables.

The Mediatrix LP offers two Ethernet connectors switches enabling to establish two connections between conventional analog telephones or Group 3 fax machines and either a WAN, a LAN or a personal computer.

The following are the Mediatrix LP Series models currently available:

Table 3: Mediatrix 4100 Series Models

Model	Interfaces
Mediatrix LP16	16 FXS ports
Mediatrix LP24	24 FXS ports

Key Features

- ▶ IP connectivity for analog phones and faxes
- ▶ Up to 24 simultaneous calls
- ▶ FXS interface ports
- ▶ Two Ethernet ports (older models may have only one port)
- ▶ HTTP, SNMP, FTP and TFTP for configuration and management
- ▶ True Plug-and-Play
- ▶ Automatic configuration script download
- ▶ Call Routing service
- ▶ Secure SIP signaling
- ▶ Secure Media transmission
- ▶ SNMPv3 and web management
- ▶ DHCP Client
- ▶ PPPoE Client
- ▶ T.38 support
- ▶ Command Line Interface (CLI)
- ▶ SSL/TLS Encryption
- ▶ 60 VRMS ringing voltage, 2 kilometer loop distance and integrated secondary lightning protection to connect to external phone line cables.

Mediatrix LP Connectors and Indicators

This section provides an overview of the front and rear panels of the Mediatrix LP.

Product Serial Number Location

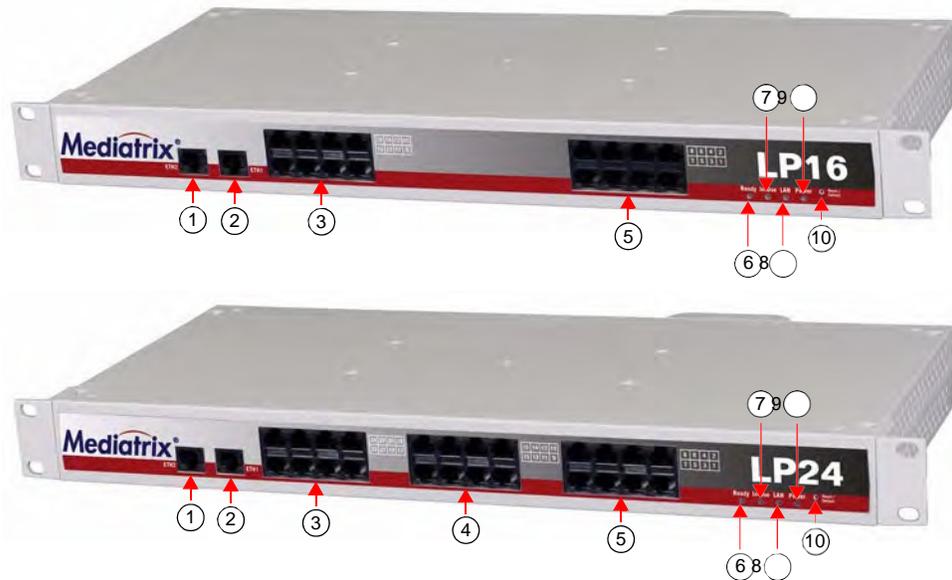
The serial number label for the Mediatrix LP device is located on the bottom of the unit.

Front Indicators and Connectors

See "[Indicators \(LEDs\)](#)" on page 16 for a description of the LED patterns the Mediatrix LP may have and the states they represent.

[Figure 1](#) shows the visual indicators and connectors located on the front of the Mediatrix LP16/LP24.

Figure 1: Mediatrix LP16/LP24 Front Panel Indicators



[Table 4](#) describes the LEDs and connectors on the front panel of the Mediatrix LP.

Table 4: Mediatrix LP16/LP24 Front Connectors and LEDs

	Connector / LED	Description
1.	ETH2	A 10/100 BaseT Ethernet RJ-45 connector that can be connected into the network card of a computer. Older models may not have this connector.
2.	ETH1	RJ-45 connector for 100 BaseT Ethernet access to a LAN.
3.	FXS connectors	Eight RJ-11 connectors to attach conventional telephones or G3 fax machines.
4.	FXS connectors	Eight RJ-11 connectors to attach conventional telephones or G3 fax machines. These connectors are available on the Mediatrix LP24 only.
5.	FXS connectors	Eight RJ-11 connectors to attach conventional telephones or G3 fax machines.
6.	Ready LED	When lit, the Mediatrix LP is ready to initiate or receive a call. The unit does not have to be registered to a server.
7.	In Use LED	When lit, at least one of the FXS lines is in use.

Table 4: Mediatrix LP16/LP24 Front Connectors and LEDs (Continued)

	Connector / LED	Description
8.	LAN LED	Provides the state of the network connected to the <i>ETH1</i> and <i>ETH2</i> connectors.
9.	Power LED	When lit, power is applied to the Mediatrix LP.
10.	Reset / Default button	Resets configuration parameters of the Mediatrix LP to default (known) values. It can be used to reconfigure the unit. See “RESET/DEFAULT Button” on page 18 for more details.

Port Numbering Convention

The following describes the port numbering conventions of the FXS connectors available on the Mediatrix LP16 and Mediatrix LP24. Note that the connectors in the center section are available only on the Mediatrix LP24 model.

Figure 2: Mediatrix LP16 FXS Connectors Port Numbering Convention

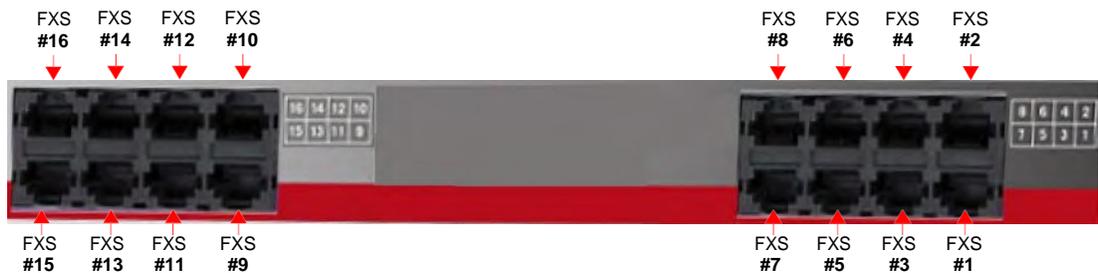
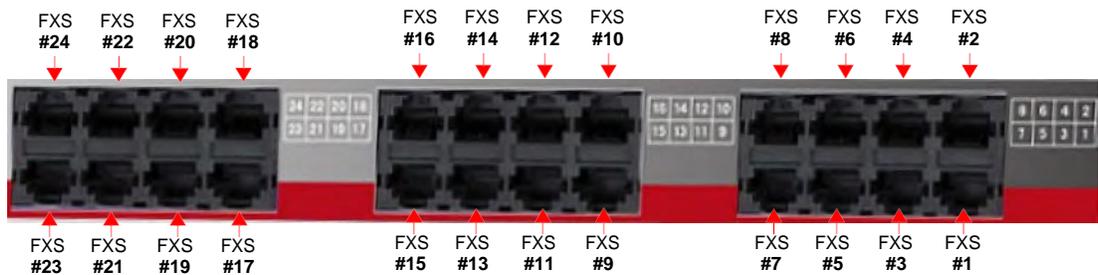


Figure 3: Mediatrix LP24 FXS Connectors Port Numbering Convention



This chapter describes the installation of the Mediatrix LP.

Planning the Installation

Before installing the Mediatrix LP, you should complete the following tasks:

- ▶ Create a network diagram (see section [“Network Diagram” on page 6](#)).
- ▶ Gather IP-related information (see section [“IP-Related Information” on page 6](#) for more information).
- ▶ Install the hardware and software needed to configure the Mediatrix LP (see section [“Network Information” on page 6](#)).

