

# Megaplex-104, Megaplex-204

## Compact Voice Channel Banks



### FEATURES

- Cost effective compact channel banks provide analog FXS interfaces for PCM transmission of voice over E1:
  - Megaplex-104 supports 8 voice channels
  - Megaplex-204 supports 16 voice channels
- Single E1 uplink
- Adjustable gain levels per channel, for both receive and transmit
- PCM encoding, using A-Law or  $\mu$ -Law companding
- In-band and out-of-band management support
- Management performed using user terminal, SNMP, Telnet or Web browser
- Each FXS port supports loop-start, polarity reversal, metering pulse generation
- Caller ID enabled
- Support for Group III fax
- Complete default startup configuration upon initial operation
- Enhanced diagnostics, including tone injection per channel
- External power supply for Megaplex-104; internal power supply for Megaplex-204
- Internal ringer supplies telephones with required DC feed and ringing voltages

### DESCRIPTION

- Megaplex-104 and Megaplex-204 are cost-effective voice channel banks designed specifically for small point-of-presence (POP) applications, such as wireless connectivity (see Figure 1). Both units have a single E1 uplink and support up to 8 or 16 FXS voice channels, respectively. The channels support various analog voice features that are required by voice service providers.
- Encoding and decoding are in full compliance with ITU-T requirements G.712 and G.713.

Voice channel companding is selectable for A-law or  $\mu$ -law.

- Each 64 kbps PCM voice channel is allocated a timeslot on the Fractional E1 main link in a DS0 compatible format, permitting voice channel switching by digital cross-connect systems (DACS). Multipoint applications over E1 networks are supported, where compact Megaplex-104/204 units at various branch locations communicate with a higher density Megaplex-2100 Modular Integrated Access Multiplexer at the main office, extending PBX services (see Figure 2). By cross-connecting timeslots via the DACS, any voice channel at one branch can be connected to any channel at another branch, providing an any-to-any connectivity.
- In addition to basic loop-start signaling for POTS, each 2-wire FXS port supports reverse polarity and 12/16 kHz metering pulse generation, thereby meeting the specifications for public payphones. An internal ringer supplies the required feed and ringing voltages for the connected telephones, without the need for an external DC power source.

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- FXS interfaces are typically used for direct connection to 2-wire telephones in the following loop-start applications:
  - Off-Premises Extension (OPX), where a telephone connected to the local PBX can be connected to an off-premises telephone, by dialing only the extension number assigned to the off-premises telephone;
  - Private Line, Automatic Ringdown application (PLAR) (also referred to as Hot Line), where two telephones are connected directly via the E1 link. When the telephone on one side goes off-hook, the other telephone rings;
  - Direct connection to 2-wire telephones in PSTN applications.
- Each FXS port supports caller ID by transparently transferring the FSK modem tones between the incoming rings. With this feature, a customer subscribed to a Caller ID service can see the Caller ID of an incoming or waiting call with any Caller ID display equipment.
- In-band fax support for Group III fax machines complies with T.4 and T.30.
- The compact size of the units is convenient for small office or residential locations. Both are suitable for desktop operation, wall-mounting or mounting in standard 19" racks:
  - Megaplex-104 is a 9" wide, 1U high unit with a plastic chassis. It uses an external power supply (included with unit);
  - Megaplex-204 is a 17" wide, 1U high unit with a metal chassis. It features an internal power supply.

**Note:** To install Megaplex-104 in a 19" rack, an **RM-33** mounting hardware kit should be ordered.

- Megaplex-104 and Megaplex-204 support either loopback timing (LBT mode) or timing from the internal clock (INT mode).
- Gain control is software selectable for both the receive and transmit directions, enabling easy installation in all environments.
- Diagnostic features include loopbacks on the FXS channels towards the remote user equipment and loopbacks on the E1 link to both the local and remote sides. Test tone injection of 1 kHz, 0 dBm0 towards the remote or local equipment is also available. Monitoring of the E1 link receive and transmit signaling, as well as port statistics is supported.

