Macrotel x1 x2 Multimode

POTS, VOIP, Bluetooth or GSM professional HD Audio hybrid

The new generation of Macrotel X introduces the AxelTech Multimode Technology.

The internal framework based on DSP (Digital Signal Processor) allows to work in real time achieving the highest audio performance.

This Technology sets Macrotel X1 Multimode and Macrotel X2 Multimode as cutting-edge equipment in the telephone interface technology and allows managing one or two telephone connections: POTS (Plain Old Telephone Service) landline, VOIP, Bluetooth or GSM (with optional interface). With Macrotel X2 Multimode any technology combination is possible.

Audio enhancement features are custom designed to guarantee the best quality in phone calls. Thanks to AxelTech's ten-year experience in the field of audio processing we should consider this product not a common telephone hybrid but a Telephone Audio Processor able to shape the sound to optimize the yield of every single phone call. In fact the new Macrotel X Multimode series integrate a powerful DSP system that takes care of the telephone signal process:

- **Automatic Gain control** (AGC)
- Echo canceller
- Hold caller/Attenuator
- **Expander and Compressor**
- Audio Limiter
- 3 Bands Fully parametric **Equalizer**

The new Macrotel X Multimode range does not require the installation of any software: the unit has an integrated Web server supporting the most popular browsers (Chrome, Firefox, Explorer, Opera, etc.).

A simple and intuitive GUI can be accessed through any device: PC, notebook, tablet, smartphone, etc.

For services synchronization and logs the Macrotel connects to a NTP server.

The main XLR input and output connectors can manage analogue or AES/EBU signals according to the device settings (AES/EBU input/output is optional).

A second XLR analogue output is anyway available. In Bluetooth mode the two outputs act like a stereo balanced output.

Macrotel X Multimode is able to record the telephone calls audio on a USB flash memory plugged in the USB front panel

slot.

Audio will be recorded in PCM format with a self-explaining filename based on date/time and can include only the RX audio or both RX and TX signals.

Moreover it's possible to send an RTP-PCM audio stream to an external PC to record the call.

This recording can include only the RX audio or both RX and TX signals.

A multiple GPIO port allows to manage the device from external equipment, like audio console or PC.

System sends "Ring", "Hold", "Hook" and "REC" status and manages "Hook", "Rec", "Mode" and "Hold" functions.

On the front panel an audio meters with 18 LEDs shows the RX and TX audio level of each channel. Additional LEDs show working Mode and Power on.

Power supply can be between 90 and 260 V AC - 50/60 Hz: this allows to use it worldwide.

Models

Macrotel X1 Multimode

Macrotel X2 Multimode

Macrotel X1 & X2 Multimode

Main Features

Analog and AES/EBU digital inputs and outputs

1 line and 2 lines models

POTS/PSTN and GSM Quad Band (option)

Integrated web server for remote control

Digital AGC processor with 3 bands fully parametric EQ

Digital Echo canceller

Separate send and receive

LAN and USB ports

Auto answer and disconnection

Balanced XLR I/O (mic/line)

Remote control software and dialer

Highlights

Multi-Line digital telephone hybrid POTS/GSM/VOIP

Echo cancellation through a digital process on DSP (POTS)

Advanced audio processing functions: AGC, Parametric EQ, Audio filters, Compressor, Expander add Limiter

Internal Web Server allows device configuration

Automatic setup

1 selectable XLR input: Analog or AES/EBU (AES/EBU is optional)

1 selectable XLR output: Analog or AES/EBU (AES/EBU is optional)

1 balanced XLR analogue output

Phone call recording in PCM format on USB support (RX only or RX+TX)

Front panel Led Meters displaying RX/TX levels

Audio stream generation in RTP/PCM format (RX only or RX+TX)

Front panel LED: Gain RX, Gain TX, Mode

“Hook” and “Hold line” lighted buttons

4 GPI interfaces, 4 GPO interfaces

Integrated Caller Identifier (CID) – only for VOIP

Input and output call logs

G711-G722 VOIP audio codecs

Local telephone output (POTS)

General Functions

The integrated web server allows configuring the Macrotel X parameters through a web interface.

Web user-friendly GUI is available on any kind of device: PC, notebook, tablet, smartphone.

