



**Hardware Installation Guide**

**Mediatix<sup>®</sup> 4400 Series**  
**Digital Gateways**

**Mediatix 4401 / 4402 / 4404 and plus models (BRI)**

Product Version 2.0

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### **Mediatrix® 4400 Series Hardware Installation Guide**

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# Contents

## Preface

<b>About this Manual .....</b>	<b>vii</b>
Document Objectives.....	vii
Intended Audience.....	viii
Related Documentation .....	viii
Document Structure.....	viii
Document Conventions .....	ix
Warning Definition .....	ix
Other Conventions .....	ix
SCN vs PSTN.....	ix
Standards Supported .....	ix
Obtaining Documentation .....	x
Media5 Web Site .....	x
Media5 Download Portal .....	x
Documentation Feedback .....	x
End User Technical Support.....	x

## Chapter 1

<b>Overview .....</b>	<b>1</b>
Overview.....	1
Key Features .....	1
Mediatix 4400 Connectors and Indicators .....	2
Product Serial Number Location .....	2
Front Indicators and Connectors .....	2
Rear Connectors .....	3
Port Numbering Convention .....	4
Bypass Feature (Mediatix 4402plus / 4404plus Models).....	4

## Chapter 2

<b>Installation .....</b>	<b>5</b>
Planning the Installation.....	5
Installation Checklist.....	5
Site Log .....	6
Network Information .....	6
Safety Recommendations.....	7
Maintaining Safety with Electricity .....	7
General Safety Practices.....	7
Preventing Electrostatic Discharge Damage.....	7
Required Mounting Tools and Equipment .....	7
Unpacking and Inspection .....	8
Location and Mounting Requirements .....	8
Location.....	8
Wall-Mounting .....	9
Free Standing Unit .....	9
Condensation .....	9
Cleaning .....	9

Hardware Installation .....	10
Connecting Cables .....	10

## Chapter 3

<b>Powering on the Mediatrix 4400.....</b>	<b>13</b>
IP Address Discovery or Configuration .....	13
Dynamic IP Address Discovery .....	13
Default Static IP Address Configuration .....	14
Vocal Unit Information .....	15
Verifying the Installation .....	15
Indicators (LEDs) .....	16
LED Patterns – Specific Conditions .....	16
LED Patterns – Default Behaviour .....	17
RESET/DEFAULT Button .....	18
At Run-Time .....	18
At Start-Time .....	18
Partial Reset .....	18
Factory Reset .....	19
Management Choices .....	20

## Appendix A

<b>Standards Compliance and Safety Information .....</b>	<b>21</b>
Standards Supported .....	21
Disclaimers .....	22
CE Marking .....	22
RoHS China .....	22
Translated Warning Definition .....	23
Safety Warnings .....	24
Circuit Breaker (15A) Warning .....	24
TN Power Warning .....	24
Product Disposal Warning .....	24
No. 26 AWG Warning .....	24
LAN Connector Warning .....	24
ISDN BRI Connector Warning .....	24
Socket Outlet Warning .....	25
Safety Recommendations .....	25

## Appendix B

<b>Cabling Considerations .....</b>	<b>27</b>
RJ-45 Cable .....	27
Straight Through Cable .....	28
Crossover Cable .....	29

## Appendix C

<b>Standard Hardware Information.....</b>	<b>31</b>
Industry Standard Protocols .....	31
Hardware Features .....	32
Interfaces .....	32
Power .....	32

---

Product Architecture Details .....	32
Real Time Fax Router Technical Specifications .....	32
Audio Specifications .....	33
DTMF Tone Detection .....	33
DTMF Tone Generation .....	33
Power Consumption .....	34
MTBF Value .....	34
Operating Environment .....	34
Dimensions and Weight .....	34
Warranty .....	35

## Appendix D

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Glossary .....	37
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## Appendix E

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List of Acronyms .....	41
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# About this Manual

Thank you for purchasing the Mediatrix 4400 Series from Media5 Corporation.

The Mediatrix 4400 Series ISDN BRI VoIP Digital Gateways allow enterprises to lower communications costs over any IP link. The Mediatrix 4400 units constitute an ideal solution for enterprise voice applications or for connecting to a service provider's broadband access.

**Table 1:** Mediatrix 4400 Series Models

Model	Interfaces	VoIP Call Capacity	BRI Power Feeding	Power over Ethernet	Bypass
Mediatrix 4401	1 BRI port	up to 2			
Mediatrix 4401 <i>plus</i>	1 BRI port	up to 2	✓	✓	
Mediatrix 4402	2 BRI ports	up to 4			
Mediatrix 4402 <i>plus</i>	2 BRI ports	up to 4	✓	✓	✓
Mediatrix 4404	4 BRI ports	up to 8			
Mediatrix 4404 <i>plus</i>	4 BRI ports	up to 8	✓	✓	✓

The Mediatrix 4402*plus* and Mediatrix 4404*plus* models may use either BRI port #1 or BRI port #2 as a bypass port for optimized call-routing and risk-free operation. See [“Bypass Feature \(Mediatrix 4402plus / 4404plus Models\)” on page 4](#) for more details.

The Mediatrix 4400 Series ISDN BRI VoIP Digital Gateways offer 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.

## Document Objectives

The *Mediatrix 4400 Hardware Installation Guide* provides technical information on how to physically install the Mediatrix 4400. It also describes the cabling required for the Mediatrix 4400 device.

The information included in this guide consists of:

- ▶ Hardware descriptions of the Mediatrix 4400 device
- ▶ Hardware installation instructions
- ▶ Installation scenarios examples
- ▶ LED indications
- ▶ Cabling and pin-out data



**Note:** There are many flavours of the Mediatrix 4400 device. Because of this, some of the information provided may not apply to your particular Mediatrix 4400 device model.

