PHONEX & MACROTEL

BROADCAST TELEPHONE HYBRIDS

- Digital telephone hybrids based on DSP audio processing
- 1 or 2 fixed/wireless lines managed via pots or GSM QuandBand
- Advanced audio features, the hightest sound depth
- Analog and Digital balanced inputs and outputs
- Integrated DTMF encoder/decoder from/to external devices
- Remote control from any mixing console, via software, webpage and tablet

AXEL TECHNOLOGY

PHONEX D1 – PHONEX D2

- Digital Telephone hybrid based on DSP audio process
- Management of 1 or 2 POTS/PSTN line and GSM Quad Band
- Audio controls: AGC Stage, Echo canceller, De-Noiser, 2Band EQ, Ducking
- Hold and attenuator features on calls
- Auto-answer and disconnection features
- Integrated DTMF dialer via software and webpage
- Integrated DTMF decoder for automation system remote control (Start/Stop)
- Separate send and receive over balanced XLR, with Mic/Line software selection
- Remote control via Telco N-1 mixing console, software, webpage and tablet
- 1 Ethernet port, 2 Rs232 serial ports, 1 USB B-type and GPIO

PHONEX D1 – PHONEX D2 MAIN FEATURES:

PhoneX D1 and **PhoneX D2** are telephone hybrids designed for the broadcast market.

The internal frameworks based on DSP (Digital Signal Processor) hit in real time the highest audio performances, that sets **PhoneX D**1 and **PhoneX D2** as state of the art technology in the telephone interface.

PhoneX series allows analog and digital balanced AES/EBU input and output over XLR connectors with "mic/line send" features switched via software.

As in **Macrotel X1** and **X2**, the **PhoneX D1** and **D2** equipment allows to manage one or two landlines, shared with GSM Quad Band modem optionally improved, to place phone calls where wired lines are not available.
Enhanced audio features exclusively designed for phone calls such as: AGC stage, Echo canceller, De-Noiser, 2Band Equalizer, Ducking and Hold caller/Attenuator.

PhoneX D2 also allows conference calls between different participants.

PhoneX D1 and **PhoneX D2** facilitate the everyday's operators usage via front panel button, the graphic LCD display sends and receives levels for each phone hybrid, via: software pc based, any webpage and wireless devices as tablet or smart phone.

Available GPIO contact from and to Telco N-1 modules.
Available connections via two rs232 serial ports and one USB.
By option an Ethernet board to manage LAN connection can be added directly into **PhoneX D1** and **PhoneX D2**.

All audio features and operating mode can be managed locally and remotely via software, without a physical intervention over phone hybrid.
Auto-ranging internal switching power supply allows to use the equipments all over the world.

PhoneX D1 and **PhoneX D2** occupies 1 standard RU.

ORDERING INFORMATION PHONEX

Code:	Model:	Description:
A112100000	PHONEX-D1	1 line digital studio telephone hybrid (PSTN/POTS). DSP Processing, independent and balanced inputs and outputs on XLR. DTMF Decoder, ASE/EBU digital inputs and outputs. GPIN and GPOUT port for remote external control. RX/TX level visualization on LCD display. 19" 1u Rack. Universal power supply integrated.
A112110000	PHONEX-D2	2 lines digital studio telephone hybrid (PSTN/POTS). DSP Processing, independent and balanced inputs and outputs on XLR. DTMF Decoder, ASE/EBU digital inputs and outputs. GPIN and GPOUT port for remote external control. RX/TX level visualization on LCD display. 19" 1u Rack. Universal power supply integrated.
		Available Option
A112100300	PHX-LAN	Ethernet port option for LAN connections (TCP/IP) and Rs232 (Parser ASCII) for PhoneX D1 and PhoneX D2.
A112080300	GSM Module	Gsm QUADBAND module option for the management of one wireless telephone line, for PhoneX D1 and PhoneX D2 equipment.

MACROTEL X1 – MACROTEL X2

Digital Telephone hybrid based on DSP audio process •
1 or 2 land/wireless lines managed via pots or GSM Quad Band •
Audio controls: AGC Stage, Attenuator, Echo canceller, 2Band EQ •
Integrated DTMF dialer via software with auto-answer and disconnection •
Separate send and receive over balanced XLR with Mic/Line software selection •
2 Rs232 serial ports, 1 USB B-type, GPIO for Telco N-1 mixing console •

MACROTEL X1 – MACROTEL X2 MAIN FEATURES:

Macrotel X1 and **Macrotel X2** are Axel Technology's Telephone hybrid third generation for a supreme audio quality.
Macrotel X1 manages one POTS/PSTN line while **Macrotel X2** can operate on two POTS/PSTN lines.

Moreover, in every landline it is available a switching "land-to-wireless mode" through one or two optional Quad Band GSM module so to establish telephone connection where wired lines are not foreseen.
Macrotel X1 and **Macrotel X2**'s telephone interface perfectly suits every phone line all over the world.
Via software the user sets the country's operation.

The audio treatment via DSP together with the automatic gain control (A.G.C) provides a loud and clear receiving level, always steady even when frequent audio caller conditions changes.
Audio controls available on the **Macrotel X1** and **Macrotel X2** series are: echo canceller with a range from 16 to 32ms, 1 A.G.C stage, 2 Band Equalizer and Attenuator audio feature.
Furthermore, the "hold" function allows you to put the caller On Hold before being On Air.

Macrotel X1 and **Macrotel X2** front panel controls allow operators to manage phone calls easily, while the graphic display LCD shows Send and Receive audio levels.