Macrotel X supports many TCP/IP standards such as HTTP for web GUI and UDP for streaming.

Connection to external NTP server (Internal RTC with buffer) for time synch.

Ethernet/GPIO connection available.

Stainless steel enclosure. Front panel with 22 levels and status LEDs.

Power supply: 90-260V AC 50/60 Hz - 10 W (green approach).

POTS Module

Standard RJ11 sockets for connecting the telephone line and external telephone set.

Internal DIAL system via DTMF for direct call (no need of an external telephone set).

Logs phone numbers of incoming and outgoing calls (date, call time start, call time end).

Exporting logs available on USB key.

The external telephone set can be release when the telephone hybrid hooks the line.

Automatic telephone line hooking (after a settable number of rings).

Automatic telephone line release based on the "dropped line" tone (this feature can be disabled).

Adjustable AGC, Compressor/Limiter and Equalizer parameters.

Adjustable Telephone band (Low or Hi-Cut).

Voip Module

Standard network RJ45 connector.

SIP version 2.0 (RFC 3261).

Authentication methods: SIP/IAX Dynamic Registration (Register) |

SIP Static IP authentication.

Supported audio codecs: G.711u (PCM u) | G.711a (PCM a) | G.722 | G.722.1 24/32.

Automatic telephone line hooking (after a settable number of rings).

Automatic telephone line release based on the "dropped line" tone (this feature can be disabled).

Logs phone numbers of incoming and outgoing calls (date, call time start, call time end).

Exporting logs available on USB key.

Adjustable AGC, Compressor/Limiter and Equalizer parameters.

Bluetooth Module

Fully certified Bluetooth version 3.0 audio module, compatible with Bluetooth version 2.1 + EDR, 1.2, and 1.1.

SIP version 2.0 (RFC 3261).

Embedded Bluetooth stack profiles: A2DP and HFP/HSP.

Supports iAP profile discovery for iPhone® and iPod® Bluetooth accessories G.711u.

Dual-channels differential audio input and output for highest quality audio.

Certifications: FCC, IC, CE.

Adjustable AGC, Compressor/Limiter and Equalizer parameters.

Front Panel

MACROTEL X1

Stainless steel mechanic 1 Rack Unit standard 19"

USB connector

18+4 LEDs RX/TX meters

Mode selection button

RX and TX gain buttons (+ and -)

Hook and Hold buttons

MACROTEL X2

Stainless steel mechanic 1 Rack Unit standard 19"

Two USB Connectors

18+4 LEDs RX/TX meters for each channel

Mode selection button for each channel

RX and TX gain buttons (+ and -) for each channel

Hook and Hold buttons for each channel

Rear Panel

MACROTEL X1

Universal power supply 90-240V AC - 50/60Hz – 10 Watt

Ethernet port LAN/WAN on RJ45 connector

GPIO port on DB 9

RJ11 Landline connector

RJ11 Telephone set connector

Analog/AES/EBU Output (AES/EBU is optional)

Analog Output

Analog/AES/EBU Input (AES/EBU is optional)