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

Use the *Mediatrix 4400 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 4400 device.
- ▶ System administrators who are responsible for installing and configuring networking equipment and who are familiar with the Mediatrix 4400 device.

## Related Documentation

In addition to this manual, the Mediatrix 4400 document set includes the following:

- ▶ *Dgw v2.0 Software Configuration Guide*  
Describes how to configure and operate the Mediatrix 4400.
- ▶ Mediatrix 4400 Installation Guide  
This booklet allows you to quickly setup and work with the Mediatrix 4400. 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 4400.
- ▶ *Notification Reference Guide*  
Lists and describes all syslog messages and notification messages that the Mediatrix 4400 may send.
- ▶ *Third Party Software Copyright Information*  
This document lists the third-party software modules used in the Mediatrix 4400 along with any copyright and license information. This document is available at: <http://www.media5corp.com/downloads>

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

## Document Structure

The Mediatrix 4400 *Hardware Installation Guide* contains the following information.

**Table 2:** Mediatrix 4400 Hardware Installation Guide Chapter/Appendices

Title	Summary
<a href="#">“Chapter 1 - Overview” on page 1</a>	Provides a brief description of the Mediatrix 4400.
<a href="#">“Chapter 2 - Installation” on page 5</a>	Contains instructions for installing the Mediatrix 4400 and connecting the cables.
<a href="#">“Chapter 3 - Powering on the Mediatrix 4400” on page 13</a>	Leads you through the basic steps to start the Mediatrix 4400.
<a href="#">“Appendix A - Standards Compliance and Safety Information” on page 21</a>	Lists the various standards compliance of the Mediatrix 4400.
<a href="#">“Appendix B - Cabling Considerations” on page 27</a>	Describes the pin-to-pin connections for cables used with the Mediatrix 4400.



**Table 2:** Mediatrix 4400 Hardware Installation Guide Chapter/Appendices (Continued)

Title	Summary
<a href="#">“Appendix C - Standard Hardware Information” on page 31</a>	Lists the technical hardware information of the Mediatrix 4400.

## Document Conventions

The following information provides an explanation of the symbols that appear on the Mediatrix 4400 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 4400. 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 4400'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>.

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## Obtaining Documentation

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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.

Please send your comments to:

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Sherbrooke, Quebec  
Canada J1L 2C8  
Fax: +1 (819) 829-5100

We appreciate your comments.

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## End User Technical Support

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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 4400 connectors and indicators.

## Overview

Provider-specific profiles ensure that the Mediatrix 4400 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 4400 integrates features such as TLS, SRTP, and HTTPS designed to bring enhanced security for network management, SIP signalling and media transmission aspects.

The Mediatrix 4400 series ISDN BRI VoIP Digital Gateways allow enterprises to lower communications costs over any IP link. Designed specifically for enterprise applications, the Mediatrix 4400 digital gateways make use of existing broadband access equipment to connect to any standards-based VoIP network.

The Mediatrix 4400 digital gateways meet the requirements of enterprises that want to connect their ISDN equipment, such as PBXs, through a BRI (Basic Rate Interface) to an IP network or as a gateway to the PSTN.

Mediatrix 4400 digital gateways provide transparent ISDN port extensions over an IP network. The remote ISDN terminals can be managed centrally and benefit from PBX services such as calling groups and voice mail.

The Mediatrix 4400 digital gateways offer 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 4400 Series models currently available:

**Table 3:** Mediatrix 4400 Series Models

Model	Interfaces	VoIP Call Capacity	BRI Power Feeding	Power over Ethernet	Bypass
Mediatrix 4401	1 BRI port	up to 2			
Mediatrix 4401 <i>plus</i>	1 BRI port	up to 2	✓	✓	
Mediatrix 4402	2 BRI ports	up to 4			
Mediatrix 4402 <i>plus</i>	2 BRI ports	up to 4	✓	✓	✓
Mediatrix 4404	4 BRI ports	up to 8			
Mediatrix 4404 <i>plus</i>	4 BRI ports	up to 8	✓	✓	✓

### Key Features

- ▶ Up to 8 simultaneous calls
- ▶ Two Ethernet ports
- ▶ ISDN BRI interface ports
- ▶ HTTP, SNMP, FTP and TFTP for configuration and management
- ▶ True Plug-and-Play
- ▶ Automatic configuration script download
- ▶ Call Routing service
- ▶ Secure SIP signalling
- ▶ Secure Media transmission

- ▶ SNMPv3 and web management
- ▶ DHCP Client
- ▶ PPPoE Client
- ▶ T.38 support
- ▶ Command Line Interface (CLI)
- ▶ SSL/TLS Encryption
- ▶ Optional Power Feeding Over Ethernet (*plus* models).
- ▶ Optional Power Feeding over ISDN Line (*plus* models).

## Mediatrix 4400 Connectors and Indicators

This section provides an overview of the front and rear panels of the Mediatrix 4400.

### Product Serial Number Location

The serial number label for the Mediatrix 4400 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 4400 may have and the states they represent.

[Figure 1](#) shows the five visual indicators located on the front of the Mediatrix 4400.

**Figure 1:** Front Panel Indicators



[Table 4](#) describes the LEDs on the front panel of the Mediatrix 4400.

**Table 4:** Mediatrix 4400 Front LEDs

	LED	Description
1.	ETH2	Provides the state of the network connected to the <i>ETH2</i> connector.
2.	Ready	When lit, the Mediatrix 4400 is ready to initiate or receive a call. The unit does not have to be registered to a server.
3.	In-Use	When lit, at least one of the BRI lines is in use.
4.	ETH1	Provides the state of the network connected to the <i>ETH1</i> connector.
5.	Power	When lit, power is applied to the Mediatrix 4400.

## Rear Connectors

The Mediatrix 4400 has several connections that must be properly set. [Figure 2](#) shows the rear panel of the Mediatrix 4400.

