

MAGIC TH_{ipPro}

ISDN, POTS & VoIP Telephone Hybrid

Hardware Manual



Preliminary

MAGIC THipPro

ISDN, POTS & VoIP Telephone Hybrid

Hardware Manual

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INTRODUCTION

MAGIC THipPro is available in three basic versions (POTS, ISDN or VoIP). In the POTS version, maximum eight caller lines can be provided. In the ISDN and VoIP version systems for eight and for sixteen lines are available.

Via the two LAN interfaces on the rear side of the unit, system control and VoIP connections are realised. Independent from the type of the line interfaces MAGIC THipPro provides eight digital Audio lines (four AES/EBU interfaces) as well as two analogue Audio inputs and outputs. Additionally, two handset/headset interfaces can be used for Pretalk.

MAGIC THipPro has an integrated wide area power supply, a keypad with display and LEDs on the front side.

S A F E T Y

Introduction

The unit described is designed to the latest technical parameters and complies with all national and international safety requirements. It operates with a high level of operational safety resulting from long development experience and stringent quality control in our company.

In normal operation this equipment is safe.

There are, however, some potential sources of danger that cannot be completely eliminated.

This Operator Manual therefore contains basic safety instructions that must be observed during system configuration and operation. The Operator Manual must be read before the system is used and the current version of the document must always be kept close to the equipment.

General safety requirements

In order to keep the technically unavoidable residual risk to a minimum it is imperative to observe the following rules:

- Transport, storage and operation of the unit/system must be under the permissible conditions only.
- Installation, configuration and disassembly must be carried out only by trained personnel and with reference to the respective documentation.
- The system must be operated by knowledgeable and authorised users only.
- The system/unit must not be operated unless it is in good working order.
- Any conversions or alterations to the system or parts of the system (including the software) must be carried out by qualified personnel from the manufacturer or by expert personnel authorised by our company.
All alterations carried out by other persons lead to a complete exemption from liability.
- The removal or disabling of safety measures, the correction of faults and errors, and the maintenance of equipment must be carried out by specially qualified personnel only.
- Non-system software is used at one's own risk. The use/installation of non-system software can adversely affect the normal functioning of the system.
- Only use tested and virus-free data carriers.

Conventions

In this manual, the following conventions are used as text markers:

Emphasis: Product names or important terms

LCD TEXT: Labelling on the front display of the system

PC Text: Labelling in the PC software

TIP

The symbol **TIP** labels information which facilitates the operation of the system in its daily use.

NOTE

The symbol **NOTE** labels general notes to observe.

ATTENTION



The symbol **ATTENTION** labels very important advice that is absolutely to observe. In case of non-observance disfunctions and even system errors are possible.

1 CONSTRUCTION

MAGIC THipPro contains a mainboard with an additional connector, a display, a keypad and five LEDs. For the ISDN and POTS version two modules with the POTS or the ISDN components can be put on the mainboard.

The functions of the *MAGIC THipPro* are implemented in a 19" unit with 1U and the dimensions of 434 mm x 44,5 mm x 252 mm. *MAGIC THipPro* can be used as a table-top device or it can be mounted in 19" racks. There are some ventilation holes for a good ventilation.

FIG. 1 FRONT VIEW: MAGIC THIPPRO



FIG. 2 REAR VIEW: MAGIC THIPPRO EQUIPPED WITH ONE MODULE



2 SYSTEM DESCRIPTION

2.1

Functionality

MAGIC THipPro is available in three basic versions (POTS, ISDN or VoIP). In the POTS version, maximum eight caller lines can be provided. In the ISDN and VoIP version, systems for eight lines as well as for sixteen lines are available.

Via the two LAN interfaces on the rear side of the unit system control and VoIP connections are realised. Independent from the type of the line interfaces *MAGIC THipPro* provides eight digital Audio lines (four AES/EBU interfaces) as well as two analogue Audio inputs and outputs. Additionally, two handset/headset interfaces can be used for Pretalk.

The Hold signal can be an external, an internal (recorded or imported as file) signal or the On Air signal. Up to four different internal Hold signals can be defined.

MAGIC THipPro has an illuminated graphical display with a resolution of 160 × 32 pixels and a front keypad, which can be used for basic settings and status indications.

With the Telephone Hybrid up to 16 callers can be switched ON AIR or in PRETALK simultaneously. Additionally, there are two configureable call forwarding functions.

To optimize the Audio quality a digital Echo Cancellor, an Automatic Gain Control (AGC) and an Expander for noise suppression are available for each caller line.

3 PUTTING THE SYSTEM INTO OPERATION

3.1 Mounting

With its dimensions (W × H × D) of 434 mm × 44,5 mm (1 U) × 252 mm the *MAGIC THipPro* system can be either used as desktop device or mounted in a 19 inch rack. Corresponding 19" mounting brackets are included in delivery.

When mounting the unit please keep in mind that the bending radius of the cables is always greater than the minimum allowed value.

When the *MAGIC THipPro* Telephone Hybrid is installed, please make sure that there is sufficient air ventilation: It is recommended to keep a spacing of ca. 3 cm from the openings. In general, the ambient temperature of the system should be within the range of +5°C and +45°C. These limits are especially to observe if the system is inserted in a rack. The systems works without ventilation.

TIP

The system temperature can be indicated on the display.

During operation air humidity must range between 5% and 85%.