Installation Checklist

The installation checklist lists the tasks for installing the Mediatrix LP. Print a copy of this checklist and mark the entries as you complete each task. Include the completed checklist in your site log.

Figure 4: Installation Checklist

Mediatrix LP name/serial number _____

Task	Verified By	Date
Network information available & recorded in site log		
Environmental specifications verified		
Site power voltages verified		
Installation site pre-power check completed		
Required tools available		
Additional equipment available		
Mediatrix LP received		
Quick start guide received		
Regulatory compliance and safety information received		
Warranty card received		
Software version verified		
Rack, desktop mounting of chassis completed		
Initial electrical connections established		
ASCII terminal attached to console port		
Cable length limits verified		
Initial configuration performed		
Initial operation verified		

Site Log

Media5 recommends that you maintain a site log to record all actions relevant to the Mediatrix LP, such as:

- ▶ Installation: Print a copy of the installation checklist and insert it into the site log.
- ▶ Upgrades and maintenance: Use the site log to record ongoing maintenance and expansion history. Update the site log to reflect the following:
 - Configuration changes
 - Maintenance schedules, requirements, and procedures performed
 - Comments, notes, and problems
 - Software changes and updates to firmware

Network Information

When planning the installation of the Mediatrix LP, you should consider the following network information.

Network Diagram

It is always good practice to draw a network overview diagram that displays all neighbouring IP nodes, serial connected elements, and other components. It is recommended that you keep a copy in the site log (see [“Site Log” on page 6](#) for more information on keeping a site log).

IP-Related Information

Before you can install the Mediatrix LP, you need to have the following information:

- ▶ IP addresses and subnet mask used for the Ethernet WAN connector
- ▶ IP addresses of the central SIP server
- ▶ IP addresses of the central server used for configuration upload and download

Power Source

If you suspect that your AC power is not reliable, for example if room lights flicker often or there is machinery with large motors nearby, have a qualified professional test the power. Install a power conditioner if necessary.

Safety Recommendations

The following are safety recommendations and best practices to follow when working with the Mediatrix LP.

Maintaining Safety with Electricity



Warning: Do not work on the Mediatrix LP, connect or disconnect cables during periods of lightning activity.



Warning: Disconnect all power before servicing the Mediatrix LP.



Warning: Hazardous network voltages might be present in WAN, LAN, and telephone networks connectors regardless of whether power to the device is OFF or ON. Use caution when working near these connectors to avoid electric shock. When detaching cables, detach the end away from the Mediatrix LP first.

General Safety Practices

Follow these guidelines to ensure personal safety and protect the equipment:

- ▶ Keep the Mediatrix LP clear and dust-free during and after installation.
- ▶ Locate the emergency power-off switch for the room in which you are working. Then, if an electrical accident occurs, you can act quickly to turn off the power.
- ▶ Disconnect all power before installing the Mediatrix LP.
- ▶ Do not work alone if potentially hazardous conditions exist.
- ▶ Never assume that power is disconnected from a circuit. Always check.
- ▶ Do not perform any action that creates a potential hazard to people or makes equipment unsafe.



Warning: This equipment must be installed and maintained by service personnel. Incorrectly connecting this equipment to a general-purpose outlet could be hazardous. The telecommunications lines must be disconnected before unplugging the main power connector.

CAUTION: Unit main become very hot in case of fan failure or during intensive use. To avoid any accidental burns, it is important to restrict the physical access to the unit, and to shut it down for 30 minutes before touching it. In case of fan failure, please contact Media5 or your authorised reseller or vendor.

Preventing Electrostatic Discharge Damage

Always follow electrostatic discharge (ESD) prevention procedures when installing or working around the Mediatrix LP.

- ▶ Ensure that the Mediatrix LP chassis is electrically connected to earth ground.
- ▶ Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the clip to earth ground to channel unwanted ESD voltages to ground safely. If no ESD wrist strap is available, ground yourself by touching the metal part of the chassis.

Required Mounting Tools and Equipment

You will need the following tools and parts to properly install the Mediatrix LP:

- ▶ Philips screwdriver for attaching brackets to the Mediatrix LP16/LP24.
- ▶ ESD-preventive wrist strap.

In addition, you might need the following external equipment:

- ▶ Modem for remote access.
- ▶ RJ-45 cables for the WAN and LAN connections.

Unpacking and Inspection

If you haven't already done so, unpack the Mediatrix LP device. Carefully remove it from the package and packing material. The Mediatrix LP package contains the following items:

- ▶ 1 x Mediatrix LP unit
- ▶ 1 x power cord for the country in which you are using the Mediatrix LP
- ▶ 2 x rack-mounting brackets
- ▶ 1 x Bumpon™ kit for desktop use

You may also need additional 10/100 BaseT Ethernet RJ-45 cables.

Location and Mounting Requirements



Warning: To prevent fire or shock hazard do not expose the unit to rain or moisture.

The Mediatrix LP16/LP24 is suitable for use in an office environment where it can be placed in the same room or cabinet where the PBX/telephony equipment is located. The unit can be mounted on a standard 48.26 cm (19 in.) equipment rack. The Mediatrix LP16/LP24 models can be connected to external phone line cables.

Location

Install the Mediatrix LP in a well-ventilated location where it will not be exposed to high temperature or humidity. Do not install the Mediatrix LP in a location exposed to direct sunlight or near stoves or radiators. Excessive heat could damage the internal components.

When deciding where to position the Mediatrix LP, ensure that:

- ▶ The Mediatrix LP is accessible for future upgrade, maintenance and troubleshooting, and cables can be easily connected.
- ▶ The Mediatrix LP is installed in a restricted access location.
- ▶ The Mediatrix LP must be installed in a location where equipotential bonding has been applied in order to have all earthed equipments in the location at the same Earth potential.
- ▶ The cabling is away from the following:
 - Sources of electrical noise such as radios, transmitters, and broadband amplifiers.
 - Power lines and fluorescent lighting fixtures.
 - Water or moisture that could enter the casing of the Mediatrix LP.
- ▶ The airflow is not restricted around the Mediatrix LP or through the vents of the unit. The unit requires a minimum of 25 mm (1 in.) clearance in front, in the back, and on both sides of the unit.
- ▶ The operating temperature is between 0°C and 40°C.
- ▶ The humidity is not over 85% and is non-condensing.
- ▶ Access to the unit should be restricted to avoid any accidental physical contact, as unit can become very hot.

Wiring Requirements

Make sure that the telephone wiring, LAN and WAN cables reach the device and can be dressed in a manner that is safe for the wiring, does not pull or create lateral stress on the connectors on the device, and does not present a trip hazard to personnel working in the vicinity of the equipment. Do not connect any cable or wiring at this time.

Rack-Mounting

Standards Supported	<ul style="list-style-type: none">• EIA-310-D• ETS 300 119
----------------------------	---

The Mediatrix LP fits in most standard 48.26 cm (19 in.) racks. Media5 recommends to use a rack compliant EIA-310-D.

► **To rack-mount the Mediatrix LP:**

1. Disconnect all of the cables from the Mediatrix LP, if applicable.
2. Insert the Mediatrix LP into the rack and secure with suitable screws (not provided). Be sure that the fan is not obstructed.
To prevent bodily injury when mounting or servicing the Mediatrix LP in a rack, ensure that the rack remains stable.
The following guidelines are provided to ensure your safety:
 - Mount the Mediatrix LP at the bottom of the rack if it is the only unit in the rack.
 - When mounting the Mediatrix LP in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
 - If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the Mediatrix LP in the rack.
3. Proceed to [“Hardware Installation” on page 10.](#)

Free Standing Unit

When installing the Mediatrix LP on a desk or table, it should be located at least 20 cm from your monitor, computer casing or other peripherals, including speakers. Never put books or paper on the Mediatrix LP. You must also apply the Bumpon™ autoadhesive protective products to the bottom of the Mediatrix LP. These will stabilize the Mediatrix LP and offer skidding resistance.