<b>Standards Supported</b>	<ul style="list-style-type: none"> <li>• IEEE P802.3af DTE Power via MDI</li> <li>• ITU-T I.430 Basic user-network interface - Layer 1 specification (section 9).</li> </ul>
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**Figure 2: Rear Panel Connectors**




[Table 5](#) describes the rear panel connections (from left to right).

**Table 5: Rear Connections of the Mediatrix 4400**

	Connection	Description
1.	Power connector	External 12 Vdc power supply.
2.	RESET/DEFAULT button	Resets configuration parameters of the Mediatrix 4400 to default (known) values. It can be used to reconfigure the unit. <b>Warning:</b> Read Section <a href="#">“RESET/DEFAULT Button”</a> on page 18 before attempting to reset the unit.
3.	ETH1	A 10/100 BaseT Ethernet RJ-45 connector for access to a LAN, WAN or computer. The Mediatrix 4400 may also offer the option to use this connector as a remote power feeding over Ethernet as per 802.3af when the network offers the capability.
4.	ETH2	A 10/100 BaseT Ethernet RJ-45 connector for access to a LAN, WAN or computer.
5.	BRI 1 – BRI 4 connectors	Up to four RJ-45 connectors to attach BRI lines. <ul style="list-style-type: none"> <li>• The Mediatrix 4402 and Mediatrix 4404 models offer an optional metallic bypass relay between Connectors #1 and #2. See <a href="#">“Bypass Feature (Mediatrix 4402plus / 4404plus Models)”</a> on page 4 for more details.</li> <li>• The Mediatrix 4400plus models offer the option to use Power Feeding over ISDN in NT mode as per ITU-T I.430 (section 9).</li> </ul> <b>Note:</b> Connectors 2, 3, and 4 are optional and not available on all Mediatrix 4400 models.

The Mediatrix 4400 also has one indicator (LED) for each BRI connector. [Table 6](#) describes these indicators.

**Table 6:** Rear Panel LEDs

LED	Description
BRI	<p>Indicates the state of each BRI connector:</p> <ul style="list-style-type: none"> <li>• Yellow LED: The connection has a Loss of Signal (LOS).</li> <li>• Green LED: The connection works properly.</li> </ul> <div style="text-align: right;">  <p>BRI connector state LED →</p> </div>

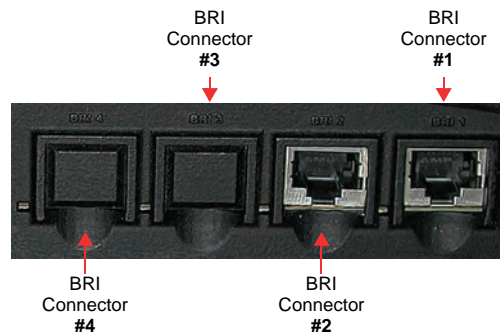
## Port Numbering Convention

The following describes the BRI connectors numbering convention.



**Note:** Connectors 2, 3, and 4 are optional and not available on all Mediatrix 4400 models.

**Figure 3:** BRI Connectors Numbering Conventions



## Bypass Feature (Mediatrix 4402plus / 4404plus Models)

In the event of a power failure or network failure, the optional bypass feature permits users to make and receive calls even when the Mediatrix 4400 is not operating. The Mediatrix 4400 **BRI 1** and **BRI 2** connectors may either act as a SCN bypass. For instance, if you decide to connect a SCN line into the *BRI 2* connector, you can use a BRI telephone connected into the *BRI 1* connector to make calls.

Furthermore:

- ▶ The connector on which the SCN line is connected must be configured as a TE.
- ▶ The other connector must be configured as a NT.

Refer to the *Software Configuration Guide* for more details on how to configure the line type.

During normal operation, the direct connection between the *BRI 1* and *BRI 2* connectors is switched out through commuting relays and both ports resume normal functions. When power is removed from the Mediatrix 4400, the relay setting is restored to a connected state and the SCN line can be used as an emergency line. Consequently, a BRI telephone used on the other port is directly connected to this SCN line. When the power is restored, this automatically removes the Bypass connection; this means that any ongoing call on the Bypass connection is terminated.

This chapter describes the installation of the Mediatrix 4400.

## Planning the Installation

Before installing the Mediatrix 4400, 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 4400 (see section “[Network Information](#)” on page 6).

### Installation Checklist

The installation checklist lists the tasks for installing the Mediatrix 4400. 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 4400 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 4400 received		
Quick start guide received		
Regulatory compliance and safety information received		
Warranty card received		
Software version verified		
Rack, desktop, or wall 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 4400, 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 4400, 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 4400, 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 4400.

## Maintaining Safety with Electricity



**Warning:** Do not work on the Mediatrix 4400, connect or disconnect cables during periods of lightning activity.



**Warning:** Disconnect all power before servicing the Mediatrix 4400.



**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 4400 first.

## General Safety Practices

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

- ▶ Keep the Mediatrix 4400 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 4400.
- ▶ 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.

## Preventing Electrostatic Discharge Damage

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.

## Required Mounting Tools and Equipment

You will need the following tools and parts to properly install the Mediatrix 4400:

- ▶ Screws and anchors for wall-mounting, if required.
  - Four wood screws or other fasteners, for installing the chassis on a wall.
- ▶ ESD-preventive wrist strap.

In addition, you might need the following external equipment:

- ▶ Modem for remote access.