MACROTEL X2

Universal power supply 90-240V AC - 50/60Hz – 2x10 Watt

Two Ethernet ports LAN/WAN on RJ45 connectors

Two GPIO ports on DB 9

Two RJ11 Landline connectors

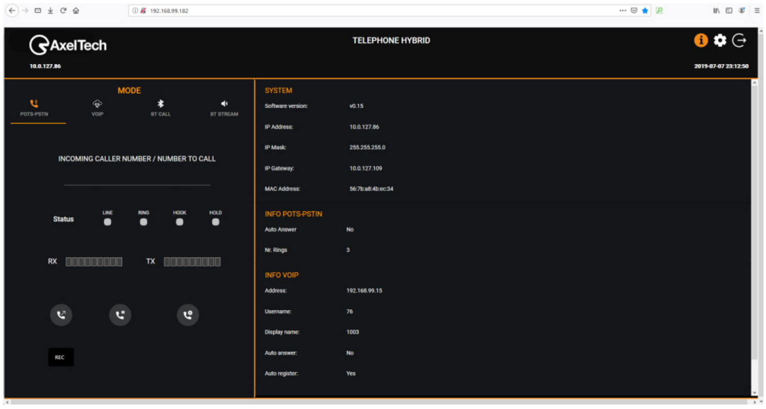
RJ11 Telephone set connectors

Channel 1 Analog/AES/EBU Output | Channel 2 Analog/AES/EBU Output

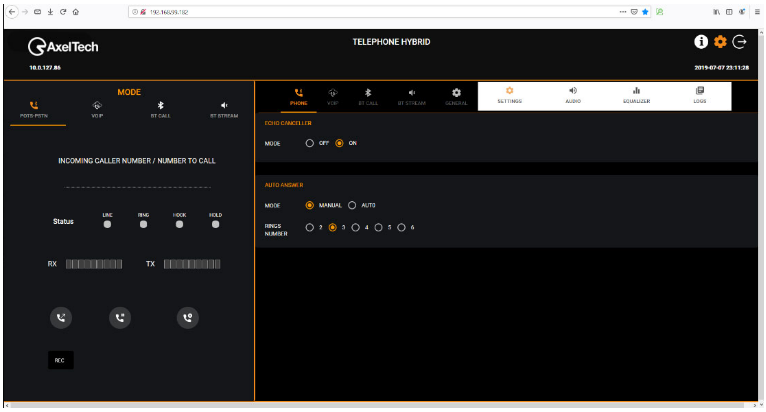
Channel 1 Analog Output | Channel 2 Analog Output

