The Mediatrix® 1104 is a high-quality and cost efficient VoIP gateway connecting small offices to an IP network, while preserving investment in analog telephones and faxes.

It allows Service Providers to deploy rapidly and economically their solutions in SOHOs and it is the ideal solution for small branch office connection to larger private networks.

Key Benefits

Voice Functionalities

- Carrier-grade voice quality
- T.38 support
- PSTN bypass option

Ease of configuration and management

- Automatic firmware and configuration file download
- SNMP and web management
- TFTP or HTTP auto-provisioning

Security

- Support for SNMPv3
- Encrypted configuration files support
- HTTP Digest authentication

Network functionalities

- QoS Support
- DHCP client
- STUN Cient
- Interoperable with equipment from leading industry vendors

Mediatrix® 1104

4-port VoIP Access Device

Mediatrix 1104 Overview

The Mediatrix 1104 connects up to 4 analog phones and/or faxes to a broadband modem.

The Mediatrix 1104 enables cost-effective VoIP deployments in small offices for both IP Centrex and private network applications.

The Mediatrix 1104 has the additional benefit of supporting high compression codecs simultaneously on each analog voice ports, thus saving valuable bandwidth.

As all other Mediatrix devices, the 1104 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 optional intelligent PSTN bypass allows Mediatrix 1104 users to make emergency calls and maintain their phone service in the event of a power outage or network failure.

VoIPowered By Mediatrix®

Functional Description

FXS Ports

The Mediatrix 1104 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 450m in the 2-wire “loop start” signaling arrangement.

The FXS ports 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 port provides its own ring generator and is capable of supplying up to 3 RENs (Ringer Equivalence Number).

Default settings for the FXS ports 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 1104 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.

Analog Modem Interface

The Mediatrix 1104 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.

Bypass Connection

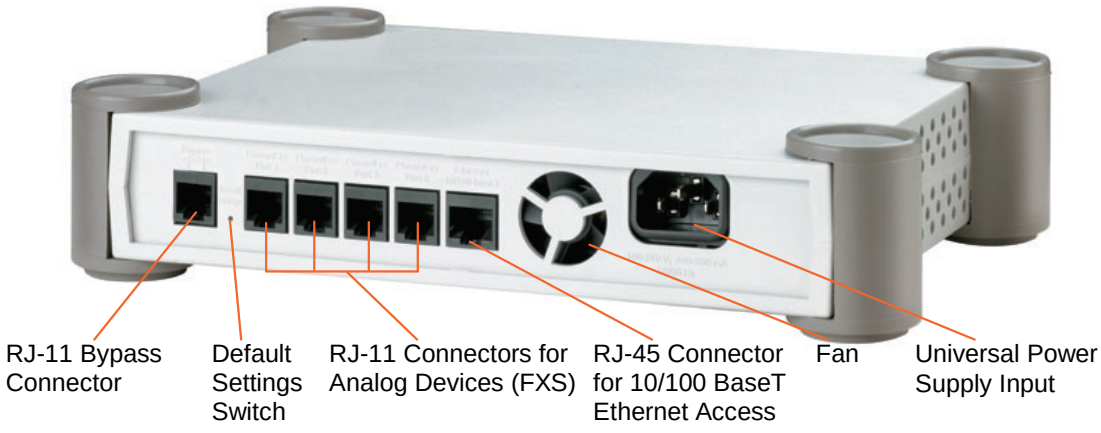
In addition to the four ports, the Mediatrix 1104 has a fifth RJ-11 connector used to connect to a standard PSTN line. During normal operation, this line is *switched out* of the circuit through commuting relay. When power is removed from the Mediatrix 1104, or if the IP network is down, the relay setting is restored to a connected state and the PSTN line can be used as an emergency *Bypass line*. Consequently, a phone/fax used on FXS port one 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, Port 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 1104 is designed to be desktop stackable. With the appropriate optional mounting kit, the Mediatrix 1104 can be wall-mounted or rack-mounted.

The unit is powered by an internal universal power supply connected to the AC main with a standard IEC-320 power cord.

Rear view of the Mediatrix® 1104



SIP Specific Features

The Mediatrix 1104 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.

Full Integration with the Mediatrix Communication Server

When a number is dialed, the Mediatrix 1104 contacts the IP Communication Server and the server searches through its internal database to translate the dialed number to a corresponding IP address. If there is no match, the server will locate a gateway and place the call on the public switched telephone network (PSTN).

MGCP / NCS Specific Features

The Mediatrix 1104 uses a Call Agent to provide specific services.

H.323 Specific Features

The Mediatrix 1104 uses a Gatekeeper to provide specific services.