ATTENTION



Incorrect ambient temperature and humidity can cause functional deficiencies.

Operation outside the threshold values indicated above leads to a loss of warranty claim.

3.2 Connection to the mains voltage

The system can be operated with mains voltage in the range from 90 V to 253 V via the internal power supply and the mains type appliance cable. The line frequency can vary from 45 Hz to 65 Hz. The maximum power consumption is 15W. The rack must be earthed according to the EMC regulations. The earthing can be carried out via the earthing screw on the back side of the unit.

The unit has a circuit closer. After plugging in the mains type appliance cable and pressing the circuit closer, the system boots within a few seconds.

3.3 Earthing of the system

For EMC reasons an earthing via the earthing screw of the system must be car-

ried out in either case.

ATTENTION Earthing



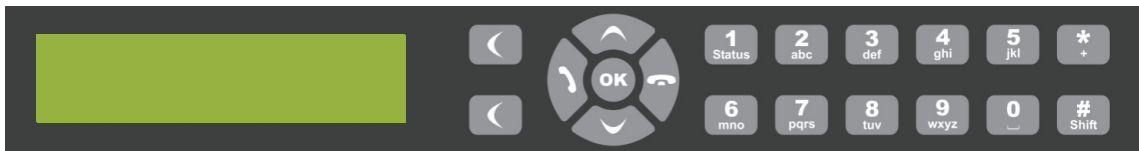
A lacking earthing can cause functional deficiencies within the unit.

3.4 Operating elements on the front side

The system has an illuminated graphical display with a resolution of 160 x 32 Pixels and 21 operating buttons.

On the right next to the display there are two softkeys whose current functions are indicated on the display. In the middle there are two buttons for navigation (selection upwards/downwards) and the **OK** button. The numerical pad supports in addition to the numerals **0...9** also the **'*** and **'#** button. For entering text the numerical pad can also be used as a normal keypad.

FIG. 3 OPERATING ELEMENTS ON THE FRONT SIDE



3.5 Alarm indication LEDs

The **MAGIC THipPro** has five LEDs for status indication.

- (1) **POWER** green
Lights up when system is ready for operation.
- (2) **SYNC** green
Lights up if at least one telephone connection is established.
- (3) **ALARM** red
Lights up if a fault has occurred in the unit. The Windows PC software provides more detailed information about the error.
- (4) **INFO 1** orange
- (5) **INFO 2** orange

3.6 Operating modes of the system

The following figures show the system in the different operating modes and their respective cablings.

3.6.1 POTS operating mode

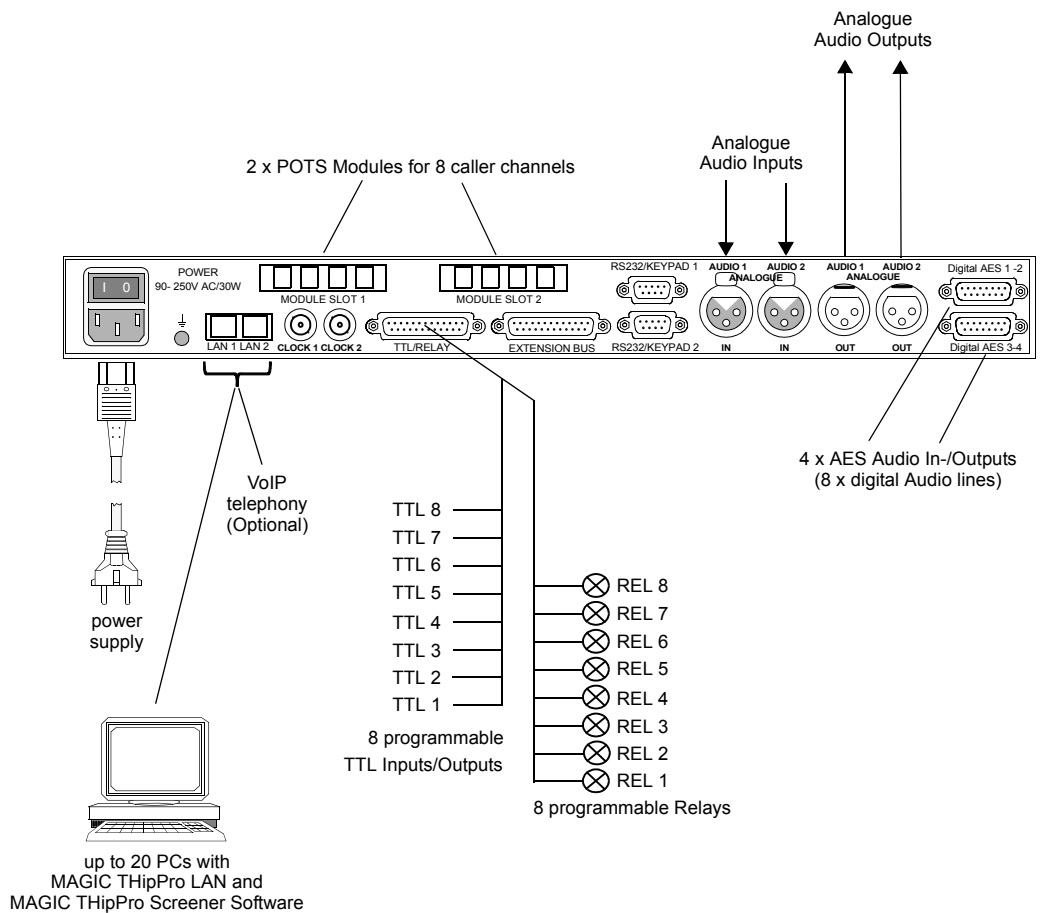
ATTENTION Earthing



If the POTS interfaces are in operation, the system must be earthed via earthing screw for EMC reasons. If the earthing is not carried out, the Audio signal can be faulty on the caller's side (humming).