## Unpacking and Inspection

If you haven't already done so, unpack the Mediatrix 4400 device. Carefully remove it from the package and packing material. The Mediatrix 4400 package contains the following items:

- ▶ 1 x Mediatrix 4400 unit
- ▶ 1 x power supply for the country in which you are using the Mediatrix 4400
- ▶ 2 x Ethernet RJ-45 cables for BRI connections (Mediatrix 4401)
- ▶ 3 x Ethernet RJ-45 cables for BRI connections (Mediatrix 4402)
- ▶ 5 x Ethernet RJ-45 cables for BRI connections (Mediatrix 4404)
- ▶ 1 x Bumpon™ kit for desktop use
- ▶ 1 x Printed Flyer

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 4400 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 wall-mounted, mounted on a standard 48.26 cm (19 in.) equipment rack, or free standing. In addition, the Mediatrix 4400 can be rack-mounted in a wiring closet or equipment room.

### Location

Install the Mediatrix 4400 in a well-ventilated location where it will not be exposed to high temperature or humidity. Do not install the Mediatrix 4400 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 4400, ensure that:

- ▶ The Mediatrix 4400 is accessible for future upgrade, maintenance and troubleshooting, and cables can be easily connected.
- ▶ 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 4400.
- ▶ The airflow is not restricted around the Mediatrix 4400 or through the vents of the unit. The unit requires a minimum of 25 mm (1 in.) clearance.
- ▶ The operating temperature is between 0°C and 40°C.
- ▶ The humidity is not over 85% and is non-condensing.

### 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.

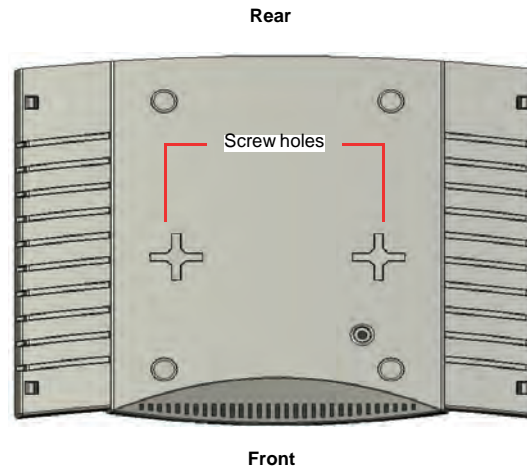
## Wall-Mounting

The Mediatrix 4400 has two screw holes on its bottom surface, allowing a single unit to be wall-mounted.

► **To wall-mount the Mediatrix 4400:**

1. Disconnect all of the cables from the Mediatrix 4400 before mounting.
2. Ensure that the wall you are using is smooth, flat, dry and sturdy. Attach a piece of plywood, approximately 250 mm x 200 mm x 12 mm (10 inches x 8 inches x 0.5 inches) securely to the wall, if necessary.
3. Position the Mediatrix 4400 against the wall (or plywood) as illustrated in [Figure 5](#).

**Figure 5:** Bottom View - Wall Mounting Screw Holes



You can position the Mediatrix 4400 any way you want.

4. Mark the position of the screw holes on the wall. Drill the two holes and install two screws.
5. Place the screw holes of the Mediatrix 4400 over the screws installed in the previous step.
6. Proceed to [“Hardware Installation” on page 10](#).

## Free Standing Unit

When installing the Mediatrix 4400 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 4400.

You must also apply the Bumpon™ autoadhesive protective products to the bottom of the Mediatrix 4400. These will stabilize the Mediatrix 4400 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 4400, 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 4400.



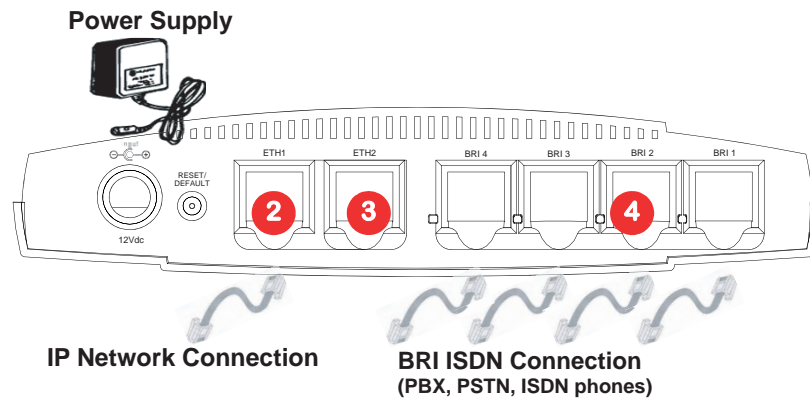
**Caution:** The Mediatrix 4400 must be installed on a circuit equipped with a breaker so that you can easily power the unit off if required.

See “Appendix B - Cabling Considerations” on page 27 for more details on the cables the Mediatrix 4400 uses.

### Connecting Cables

The following describes how to connect the various cables to the Mediatrix 4400.

Figure 6: Hardware Installation



#### ► To install the cables:

1. Before you begin, be sure that the Mediatrix 4400 is powered off.
2. Connect a 10/100 BaseT Ethernet RJ-45 cable into the *ETH1* connector of the Mediatrix 4400. The other end of the cable is connected to the WAN via a modem or other means. See “RJ-45 Cable” on page 27 for more details on this cable.
3. Connect a 10/100 BaseT Ethernet RJ-45 cable into the *ETH2* connector of the Mediatrix 4400 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. See “RJ-45 Cable” on page 27 for more details.
4. Connect up to four BRI RJ-45 **straight-through** cables into any of the BRI connectors (labelled **BRI 1**, **BRI 2**, **BRI 3**, and **BRI 4**) (BRI connectors 2, 3, and 4 are optional and not available on all models). If you are using the Mediatrix 4400 with a PBX, connect the other end of the cables to the PBX. If you are using the Mediatrix 4400 with the PSTN, connect the other end of the cables to a proper PSTN outlet. If you are using the Mediatrix 4400 with ISDN telephones, connect the other end of the cables to ISDN telephones. You have two choices to power your ISDN telephones.
  - Provide an alternate power feeding to the ISDN telephones. This could be by plugging the telephones into a standard electrical outlet or by using an ISDN device that provides power feeding such as an S-bus. This option depends on the type of telephone you are using.
  - Use the Mediatrix 4400’s ISDN Power Feeding feature if available. The versions of the Mediatrix 4400 that provide ISDN power feeding are identified as the Mediatrix 4401*plus*, Mediatrix 4402*plus*, and Mediatrix 4404*plus*. This identification appears on the label located on the bottom side of the unit. If you have such a unit, you can directly

connect your ISDN telephones. Note that not all ISDN telephones support this feature.

