



**Mediatrix**<sup>®</sup>

**4400 Series**

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



## Key Benefits

- 1, 2 or 4 ISDN BRI interface ports
- Up to 8 simultaneous calls
- 2 Ethernet ports
- Secured SIP signalling and media transmission
- User programmable call handling
- Deployable in SIP VoIP networks
- HTTP, SNMP, FTP and TFTP for configuration and management
- Fax over IP support, including T.38
- Multiple codec support
- Multiple LEDs for status indication at a glance
- May be synchronized via the Remote clock synchronization feature ('Master' unit required)

## Product Overview

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 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 offers security features such as TLS, SRTP, certificates management, and HTTPS designed to bring enhanced security for the network management, SIP signalling and media transmission aspects.

## Applications

The Mediatrix 4400 digital VoIP gateways allow any office to use an existing IP network for lower-cost voice communications.

The Mediatrix units link any standard ISDN BRI connection to the IP network and deliver the clarity of toll quality voice for a comprehensive VoIP solution.

T.38 FoIP, fax bypass, and modem bypass capabilities ensure that the Mediatrix 4400 digital gateways seamlessly transport voice and data services. The Mediatrix 4400 digital gateways offer flexibility and scalability for VoIP network integration and low bandwidth voice.

With configurable NT/TE BRI ports, call-switching and user programmable call routing (including caller/called ID), Mediatrix 4400 digital gateways integrate smoothly into existing PBX and PSTN networks.

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MIP-GES080915 4400TechnicalSpecifications

## Functional Description

### ☒ BRI Ports

The Mediatrix 4400 Series is equipped with ISDN Basic rate interface S/T transceiver capable of NT et TE operating mode conform to ITU-T I.430 and TBR 3 [8, 4].

### ☒ Enhanced Security

- HTTPS, for the exchange of Configuration File and web pages.
- SRTP with MIKEY or SDES.
  - Supported Cypher
    - AES – 128 bits
- MIKEY key management protocol (RFC 3830 and 4567).
- SDES key management protocol (RFC 4568).
- X.509 Certificate management.
- TLS transport method.
  - Supported Key Exchange Mechanism:
    - RSA
    - Diffie-Hellman
  - Supported Cyphers (minimum):
    - AES (128 and 256 bits)
    - 3DES (168 bits)

### ☒ Fax Interface

The Mediatrix 4400 Series can handle G3 fax transmissions at speeds up to 14.4 kbps. Automatic fax mode detection is also available on all ports, as well as Real-Time Fax-Over IP with T.38 protocol stack. Data handling and synchronization formerly T.4 and T.30 protocols, are processed by the embedded DSP and CPU.

Quality of T.38 fax transmissions is dependent upon the system configuration, type of call control system used, type of Mediatrix units deployed, as well as the model of fax machines used. Should some of these conditions be unsatisfactory, performance of T.38 fax transmissions may vary and be reduced below expectations.

### ☒ Power over Ethernet (Optional)

The Mediatrix 4400 offers the POE option to use the RJ-45 WAN connectors as remote power feeding over Ethernet as per 802.3af when the network offers the capability.

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).

The versions of the Mediatrix 4400 that provide power feeding over Ethernet 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.

### ☒ Power Feeding Module (Optional)

The Mediatrix 4400 offers the option to use a BRI power feeding module as per ITU-T I.430 (section 9). 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.

### ☒ PSTN Bypass (Mediatrix 4402/4404 Models)

In the event of a power 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 PSTN bypass. For instance, if you decide to connect a PSTN line into the *BRI 2* connector, you can use a BRI telephone connected into the *BRI 1* connector to make calls.

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 PSTN line can be used as an emergency line. Consequently, a BRI telephone used on the other port is directly connected to this PSTN line. When the power is restored, this automatically removes the Bypass connection; this means that any ongoing call on the

Back view of the Mediatrix 4400 Series (Mediatrix 4402 shown)



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Bypass connection is terminated.

## ☒ Housing and Power

The Mediatrix 4400 Series is designed to be a desk mount or wall mount installation.

The unit is powered by an external 12 Vdc power supply (wall plug or desktop, based on country/area model).

## ☒ SIP Specific Features

The Mediatrix 4400 Series supports the SIP signaling protocol as an endpoint entity. It can communicate directly with other endpoints (direct IP call) or register to a SIP call agent should the user request to.