Condensation

When bringing the unit into a warm environment from the cold, condensation may result that might be harmful to the unit. If this occurs, allow the unit to acclimatize for an hour before powering it on.

Cleaning

To clean the Mediatrix LP, wipe with a soft dry cloth. Do not use volatile liquids such as benzine and thinner that are harmful to the unit casing.

For resistant markings, wet a cloth with a mild detergent, wring well and then wipe off. Use a dry cloth to dry the surface.

Hardware Installation

This section describes how to set the connectors of the Mediatrix LP.



Warning: Do not connect the Mediatrix LP directly to Telecommunication Systems.



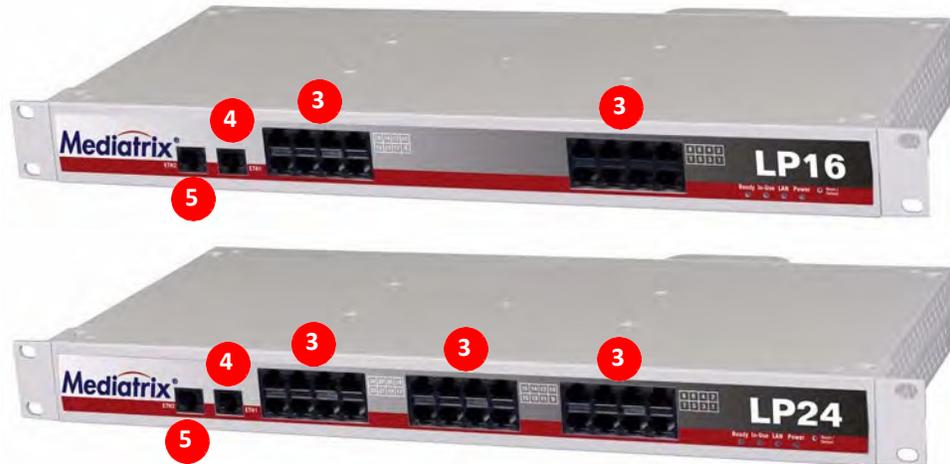
Caution: The Mediatrix LP must be installed on a circuit equipped with a breaker so that you can easily power the unit off if required.

See "[Appendix B - Cabling Considerations](#)" on page 27 for more details on the cables the Mediatrix LP uses.

Connecting Cables

The following describes how to connect the various cables to the Mediatrix LP16 or Mediatrix LP24.

Figure 5: Mediatrix LP16/LP24 Hardware Installation



► To install the cables:

1. Before you begin, be sure that the Mediatrix LP16/LP24 is powered off.
2. Connect the power cord to its connector on the rear of the unit. Do not yet connect the other end of the power cord to an electrical earthed socket-outlet.
3. Connect analog telephones or fax machines into the phone/fax connectors. The Mediatrix LP16 has 16 connectors, while the Mediatrix LP24 has 24 connectors. Use a standard telecommunication cord with a minimum of 26 AWG wire size.



Note: The Mediatrix LP16/LP24 telephone line interface has been designed to interface with a conventional telephone or fax machine. Connections to FXS ports of third party devices such as a PBX / Key System could damage the Mediatrix LP16/LP24.

4. Connect a 10/100 BaseT Ethernet RJ-45 cable into the *ETH1* connector of the Mediatrix LP16/LP24; connect the other end to a compatible Ethernet interface that supplies TCP/IP network access (e.g., router, switch, hub or computer). Use a standard telecommunication cord with a minimum of 26 AWG wire size. You are now ready to start the Mediatrix LP16/LP24.

5. Connect a 10/100 BaseT Ethernet RJ-45 cable into the *ETH2* connector of the Mediatrix LP and connect the other end to the network card of a computer.
Use a standard telecommunication cord with a minimum of 26 AWG wire size. You can either use a crossover or straight Ethernet cable because it performs automatic MDI / MDIX detection. See ["RJ-45 Cable" on page 27](#) for more details.
Older models may not have this connector.

Powering on the Mediatrix LP

This chapter describes the initial provisioning of the Mediatrix LP.

IP Address Discovery or Configuration

This section describes how to contact the Mediatrix LP's management interface to start with unit configuration. Note that the Mediatrix LP IPv6 interface is disabled by default.

Once the physical connection is complete and the Mediatrix LP is powered up, you must first find out the IP address the Mediatrix LP is using. The Mediatrix LP's IP address can be set either dynamically or statically. The default behaviour of the Mediatrix LP is to try to obtain a dynamic IP address through a DHCP server.

Dynamic IPv4 Address Discovery

The default configuration is set so that the unit can be directly plugged into a network and provisioned with a DHCP server. Media5 strongly recommends to set your DHCP server before installing the unit on the network. This way, you know the IP address associated with a particular unit.



Caution: If you set a Mediatrix LP with a static *eth1-4* IPv4 address in a subnet (for instance, 192.168.200.1) and the *eth5* interface receives a dynamic IP address in the same subnet (via a DHCP server or PPP peer), you will not be able to contact the unit via the WAN. You must be careful that a dynamic IP address does not overlap a static IP subnet that is already configured. Note that the current default value of the Mediatrix LP is 192.168.0.10.

See the *Software Configuration Guide* for more details on how to set an external DHCP server.



Caution: If you are experiencing problems, or if you do not want to use a DHCP server and use a static IP address instead, perform a Partial Reset procedure, as explained in [“Partial Reset” on page 19](#).

DHCP servers generally allocate a range of IP addresses for use on a network and reserve IP addresses for specific devices using a unique identifier for each device. The Mediatrix LP unique identifier is its media access control (MAC) address. You can locate the MAC address as follows:

- ▶ It is printed on the label located on the bottom side of the unit.
- ▶ It is stored in the *System Information* page of the web interface.

If you have not reserved a IP address, you can discover which IP address has been assigned to the Mediatrix LP by either:

- ▶ taking one of the telephones connected to the Mediatrix LP and dialing ***#*0** on the keypad. The current IP address of the Mediatrix LP (static or DHCP) will be stated.
- ▶ consulting your DHCP server's logs to find out details on the DHCP lease that was given to the Mediatrix LP.
- ▶ using a network packet sniffer (e.g., Wireshark) to examine the DHCP messages exchanged between the Mediatrix LP and your DHCP server while the Mediatrix LP boots up.

► **To start the Mediatrix LP with a dynamic IP address:**

1. If you need to discover the IP address of the Mediatrix LP, install and start your network packet sniffer.
2. Power on the Mediatrix LP by connecting the other end of the power cord to an electrical earthed socket-outlet. The electrical outlet must be installed near the Mediatrix LP so that it is easily accessible.



Note: If the *Power* LED is always blinking and never turns on, this means that the Mediatrix LP cannot find either an IPv4 DHCP server or an IPv6 address automatically. Check that you have a DHCP server properly configured on your network.

You can now access the Mediatrix LP web interface. Refer to the *Software Configuration Guide* for more details.

Initial Provisioning Sequence

When starting the Mediatrix LP for the first time, it needs to be configured before it can support calls. This process is known as *provisioning*. This sequence assumes that you have installed the Mediatrix LP hardware as per [“Hardware Installation” on page 10](#).

The Mediatrix LP requests its configuration only on the first restart. You can change the configuration at will after the initial provisioning and the provisioning system can refresh the Mediatrix LP configuration.

► **Initial provisioning sequence:**

1. When the Mediatrix LP starts, it broadcasts a message requesting DHCP services (if the unit is configured to start in DHCP mode).
2. The DHCP server responds with a set of IP addresses and network parameters, one of which is the Mediatrix LP IP address.