You must also enable the feature as described in the *Software Configuration Guide*.

Refer to [“RJ-45 Cable” on page 27](#) for more details on this cable.

You are now ready to start the Mediatrix 4400.



This chapter describes the initial provisioning of the Mediatix 4400.

## IP Address Discovery or Configuration

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This section describes how to contact the Mediatix 4400's management interface to start with unit configuration.

Once the physical connection is complete and the Mediatix 4400 is powered up, you must first find out the IP address the Mediatix 4400 is using. The Mediatix 4400's IP address can be set either dynamically or statically. The default behaviour of the Mediatix 4400 is to try to obtain a dynamic IP address through a DHCP server.

### Dynamic IP 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 Mediatix 4400 with a static *eth1-4* IP 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 Mediatix 4400 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 18.

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 Mediatix 4400 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 an IP address, you can discover which IP address has been assigned to the Mediatix 4400 by either:

- ▶ consulting your DHCP server's logs to find out details on the DHCP lease that was given to the Mediatix 4400.
- ▶ using a network packet sniffer (e.g., Wireshark) to examine the DHCP messages exchanged between the Mediatix 4400 and your DHCP server while the Mediatix 4400 boots up.

► **To start the Mediatix 4400 with a dynamic IP address:**

1. If you need to discover the IP address of the Mediatix 4400, install and start your network packet sniffer.
2. Power on the Mediatix 4400 by connecting the power cord to the unit and then connecting the other end to an electrical outlet. If this is the very first time you are installing the Mediatix 4400, it will restart twice.



**Warning:** The electrical outlet must be installed near the Mediatix 4400 so that it is easily accessible.



**Note:** If the *Power* LED is always blinking and never turns on, this means that the Mediatix 4400 cannot find a DHCP server. Check that you have a DHCP server properly configured on your network.

You can now access the Mediatix 4400 web interface. Refer to the *Software Configuration Guide* for more details.

## Initial Provisioning Sequence

When starting the Mediatix 4400 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 Mediatix 4400 hardware as per “[Hardware Installation](#)” on page 10.

The Mediatix 4400 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 Mediatix 4400 configuration.

► **Initial provisioning sequence:**

1. When the Mediatix 4400 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 Mediatix 4400 IP address.

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

- Mediatix 4400 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 Mediatix 4400 request its configuration by using a configuration file.

## Default Static IP Address Configuration

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

► **To start the Mediatix 4400 with a static IP address:**

1. Power on the Mediatix 4400 by connecting the power cord to the unit and then connecting the other end to an electrical outlet. If this is the very first time you are installing the Mediatix 4400, it will restart twice.



**Warning:** The electrical outlet must be installed near the Mediatix 4400 so that it is easily accessible.

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. Insert a small, unbent paper clip into the *RESET/DEFAULT* hole located at the rear of the Mediatix 4400.

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 Mediatix 4400 uses the default IP address 192.168.0.1/24. Refer to “[Partial Reset](#)” on page 18 for details on the partial reset procedure.

You can now access the Mediatix 4400 web interface. Refer to the *Software Configuration Guide* for more details.

## Vocal Unit Information

When entering special characters on your telephone pad, the Mediatix 4400 talks back to you with relevant information.

► **To access vocal unit information:**

1. Take one of the telephones connected to the Mediatix 4400.
2. Dial one of the digits sequence on the keypad.

**Table 7:** Vocal Unit Information

Digits to Dial	Information Vocally Sent by the Mediatix 4400
*#*0	Current IP address of the Mediatix 4400 (static or DHCP).
*#*1	MAC address of the Mediatix 4400.

## Verifying the Installation

There are a few ways to verify that the Mediatix 4400 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 Mediatix 4400 you want to verify. If the Mediatix 4400 does not respond, do the following:

- Verify that the WAN cable is securely connected to the Mediatix 4400 and to the network connector.
- Be sure that you did not connect crossover network cables.
- Verify the state of the IP network to ensure it is not down (the *ETH1* or *ETH2* LED should be ON or blinking).

## Indicators (LEDs)

The indicators (LEDs) of the Mediatix 4400 are described in “Mediatix 4400 Connectors and Indicators” on page 2.

### LED Patterns – Specific Conditions

Table 8 describes the different states a Mediatix unit can have and their associated LED patterns.

**Table 8:** 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.	Power LED: <ul style="list-style-type: none"> <li>blinking, 1Hz, 50% duty</li> </ul> All other LEDs: <ul style="list-style-type: none"> <li>OFF</li> </ul>
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"> <li>blinking, 1Hz, 50% duty</li> </ul>
DefaultSettingsPending	Triggered when the <i>RESET/DEFAULT</i> button is not released while in <i>ResetPending</i> state. 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. 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.	All LEDs: <ul style="list-style-type: none"> <li>steady ON</li> </ul>
UpdateInProgress	A firmware pack is downloaded into the unit and written to persistent storage.	All LEDs: <ul style="list-style-type: none"> <li>cycling from left to right, individually blinking 1Hz, 33% duty</li> </ul>
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"> <li>blinking at 3Hz, 50% duty. One LED out of two has a 180 degree phase. This pattern lasts for 8 seconds.</li> </ul>
Rescue Network Enabled	Triggered after the user has performed a partial reset procedure.	Power and <i>In Use</i> LEDs: <ul style="list-style-type: none"> <li>blinking (synchronized) 1Hz, 75% duty</li> </ul>
BootOnRecoveryBank	Triggered when the unit is booting on the recovery bank and no update is pending.	Power LED: <ul style="list-style-type: none"> <li>blinking, 0.25Hz, 75% duty</li> </ul>