## Additional Features

### ☒ Fully Configurable “PSTN-Like” Experience

The Mediatrix 4400 Series generates all the familiar tones commonly heard on a standard telephone network. For example, a dial tone is heard as soon as the handset is lifted. Call progress tones such as ringback and busy are also supported.

The Mediatrix 4400 Series can be configured to accept almost any type of telephone number. Service providers can configure the Mediatrix 4400 Series to behave like the PSTN. For example users can dial “1” and ten numbers when placing a long distance call in North America, or numbering formats common to European countries can be implemented, to emulate the PSTN as much as possible.

### ☒ Remote Configuration / Easy Management

The Mediatrix 4400 Series can be integrated seamlessly within an existing administrative environment. SNMP support allows device-related adjustment parameters to be modified and polled remotely. Implementation of a web interface provides user-friendly access to common parameters. Firmware upgrade (CPU and DSP code) and configuration files are downloaded via a HTTP, FTP, TFTP, or HTTPS server. Auto-provisioning of Mediatrix units is performed with added security through configuration file encryption and HTTP digest authentication.

### ☒ Industry Standard Protocols

The Mediatrix 4400 Series is designed to support all major industry standards used today, as well as those that will be implemented at a later date. Because of this specific design characteristic, the Mediatrix 4400 Series integrates with existing telephone, fax and data equipment such as PCs and routers.

## Supported Standards

### ☒ Vocoders

- G.711 (a-law,  $\mu$ -law) with optional VAD support
- G.723.1
- G.726
- G.729a
- G.729ab

### ☒ IP Telephony Protocols

- SIP
  - RFC 3261
  - RFC 3262
  - RFC 3263

### ☒ Real-Time Transport Protocols

- RTP/RTCP
  - RFC 1889
  - RFC 1890
  - RFC 2833
  - RFC 3389

### ☒ Network Management Protocols

- 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
- TR-069 for massive deployments (optional feature available at purchase time)

### ☒ Data Features

- PPPoE client
  - RFC 1332
  - RFC 1661
  - RFC 1334
  - RFC 1994
  - RFC 2516

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- RFC 1471
- RFC 1472
- RFC 1473
- RFC 1877
- Note: some PPPoE RFCs are implemented partially.
- TFTP or HTTP auto-provisioning
- DHCP server
- NAPT

### ☒ QoS

- ToS
- DiffServ
- 802.1p
- 802.1Q

### ☒ Voice Signaling

- Euro ISDN EDSS-1 / ETSI BRI/NET3
- ETS 300 012-1 (ITU-T I.430)
- ETS 300 402-2 (ITU-T Q.921)
- ETS 300 403-1/2 (ITU-T Q.931)
- ETS 300 102-2 (ITU-T Q.931)
- ETS 300 402-1 (ITU-T Q.921)
- ETS 300 403-2 (ITU-T Q.931)
- ETS 300 102-1 (ITU-T Q.931)
- ISDN speech, audio and data (Fax Gr 4, UDI 64, RDI 64)
- ECMA-143 (QSIG-BC)

### ☒ Echo Cancellation

- G.168

## General Specifications

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### ☒ Display

- Ready LED
- In-Use LED
- LAN activity LED
- Power status LED

### ☒ Interfaces

- 1 RJ-45 WAN connector, 10/100 BaseT Ethernet access
- Up to 4 RJ-45 BRI connectors for ISDN connectivity
  - Software configurable as NT or TE
  - Configurable point-to-point, point-to-multipoint and connector pinout

- Optional cut-through relay for emergency operation (bypass connection) between port 1 and 2.
- Optional Power Over Ethernet
- Optional Power Feeding Module for BRI phones

### ☒ Power

- External 12 Vdc power supply (wall plug or desktop, based on country/area model).
- Seamless switch over period if the client UPS detects a power loss and activates within 8 ms.
- Country-specific models

### ☒ Casing / Installation

- Casing: Desktop (Plastic ABS UL94 V0).
- Installation: The Mediatrix 4400 Series is designed to be a desk mount or wall mount installation..

