

MAGIC TH1*ipGo*

MAGIC TH1*potsGo*

Digital VoIP & POTS Telephone Hybrids

Hardware Manual



MAGIC TH1ipGo & MAGIC TH1potsGo

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Hardware Manual

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INTRODUCTION

The *MAGIC TH1Go* system allows the forwarding of a telephone call to an analogue Audio interface. Two system versions are available. *MAGIC TH1ipGo* can be operated via the LAN interface as single *VoIP* hybrid. *MAGIC TH1potsGo* provides an additional *POTS* interface and can be operated with an analogue telephone line as one channel hybrid. Optionally, it can be extended with the new *VoIP* standard and is therefore already prepared for the future.

To optimise the caller signal the caller line has implemented its own digital *Echo Cancellor* (approx. up to 100 msec), *AGC* (Automatic Gain Control) and *Expander*.

The configuration of the system can be made via an *HTML5 compatible web browser* (e.g. Firefox, Safari, Chrome) or via the front keypad of the unit. *MAGIC TH1Go* also provides four *TTL inputs/outputs* and two *Relays* for external control.

MAGIC TH1Go is available as 1/2 x 19" x 1 U system with external 12 V power supply.

S A F E T Y

Introduction

The unit described has been designed to the latest technical parameters and complies with all current national and international safety requirements. It operates on a high level of reliability because of long-term experience in development and constant and strict quality control in our company.

In case of normal operation the unit is safe.

However, some potential sources of danger for person, material and optimal operation remain - especially if daily routine and technical errors coincide.

This manual therefore contains basic safety instructions that must be observed during configuration and operation. It is essential that the user reads this manual before the system is used and that a current version of the manual is always kept close to the equipment.

General Safety Requirements

To keep the technically unavoidable residual risk as low as possible, it is absolutely necessary to observe the following rules:

- Transport, storage and operation of the unit must be under the permissible conditions only.
- Installation, configuration and disassembly must be carried out only by trained personnel on the basis of the respective documentation.
- The unit must be operated by competent and authorised users only.
- The unit must be operated in good working order only.
- Any conversions or alterations to the unit or to parts of the unit (including software) must be carried out by trained personnel authorised by the manufacturer.
Any conversions or alterations carried out by other persons lead to a complete exemption of liability.
- Only qualified personnel is authorised to remove or override safety measures and to carry out the maintenance of the system.
- External software is used at one's own risk. Use of external software can affect the operation of the system.
- Use only 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

The functions of *MAGIC TH1Go* are implemented in a single unit. The system is designed for mounting in a 19" rack (1 U).

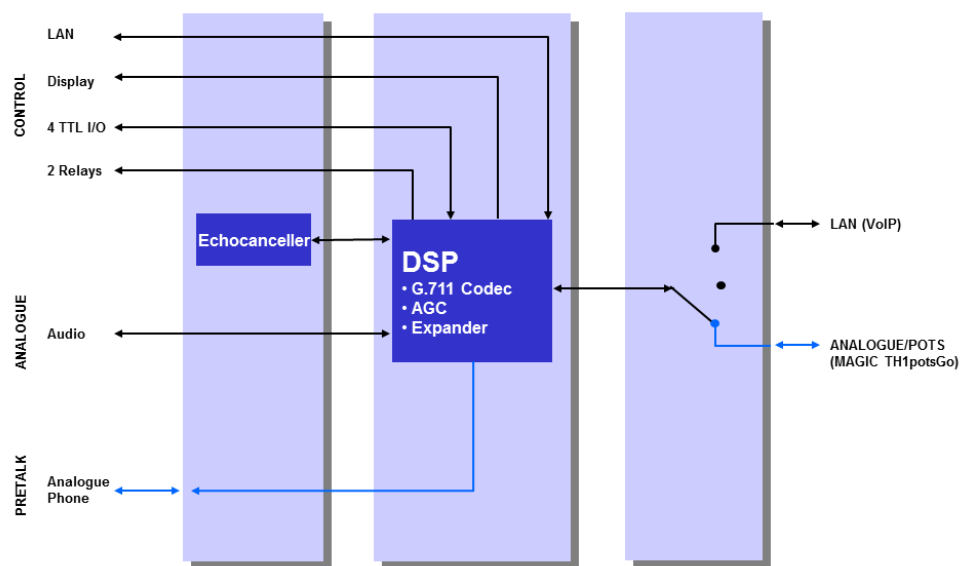
FIG. 1 MAGIC TH1POTSGO AND MAGIC TH1IPGO TELEPHONE HYBRIDS



2 SYSTEM DESCRIPTION

The functional elements of the system are pictured in Fig. 2.