The wiring for the operation is pictured in Fig. 4. *MAGIC THipPro POTS* can be equipped with two fourfold POTS modules and can be used as a eight line POTS Hybrid.

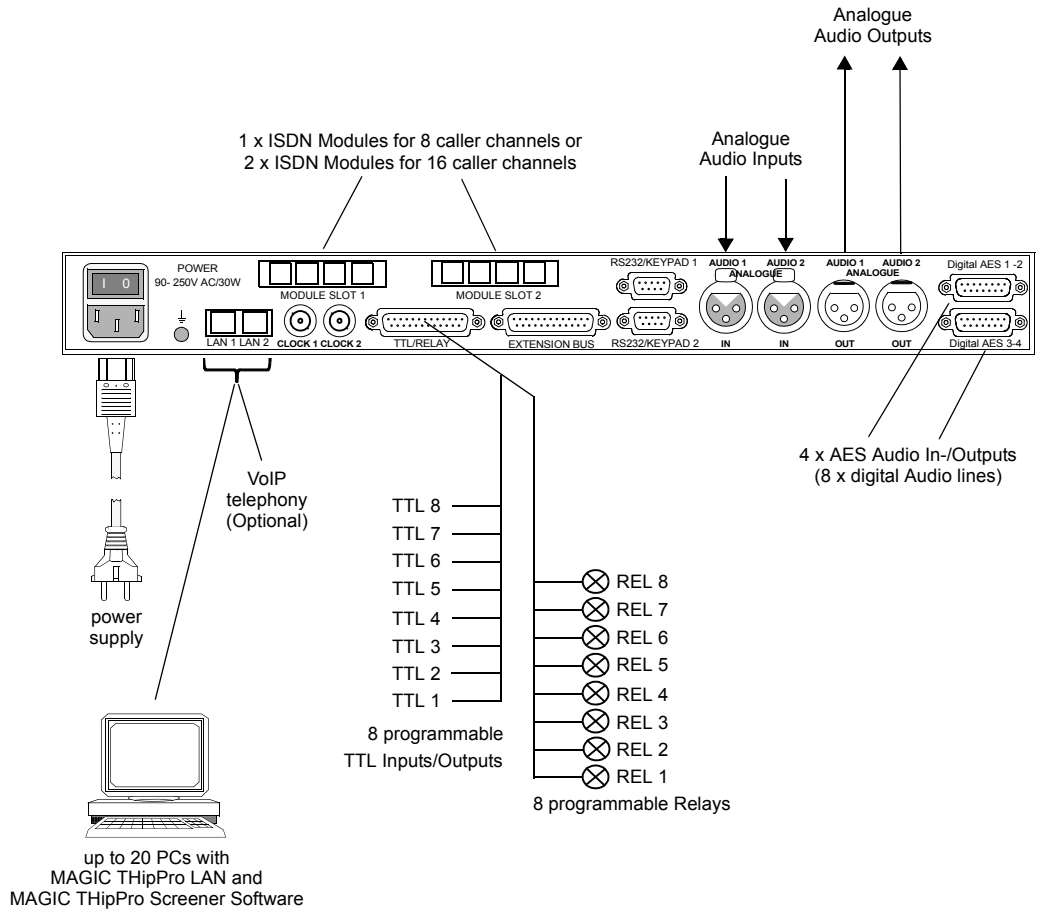
FIG. 4 WIRING OF THE MAGIC THIPPRO POTS



3.6.2 ISDN operating mode

MAGIC THipPro can be equipped with two fourfold ISDN BRI modules and can be used as a eight or a 16 line ISDN Hybrid.

