



**Mediatrix®**

**4100 Series**

The Mediatrix® 4100 Series access devices are high-quality and cost efficient VoIP gateways connecting larger branch offices and multi-tenant buildings to an IP network, while preserving investment in analog telephones and faxes.

The Mediatrix 4100 Series access devices allow Service Providers to deploy rapidly and economically their solutions in medium-size premises and they are the ideal solution for branch office connectivity to larger private networks.



## Product Overview

### Key Benefits

#### ☒ Best Total Cost of Ownership

- Ease of deployment & management with autoprovisioning
- Protect analog telephony investments with the VoIP benefits

#### ☒ Best Price Quality Ratio

- High Voice Quality and Reliability
- Wide support of countries

#### ☒ Brand New Mediatrix Package for VoIP FXS Interfaces

- Extended range of port density (8, 16, or 24 FXS)
- Secured SIP signalling and media transmission
- Transparent replacement of Mediatrix 1100 Series

#### The Mediatrix 4100 Series connects up to 24 analog phones and/or faxes to a broadband modem or LAN.

The Mediatrix 4100 Series enables cost-effective VoIP deployments in medium-size branch offices and multi-tenant applications.

The Mediatrix 4100 has the additional benefit of supporting high compression codec's simultaneously on each analog voice ports, thus saving valuable bandwidth.

As all other Mediatrix devices, the 4100 Series provides web interface, giving users a convenient access to the unit for initial set-up. The devices can also auto-provision by fetching their encrypted configuration from a TFTP or HTTP server making installation secure and transparent to the end-users. To further facilitate deployments, factory loaded configurations are possible.

In addition, an intelligent PSTN bypass allows Mediatrix 4100 users to make emergency calls and maintain their phone service in the event of a power outage or network failure.

The Mediatrix 4100 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.

Media5 Sales Department

Americas - Tel: 1-877-GET-VOIP / (877) 438-8647 Tel: (819) 829-8749

Fax: (819) 829-5100

Europe, Middle East, Africa - Tel: 49 (0)30-3496-2085/ CALA - Tel: (954)-349-0394 Fax: (954) 349-8722

MIP-GES080915 4100TechnicalSpecifications

## Functional Description

### ✘ Models

- Mediatrix 4108 : 8 FXS ports
- Mediatrix 4116: 16 FXS ports
- Mediatrix 4124 : 24 analog FXS lines

### ✘ 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)

### ✘ FXS Extensions (Mediatrix 4124) or Ports (Mediatrix 4108/4116)

The Mediatrix 4100 is equipped with Central Office quality SLICs (Subscriber Line Interface Circuit) supporting all the BORSCHT (Battery feed, Overvoltage protection, Ringing, Signaling, Coding, Hybrid, Testing) functions and thus meeting most worldwide telephony standards. Station line length can reach up to 450 m of internal cabling in the 2-wire "loop start" signaling arrangement.

The FXS extensions support On-Hook audio transmission, thus providing many advanced CLASS features such as message waiting indication, Caller-ID FSK transmission and such.

The sinusoidal ringing signal frequency can be modified by software. Typical values range from 20 to 50 Hertz, 20 Hertz being the default frequency. Each extension provides its own ring generator and is capable of supplying up to 3 RENs (Ringer Equivalence Number).

Default settings for the FXS extensions are such that BellCore/North American standards are met. On request, port settings may be modified to comply with other known international standards. Software-configurable port setting for international requirements is available.

### ✘ Fax Interface

The Mediatrix 4100 can handle G3 fax transmissions at speeds up to 14.4 kbps. Automatic fax mode detection is also available on all extensions, 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.

### ✘ Analog Modem Interface

The Mediatrix 4100 can be used with analog modems. When configured correctly, modems with high rate capabilities (for instance, V.90) will automatically fall back within the transmission range supported.

Quality of modem transmissions is dependent upon the system configuration, quality of the analog lines, as well as the number of analog-to-digital and digital-to-analog conversions. Modem performance may therefore be reduced below the optimum values stated above.

Rear view of the Mediatrix® 4100



## ☒ Bypass Connection

The Mediatrix 4100 has an RJ-11 connector used to connect to a standard PSTN line. During normal operation, this line is *switched out* of the circuit through a commuting relay. When power is removed from the Mediatrix 4100, or if the IP network is down, the relay setting is restored to a connected state and the PSTN line can be used as an emergency *Bypass line*. Consequently, a phone/fax used on the first extension will be directly connected to this PSTN Bypass line. The Bypass line can also be triggered with a software control signal. When the error conditions have been cleared or the power is restored, Extension one stays in Bypass connection until the device connected to it is On-Hook. This safety feature ensures that an emergency call does not get disconnected from the PSTN.