**Table 8:** LED Patterns (Continued)

Condition	Description	LED Pattern
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"> <li>blinking, 3 Hz, 50% duty.</li> </ul>
NetworkRescue	The unit tries to download and install a firmware given by the Network Rescue server.	Ready LED: <ul style="list-style-type: none"> <li>Off</li> </ul> All other LEDs: <ul style="list-style-type: none"> <li>blinking to show a LED displacing light from left to right and right to left.</li> </ul>

## LED Patterns – Default Behaviour

When no specific condition matches those described in [Table 8](#), the LEDs behave individually according to the following rules:

**Table 9:** Default LED Behaviour

LED Type	Condition	Behaviour
Power	RestartInProgress	Blinking, 1 Hz, 50% duty
	RestartCompleted	Steady ON
ETH	Network traffic	Blinking, variable rate
	No network traffic	Steady ON
ETH2	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
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 Mediatrix 4400 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 Mediatrix 4400 is running without powering the unit off. [Table 10](#) describes the actions you can perform in this case.

**Table 10:** RESET/DEFAULT Button Interaction

RESET/DEFAULT Button Pressed for:	Action	Comments	LEDs Pattern
2 to 6 seconds	Restarts the Mediatrix 4400	No changes are made to the Mediatrix 4400 settings.	<i>Power</i> LED: <ul style="list-style-type: none"> <li>• blinking, 1Hz, 50% duty</li> </ul> All other LEDs: <ul style="list-style-type: none"> <li>• OFF</li> </ul>
7 to 11 seconds	Sets the Mediatrix 4400 in Partial Reset Mode	Sets some of the Mediatrix 4400 configuration to pre-determined values.	All LEDs <ul style="list-style-type: none"> <li>• blinking, 1Hz, 50% duty</li> </ul>
12 to 16 seconds	Restarts the Mediatrix 4400 in Factory Reset	Deletes the persistent configuration, creates a new configuration file with the default factory values, and then restarts the unit.	All LEDs <ul style="list-style-type: none"> <li>• steady ON</li> </ul>
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 19](#)). This feature reverts the Mediatrix 4400 back to its default factory settings.

### Partial Reset

The Partial reset provides a way to contact the Mediatrix 4400 in a known and static state while keeping most of the configuration unchanged.

Following a partial reset, the Mediatrix 4400 management interface is set to the *Rescue* interface. The default address for this interface is 192.168.0.1/24. Any existing network interface that conflicts with the *Rescue* interface address is disabled.

You can contact the Mediatrix 4400 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: Sets the “admin” password to **administrator** and the “public” password to an

empty string.

- ▶ 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 4400. 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 4400 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 4400 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 4400 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 4400 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 4400 off.
2. Insert a small, unbent paper clip into the *RESET/DEFAULT* hole located at the rear of the Mediatrix 4400. 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 4400 restarts.  
This procedure resets all variables in the MIB modules to their default value.  
When the Mediatrix 4400 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 4400.

## Management Choices

Congratulations for properly installing the Mediatrix 4400. You can now configure the software parameters of the unit.

The Mediatrix 4400 offers various management options. All these options are described in the *Dgw v2.0 Software Configuration Guide*.

**Table 11:** Management Options

Management Choice	Features
Web GUI	The Mediatrix 4400 web interface allows you to configure the following information: <ul style="list-style-type: none"> <li>• Network attributes</li> <li>• SIP parameters</li> <li>• VoIP settings</li> <li>• Management settings such as configuration scripts, restore / backup, etc.</li> </ul>
SNMPv1/2/3	The Mediatrix 4400 SNMP feature allows you to configure all the MIB services.
Command Line Interface (CLI)	The Mediatrix 4400 CLI feature allows you to configure all the MIB services.
Unit Manager Network	The UMN offers the following: <ul style="list-style-type: none"> <li>• Auto-discovery</li> <li>• Group provisioning</li> <li>• SNMP access and remote management.</li> </ul>

# Standards Compliance and Safety Information

This Appendix lists the various standards compliance of the Mediatrix 4400.

## Standards Supported

The Mediatrix 4400 complies to the following standards:

**Table 12:** Standards Compliance

Category	Specification
Agency approvals	<ul style="list-style-type: none"> <li>European Union, CE mark (Declaration of Conformity)</li> </ul>
Safety standards	<ul style="list-style-type: none"> <li>IEC 60950 (1<sup>st</sup> Edition 2001 With all national deviations)</li> </ul>
Emissions	<ul style="list-style-type: none"> <li>FCC Part 15:2004 Class B</li> <li>EN55022 (2006) Class B</li> <li>EN61000-3-2 (2000) Harmonic current emissions</li> <li>EN61000-3-3 (1995) Voltage fluctuations and flicker (with amendment A1)</li> </ul>
Immunity	EN55024:1998 including the following (with amendments A1 and A2): <ul style="list-style-type: none"> <li>EN61000-4-2 (1995), ESD</li> <li>EN61000-4-3 (1996), Radiated RF</li> <li>EN61000-4-4 (1995), Burst Transients</li> <li>EN61000-4-5 (1995), Surge</li> <li>EN61000-4-6 (1996), Conducted RF</li> <li>EN61000-4-11 (1995), Voltage Dips and Interruptions</li> </ul>
Telecom	<ul style="list-style-type: none"> <li>TBR3:1995 (with amendments A1: 1997)<sup>a</sup></li> </ul>

a. Clauses 9.2.1, 9.2.6, 9.2.7, 9.2.9, 9.2.10, 10.1 to 10.6, 10.8, 10.10, 11.1 to 11.3, 11.4.2, 11.4.4, 11.4.5, 11.5



**Note:** The standards compliance of the Mediatrix 4400 are printed on a sticker located on the bottom of the unit.

## Disclaimers

The following are the disclaimers related to the Mediatrix 4400.