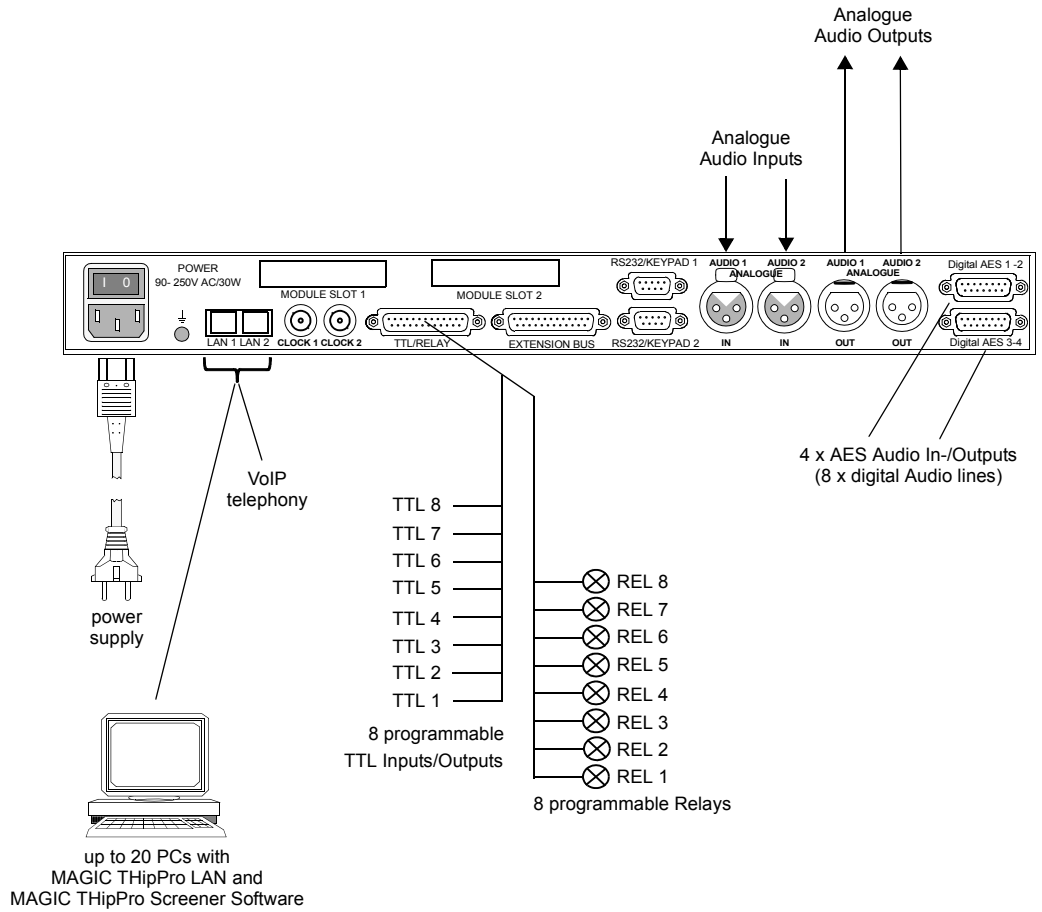
FIG. 5 WIRING IN OF THE MAGIC THIPPRO ISDN



3.6.3 VoIP operating mode

MAGIC THipPro can act as a eight or 16 line Hybrid. One of the LAN interfaces can be used.

FIG. 6 WIRING OF THE MAGIC THIPPRO VOIP



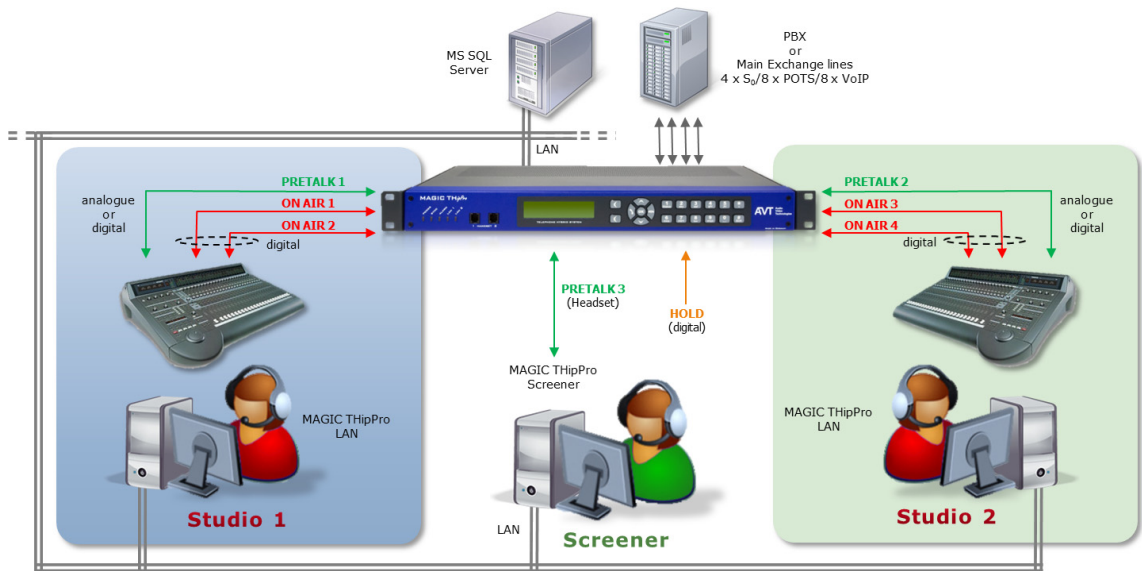
3.7 Applications

Below you will find some example applications with *MAGIC THipPro*.

3.7.1 Two studios with presenter and one screener location

If *MAGIC THipPro 8* is used, eight common caller lines are available for both studios. In each studio all eight lines are displayed. The *MAGIC THipPro LAN Software* is installed for the workplaces in the studios. The Screener works with the *MAGIC THipPro Screener Software*. Each Presenter has his own Pretalk line and two On Air lines to realize a Two Faders operation. The Screener uses a headset for Pretalk which is directly connected to the telephone hybrid. Additionally, an external signal can be fed in as Hold signal. Alternatively, the On Air or a recorded signal can be used for Hold.