The audio inputs / outputs are electronically balanced by XLR connectors; the send input has been designed to be managed as line level or microphone level to match perfectly each user needs.
Both telephone hybrids are manageable via USB and Serial connection, or directly from Telco N-1 mixing console modules.
The software manages the phone hybrid operability globally, that means the user can change the working audio parameters and operative mode without any physical action on the equipments.
Auto-ranging internal switching power supply allows to use the equipment all over the world.
Macrotel X1 and **Macrotel X2** fits in 1 standard RU.

ORDERING INFORMATION MACROTEL

Code:	Model:	Description:
A112080000	MACROTEL X1	1 line digital studio telephone hybrid (PSTN/POTS). DSP Processing, independent and balanced inputs and outputs on XLR, GPIN and GPOUT port for remote external control. RX/TX level visualization on LCD display. 19" 1u Rack. Universal power supply integrated.
A112090000	MACROTEL X2	2 lines digital studio telephone hybrid (PSTN/POTS). DSP Processing, independent and adjustable balanced inputs and outputs on XLR, GPIN and GPOUT port for remote external control. RX/TX level visualization on LCD display. 19" 1u Rack. Universal power supply integrated.
		Available Option
A112080300	GSM Module	Gsm QUADBAND module option for the management of one wireless telephone line, for Macrotel X1 and Macrotel X2 equipment.

TECHNICAL SPECIFICATIONS PhoneX D1 – PhoneX D2 - Macrotel X1 - Macrotel X2

TECHNICAL SPECIFICATIONS

GENERAL	PhoneX D1 - PhoneX D2	Macrotel X1 - Macrotel X2
Dimension:	434x351x44mm (1 rack unit)	
AC Rate:	230Vac / 110Vac 50 Hz / 60 Hz 30VA	
Type of power supply:	Switching power supply	
Processing architecture:	Fully digital, based on DSP 24bit/100Mhz. Signal processing is performed by phase linear filter	
Weight:	≈ 5 Kg	
Operating Temperature:	-5°C / +50°C	

ANALOG INPUT MODULE send	PhoneX D1 - PhoneX D2	Macrotel X1 - Macrotel X2
A/D Conversion:	24bit Sigma-Delta Conversion (Crystal CS4272)	
Connectors:	XLR, female - Electronically balanced	
AD Clipping Point:	+20.0dBu	
Operative Nominal Level:	From –12.0dBu to +12.0dBu (0.1dBu Step)	
Line Impedance:	10 kΩ (Electronically balanced selectable) EMI–suppressed	
Distortion:	less than 0.01% TDH+NOISE (0.0dBu 1Khz)	
AD Dynamic Range:	108 dB RMS (110 dB A weighted)	
Input Modes:	Mono	

ANALOG OUTPUT MODULE receive	PhoneX D1 - PhoneX D2	Macrotel X1 - Macrotel X2
D/A Conversion:	24bit Sigma-Delta Conversion (Crystal CS4272)	
Connectors:	XLR, male - Electronically balanced	
Output Level:	-12.0dBu to +14.0dBu (0.1dBu Step) – Max (+19dBu)	
Impedance Source:	10 Ω	
Load Impendance:	600 Ω or greater	
Distorsion:	Less than 0.01% TDH+NOISE (0.0dBu @ 1Khz)	

DIGITAL INPUT MODULE	PhoneX D1 - PhoneX D2	Macrotel X1 - Macrotel X2
D/A Conversion:	XLR, female – Electronically balanced	-
Connectors:	AES3/EBU	-
Output Level:	32 kHz / 44.1 kHz / 48 kHz / 64 kHz / 88.2 kHz / 96 kHz with src and jitter correction	-
Impedance Source:	From 0.0 dBFs to -24dBFs (0.1 dBu step)	-
Load Impendance:	125 dB (Typ), 122 dB (Min)	-
Distorsion:	less than 0.01% TDH+NOISE (0.0dBu 1Khz)	-
Modes:	Mono	-

DIGITAL OUTPUT MODULE	PhoneX D1 - PhoneX D2	Macrotel X1 - Macrotel X2
Connectors:	XLR, Male – Electronically balanced	-
Format:	AES3/EBU	-
Sample rates:	32 kHz / 44.1 kHz / 48 kHz / 64 kHz / 88.2 kHz / 96 kHz with src and jitter correction	-
Resolution:	16 bit – 20 bit – 24 bit	-
Operative Nominal level:	From 0.0 dBFs to -24dBFs (0.1 dBu step)	-
Dynamic Range:	125 dB (Typ), 122 dB (Min)	-
Distortion:	less than 0.01% TDH+NOISE (0.0dBu 1Khz)	-
Modes:	Mono Hybrid1=Hybrid2	-

TELEPHONE MODULE GSM Module	PhoneX D1 - PhoneX D2	Macrotel X1 - Macrotel X2
Type:	Quad-Band GSM 850/900/1800/1900 Mhz	
Operating temperature:	-30°C ≈ +75°C	
Dimensions:	90 x 130 x 38 mm	
Weight:	< 190 g	
Supply voltage range:	From 8 to 30Vac	
Power consuption @12V:	Power down 0.5mA, Sleep mode 29mA, Speech mode 184mA	
Antenna Interface:	SMA 50 Ω	

REMOTE INTERFACE	PhoneX D1 - PhoneX D2	Macrotel X1 - Macrotel X2
Digital GPIn GPOut:	4x GP In optocoupled - 4x GP Out Open Collector optoisolated	
Serial Interface:	1x or 2x RS-232 Serial protocol ports EMI filtered	
USB:	1x Universal Serial Bus port – B type EMI filtered	
Ethernet Port and Parser ASCII protocol:	Ethernet port by option, over RJ45 connector with web server interface.	-

Pictures and technical specs in this leaflet are provided for information purpose only and are subject to change without further notification (Ver. 2.1)

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