The following are some of the network parameters assigned via DHCP:

- Mediatrix LP IP address
- Subnet Mask
- Default Router IP address
- DNS IP addresses
- Configuration script server IP address and port number (optional)
- SIP Servers IP address and port number

3. The Mediatrix LP request its configuration by using a configuration file.

Default Static IPv4 Address Configuration

If there is no DHCP server in your network, then the IP address has to be configured statically.

► **To start the Mediatrix LP with a static IP address:**

1. With a 10/100 Hub and two 10/100 BaseT Ethernet RJ-45 straight cables, connect both cables to the Hub; one of them is connected into the **ETH1** connector. The other cable links the computer to the Hub.
2. Reconfigure the IP address of your computer to **192.168.0.11** and the Subnet Mask to **255.255.255.0**. Restart the computer.
3. Power on the Mediatrix LP by connecting the other end of the power cord to an electrical earthed socket-outlet. The electrical outlet must be installed near the Mediatrix LP so that it is easily accessible.
4. Insert a small, unbent paper clip into the **Reset / Default** hole located at the front of the Mediatrix LP. The *Power* LED will start blinking, and after a few seconds, all the LEDs will start blinking. Release the paper clip after all the LEDs start blinking and before they all stop blinking (between 7-11 seconds).

This procedure is called a partial reset. After a partial reset is performed, the Mediatrix LP uses the default IP address 192.168.0.1/24. Refer to [“Partial Reset” on page 19](#) for details on the partial reset procedure.

The corresponding link-local IPv6 address is also available and printed on the sticker under the Mediatrix LP.

You can now access the Mediatrix LP web interface. Refer to the *Software Configuration Guide* for more details.

IPv6 Link Local Address Configuration

If there is no DHCPv6 server or IPv6 router in your network, you can use the link local address to contact the unit. Note that the Mediatrix LP IPv6 interface is disabled by default.

1. With a 10/100 Hub and two 10/100 BaseT Ethernet RJ-45 straight cables, connect both cables to the Hub; one of them is connected into the connector. The other cable links the computer to the Hub.
2. Power on the Mediatrix LP by connecting the other end of the power cord to an electrical earthed socket-outlet. The electrical outlet must be installed near the Mediatrix LP so that it is easily accessible.
3. Insert a small, unbent paper clip into the **Reset / Default** hole located at the front of the Mediatrix LP. The *Power* LED will start blinking, and after a few seconds, all the LEDs will start blinking. Release the paper clip after all the LEDs start blinking and before they all stop blinking (between 7-11 seconds).

This procedure is called a partial reset. After a partial reset is performed, the Mediatrix LP enables its link local IPv6 address. Refer to [“Partial Reset” on page 19](#) for details on the partial reset procedure.

The corresponding link-local IPv6 address is also available and printed on the sticker under the Mediatrix LP.

4. Proceed with accessing the Mediatrix LP’s web interface by using the unit’s link local address. The unit’s link local address is printed on a sticker under the unit.

The link local address can be determined by using the following pattern: [fe80::290:f8ff:feXX:XXXX] where XXXXXX are the last 6 digits of the unit’s MAC address. Example: The link local address for the Mediatrix LP with MAC address 00:90:F8:12:34:56 would be **[fe80::290:f8ff:fe12:3456]**.



Note: On Windows, a scope ID needs to be added to the link local address ([fe80::290:f8ff:fe12:3456%11]). You can find this number by executing the ‘ipconfig’ command in a command prompt. Note the number at the end of the IPv6 default Gateway for the interface used to contact the unit.

On Linux, the scope identifier may be the link name or the interface number. The interface number can be determined through the Linux command line.

Vocal Unit Information

When entering special characters on your telephone pad, the Mediatrix LP talks back to you with relevant information.

► **To access vocal unit information:**

1. Take one of the telephones connected to the Mediatrix LP.
2. Dial one of the digits sequence on the keypad.

Table 5: Vocal Unit Information

Digits to Dial	Information Vocally Sent by the Mediatrix LP
*#*0	Current IP address of the Mediatrix LP (static or DHCP).
*#*1	MAC address of the Mediatrix LP.

Verifying the Installation

There are a few ways to verify that the Mediatrix LP is properly connected to the IP network and is working:

- ▶ By contacting it with a SNMP browser
- ▶ By contacting it via the CLI
- ▶ By contacting it via a web browser
- ▶ By pinging it

These procedures assume that you know the IP address of the Mediatrix LP you want to verify. If the Mediatrix LP does not respond, do the following:

- ▶ Verify that the LAN and WAN cables are securely connected to the Mediatrix LP and to the network connectors.
- ▶ Be sure that you did not connect crossover network cables.
- ▶ Verify the state of the IP network to ensure it is not down (the LAN LED should be ON or blinking).

Indicators (LEDs)

The indicators (LEDs) of the Mediatrix LP are described in [“Mediatrix LP Connectors and Indicators” on page 2](#).

LED Patterns – Specific Conditions

[Table 6](#) describes the different states a Mediatrix unit can have and their associated LED patterns.

Table 6: LED Patterns

Condition	Description	LED Pattern
RestartPending	Triggered when the <i>RESET/DEFAULT</i> button is pressed in the <i>ResetPending</i> state. The unit prepares for a physical shutdown and restart.	<p><i>Power</i> LED:</p> <ul style="list-style-type: none"> • blinking, 1Hz, 50% duty <p>All other LEDs:</p> <ul style="list-style-type: none"> • OFF
RecoveryPending	Triggered when the <i>RESET/DEFAULT</i> button is pressed at start-time or for at least 7 seconds.	All LEDs: <ul style="list-style-type: none"> • blinking, 1Hz, 50% duty
DefaultSettingsPending	<p>Triggered when the <i>RESET/DEFAULT</i> button is not released while in <i>ResetPending</i> state.</p> <p>At run time, if the <i>RESET/DEFAULT</i> button is released within 5 seconds, the unit applies default settings, otherwise the action is cancelled and the unit goes back to the operation mode state or it resets.</p> <p>At start time, the unit stays in this state until the <i>RESET/DEFAULT</i> button is released. The unit then applies the default settings and restarts.</p>	All LEDs: <ul style="list-style-type: none"> • steady ON
UpdateInProgress	A firmware pack is downloaded into the unit and written to persistent storage.	All LEDs: <ul style="list-style-type: none"> • cycling from left to right, individually blinking 1Hz, 33% duty

Table 6: LED Patterns (Continued)

Condition	Description	LED Pattern
UpdateFailed	Triggered after a failure of a firmware pack download operation. After 4 seconds, the unit restarts.	All LEDs: <ul style="list-style-type: none"> blinking at 3Hz, 50% duty. One LED out of two has a 180 degree phase. This pattern lasts for 8 seconds.
Rescue Network Enabled	Triggered after the user has performed a partial reset procedure.	Power and In Use LEDs: <ul style="list-style-type: none"> blinking (synchronized) 1Hz, 75% duty
BootOnRecoveryBank	Triggered when the unit is booting on the recovery bank and no update is pending.	Power LED: <ul style="list-style-type: none"> blinking, 0.25Hz, 75% duty
Automatic network configuration in progress	Waiting for DHCP (IPv4 or IPv6) answer or IPv6 router advertisement or PPPoE connection.	All LEDs: <ul style="list-style-type: none"> Blinking green, 3Hz, 50% duty
No network address set	Triggered when the unit cannot be contacted because DHCP failed, PPP failed, and no static interface is configured.	Power LED: <ul style="list-style-type: none"> blinking, 3 Hz, 50% duty.
NetworkRescue	The unit tries to download and install a firmware given by the Network Rescue server.	Ready LED: <ul style="list-style-type: none"> Off All other LEDs: <ul style="list-style-type: none"> blinking to show a LED displacing light from left to right and right to left.