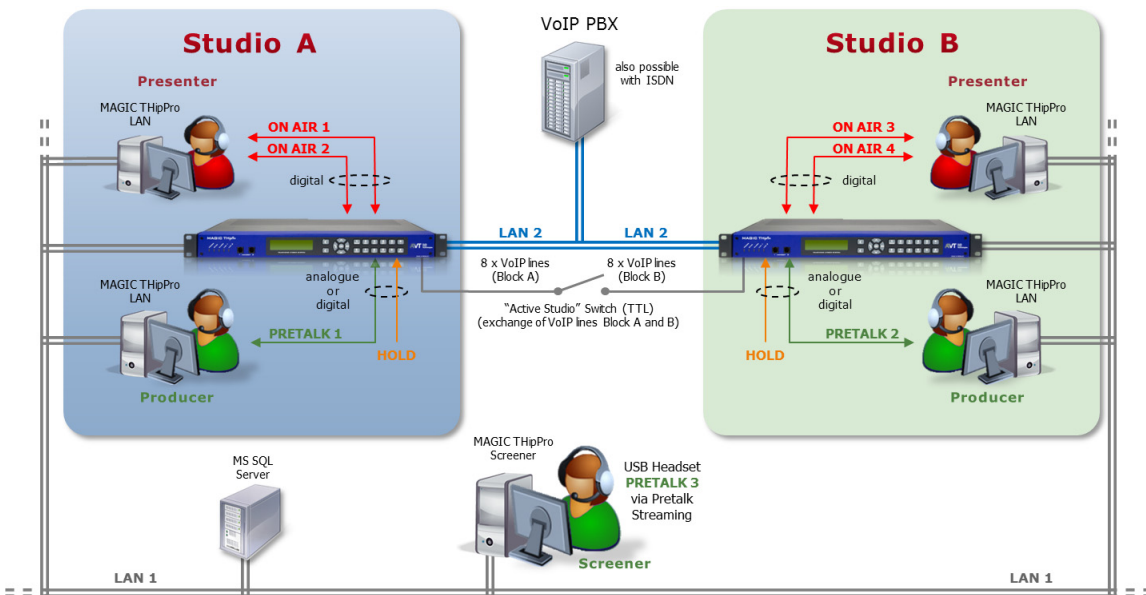
FIG. 7 APPLICATION WITH TWO STUDIOS



3.7.2 Two studios in redundancy operation

Two identical studios are equipped with two MAGIC THipPro ISDN or VoIP systems. Studio A is used as active studio whereas Studio B is used as backup. To each studio a block of eight caller lines is allocated. The Presenter and the Producer use the MAGIC THipPro LAN Software in the studios. The Screener workplace is connected via Pretalk Streaming and works with a USB Headset that is directly connected to the Screener PC. In this way, in case of a backup the Screener has access to Studio B just by activating a preset. The caller lines can be switched via a TTL contact (switch "Active Studio").

FIG. 8 APPLICATION WITH REDUNDANCY

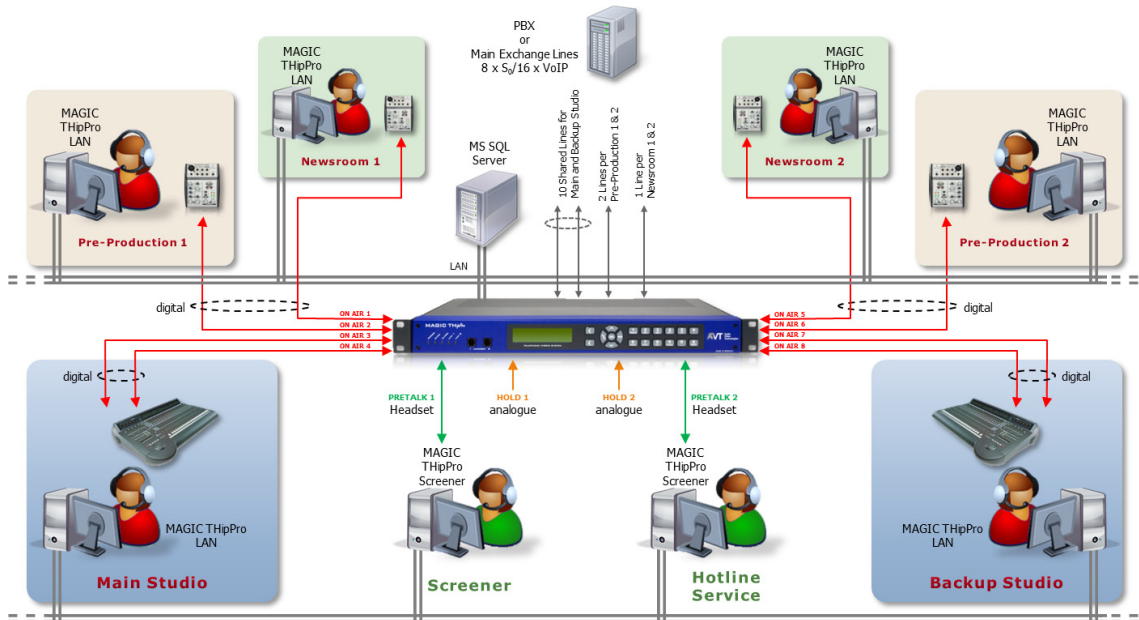


3.7.3 MAGIC THipPro with MAGIC Admin Upgrade

With the optional MAGIC THipPro Admin Upgrade, the MAGIC THipPro Telephone Hybrid can be used for up to six studios. The caller lines can be assigned to the individual studios or they can be used by several studios together. In each studio only the allocated caller lines are displayed. In our example a main studio and a backup studio are established. Both can access the shared ten caller lines and every studio has two On Air lines for a Two Faders mode. If the main studio fails, the backup studio can go immediately On Air. The Screener talks to the callers in Pretalk via a headset using the MAGIC THipPro Screener Software for control. Furthermore, a workplace where caller data is collected/updated is installed (Hotline Service) where also a headset and the MAGIC THipPro Screener Software are in use. Besides the main and the backup studio, there are two Pre-Productions and two News Studios. Each of the four studios works with its own ON AIR line and uses the MAGIC THipPro LAN Software.