## CONFIGURATION AND MANAGEMENT

- All operating parameters of the Megaplex-104/204 units are configured using a simple, menu-based software. For upgrades or backup, software upload and download can be performed via TFTP.
- When initially turned on, Megaplex-104/204 operates with a complete default startup configuration. Timeslots are allocated automatically for all connected channels and for the channel signaling. This saves time and enables an almost plug & play capability for basic applications.
- Megaplex-104/204 can be configured and monitored via a local ASCII terminal, Telnet, or via an SNMP management system. A dedicated RJ-45 serial port is provided for connecting a local terminal. For off-site management, a terminal can also be connected via a modem extension to the serial port. Management can also be performed via a user-friendly graphic interface using a Web browser.
- Remote management can be transmitted in-band over the E1 uplink or out-of-band via the Ethernet port (TS 31 is automatically allocated for in-band management by the startup configuration). All operating parameters are configurable via the management system for both the local and remote units.

## APPLICATIONS

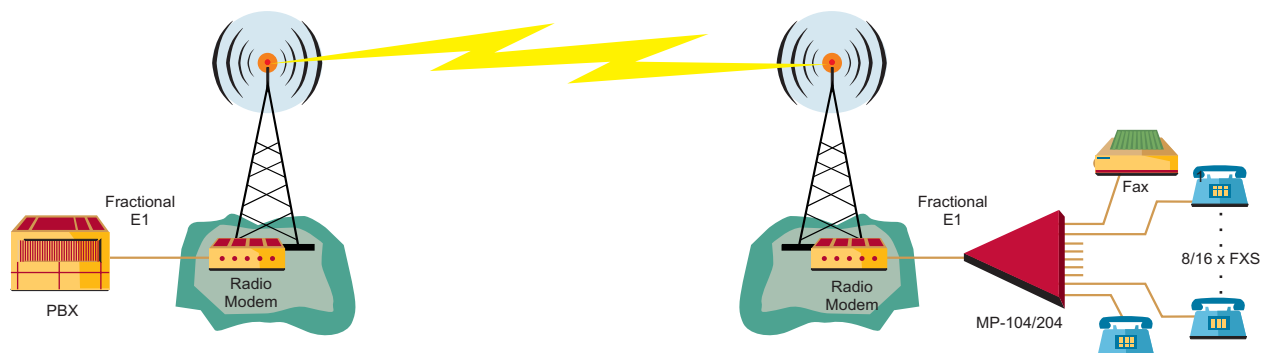


Figure 1. Wireless Application

# Megaplex-104, Megaplex-204

## Compact Voice Channel Banks

### SPECIFICATIONS

#### VOICE CHANNELS

- **Number of Channels**  
MP-104: 8 channels  
MP-204: 16 channels
- **Bandwidth Requirement**  
64 Kbps (one timeslot) per enabled channel
- **Voice Encoding**  
PCM (per ITU-T G.711 and AT&T PUB-43801), A-law or  $\mu$ -law
- **Analog Voice Interface**  
ITU-T standards: G.713, 2-wire for voice and signaling  
Nominal level: 0 dBm  
Nominal impedance: 600 $\Omega$   
Return loss (300 to 3400 Hz): Better than 20 dB  
Frequency response (Ref:1020Hz):  
300 to 3000 Hz:  $\pm 0.5$  dB  
250 to 3400 Hz:  $\pm 1.1$  dB

Level adjustment (soft-selectable):  
TX: +5 dBm to -10 dBm  
RX: +5 dBm to -10 dBm  
Steps: 0.5dB ( $\pm 0.1$  dB), nominal  
Signal to total distortion, G.712, G.713 method 2:  
0 to -30 dBm0:  
Better than 33 dB  
+3 to -45 dBm0  
Better than 22 dB  
Idle channel noise: better than -70 dBm0 (+20 dBnc)

- **FXS Interface**  
Signaling method:  
EIA RS-464 loop-start  
**On-Hook/Off-Hook threshold:**  
3 to 24 VDC between Tip and Ring at Off-Hook state  
Higher than 25 VDC between Tip and Ring at On-Hook state

#### Ringer:

Voltage: 50 VRMS ( $\pm 10\%$ ), overload protected,  
Frequency: 20, 25, or 50 Hz ( $\pm 10\%$ ), soft-selectable  
Cadence: 1 second ON, 3 seconds OFF (default); up to 4 different cadencies can be set by user