Additional Features

Fully Configurable "PSTN-Like" Experience

The Mediatrix 1104 generates all the familiar tones commonly heard on a standard telephone network. For example, a dial tone will be heard as soon as the handset is lifted. Call progress tones such as ringback and busy are also supported.

The Mediatrix 1104 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, where users could dial three numbers to reach an extension. It is also very easy to configure the Mediatrix 1104 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 1104 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 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 1104 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 1104 can be integrated with existing telephone, fax and LAN/WAN equipment such as bridges, routers and switches.

The following standards are supported:

Vocoders	• G.711 (a-law, μ-law) • G.723.1 (H.323 v4.0) • G.723.1a • G.726 (SIP v5.0, MGCP v5.0) • G.729a (SIP v4.4, H.323 v4.0, MGCP v4.4) • G.729ab
IP Telephony Protocols	• SIP – RFC2543, RFC3261 • H.323v3 • MGCP • PacketCable™ network-based call signaling (NCS) protocol, PKT-SP-EC-MGCP-I01-990312
Real-Time Transport Protocols	• RTP/RTCP – RFC1889, RFC1890, RFC2833, RFC3389
Network Management Protocols	• SNMPv3 • HTTP 1.0 – RFC1945 (SIP v5.0, H.323 v2.4) • Basic and digest HTTP authentication – RFC2617 (SIP v5.0) • DHCP – RFC2131, RFC2132 • TFTP – RFC1350, RFC2347, RFC2348, RFC2349 • Syslog
QoS	• ToS • DiffServ • 802.1p • 802.1Q

General Specifications

Display

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

Connectors

- 4 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 Mbits)

Power

- Integrated universal power supply input that can accept 100 to 240 Vac, 50/60 Hz input.
- Seamless switch over period if the client UPS detects a power loss and activates within 8 ms.

Casing / Mechanical

Casing: Desktop (Plastic ABS UL94 V0), stackable

Product Architecture Details

- Supports 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

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

Analog Line Interface (FXS)

- Direct connection to a fax machine or telephone
- RJ-11 connector
- DC feeding of the access line protected for over voltage
- Loop current detection and hook flash detection capable
- Generation of Selective Ring

Trunk Type	Loop Start: capable of Wink and Immediate signalization
Ring Source	45 VRMS max @ 20 up to 50 Hz (selectable) sine signal
Nominal Impedance	BellCore compliant 600/900 ohms default setting. Impedance Software Configurable.
Ring Drive Capacity	Up to 3 ringer equivalents (3 RENs) per port
Loop Current Range	15 to 32 mA factory set. Default 20 mA regulated
Ring Trip Detection Time	2 ring cycles max
On-Hook Voltage	-48 VDC
Freq. Response	200 Hz to 3400 Hz ± 3dB (Tx/Rx)
Return Loss	500-3200 Hz: 30 dB

Miscellaneous Audio Specifications

- Software input and output level adjustable within the range of -36 dB to +12 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

16 Digit DTMF Decoding	0 to 9, *, #, A, B, C, D
Permitted Amplitude Tilt	High frequency can be +4 dB to -8 dB relative to low frequency
Dynamic Range	-25 dBm to 0 dBm per tone
Frequency Accept	± 1.5% of nominal frequencies
Minimum Tone Duration	40 ms, can be increased with software configuration
Interdigit Timing	Detects like digits with a 40 ms interdigit delay

DTMF Tone Generation

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

Standards Compliance

Agency Approvals	• UL • CE Marking • FCC • JATE • Anatel • NOM
Safety Standards	• UL60950 3rd Edition (2000) • CAN/CSA-C22.2 No. 60950-00 • IEC 60950 3rd Edition (1999), 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) 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 • TBR 21:January 1998

MTBF Value

The Mean Time Before Failure (MTBF) value of the Mediatrix 1104 is 265 000 hours at 25 degrees Celsius ambient temperature. It has been defined using RelCalc v5.0, Bellcore method (LimitedStress - Method I, Case 3), Desktop unit.

Power Consumption

Idle Mode; 85Vac	I = 220 mA P = 8.5 W
Idle Mode; 265Vac	I = 120 mA P = 11 W
Ringing Mode (worst case); 85Vac	I = 350 mA P = 14.5 W
Ringing Mode (worst case); 265Vac	I = 175 mA P = 17.25 W

Operating Environment

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

Dimensions and Weight

Without Rack Mounting Tabs	4.5 cm x 22 cm x 18 cm – 1.8 x 8.8 x 7.2 in. (approx.)
With Rack Mounting Tabs	4.5 cm x 23 cm x 18 cm – 1.8 x 9.2 x 7.2 in. (approx.)
With Rubber Feet	5.5 cm x 26.2 cm x 17.8 cm – 2.2 x 10.3 x 7.0 in. (approx.)
Weight	816 g (1.8 lb)

Warranty

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

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