Due to the MAGIC THipPro Admin Upgrade two different Hold signals, which can be allocated to the individual studios, are possible. Alternatively, the On Air signal or a recorded Hold signal can be used.

FIG. 9 APPLICATION WITH ADMIN UPGRADE



A 1 INTERFACES

A1.1 **MAGIC THipPro**

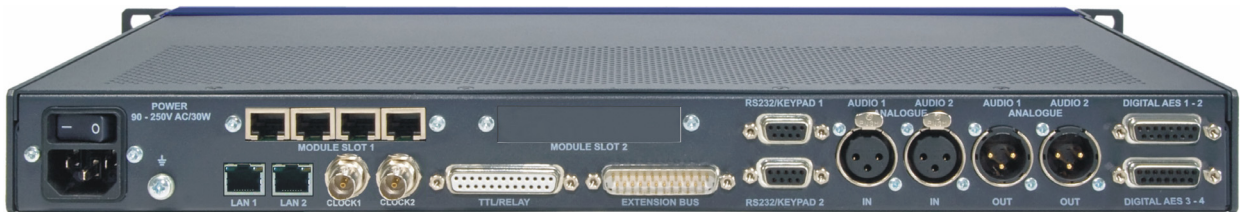
On the front side of the unit 5 LEDs for status indication and 2 Handset/Headset interfaces for PRETALK are available.

FIG. 10 FRONT VIEW OF MAGIC THIPPRO



The connectors for the interfaces are at the rear side of the unit.

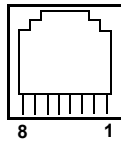
FIG. 11 REAR VIEW OF MAGIC THIPPRO 8 ISDN



A1.2 Control and data interfaces

A1.2.1 LAN 1 and LAN 2 interfaces

The LAN 1 and LAN 2 interfaces can be used as control interfaces. One of the two interfaces can also be used as VoIP interface. For the LAN interfaces RJ 45 sockets are used. The pin assignment of the socket is shown in TAB. 1.

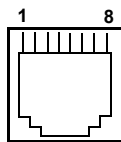


TAB. 1 PIN ASSIGNMENT: LAN INTERFACES

Socket: Western (8 pin) RJ45			Electrical characteristics
Pin	Signal		
1	TX+ Data out +		Recommendation: IEEE 802.3/Ethernet
2	TX- Data out -		Data rate (automatic): 10BaseT (10 Mbit/s)
3	RX+ Data in +		100BaseTX (100 MBit/s)
4	not used		Recommended cable: CAT5
5	not used		Maximum cable length: 100m
6	RX- Data in -		
7	not used		
8	not used		

A1.2.2 ISDN Line Interfaces

MAGIC THipPro can be equipped with in maximum 2 pieces of 4 x ISDN BRI modules. The ISDN BRI interfaces are available on RJ 45 sockets. The pin assignment is shown in TAB. 2.

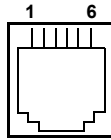


TAB. 2 PIN ASSIGNMENT: BRI ISDN INTERFACES

Socket: Western (8 pin) RJ45			Electrical characteristics
Pin	Signal		
1	not used		Recommendation: I.430
2	not used		Data rate: B channel: 2 x 64 kbit/s
3	TX + Data out +		D channel: 16 kbit/s
4	RX + Data in +		
5	RX - Data in -		
6	TX - Data out -		
7	not used		
8	not used		

A1.2.3 POTS Line Interfaces

MAGIC THipPro can be equipped with 2 pieces of 4 x POTS modules and therefore provides 8 x POTS interfaces. The POTS interfaces are available on RJ 11 sockets. The pin assignment is shown in TAB. 3.

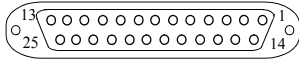


TAB. 3 PIN ASSIGNMENT: POTS LINE INTERFACES

Socket: Western (6 pin) RJ11		
Pin	Signal	Electrical characteristics
1	not used	Typical characteristics: Bandwidth: 300 - 3.3 kHz Signal to noise ratio: 45 dB Average level: -9 dBm (275 mV) Impedance: 600 ohms DC voltage: 48 V (±6 V typ) DC current: 20-26 mA (typ) Ringing voltage: 90 Vrms Ringing frequency: 20 Hz (2 sec on, 4 sec off)
2	not used	
3	TEL LINE +	
4	TEL LINE -	
5	not used	
6	not used	

A1.2.4 TTL/RELAY interface

The TTL/Relay interface is realised as a 25-pin socket. It provides 8 TTL inputs or outputs and 8 Relay contacts. The pin assignment of the socket is shown in TAB. 4.