### 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 <sup>6+</sup> )	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 4400 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 letsel 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.

**¡Advertencia!** 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.

**Warning!:** Denna varningssymbol 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 Connector Warning
- ▶ ISDN BRI Connector 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 Connector Warning



**Warning:** Do not connect the LAN connector 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.

### ISDN BRI Connector Warning



**Warning:** Do not connect the ISDN BRI connectors directly 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.

## 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.



# Cabling Considerations

This Appendix describes the pin-to-pin connections for cables used with the Mediatrix 4400.



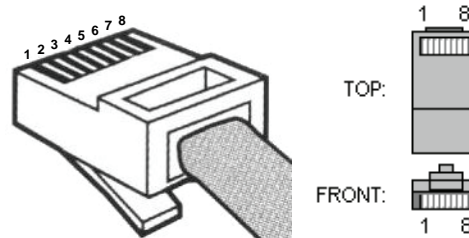
**Warning:** To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.

## 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 7: RJ-45 Cable**



When connecting an Ethernet cable to the Mediatrix 4400, 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 4400 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 4400 to a hub or a switch, while a crossover cable is required to connect the Mediatrix 4400 to a PC.

## Straight Through Cable

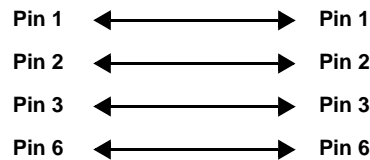
A RJ-45 straight through cable is used to connect a computer to a network device. For instance, you must use straight through cables to connect a computer to a network hub, switch, and router.

**Table 13:** 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 8:** Straight Through Connectivity



### Pin Name and Function

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

**Table 14:** 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

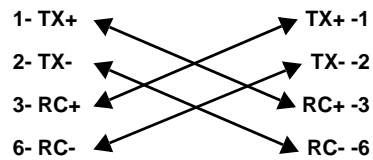
A RJ-45 crossover cable is used when only two systems are to be connected to each other, peer to peer, at the Ethernet Cards by “crossing over” (reversing) their respective pin contacts. An example would be connecting two computers together to create a network. The crossover eliminates the need for a 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 9:** Crossover Connectivity









# 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

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The Mediatrix 4400 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 4400 can be integrated with existing telephone, fax and data equipment such as PCs and routers.

**Table 15:** Industry Standard Protocols

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

**Table 15:** Industry Standard Protocols (Continued)

Parameter	Description
Voice Signalling	<ul style="list-style-type: none"> <li>• Euro ISDN EDSS-1 / ETSI PRI/NET5</li> <li>• ETS 300 012-1 (ITU-T I.430)</li> <li>• ETS 300 402-2 (ITU-T Q.921)</li> <li>• ETS 300 403-1/2 (ITU-T Q.931)</li> <li>• ETS 300 102-2 (ITU-T Q.931)</li> <li>• ETS 300 402-1 (ITU-T Q.921)</li> <li>• ETS 300 403-2 (ITU-T Q.931)</li> <li>• ETS 300 102-1 (ITU-T Q.931)</li> <li>• ISDN speech, audio and data (Fax Gr 4, UDI 64, RDI 64)</li> <li>• ECMA-143 (QSIG-BC)</li> </ul>

## Hardware Features

### Interfaces

- ▶ 2 x RJ-45 WAN connectors, 10/100 BaseT Ethernet access
- ▶ Up to 4 RJ-45 BRI connectors for ISDN connectivity

### Power

- ▶ External 12 Vdc power supply (wall plug or desktop, based on country/area model).

## Product Architecture Details

- ▶ Supports multiple concurrent communications using any vocoders.
- ▶ DSP-based DTMF detection and generation.
- ▶ DSP-based fax relay.
- ▶ 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 16:** Fax Technical Specifications

Parameter	Description
Ethernet	10/100 BaseT Ethernet
Data Link	Ethernet
Network	IP (Internet Protocol)

**Table 16:** Fax Technical Specifications (Continued)

Parameter	Description
Transport	TCP / UDP
Protocols	Group 3 Fax Clear channel (G.711) or T.38 Real Time Fax Over IP protocol Stack
Fax Data Compression	MH
Fax Transmission	Up to 14.4 kbps

## 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.
- ▶ 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	-35 dBm to +3 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	-6 dBm to -4 dBm
Frequency Deviation	Less than 1%

## Power Consumption

**Table 19:** Power Consumption

Parameter	Description
Active DSP, loopback TE-NT for 2 and 4 ports	AC = 5W, 11.5VA DC = 3.30W
Active DSP, loopback TE-NT for 2 and 4 ports, 4W charge for power feeding	AC = 14.4W, 27VA DC = 11.77W
Power over Ethernet feeding (Active DSP, loopback TE-NT for 2 and 4 ports, 4W charge for power feeding)	DC = 15W <b>Note:</b> You must ensure that the charge number on the BRI ports in NT mode does not exceed the maximal capacity of the Ethernet Power Source (PSE).

## MTBF Value

The Mean Time Before Failure (MTBF) value of the Mediatrix 4400 models is estimated as follows:

- ▶ Mediatrix 4400 standard models: 275,000 hours
- ▶ Mediatrix 4400*plus* models: 200,000 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 without the external power supply.