#### Metering pulse generation:

Output frequency:  
12 or 16 kHz ( $\pm 2$  Hz), soft-selectable  
Output level: 1.7 VRMS

- **End-to-End Signaling**  
Channel associated signaling per ITU-T G.704 para. 3.3.3.2, 500 samples per second.
- **Connectors (per channel)**  
6-pin RJ-12

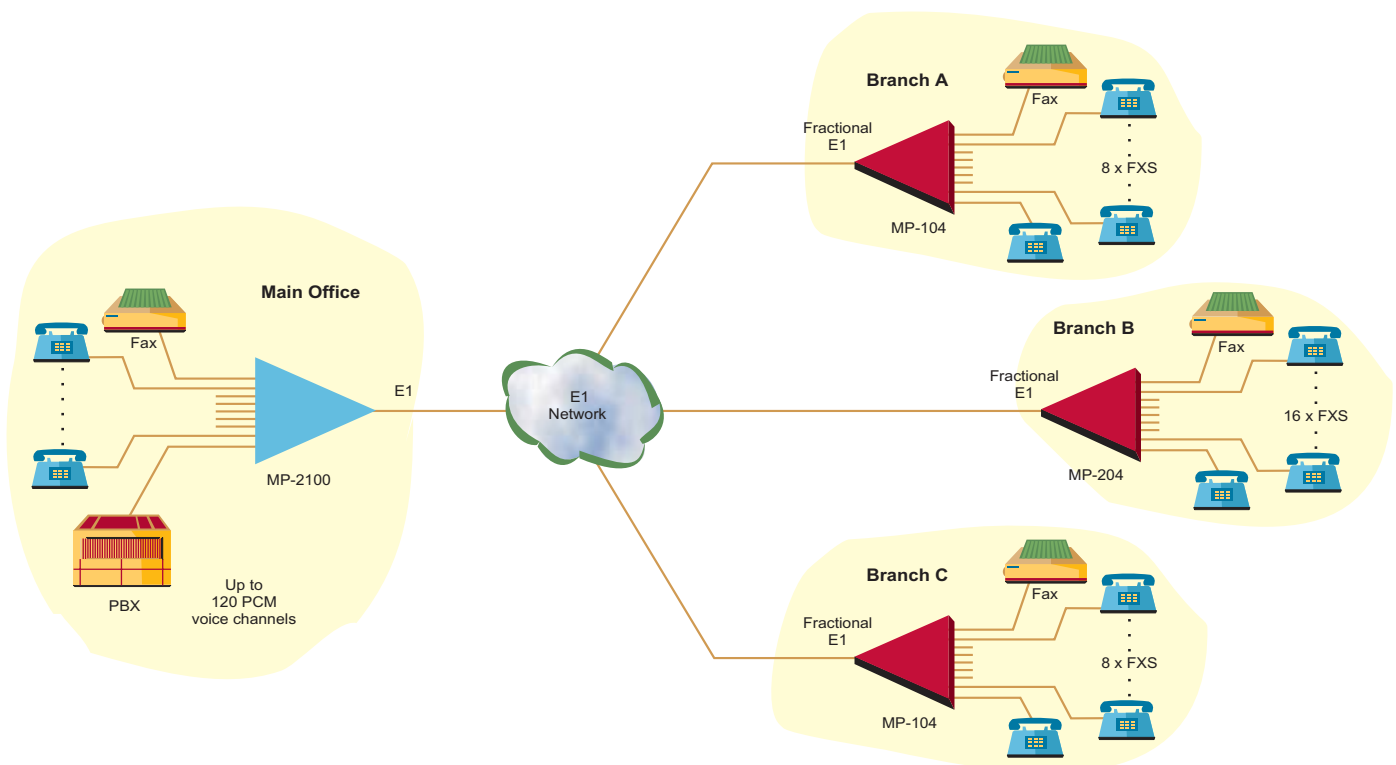


Figure 2. Multipoint Office Application

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## Compact Voice Channel Banks