LED Patterns – Default Behaviour

When no specific condition matches those described in [Table 6](#), the LEDs behave individually according to the following rules:

Table 7: Default LED Behaviour

LED Type	Condition	Behaviour
Power	RestartInProgress	Blinking, 1 Hz, 50% duty
	RestartCompleted	Steady ON
LAN	Network traffic	Blinking, variable rate
	No network traffic	Steady ON
In Use	Lines Idle and Unlocked	Steady OFF
	Lines InUse and Unlocked	Steady ON
	Shutting Down	Steady yellow
	Locked	Blinking yellow, 1 Hz, 50% duty

Table 7: Default LED Behaviour (Continued)

LED Type	Condition	Behaviour
Ready	All lines are enabled (operational state).	Steady ON
	All lines are disabled (operational state).	Steady OFF
	At least one line is enabled and at least one line is disabled (operational state).	Blink 0.25 Hz 75%

RESET/DEFAULT Button

The *RESET/DEFAULT* button allows you to:

- ▶ Cancel an action that was started.
- ▶ Revert to known factory settings if the Mediatix LP refuses to work properly for any reason or the connection to the network is lost.
- ▶ Reconfigure a unit.

At Run-Time

The *RESET/DEFAULT* button can be used at run-time – you can press the button while the Mediatix LP is running without powering the unit off. [Table 8](#) describes the actions you can perform in this case.

Table 8: RESET/DEFAULT Button Interaction

RESET/DEFAULT Button Pressed for:	Action	Comments	LEDs Pattern
2 to 6 seconds	Restarts the Mediatix LP	No changes are made to the Mediatix LP settings.	<i>Power LED:</i> <ul style="list-style-type: none"> • blinking, 1Hz, 50% duty <i>All other LEDs:</i> <ul style="list-style-type: none"> • OFF
7 to 11 seconds	Sets the Mediatix LP in Partial Reset Mode	Sets some of the Mediatix LP configuration to pre-determined values.	<i>All LEDs</i> <ul style="list-style-type: none"> • blinking, 1Hz, 50% duty
12 to 16 seconds	Restarts the Mediatix LP in Factory Reset	Deletes the persistent configuration, creates a new configuration file with the default factory values, and then restarts the unit.	<i>All LEDs</i> <ul style="list-style-type: none"> • steady ON
17 seconds and more	No action is taken	The RESET/DEFAULT Button Pressed event is ignored	N/A

At Start-Time

You can use the *RESET/DEFAULT* button at start-time – you power the unit off, and then depress the button until the LEDs stop blinking and remain ON. This applies the “Factory Reset” procedure (see [“Factory Reset” on page 20](#)). This feature reverts the Mediatix LP back to its default factory settings.

Partial Reset

The Partial reset provides a way to contact the Mediatrix LP in a known and static state while keeping most of the configuration unchanged.

Following a partial reset, the Mediatrix LP management interface is set to the *Rescue* interface. The default address for this interface is 192.168.0.1/24 and has its corresponding link-local IPv6 available and printed on the sticker under the Mediatrix LP. Any existing network interface that conflicts with the *Rescue* interface address is disabled.

You can contact the Mediatrix LP at this address to access its configuration parameters. It is not advised to access the unit on a regular basis through the *Rescue* network interface. You should reconfigure the unit's network interfaces as soon as possible in order to access it through another interface. See "[After a Partial Reset](#)" on page 19 for more details.

In a partial reset, the following services and parameters are also affected:

- ▶ AAA service: User(s) from profile are restored with their factory password.
- ▶ SNMP service: Resets the *enableSnmpV1*, *enableSnmpV2*, *enableSnmpV3* and *snmpPort* values to their default values.
- ▶ WEB service: Resets the *serverPort* to its default value.

▶ To trigger the Partial Reset:

1. Insert a small, unbent paper clip into the *RESET/DEFAULT* hole located at the rear of the Mediatrix LP. While pressing the *RESET/DEFAULT* button, restart the unit.
Do not depress before all the LEDs start blinking (between 7-11 seconds).
2. Release the paper clip.

After a Partial Reset

Following a partial reset, you should:

1. Create or activate network interfaces as described in the *Software Configuration Guide*, Chapter *Interface Parameters*, Section *Interfaces Configuration*. Do not disable the *Rescue* interface!
2. Change the Mediatrix LP system management network interface to something other than *Rescue* as described in the *Software Configuration Guide*, Chapter *Miscellaneous – Management Interface*, Section *Management Interface Configuration*.

Note that you must be able to contact the interface you select in order to continue with the following steps.
3. Contact the Mediatrix LP through the new system management network interface.
4. Disable the *Rescue* network interface as described in the *Software Configuration Guide*, Chapter *Interface Parameters*, Section *Interfaces Configuration*.

Factory Reset

The Factory reset reverts the Mediatrix LP back to its default factory settings. It deletes the persistent MIB values of the unit, including:

- ▶ The firmware pack download configuration files.
- ▶ The SNMP configuration, including the SNMPv3 passwords and users.
- ▶ The PPPoE configuration, including the PPP user names and passwords.

The Factory reset creates a new configuration file with the default factory values. It should be performed with the Mediatrix LP connected to a network with access to a DHCP server. If the unit cannot find a DHCP server, it sends requests indefinitely.

▶ To trigger the Factory Reset:

1. Power the Mediatrix LP off.
2. Insert a small, unbent paper clip into the **Reset / Default** hole located at the front of the Mediatrix LP. While pressing the *Reset / Default* button, restart the unit.
Do not depress before the LEDs stop blinking and are steadily ON.

3. Release the paper clip.

The Mediatrix LP restarts.

This procedure resets all variables in the MIB modules to their default value.

When the Mediatrix LP has finished its provisioning sequence, it is ready to be used with a DHCP-provided IP address and MIB parameters.

This procedure can also be performed at run-time.



Note: The Factory reset alters any persistent configuration data of the Mediatrix LP.

Management Choices

Congratulations for properly installing the Mediatrix LP. You can now configure the software parameters of the unit.

The Mediatrix LP offers various management options. All these options are described in the *Dgw v2.0 Software Configuration Guide*.

Table 9: Management Options

Management Choice	Features
Web GUI	The Mediatrix LP web interface allows you to configure the following information: <ul style="list-style-type: none"> • Network attributes • SIP parameters • VoIP settings • Management settings such as configuration scripts, restore / backup, etc.
SNMPv1/2/3	The Mediatrix LP SNMP feature allows you to configure all the MIB services.
Command Line Interface (CLI)	The Mediatrix LP CLI feature allows you to configure all the MIB services.
Unit Manager Network	The UMN offers the following: <ul style="list-style-type: none"> • Auto-discovery • Group provisioning • SNMP access and remote management.

A

Standards Compliance and Safety Information

This Appendix lists the various standards compliance of the Mediatrix LP.

Standards Supported

The Mediatrix LP complies to the following standards:

Table 10: Standards Compliance

Category	Specification
Agency approvals	<ul style="list-style-type: none"> European Union, CE mark (Declaration of Conformity) CSA FCC
Safety standards	<ul style="list-style-type: none"> UL 60950-1, Second Edition + Amd 1:2011 CAN/CSA-C22.2 No. 60950-1-07 + Amd 1:2011 Anatel Resolution 238:2000 IEC 60950-1:2005 (2nd Edition) + Amd 1:2009 (with all national deviations)
Emissions	<ul style="list-style-type: none"> FCC Part 15:1998 Class B Resolution 442: 2006 EN55022 (2006) Class B EN61000-3-2 (2000) Harmonic current emissions EN61000-3-3 (1995) Voltage fluctuations and flicker (with amendment A1)
Immunity	EN55024:1998 including the following (with amendments A1 and A2): <ul style="list-style-type: none"> EN61000-4-2 (1995), ESD EN61000-4-3 (1996), Radiated RF EN61000-4-4 (1995), Burst Transients EN61000-4-5 (1995), Surge EN61000-4-6 (1996), Conducted RF EN61000-4-11 (1995), Voltage Dips and Interruptions



Note: The standards compliance of the Mediatrix LP are printed on a sticker located on the bottom of the unit.