## Operating Environment

**Table 20:** Operating Environment

Parameter	Description
Operating Temperature	0°C to 40°C
Humidity	Up to 85%, non-condensing
Storage	-20°C to +70°C

## Dimensions and Weight

**Table 21:** Dimensions and Weight

Parameter	Description
Dimensions	Height: 4.9 cm (1.9 in) Width: 22 cm (8.7 in) Depth: 17.6 cm (6.9 in)
Weight	Mediatrix 4401/4402/4404: 458g (1.0 lb) Mediatrix 4401plus/4402plus/4404plus= 514g (1.1 lb)

## Warranty

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



**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.

**Basic Rate Interface (BRI)**

An Integrated Services Digital Network configuration defined in the physical layer standard I.430 produced by the ITU. This configuration consists of two 64 kbit/s “bearer” channels (B channels) and one 16 kbit/s “data” channel (D channel). The B channels are used for voice or user data, and the D channel is used for any combination of: data, control/signalling and X.25 packet networking. The two B channels can be bonded together giving a total data rate of 128 kbit/s. BRI is the kind of ISDN interface most likely to be found in residential service.

**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.

**Gateway**

A device linking two different types of networks that use different protocols (for example, between the packet network and the Public Switched Telephone Network).

**Integrated Services Digital Network (ISDN)**

A set of digital transmission protocols defined by the international standards body for telecommunications, the ITU-T (formerly called the CCITT). These protocols are accepted as standards by virtually every telecommunications carrier all over the world.

ISDN complements the traditional telephone system so that a single pair of telephone wires is capable of carrying voice and data simultaneously. It is a fully digital network where all devices and applications present themselves in a digital form.

**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.



# List of Acronyms

AWG	American Wire Gauge
BRI	Basic Rate Interface
CE	Cummunauté européenne (French)
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name Server
IETF	Internet Engineering Task Force
LAN	Local Area Network
LED	Light Emitting Diode
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



# Index

## Numerics

- 10 BaseT [3](#), [10](#), [27](#)
  - defined [37](#)
  - see also [cabling](#)
- 100 BaseT [3](#), [10](#), [27](#)
  - defined [37](#)
  - see also [cabling](#)

## A

- acronyms [41](#)
- audience, intended [viii](#)
- auto MDI/MDIX [27](#)

## B

- Bypass connection, in BRI [4](#)

## C

- cables, connecting [10](#)
- cabling
  - RJ-45
    - crossover [29](#)
    - pin name [28](#)
    - pinout information [28](#)
    - straight through [28](#)
  - see also [10 BaseT](#)
  - see also [100 BaseT](#)
- cleaning the unit [9](#)
- compliance to standards. see [standards compliance](#)
- condensation [9](#)
- connecting
  - cables during installation [10](#)
  - unit [10](#)
- connectors
  - BRI ports [3](#)
  - ETH1 [3](#)
  - ETH2 [3](#)
  - front [2](#)
  - rear [3](#)
  - RESET/DEFAULT [3](#)
  - universal power supply unit [3](#)
- crossover cable. see [cabling](#)
- customer services [x](#)

## D

- document
  - conventions [ix](#)
  - objectives [vii](#)
  - structure [viii](#)
- documentation
  - Media5 download portal [x](#)
  - Mediatrix download portal [x](#)
  - where to obtain [x](#)

## E

- end user technical support [x](#)

## F

- factory reset
  - reverting to [19](#)
  - see also [partial reset](#)
- front
  - connectors [2](#)
  - indicators [2](#)

## H

- humidity level [8](#)

## I

- indicators
  - front [2](#)
  - rear [3](#)
- inspecting the contents [8](#)
- installation
  - cables, connecting [10](#)
  - checklist [5](#)
  - connecting the hardware [10](#)
  - default static IP address configuration [14](#)
  - dynamic IP address discovery [13](#)
  - free standing unit [9](#)
  - network information [6](#)
  - proper location [8](#)
  - provisioning sequence, initial [14](#)
  - required tools and equipment [7](#)
  - reserving IP address [13](#)
  - safety recommendations [7](#)
  - selecting site for [8](#)
  - setting up the unit for the first time [13](#)
  - site log [6](#)
  - verifying [15](#)
  - wall-mounting [9](#)
  - wiring requirements [8](#)
- intended audience [viii](#)
- IP address, vocal identification of [15](#)

## K

- key features [1](#)

## L

- LAN
  - cable [15](#)
  - defined [38](#)
- LEDs
  - defined [38](#)
  - states [16](#)
- location, defining for installation [8](#)

## M

- MAC address [13](#)
  - defined [38](#)
  - vocal identification of [15](#)
- MDI/MDIX, auto [27](#)
- Media5 download portal [x](#)
- Mediatrix download portal [x](#)
- mounting, on a wall [9](#)

## O

objectives of document vii  
operating temperature 8  
overview of the product 1

## P

partial reset 18  
    see also *factory reset*  
power feeding over Ethernet 3  
power feeding over ISDN 3  
product models 1  
product overview 1  
provisioning, initial sequence 14

## R

rear  
    connectors 3  
    indicators 3  
related documentation viii  
Reset, partial reset procedure 18  
reset, factory reset procedure 19  
RJ-45. see *cabling*

## S

safety  
    recommendations 25  
    warnings  
        Circuit Breaker (15A) 24  
        LAN Connector 24  
        No. 26 AWG 24  
        Product Disposal 24  
        Socket Outlet 25  
        TN Power 24  
site, selecting for unit 8  
special vocal features  
    IP address 15  
    MAC address 15  
standards compliance  
    agency approvals 21  
    CE marking 22  
    emissions 21  
    immunity 21  
    RoHS China 22  
    safety standards 21  
    telecom 21  
standards supported ix  
straight through cable. see *cabling*  
support services x

## T

technical support for end user x  
temperature, operating 8  
TPE. see *cabling*  
translated warning definition 23

## U

unpacking the contents 8  
using this manual ix  
UTP. see *cabling*

## V

verifying the installation 15  
vocal features, special  
    IP address 15  
    MAC address 15  
vocal unit information 15

## W

wall-mounting the unit 9  
wiring, requirements for installation 8