TAB. 4 PIN ASSIGNMENT: TTL/RELAY INTERFACE

Socket: SUB-D 25 pin

Pin	Signal	Direction	Electrical characteristics
1	TTL 1	input/output	TTL interface: Capacity of the TTL outputs: Maximum voltage: 3.3V Maximum current: 10mA
2	TTL 2	input/output	
3	TTL 3	input/output	
4	TTL 4	input/output	
5	TTL 5	input/output	
6	TTL 6	input/output	
7	TTL 7	input/output	
8	TTL 8	input/output	
9	RELAY 4 (B)	output, NO	Relay interface: Capacity of the relays: Maximum voltage: 48V Maximum current: 200mA
10	RELAY 5 (B)	output, NO	
11	RELAY 6 (B)	output, NO	
12	RELAY 7 (B)	output, NO	
13	RELAY 8 (B)	output, NO	
14	RELAY 1 (A)	output, NO	
15	RELAY 1 (B)	output, NO	
16	GND		
17	RELAY 2 (A)	output, NO	
18	RELAY 2 (B)	output, NO	
19	RELAY 3 (A)	output, NO	
20	RELAY 3 (B)	output, NO	
21	RELAY 4 (A)	output, NO	
22	RELAY 5 (A)	output, NO	
23	RELAY 6 (A)	output, NO	
24	RELAY 7 (A)	output, NO	
25	RELAY 8 (A)	output, NO	

NO = Normally Open

A1.2.5 RS232/Keypad Interfaces

Not in use.

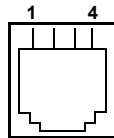
A1.2.6 Extension Bus

Not in use.

A1.3 Audio interfaces

A1.3.1 Handset/Headset Interfaces

Two Handset/Headset interfaces are available at the front side of the *MAGIC THipPro*. The pin assignments of the RJ10 connectors are shown in TAB. 5.

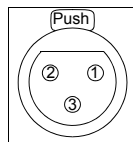


TAB. 5 HANDSET INTERFACE		
Socket: Western (4 pin) RJ10		
Pin	Signal	Electrical characteristics
1	HANDSET IN a/+5V phantom power	Microphone: Impedance: ~ 2 kOhm Sensitivity: ~ -60 dB @ 1-kHz
2	HANDSET OUT b (GND)	
3	HANDSET OUT a	Telephone receiver: Impedance: ~150 Ohm Sensitivity: ~ 97dB @ 1-kHz
4	HANDSET IN b	

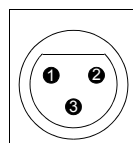
A1.3.2 Analogue Audio interfaces

MAGIC THipPro provides two analogue Audio (Audio 1, Audio 2) inputs and outputs.

For the inputs XLR sockets and for the outputs XLR plugs are available. The pin assignments of the sockets and connectors are shown in TAB. 6 and TAB. 7.



TAB. 6 ANALOGUE AUDIO INPUT		
Socket: 3 pin XLR		
Pin	Signal	Description
1	GND	Ground
2	A	+
3	B	-



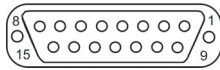
TAB. 7 ANALOGUE AUDIO OUTPUT		
Connector: 3 pin XLR		
Pin	Signal	Descriptions
1	GND	Ground
2	A	+
3	B	-

A1.3.3 Digital AES/EBU Audio Interfaces

MAGIC THipPro provides eight digital Audio inputs and outputs available on four physical AES/EBU interfaces.

Two 15-pin Sub-D sockets provide the digital AES/EBU interfaces. The BNC socket CLOCK 1 can be used to insert an external AES/EBU clock or to receive an AES/EBU clock . The CLOCK 2 interface is not in use.

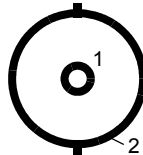
As an option adapter cables with XLR connectors can be provided. The pin assignment of the 15-pin Sub-D sockets are shown in TAB. 8. The pin assignment of the BNC socket is described in TAB. 9.



TAB. 8 DIGITAL AUDIO INTERFACES AES/EBU 1-2 AND AES/EBU 3-4

Socket: SUB-D 15 pin

Pin	Signal	Description
1	AES 1 IN +	
2	AES 1 IN -	
3	AES 2 IN +	
4	AES 2 IN -	
5	AES 1 OUT +	
6	AES 1 OUT -	
7	AES 2 OUT +	
8	AES 2 OUT -	
9	GND	
10 ... 15	GND	



TAB. 9 WORD CLOCK, BNC SOCKET "CLOCK 1"

Pin	Signal	Electrical characteristics	
		Amplitude:	0,5 to 1,9 Vop
1	CLOCK IN/OUT	Impedance:	75 Ohm unsym.
2	GND		

A 2 TECHNICAL DATA MAGIC THIPPRO**CODING ALGORITHMS**

- G.711 3,1-kHz (Telephone algorithm)
- G.722 (with HD Voice Upgrade in VoIP mode)

LINE INTERFACES:

- ISDN 8/16 version
 - 4/8 x S₀
 - 2 x LAN
- POTS version
 - 8 x POTS
 - 2 x LAN
- VoIP 8/16 version
 - 2 x LAN

PRETALK INTERFACES

- Handset/Headset interface
 - 2 x HANDSET/HEADSET

CONTROL INTERFACES

- 2 x LAN
- TTL/RELAY
 - 8 x Relay
 - 8 x TTL Input/Output

AUDIO INTERFACES

Analogue Audio 1/2:

- Electronically balanced input XLR female
- Electronically balanced input XLR male