Disclaimers

The following are the disclaimers related to the Mediatrix LP.

Federal Communications Commission (FCC) Part 15

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ▶ Reorient or relocate the receiving antenna.
- ▶ Increase the separation between the equipment and receiver.
- ▶ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ▶ Consult the dealer or an experienced radio/TV technician for help



Note: Any changes or modifications not expressly approved by Media5 could void the user's authority to operate the equipment.

CE Marking



DECLARATION OF CONFORMITY

We Media5 Corporation, located at 4229 Garlock st. Sherbrooke, Québec, Canada J1L 2C8 declare that for the hereinafter mentioned product the presumption of conformity with the applicable essential requirements of DIRECTIVE 1999/5/EC OF THE EUROPEAN PARLIAMENT (RTTE DIRECTIVE) is given.

Any unauthorized modification of the product voids this declaration.

For a copy of the original signed Declaration Of Conformity please contact Media5 at the above address.

RoHS China

这个文件涉及的是在中华人民共和国境内进口或销售的电子信息产品
Include this document with all Electronic Information Products
imported or sold in the People's Republic of China

部件名称 (Parts)	有毒有害物质或元素 (Hazardous Substance)					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr ⁶⁺)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
塑料和聚合物部件 (Plastic and Polymeric parts)	○	○	○	○	×	×
集成电路 (Integrated Circuit)	×	○	×	○	×	×

○： 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T-11363 - 2006 规定的限量要求以下。
 Indicates that the concentration of the hazardous substance in all homogeneous materials in the parts is below the relevant threshold of the SJ/T-11363 - 2006 standard.

×： 表示该有毒有害物质至少在该部件的某一均质材料中的含量可能超出SJ/T-11363 - 2006规定的限量要求。
 Indicates that the concentration of the hazardous substance of at least one of all homogeneous materials in the parts might exceed the relevant threshold of the SJ/T-11363 - 2006 standard.

除非另外特别的标注,此标志为针对所涉及产品的环保使用期限标志. 某些可更换的零部件会有一个不同的环保使用期限(例如,电池单元模块)贴在其产品上.

此环保使用期限只适用于产品是在产品手册中所规定的条件下工作.

The Environmentally Friendly Use Period (EFUP) for all enclosed products and their parts are per the symbol shown here, unless otherwise marked. Certain field-replaceable parts have a different EFUP (for example, battery modules) and so are marked to reflect such.

The Environmentally Friendly Use Period is valid only when the product is operated under the conditions defined in the product manual.



Translated Warning Definition

The following information provides an explanation of the symbols which appear on the Mediatrix LP and in the documentation for the product.



Warning: Means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, you must be aware of the hazards involved with electrical circuitry and familiar with standard practices for preventing accidents.

Waarschuwing: Dit waarschuwingssymbool betekent gevaar. U overtreedt in een situatie die lichamelijke letsels kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen.

Varoitus: Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista.

Attention: Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents.

Warnung: Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewusst.

Avvertenza: Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti.

Advarsel: Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du være oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker.

Aviso: Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes.

¡Advertencial! Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes.

Varning! Denna varningsymbol signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanligt förfarande för att förebygga skador.

Safety Warnings

This section lists the following safety warnings:

- ▶ Circuit Breaker (15A) Warning
- ▶ TN Power Warning
- ▶ Product Disposal Warning
- ▶ No. 26 AWG Warning
- ▶ LAN and FXS Ports Connectors Warning
- ▶ Socket Outlet Warning

Circuit Breaker (15A) Warning



Warning: This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 120 VAC, 15A U.S. (240 VAC, 10A international) is used on the phase conductors (all current-carrying conductors).

TN Power Warning



Warning: The device is designed to work with TN power systems.

Product Disposal Warning



Warning: Ultimate disposal of this product should be handled according to all national laws and regulations.

No. 26 AWG Warning



Warning: To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.

LAN and FXS Ports Connectors Warning



Warning: Do not connect the LAN and the FXS ports connectors directly to the Public Switched Telephone Network (PSTN), to an off premise application, an out of plant application, any exposed plant application, or to any equipment other than the intended application, connection may result in a safety hazard, and/or defective operation and/or equipment damage.

Exposed plant means where any portion of the circuit is subject to accidental contact with electric lighting or power conductors operating at a voltage exceeding 300V between conductors or is subject to lightning strikes.

Socket Outlet Warning



Warning: The socket outlet, if used, shall be located near the equipment and shall be easily accessible by the user. The AC adaptor inlet is considered as disconnection device. The device must be readily operational.

Safety Recommendations

To insure general safety follow these guidelines:

- ▶ Do not open or disassemble this product.
- ▶ Do not get this product wet or pour liquids into it.
- ▶ Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.



Caution: When using this equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock and injury to persons, including the following:

- Do not use this product near water, for example, near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement or near a swimming pool.
- Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
- Do not use the telephone to report a gas leak in the vicinity of the leak.

B

Cabling Considerations

This Appendix describes the pin-to-pin connections for cables used with the Mediatrix LP.



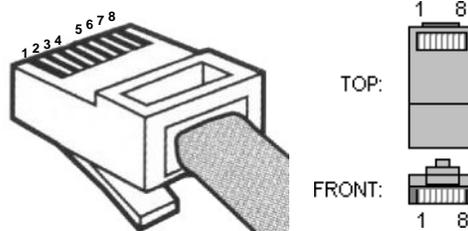
Warning: To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.

RJ-45 Cable

The RJ-45 connector is commonly used for network cabling and for telephony applications. It is used to wire both ends identically so the signals pass straight through.

RJ-45 cabling is also known as Twisted-pair Ethernet (TPE), Unshielded twisted pair (UTP) and 10/100 Base-T.

Figure 6: RJ-45 Cable



When connecting an Ethernet cable to the Mediatrix LP, use a standard telecommunication cord with a minimum of 26 AWG wire size. It is possible to use either a crossover or straight Ethernet cable to connect in the Ethernet connectors. These connectors perform automatic MDI / MDIX detection, meaning that they adapt to the type of cable connected to them.

The auto MDI / MDIX feature works only when the connectors are configured in auto detect mode, which is the default mode.

Whenever you force the Mediatrix LP to use a specific Ethernet mode (for example 100 Mb Full Duplex), the type of cable to use depends on the other peer. For example, a straight cable is required to connect the Mediatrix LP to a hub or a switch, while a crossover cable is required to connect the Mediatrix LP to a PC.

Straight Through Cable

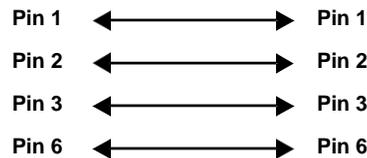
A RJ-45 straight through cable is used to connect a computer to a network device. For instance, you must use straight through cables to connect a computer to a network hub, switch, and router.

Table 11: RJ-45 Pinout Information

Pin #	Function	Colour Coding	
		EIA/TIA 568A	EIA/TIA 568B AT&T 258A
1	Transmit +	White with green stripe	White with orange stripe
2	Transmit -	Green with white stripe or solid green	Orange with white stripe or solid orange
3	Receive +	White with orange stripe	White with green stripe
4	N/A	Blue with white stripe or solid blue	Blue with white stripe or solid blue
5	N/A	White with blue stripe	White with blue stripe
6	Receive -	Orange with white stripe or solid orange	Green with white stripe or solid green
7	N/A	White with brown stripe or solid brown	White with brown stripe or solid brown
8	N/A	Brown with white stripe or solid brown	Brown with white stripe or solid brown

The RJ-45 cable uses two pairs of wires: one pair for transmission and the second pair for reception. It is wired so that pins 1 & 2 are on one twisted pair and pins 3 & 6 are on a second pair according to common wiring standards which meet the EIA/TIA T568A and T568B requirements.