### ☒ Product Architecture Details

- Supports up to 8 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.
- Fax over IP
- T.38 Fax relay (9.6 k, 14.4 k)
- G.711 Fax and Modem Bypass
- Clear channel (G.711) or T.38

<b>Ethernet</b>	10/100 BaseT Ethernet
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<b>Data Link</b>	Ethernet
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<b>Network</b>	IP (Internet Protocol)
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<b>Transport</b>	TCP / UDP
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<b>Protocols</b>	Group 3 Fax Clear channel (G.711), G.726 or T.38 Real Time Fax Over IP protocol Stack
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<b>Fax Data Compression</b>	MH
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<b>Fax Transmission</b>	Up to 14.4 kbps
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**☒ Digital Line Interface (BRI)**

- Direct connection to S/T interface ( PBX or telephone
- RJ-45 connectors

**☒ Miscellaneous Audio Specifications**

- Software-adjustable dynamic and static jitter buffer protection.
- Programmable by country: Call progress tone generation including dial tone, busy tone, ring back and error tones.
- Silence detection/suppression level software adjustable.

**☒ DTMF Tone Detection**

<b>16-Digit DTMF Decoding</b>	0 to 9, *, #, A, B, C, D
<b>Permitted Amplitude Tilt</b>	High frequency can be +2 dB to -8 dB relative to low frequency
<b>Dynamic Range</b>	-35 dBm to +3 dBm per tone
<b>Frequency Accept</b>	± 1.5% of nominal frequencies
<b>Minimum Tone Duration</b>	40 ms, can be increased with software configuration
<b>Interdigit Timing</b>	Detects like digits with a 40 ms interdigit delay

**☒ DTMF Tone Generation**

<b>Per Frequency Nominal</b>	-6 dBm to -4 dBm
<b>Frequency Deviation</b>	Less than 1%

**☒ Call Routing**

- Local switching
- Interface hunt groups
- Routing Criteria
  - Interface
  - Calling/called party number
  - Time of day, day of week, date
  - ISDN bearer capability
- Number manipulation functions
  - Replace numbers
  - Add/remove digits
  - Multiple remote gateways
  - PLAR
- Call properties manipulations

- SIP header manipulations

**☒ Power Consumption**

Model	Voltage/Freq.	Current (mA)	Power (W)	VA
440X	120Vac	90	4.5	11
	240Vac	60	5	14
	12Vdc	290	3.5	3.5
440X plus	120Vac	205	12.5	25
	240Vac	130	13	31
	12Vdc	850	10	10

**☒ Thermal Dissipation (W)**

Model	Voltage/Freq.	Current (mA)	Dissipation (W)
440X	120Vac	90	4.5
	240Vac	60	5
	12Vdc	290	3.5
440X plus	120Vac	205	8.5
	240Vac	130	9
	12Vdc	850	6

**Note:** 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).

**☒ Operating Environment**

<b>Operating Temperature</b>	0°C to 40°C
<b>Humidity</b>	Up to 85 %, non-condensing
<b>Storage</b>	-20°C to +70°C

## ✘ Dimensions and Weight

<b>Unit Dimensions</b>	Height: 4.9 cm (1.9 in.) approx. Width: 22 cm (8.7 in.) approx. Depth: 17.6 cm (6.9 in.) approx.
<b>Unit Weight</b>	Mediatrix 4401/4402/4404 = 458g Mediatrix 4401+/4402+/4404+ = 514g

Other measurements available on request.

## Standards Compliance

### ✘ Agency Approvals

- CE Marking

### ✘ Safety Standards

- IEC 60950 (1st Edition 2001 With all national deviations)

### ✘ Emissions

- EN55022 (1998) Class B
- EN61000-3-2 (2000) Harmonic current emissions
- EN61000-3-3 (1995) Voltage fluctuations and flicker (with amendment A1)

### ✘ Immunity

EN55024 (1998), with amendments A1 and A2 including the following:

- 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 (1994), Voltage Dips and Interruptions

## Models

The Mediatrix 4400 Series comes in the following models:

Model	Interfaces	VoIP Call Capacity
Mediatrix 4401/4401 <i>plus</i>	1 BRI port	Up to 2
Mediatrix 4402/4402 <i>plus</i>	2 BRI ports	Up to 4
Mediatrix 4404/4404 <i>plus</i>	4 BRI ports	Up to 8

## Mediatrix SDK (Software Development Kit)

- Enables developers and content authors to create rich, integrated VoIP applications for their specific requirements
- Available for download free of charge at <http://mediatrixsdk.media5corp.com>

## Warranty

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

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