- Impedance Input: > 25 k Ω
 Output: < 50 Ω
- Frequency response 50 Hz ... 3400 Hz

Digital Audio AES/EBU:

- Format IEC-958 AES/EBU Professional
- Electronically balanced input 15-pin SUB-D female
- Electronically balanced output 15-pin SUB-D female
- Impedance Input: 110 Ω
 Output: 110 Ω
- Separate Sample Rate Converter for Inputs

Handset/Headset:

- Electronically balanced input RJ10 socket
- Electronically balanced output RJ10 socket

SIGNAL PROCESSING

- AGC per channel, configurable
- Level adjustment control during connection: -16 dB ... +16 dB
- Echo Canceller per channel
- Expander per channel, configurable

DISPLAY

- graphical resolution 160 x 32 Pixel
- illuminated (can be switched off)

DIMENSIONS

H x W x D

- 44,5 x 434 x 252 mm

WEIGHT

- ca. 3,7 kg

ADDITIONAL INFORMATION

EMC

- EN 55103

Electric safety

- EN 60950

Temperature Range

- +5 °C to 45 °C

Relative humidity

- 5% is 85%

A 3 GENERAL

A3.1

Order numbers

MAGIC THipPro 8 VoIP	802050
MAGIC THipPro 8 POTS	802051
MAGIC THipPro 8 ISDN	802052

MAGIC THipPro 16 VoIP	802053
MAGIC THipPro 16 ISDN	802055

Accessories

MAGIC THipPro Telephone Handset with Handset Rest	490180
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MAGIC THipPro Telephone Headset Mono Aural	490181
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MAGIC THipPro Telephone Headset Bin Aural	490182
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MAGIC THipPro Volume Adapter	490178
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Cables

AES/EBU/CLK Adapter Cable	490183
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Software Options

MAGIC THipPro LAN Software licence	430401
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MAGIC THipPro Screener Software licence	430402
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MAGIC THipPro Admin Upgrade	430404
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MAGIC THipPro DTMF Tone Analyzer Upgrade	430405
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Pretalk Streaming Upgrade	430464
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System Upgrades

MAGIC THipPro 8 ISDN/POTS -> 8 VoIP channels Upgrade	802057
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MAGIC THipPro 16 ISDN/POTS -> 16 VoIP channels Upgrade	802058
---	--------

MAGIC THipPro 8 ISDN -> 16 ISDN channels Upgrade	802059
MAGIC THipPro 8 VoIP -> 16 VoIP channels Upgrade	802060
MAGIC THipPro 8 ISDN/POTS -> 16VoIP channels Upgrade	802061

A3.2 **Scope of delivery**

- MAGIC THipPro Telephone Hybrid
 - CD Windows PC Software
 - External Power Supply Adapter
 - Input: 100 - 240V/24W, 50 - 60 Hz
 - Output: 12V
 - Self adhesive feet
 - 19" Mounting brackets
 - Manual

A3.3 **Declaration of conformity**

The declaration of conformity you will find at the end of this manual.

A 4 SERVICE INFORMATION

A4.1 Software Updates

On our homepage you can download software updates for free. Go to

<http://www.avt-nbg.de>

and select **Download - Software**.

A4.2 Support

You can contact our Support Hotline during the normal office hours between 09.00h - 17.00h (GMT+1) under the following telephone number:

+49 911 5271 160

or via E-Mail under

support@avt-nbg.de

To deal with your problem efficiently please note the factory number of the unit as well as the software version that you use.

A4.3 Repairs

If, contrary to expectations, your unit is defective please fill in the attached status report and send the unit to the following address:

**AVT Audio Video Technologies GmbH
- Repairs -
Nordostpark 12
D-90411 Nuernberg
Germany**

CE-Konformität

DECLARATION OF CONFORMITY

Name des Anbieters: AVT Audio Video Technologies GmbH
Supplier's name:

Anschrift des Anbieters: Nordostpark 12
Supplier's address D-90411 Nürnberg

erklärt, daß das Produkt
declares, that the product

Produktname(n):	MAGIC THipPro 8 VoIP Telephone Hybrid	802050
Product name(s):	MAGIC THipPro 8 POTS Telephone Hybrid	802051
	MAGIC THipPro 8 ISDN Telephone Hybrid	802052
	MAGIC THipPro 16 VoIP Telephone Hybrid	802053
	MAGIC THipPro 16 ISDN Telephone Hybrid	802055

mit den Vorschriften folgender Europäischer Richtlinien übereinstimmt:
conforms to the standards of the following European directives:

Nummer/Text: EN 60950 A4 Gerätesicherheit
Number/title:

Die Übereinstimmung wird nachgewiesen durch vollständige Einhaltung folgender Normen:
The conformity is evidenced by strictly meeting the following standards:

Harmonisierte Normen: EN 55022, EN 55024,
Harmonized Standards: EN 300386,
FCC Part 15 B

Ort, Datum: Nürnberg, 20.02.2013
Place, date:

Name(n): Wilfried Hecht
Name:

Rechtsverbindliche Unterschrift(en):
Legally binding signatures:

Telefon: +49 911 5271-0
Phone:

Diese Erklärung beinhaltet keine Zusicherung von Eigenschaften.
This declaration includes no warranty of properties.

Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.
The safety instructions specified in the product documentation delivered must be observed.