Figure 7: Straight Through Connectivity



Pin Name and Function

The following is the function of each pin in a RJ-45 cable.

Table 12: Pin Name and Function

Pin #	Name	Function
1	Transmit Data Plus	Positive signal for the TD differential pair. This signal contains the serial output data stream transmitted onto the network.
2	Transmit Data Minus	Negative signal for the TD differential pair. This contains the same output as pin 1.
3	Receive Data Plus	Positive signal for the RD differential pair. This signal contains the serial input data stream received from the network.
4	not connected	
5	not connected	
6	Receive data minus	Negative signal for the RD differential pair. This signal contains the same input as pin 3.
7	not connected	
8	not connected	

Crossover Cable

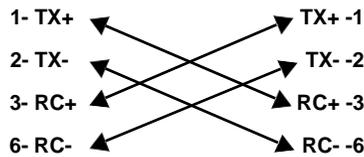
A RJ-45 crossover cable is used when only two systems are to be connected to each other, peer to peer, at the Ethernet Cards by “crossing over” (reversing) their respective pin contacts. An example would be connecting two computers together to create a network. The crossover eliminates the need for a hub when connecting two computers. A crossover cable may also be required when connecting a hub to a hub, or a transceiver to transceiver or repeater to repeater. When connecting a hub to a transceiver, a straight through cable is always used.



Note: This is not an IEEE supported configuration and should be used for test purposes only.

A crossover cable is sometimes called a null modem. The coloured wires at either end are put into different pin numbers, or crossed over.

Figure 8: Crossover Connectivity



RJ-11 (Telephone) Cable

The RJ-11 cable is commonly used for telephone connection.



Caution: Do not plug a phone jack connector into an RJ-45 port.

Wiring Conventions

For telephone connections, a cable requires one pair of wires. Each wire is identified by different colours. For instance, one wire might be red and the other, red with white stripes. Also, an RJ-11 connector must be attached to both ends of the cable.

Each wire pair must be attached to the RJ-11 connectors in a specific orientation. The following figure illustrates how the pins on the RJ-11 connector are numbered. Be sure to hold the connectors in the same orientation when attaching the wires to the pins.

Figure 9: RJ-11 Connector Pin Numbers

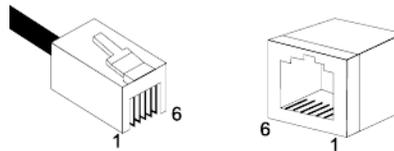


Table 13: RJ-11 Pinout Information

Pin #	Function
1	Not used
2	Not used
3	Ring
4	Tip

Table 13: RJ-11 Pinout Information (Continued)

Pin #	Function
5	Not used
6	Not used

The RJ-11 pair of wires is wired so that pins 3 and 4 are connected to the Ring and Tip, which meets the following requirements:

- ▶ EIA/TIA-IS 968
- ▶ CS-03 Issue 8, Part III requirements.



Warning: The RJ-11 cable should comply with UL 1863 and CSA C22.2 No 233 standards. The Mediatrix LP16/LP24 supports longer cables (up to 2 km) and offers an integrated secondary lightning protection whereas the regular Mediatrix 4116/4124 does not support these features. If you connect the unit to external lines, you must ensure to have primary protection.

C

Standard Hardware Information

The specifications and information regarding this product are subject to change without notice. Every effort is made to ensure the accuracy of this document. Because of ongoing product improvements and revisions, Media5 cannot guarantee its accuracy, nor can be responsible for errors or omissions. Please contact your Media5 sales representative to obtain the latest version of the technical specifications.

Industry Standard Protocols

The Mediatrix LP has been designed to support all major industry standards used today, as well as those that will eventually be implemented at a later date. Because of this specific design characteristic, the Mediatrix LP can be integrated with existing telephone, fax and data equipment such as PCs and routers.

Table 14: Industry Standard Protocols

Parameter	Description
Vocoders	<ul style="list-style-type: none"> • G.711 (a-law, u-law) with optional VAD support • G.723.1a • G.726 • G.729a • G.729ab
IP Telephony Protocols	<ul style="list-style-type: none"> • SIP - RFC 3261, RFC 3262, RFC 3263
Real-Time Transport Protocols	<ul style="list-style-type: none"> • RTP/RTCP - RFC 1889, RFC 1890, RFC 2833, RFC 3389
Network Management Protocols	<ul style="list-style-type: none"> • SNMPv3 • DHCP - RFC 2131, RFC 2132 • TFTP - RFC 1350 • Syslog - RFC 3164 • HTTP 1.0 - RFC 1945 • HTTP 1.1 - RFC 2616 • HTTPS • Basic and digest HTTP authentication - RFC 2617
Data Features	<ul style="list-style-type: none"> • PPPoE client - RFC 1332, RFC 1661, RFC 1334, RFC 1994, RFC 2516, RFC 1471, RFC 1472, RFC 1473, RFC 1877. Note: some PPPoE RFCs are implemented partially. • TFTP or HTTP auto-provisioning • DHCP server • NAPT
QoS	<ul style="list-style-type: none"> • ToS • DiffServ • 802.1p • 802.1Q

Hardware Features

Interfaces

Mediatrrix LP16

- ▶ 2 x RJ-45 WAN connector, 10/100 BaseT Ethernet access
- ▶ 16 x RJ-11 connectors, analog phone/fax (FXS) interface

Mediatrrix LP24

- ▶ 2 x RJ-45 WAN connector, 10/100 BaseT Ethernet access
- ▶ 24 x RJ-11 connectors, analog phone/fax (FXS) interface

Power

- ▶ AC: Standard power cord receptacle (IEC 320 – C14) for universal AC input internal SMPS.

Product Architecture Details

- ▶ Supports multiple concurrent communications using any vocoders.
- ▶ DSP-based DTMF detection and generation.
- ▶ DSP-based echo cancellation (G.168).
- ▶ DSP-based fax/data relay.
- ▶ Embedded operating system with 32-bit real-time multitasking Kernel.
- ▶ Embedded IPv4 TCP/IP stack with configurable QoS implemented by:
 - ToS byte at Network layer 3
 - 802.1p at Data Link layer 2
- ▶ Network parameters assigned via DHCP

Real Time Fax Router Technical Specifications

Automatic selection between voice and fax.

Table 15: Fax Technical Specifications

Parameter	Description
Ethernet	10/100 BaseT Ethernet
Data Link	Ethernet
Network	IP (Internet Protocol)
Transport	TCP / UDP
Protocols	Group 3 Fax Clear channel (G.711), G.726, or T.38 Real Time Fax Over IP protocol Stack
Fax Data Compression	MH
Fax Transmission	Up to 14.4 kbps

Analog Line Interface (FXS)

- ▶ RJ-11 connectors
- ▶ Direct connection to a fax machine or telephone (Internal installation and internal cabling)
- ▶ DC feeding of the access line protected for overvoltage
- ▶ Loop current detection and hook flash detection capable
- ▶ Generation of Selective Ring

Table 16: Analog Line Interface

Parameter	Description
Trunk Type	Loop Start: capable of Wink and Immediate signalization
Ring Source	60 VRMS max @ 20 up to 50 Hz (selectable) sine signal
Nominal Impedance	BellCore compliant 600/900 ohms default setting.
Ring Drive Capacity	Up to 3 ringer equivalents (3 RENs) per port.
Loop Current Range	15 to 32 ma factory set. Default 20 ma regulated. 20 to 25 ma factory set. Default 22 ma regulated.
Ring Trip Detection Time	2 ring cycles max
On Hook Voltage	-48 VDC
Frequency Response	200 Hz to 3400 Hz ± 3 dB (Tx/Rx)
Return Loss	500-3200 Hz: 30 dB

Audio Specifications

- ▶ Software-adjustable dynamic and static jitter buffer protection.
- ▶ Programmable by country: Call progress tone generation including dial tone, busy tone, ringback and error tones.
- ▶ DSP-based echo control device.
- ▶ Silence detection/suppression level software adjustable.