Channel 1 Analog/AES/EBU Input | Channel 2 Analog/AES/EBU Input

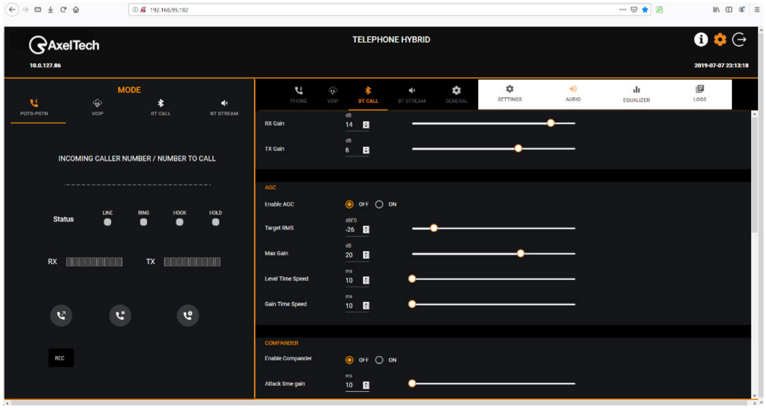
Web Interface



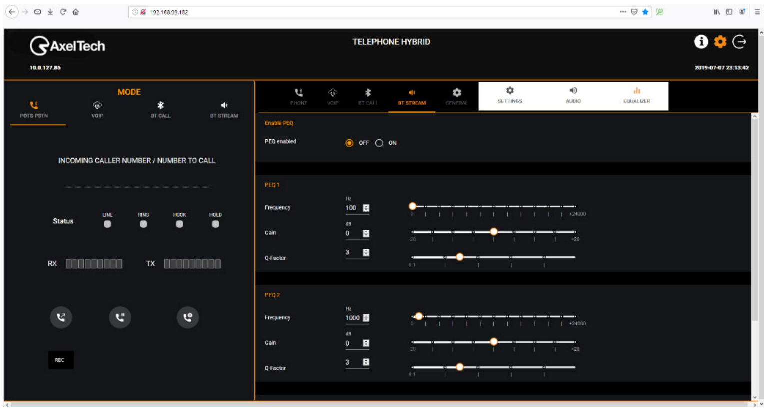
Web Interface - Main Page



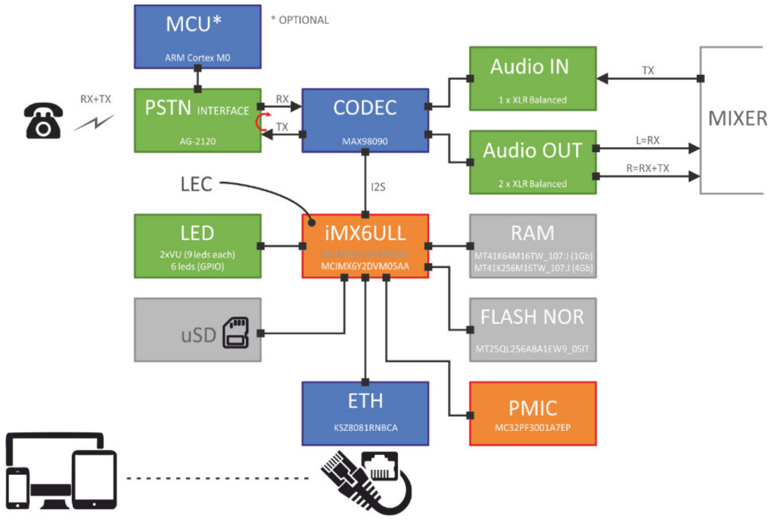
Web Interface - Phone Settings



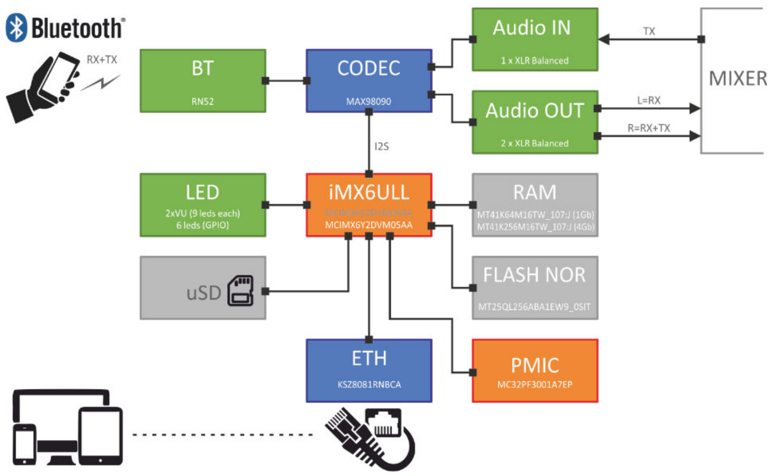
Web Interface - Audio Parameters



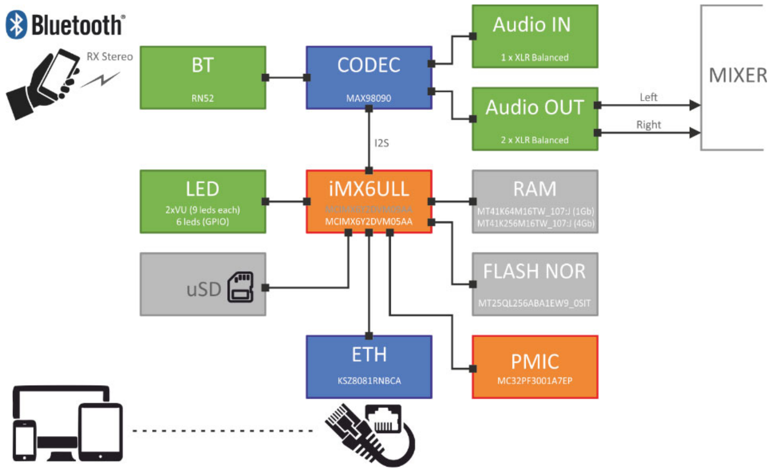
Web Interface - Bluetooth Equalization



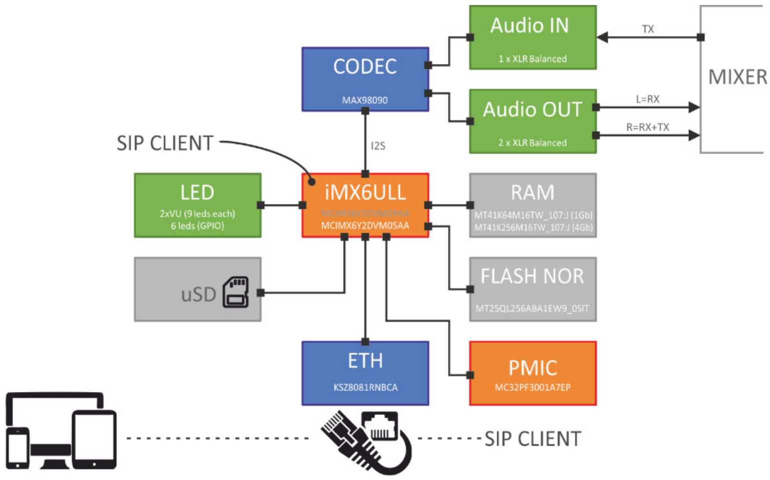
Pots Mode



Bluetooth Mode



Voip Mode



Bluetooth Stream

Technical Specification

GENERAL

Power supply:	**90-260 V AC / 47-63 Hz**

GENERAL	
Power consumption:	**10 W**
Dimensions WxHxD:	**483 x 44,5 x 140 mm (1 rack unit 19”)**
Weight:	**< 2Kg**
ANALOG AUDIO INPUT	
Connectors:	**Balanced on XLR – EMI Suppression**
Input impedance:	**50 KΩ**
Nominal Input Level (sensitivity):	**Adjustable via software: -9 dBu +15,0 dBu**
Level range:	**–20,0 dBu + 20,0 dBu**
Input level max.:	**+20,0 dBu**
CMRR input:	**>60 dB (20 Hz 20 kHz)**
DIGITAL AUDIO INPUT (OPTIONAL)	
Connectors:	**Balanced on XLR – EMI Suppression**

DIGITAL AUDIO INPUT (OPTIONAL)	
Input impedance:	**110 KΩ**
Format:	**AES3/EBU & SPDIF**
Sample rate:	**32, 44.1, 48, 64, 88.2, 96 KHz**
Nominal Input Level (sensitivity):	**From 0,0 dBFs to –24dBFs (0,1dB step)**
Level range:	**0,0 dBFs ⍰ -36dBFs**
ANALOG AUDIO OUTPUT	
Connectors:	**Balanced on XLR – EMI Suppression**
Output impedance:	**47 KΩ**
Output level:	**Adjustable via software: -9dBu ⍰ +15,0 dBu**
Level range:	**–20,0dBu ⍰ + 20,0dBu**
Output level max.:	**+ 20,0dBu**