## ☒ Housing & Power

The Mediatrix 4100 is designed to be rack-mounted on 19 in. industrial racks (EIA-310-D).

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

## SIP Specific Features

The Mediatrix 4100 supports the SIP signalling 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.

## MGCP/NCS Specific Features

The Mediatrix 4100 uses a Call Agent to provide specific services.

## Additional Features

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

The Mediatrix 4100 provides 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 4100 can be configured to accept almost any type of telephone number. For instance, it would be quite simple to configure a network of Mediatrix units to act as a module of a PBX, having its users dial three numbers to reach an extension. It is also very easy to configure the Mediatrix 4100 to behave like the PSTN, for example users can dial “1” and ten numbers when placing a long distance call in North America.

### ☒ Remote Configuration / Easy Management

The Mediatrix 4100 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 (in SIP v5.0 only) provides user-friendly access to common parameters. Firmware upgrade (CPU and DSP code) and configuration files are downloaded via a TFTP or HTTP server. Auto-provisioning of Mediatrix units is performed with added security through configuration file encryption and HTTP digest authentication.

### ☒ Industry Standard Protocols

The Mediatrix 4100 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® 4100 can be integrated with existing telephone, fax and LAN/WAN equipment such as bridges, routers and switches.

## Supported Standards

The following standards are supported:

### ☒ Vcoders

- G.711 (a-law,  $\mu$ -law)
- G.723.1a
- G.726 (40, 32, 24, 16 kbit/s)
- G.729ab

### ☒ IP Telephony Protocols

- SIP
  - RFC 3261
- MGCP
  - RFC 3435
- PacketCable™ network-based call signaling (NCS) protocol, PKT-SP-EC-MGCP-I01-990312

### ☒ Real-Time Transport Protocols

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

### ☒ Network Management Protocols

- SNMPv3
- HTTP 1.0

- RFC 1945
- Basic and digest HTTP authentication
  - RFC 2617
- DHCP
  - RFC 2131
  - RFC 2132
- TFTP
  - RFC 1350
  - RFC 2347
  - RFC 2348
  - RFC 2349
- Syslog
- TR-069 for massive deployments (optional feature available at purchase time)

### ☒ QoS

- ToS
- DiffServ
- 802.1p
- 802.1Q
- STUN
  - RFC 3489

## General Specifications

### ☒ Display

- Power LED
- LAN activity LED
- Activity/In-Use LED indication on FXS ports
- Ready LED

### ☒ Connectors

- Mediatrix 4124: 1 RJ-21X TELCO 25 pairs connector, analog phone/fax (FXS) interface
- Mediatrix 4116: 16 RJ-11 connectors, analog phone/fax (FXS) interface
- Mediatrix 4108: 8 RJ-11 connectors, analog phone/fax (FXS) interface
- 1 RJ-11 connector, PSTN bypass
- 1 RJ-45 connector, 10/100 BaseT Ethernet access (autosense: up to 100 Mbps)

### ☒ Power

- AC: Standard power cord receptacle (IEC 320 – C14) for universal AC input internal SMPS
- Seamless switch over period if the client UPS detects a power loss and activates within 8 ms.

### ☒ Casing / Mechanical

- Casing: Plastic ABS UL94 5V
- Installation: rack-mountable, 1U size

### ☒ Product Architecture Details

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

### ☒ Real Time Fax Router Technical Specifications

Automatic selection between voice and fax

<b>Protocols</b>	Group 3 Fax Clear channel (G.711), G.726 or T.38 Real Time Fax Over IP protocol Stack
<b>Fax Data Compression</b>	MH
<b>Fax Transmission Protocols</b>	Up to 14.4 kbps

### ☒ Analog Line Interface (FXS)

- Mediatrix 4124: RJ21X connector
- Mediatrix 4108/4116: RJ-11 connectors
- Direct connection to a fax machine or telephone (Internal installation and internal cabling)
- DC feeding of the access line protected for over voltage
- Loop current detection and hook flash detection capable
- Generation of Selective Ring

<b>Trunk Type</b>	Loop Start: capable of Wink and Immediate signalization
<b>Ring Source</b>	45 VRMS max @ 20 up to 50 Hz (selectable) sine signal
<b>Nominal Impedance</b>	BellCore compliant 600/900 ohms default setting. Impedance Software

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	Configurable.
<b>Ring Drive Capacity</b>	Up to 3 ringer equivalents (3 RENs) per extension
<b>Loop Current Range</b>	15 to 32 mA factory set. Default 20 mA regulated
<b>Ring Trip Detection Time</b>	2 ring cycles max
<b>On-Hook Voltage</b>	-48 VDC
<b>Freq. Response</b>	200 Hz to 3400 Hz ± 2 dB (Tx/Rx)
<b>Return Loss</b>	500-3200 Hz: 30 dB

**☒ Miscellaneous Audio Specifications**

- Software input and output level adjustable within the range -30 dB to +20 dB.
- Software-adjustable dynamic and static jitter buffer protection.
- Programmable by country: Call progress tone generation including dial tone, busy tone, ringback and error tones.
- DSP-based echo control device.
- Silence detection/suppression level software adjustable.