DTMF Tone Detection

Table 17: DTMF Tone Detection

Parameter	Description
16-Digit DTMF Decoding	0 to 9, *, #, A, B, C, D
Permitted Amplitude Tilt	High frequency can be +2 dB to -8 dB relative to low frequency
Dynamic Range	-25 dBm to 0 dBm per tone
Frequency Accept	$\pm 1.5\%$ of nominal frequencies
Minimum Tone Duration	40 ms
Interdigit Timing	Detects like digits with a 40 ms interdigit delay

DTMF Tone Generation

Table 18: DTMF Tone Generation

Parameter	Description
Per Frequency Nominal	-8 dBm to -5 dBm
Frequency Deviation	Within 1.5% of nominal values

Power Consumption

Table 19: Power Consumption

Mediatrix Model	Voltage/ Frequency	Operating Condition	Current (mA)	Power (W)	VA	Thermal Dissipation (W)
LP16	120Vac / 60Hz	All ports off hook	TBD	TBD	TBD	TBD
	240Vac / 50Hz	All ports off hook	TBD	TBD	TBD	TBD
	120Vac / 60Hz	All ports ringing into 3REN each	TBD	TBD	TBD	TBD
	240Vac / 50Hz	All ports ringing into 3REN each	TBD	TBD	TBD	TBD
LP24	120Vac / 60Hz	All ports off hook	TBD	TBD	TBD	TBD
	240Vac / 50Hz	All ports off hook	TBD	TBD	TBD	TBD
	120Vac / 60Hz	All ports ringing into 3REN each	TBD	TBD	TBD	TBD
	240Vac / 50Hz	All ports ringing into 3REN each	TBD	TBD	TBD	TBD

MTBF Value

The Mean Time Before Failure (MTBF) value of the Mediatrix LP models is estimated as follows:

- ▶ Mediatrix LP16: 171,000 hours
- ▶ Mediatrix LP24: 162,000 hours

These values are at 25 degrees Celsius ambient temperature. It has been defined using RelCalc v5.0, Bellcore method (LimitedStress - Method I, Case 3), Desktop unit .

Operating Environment

Table 20: Operating Environment

Parameter	Description
Operating Temperature	0°C to 40°C

Table 20: Operating Environment (Continued)

Parameter	Description
Humidity	Up to 85%, non-condensing
Storage	-20°C to +70°C

Dimensions and Weight

Table 21: Dimensions and Weight

Parameter	Description
Dimensions	43 cm x 21 cm x 4.4 cm – 17.19 in. x 8.4 in. x 1.74 in. (approx.)
Weight	1.8 kg (4.0 lbs)

Warranty

All Media5 products carry Media5 Corporation's standard three-year hardware and software warranty. An extended warranty is available.

D

Glossary

10 BaseT

An Ethernet local area network that works on twisted pair wiring.

100 BaseT

A newer version of Ethernet that operates at 10 times the speed of a 10 BaseT Ethernet.

Domain Name Server (DNS)

Internet service that translates domain names into IP addresses. To use a domain name, a DNS service must translate the name into the corresponding IP address. For instance, the domain name *www.example.com* might translate to 198.105.232.4.

Dual-Tone Multi-Frequency (DTMF)

In telephone systems, multi-frequency signalling in which a standard set combinations of two specific voice band frequencies, one from a group of four low frequencies and the other from a group of four higher frequencies, are used. Although some military telephones have 16 keys, telephones using DTMF usually have 12 keys. Each key corresponds to a different pair of frequencies. Each pair of frequencies corresponds to one of the ten decimal digits, or to the symbol “#” or “*”, the “*” being reserved for special purposes.

Dynamic Host Configuration Protocol (DHCP)

TCP/IP protocol that enables PCs and workstations to get temporary or permanent IP addresses (out of a pool) from centrally-administered servers.

Federal Communications Commission (FCC)

U.S. government regulatory body for radio, television, interstate telecommunications services, and international services originating in the United States.

Foreign Exchange Service/Station (FXS)

A network-provided service in which a telephone in a given local exchange area is connected, via a private line, to a central office in another, i.e., “foreign”, exchange, rather than the local exchange area’s central office. This is the station (telephone) end of an FX circuit. An FXS port will provide dial tone and ring voltage.

International Telecommunication Union (ITU)

Organization based in Geneva, Switzerland, that is the most important telecom standards-setting body in the world.

Internet Protocol (IP)

A standard describing software that keeps track of the Internet’s addresses for different nodes, routes outgoing messages, and recognizes incoming messages.

Light Emitting Diode (LED)

A semiconductor diode that emits light when a current is passed through it.

Local Area Network (LAN)

Data-only communications network confined to a limited geographic area, with moderate to high data rates. See also WAN.

Media Access Control (MAC) Address

A layer 2 address, 6 bytes long, associated with a particular network device; used to identify devices in a network; also called hardware or physical address.

Network

A group of computers, terminals, and other devices and the hardware and software that enable them to exchange data and share resources over short or long distances. A network can consist of any combination of local area networks (LAN) or wide area networks (WAN).

Private Branch Exchange (PBX)

A small to medium sized telephone system and switch that provides communications between onsite telephones and exterior communications networks.

Protocol

A formal set of rules developed by international standards bodies, LAN equipment vendors, or groups governing the format, control, and timing of network communications. A set of conventions dealing with transmissions between two systems. Typically defines how to implement a group of services in one or two layers of the OSI reference model. Protocols can describe low-level details of machine-to-machine interfaces or high-level exchanges between allocation programs.

Public Switched Telephone Network (PSTN)

The local telephone company network that carries voice data over analog telephone lines.

Router

A specialized switching device which allows customers to link different geographically dispersed local area networks and computer systems. This is achieved even though it encompasses different types of traffic under different protocols, creating a single, more efficient, enterprise-wide network.

Switched Circuit Network (SCN)

A communication network, such as the public switched telephone network (PSTN), in which any user may be connected to any other user through the use of message, circuit, or packet switching and control devices.

Server

A computer or device on a network that works in conjunction with a client to perform some operation.

Session Initiation Protocol (SIP)

A protocol for transporting call setup, routing, authentication, and other feature messages to endpoints within the IP domain, whether those messages originate from outside the IP cloud over SCN resources or within the cloud.

Subnet

An efficient means of splitting packets into two fields to separate packets for local destinations from packets for remote destinations in TCP/IP networks.

Transmission Control Protocol/Internet Protocol (TCP/IP)

The basic communication language or protocol of the Internet. It can also be used as a communications protocol in a private network (either an intranet or an extranet).

Voice Over IP (VoIP)

The technology used to transmit voice conversations over a data network using the Internet Protocol. Such data network may be the Internet or a corporate Intranet.

Wide Area Network (WAN)

A large (geographically dispersed) network, usually constructed with serial lines, that covers a large geographic area. A WAN connects LANs using transmission lines provided by a common carrier.

E**List of Acronyms**

AWG	American Wire Gauge
CE	Cummunauté européenne (French)
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name Server
ESD	Electrostatic Discharge
IETF	Internet Engineering Task Force
IP	Internet Protocol
LAN	Local Area Network
LED	Light Emitting Diode
ma	milliampere
MAC	Media Access Control
MDI	Media Dependent Interface
MDIX	Media Dependent Interface Crossover
PBX	Private Branch eXchange
PSTN	Public Switched Telephone Network
RFC	Request for Comment
SCN	Switched Circuit Network
SIP	Session Initiation Protocol
TPE	Twisted-Pair Ethernet
UTP	Unshielded Twisted pair
VoIP	Voice over Internet Protocol
WAN	Wide Area Network

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