### E1 MAIN LINK

- **Compliance**  
ITU-T Rec. G.703, G.706, G.732, G.823
- **Framing**  
G.732N  
G.732N with CRC-4  
G.732S  
G.732S with CRC-4
- **Data Rate**  
2.048 Mbps (nominal)
- **Line Code**  
HDB3
- **Line Impedance**  
120Ω for balanced,  
75Ω for unbalanced  
(jumper-selectable)
- **Signal Levels**  
Receive level:  
0 to -36 dB with LTU  
0 to -10 dB without LTU  
Transmit level: ±3V (±10%)
- **Jitter Performance**  
Per ITU-T G.823
- **Timing Modes**  
LBT mode: MP-104/204 uses  
clock derived from the E1 link  
INT mode: MP-104/204 locks  
timing to its internal oscillator
- **Connector**  
8-pin RJ-45  
*Note:* MP-CBL-RJ45/2BNC/E1 adapter can  
be ordered for converting the main link  
RJ-45 connector into a pair of BNC  
connectors for unbalanced coax interface.

### ETHERNET MANAGEMENT PORT

- **Interface**  
10/100BaseT
- **Layer II Protocol**  
MAC
- **Connector**  
8-pin RJ-45

### SERIAL PORT FOR TERMINAL

- **Interface**  
V.24/RS-232, asynchronous, DTE
- **Data Rate**  
9.6, 19.2, 38.4, 57.6 or  
115.2 kbps
- **Connector**  
8-pin RJ-45

### GENERAL

- **Management**
  - ASCII terminal directly  
connected to Serial port
  - Remote terminal via Telnet
  - RADview or other SNMP  
management system
  - Web-based graphic terminal  
interface
- **Power**  
Input (both): 100 to 240 VAC,  
50/60 Hz  
**MP-104**  
Requires external AC power  
supply (supplied with unit)
  - Connector: 8-pin (2 rows of  
4-pins) molex for external power  
supply
  - Power consumption:  
+5.0 VDC: 0.05A  
+3.3 VDC: 1.2A  
-33 VDC: 0.3A**MP-204**  
Includes internal AC power supply
  - Connector: standard 3-prong AC  
power connector
  - Power consumption:  
+5.0 VDC: 0.05A  
+3.3 VDC: 1.2A  
-33 VDC: 0.55A
- **Diagnostics**  
Per FXS channels:
  - Remote analog loopback
  - 1 KHz tone injection towards  
remote and local sidesE1 link:
  - Local digital loopback
  - Remote digital loopback
- **Monitoring (on E1 Link)**
  - Receive signaling
  - Transmit signaling
  - Port statistics
- **Indicators**
  - Power ON (green)
  - Alarm in unit (red)
  - Test on unit (yellow)Ethernet port:
  - Packet activity (yellow)
  - Connection OK (green)E1 link:
  - Local sync loss (red)
  - Remote sync loss (red)Per FXS channel:
  - Local Off Hook (green)
  - Remote Call (green)

- **Physical**  
**MP-104**  
Height: 4.3 cm / 1.7 in (1.U)  
Width: 23.7 cm / 9.3 in  
Depth: 17.0 cm / 6.7 in  
Weight: 0.5 kg / 1.1 lb  
(external PS: 0.4 kg / 0.9 lb)  
**MP-204**  
Height: 4.3 cm / 1.7 in (1.U)  
Width: 43.5 cm / 17.1 in  
Depth: 24.3 cm / 9.6 in  
Weight: 3.2 kg / 7.0 lb
- **Environment**  
Operating temperature:  
0 to 50°C / 32 to 122°F  
Storage temperature:  
-20 to 70°C / -4 to 158°F  
Humidity: Up to 90%,  
non-condensing

## ORDERING

### MP-104/E1/8/FXS

8-Port Compact Voice Channel Bank

### MP-204/E1/16/FXS

16-Port Compact Voice Channel Bank

### MP-CBL-RJ45/2BNC/E1

Interface adapter for converting the E1  
link's RJ-45 connector into a pair of BNC  
connectors for unbalanced coax interface

### RM-33

Hardware for mounting a single MP-104  
unit (and its power supply) in a 19" rack



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166-100-03/03