**☒ DTMF Tone Detection**

<b>16 Digit DTMF Decoding</b>	0 to 9, *, #, A, B, C, D
<b>Permitted Amplitude Tilt</b>	High frequency can be +4 dB to -8 dB relative to low frequency
<b>Dynamic Range</b>	-25 dBm to 0 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>	-8 dBm to -5 dBm
<b>Frequency Deviation</b>	Within 1.5% of nominal values

**☒ 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

**☒ MTBF Value (preliminary evaluation)**

The estimated Mean Time Before Failure (MTBF) value of the Mediatrix 4100 is 180 000 hours at 25 degrees Celsius ambient temperature. It has been defined using RelCalc v5.0, Bellcore method (LimitedStress - Method I, Case 3) with 4 extensions ringing, 20 on standby.

**☒ Power Consumption – Mediatrix 4108**

<b>Idle Mode: 120Vac</b>	18W 27VA
<b>Idle Mode: 240Vac</b>	20W 42VA
<b>All ports ringing into 3 REN each: 120Vac</b>	25W 37VA
<b>All ports ringing into 3 REN each: 240Vac</b>	28W 56VA

**☒ Power Consumption – Mediatrix 4116**

<b>Idle Mode: 120Vac</b>	30W 44VA
<b>Idle Mode: 240Vac</b>	34W 66VA
<b>All ports ringing into 3 REN each: 120Vac</b>	43W 64VA
<b>All ports ringing into 3 REN each: 240Vac</b>	43W 82VA

**☒ Power Consumption – Mediatrix 4124**

<b>Idle Mode: 120Vac</b>	43W 65VA
<b>Idle Mode: 240Vac</b>	43W 86VA

All ports ringing into 3 REN each: 120Vac	66W 70VA
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All ports ringing into 3 REN each: 240Vac	66W 120VA
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#### ☒ Thermal Dissipation (W) – Mediatrix 4108

Idle Mode: 120Vac	17W
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Idle Mode: 240Vac	19W
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All ports ringing into 3 REN each: 120Vac	15W
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All ports ringing into 3 REN each: 240Vac	18W
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#### ☒ Thermal Dissipation (W) – Mediatrix 4116

Idle Mode: 120Vac	28.5W
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Idle Mode: 240Vac	32.5W
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All ports ringing into 3 REN each: 120Vac	23.5W
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All ports ringing into 3 REN each: 240Vac	23.5W
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#### ☒ Thermal Dissipation (W) – Mediatrix 4124

Idle Mode: 120Vac	41W
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Idle Mode: 240Vac	41W
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All ports ringing into 3 REN each: 120Vac	37W
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All ports ringing into 3 REN each: 240Vac	37W
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#### ☒ Operating Environment

Operating Temperature	0°C to 40°C
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Humidity	Up to 85 %, non-condensing
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Storage	-20°C to +70°C
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#### ☒ Dimensions and Weight

Height	4.4 cm (1.74 in.) approx.
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Width	43 cm (17.19 in.) approx.
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Depth	21 cm (8.4 in.) approx.
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Weight	1.7 kg (3.7 lbs)
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## Standards Compliance

#### ☒ Agency Approvals

- UL
- CE Marking
- FCC
- Anatel
- NOM

#### ☒ Safety Standards

- UL60950 3rd Edition (2000)
- CAN/CSA-C22.2 No. 60950-00
- IEC 60950 1st Edition (2001), with all national deviations
- Anatel Resolution 238:2000
- NOM-019-SCFI-1998

#### ☒ Emissions

- FCC Part 15 (1998) Class B
- EN55022 (1994) Class B, with amendments A1 and A2
- EN61000-3-2 (1995) Harmonic Current Emissions
- EN61000-3-3 (1995) Voltage Fluctuations and Flicker
- Anatel Resolution 237:2000

#### ☒ Immunity

- EN55024 (1998) and A1 (2001) 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 (1995), Voltage Dips and Interruptions

#### ☒ Telecom

- FCC Part 68:Subpart D
- Industry Canada CS-03 Issue 8, Part 1
- TBR21:January 1998

## Mediatrix SDK (Software Development Kit)

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- 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

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All products carry Media5 standard three-year hardware and software warranty.

An extended warranty is available.

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