ANALOG AUDIO OUTPUT	
CMRR output:	**>60dB (20Hz 20kHz)**
DIGITAL AUDIO OUTPUT (OPTIONAL)	
Connectors:	**Balanced on XLR – EMI Suppression**
Input impedance:	**110 KΩ**
Format:	**AES3/EBU**
Sample rate:	**32, 44.1, 48, 64, 88.2, 96 KHz**
Nominal Input Level (sensitivity):	**From 0,0 dBFs to –24dBFs**
Level range:	**0,0 dBFs -36dBFs**
POTS INTERFACE	
Connectors:	**2x RJ11 Line and Telephone set**
Output impedance:	**Selectable**

POTS INTERFACE	
Echo canceller suppression:	**> 40dB**
VOIP INTERFACE	
Version:	**SIP Version 2.0 - RFC 3261**
Codec Audio Compatibility:	**G.711u (PCM u), G.711a (PCM a), G.722, G.722.1 24/32**
Authentication Methods:	**SIP/IAX Dynamic Registration (Register) SIP Static IP authentication**
BLUETOOTH INTERFACE	
Compatibility:	**Fully certified Bluetooth version 3.0 audio module, Fully compatible with Bluetooth version 2.1+EDR Compatible with 1.2 and 1.1**
	SIP Version 2.0 - RFC 3261
Connection mode:	**Embedded Bluetooth stack profiles: A2DP and HFP/HSP**
IOS:	**Supports iAP profile discovery for**

BLUETOOTH INTERFACE

iPhone® and iPod® Bluetooth accessories G.711u (PCM u)

GENERAL

GPIO Inputs/Outputs:	4 GPI 4 GPO
Communication Port:	1xLAN
Front Panel LEDs:	18+4+2
USB:	Type A
Operating Temperature:	0°C ÷ 50°C

COMMUNICATION

Configuration Software:	Web Server
Password Protection:	Yes
UDP, TCP, HTTP, SNTP.	Yes
Supported Network Protocols:	HTTP, UDP, TCP, NTP,

Axel Technology S.R.L.
Via Caduti di Sabbiuno 6/F - 40011 - Anzola dell'Emilia (BO) Italy
sales@axeltechnology.com - www.axeltechnology.com