FIG. 2 FUNCTIONAL ELEMENTS OF MAGIC TH1GO



2.1 Functionality

The *MAGIC TH1ipGo* system incorporates a *LAN* interface, the *MAGIC TH1potsGo* offers an additional *POTS* interface. The operating mode can be set with the help of the web browser application or the front keypad and display.

The complete signal processing is taken over by a digital *signal processor*. In this way the following functions are carried out:

- G.711 Audio encoding and decoding
- G.722 Audio encoding and decoding (*HD Voice*)¹
- an independent *AGC* (Automatic Gain Control)
- an independent *Expander* (to suppress spurious signals)
- control of the complete system (Display, Relay, TTL, LAN)

A separate component provides the *Echo Canceller* function. As *ON AIR* Audio input/output an analogue Audio interface is available.

¹ MAGIC TH1potsGo: only in optionally VoIP mode.

For *PRETALK* a standard *POTS Telephone* can be connected and used.

MAGIC TH1Go can be operated by a *POTS Telephone* and via the *front keypad* and the illuminated *display*. With the quick dial keys of the *POTS Telephone* *MAGIC TH1Go* can be completely operated. A call can be accepted in *PRETALK*. The caller can be switched by pressing one of the quick dial keys to *HOLD* or *ON AIR* or at least can be dropped. All other functions such as *AGC*, Voice disguise can also be selected by the quick dial keys of the phone. The configuration and operation is especially comfortable via the *HTML5 compatible web browser*, which communicates with the system via the LAN interface.

Most basic operating functions like accepting a call, dropping a connection and establishing a connection with a pre-programmed number can be carried out via four programmable *TTL contacts*. Two *relays* are available for status indication.

3 PUTTING THE SYSTEM INTO OPERATION

3.1 **Mounting**

With its dimensions (W × H × D) of 220 mm × 44,5 mm (1 U) × 220 mm the *MAGIC TH1Go* 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 TH1Go* 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 (*MENU STATUS INFORMATION*)

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

ATTENTION **Incorrect ambient temperature and humidity can cause functional deficiencies.**

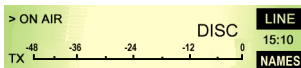


Operation outside the threshold values indicated above leads to a loss of warranty claim.

3.2 **Connection to the mains voltage**

The system can be operated with mains voltage in the range of 90 V and 253 V via the external power supply adapter included in delivery. The mains frequency can range from 45 Hz to 65 Hz. The maximum power consumption is 15 W. The rack must be earthed according to the VDE Regulations. This can be carried out via the earthing screw on the back side of the unit.

After plugging in the external power supply adapter the unit boots in a few seconds. In standby mode the level meter/status display is shown on the display.



3.3 Earthing of the system

For EMC reasons an earthing via the earthing screw of the system must be carried out in either case.

ATTENTION Earthing



A lacking earthing can cause functional deficiencies within the unit.

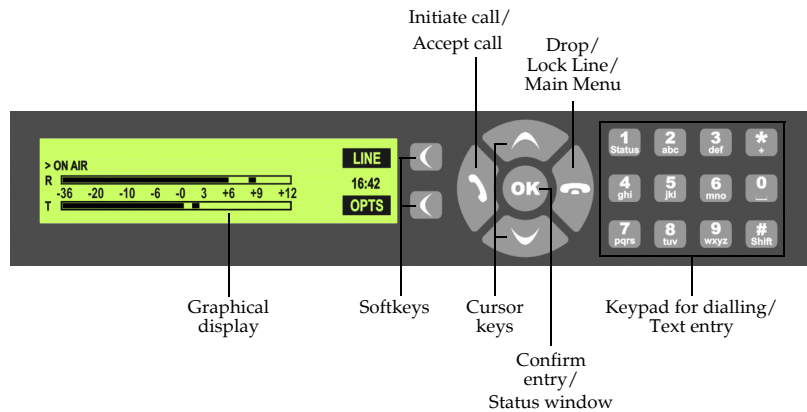
3.4 Operating elements on the front side

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), two buttons for accepting/dropping calls as well as an **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.

The operation is similar to standard mobile phones.

FIG. 3 OPERATING ELEMENTS ON THE MAGIC TH1GO FRONT SIDE



3.5 Operating modes of the system

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

3.5.1 POTS operating mode (only MAGIC TH1potsGo)

ATTENTION Earthing



If the POTS interface is 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).

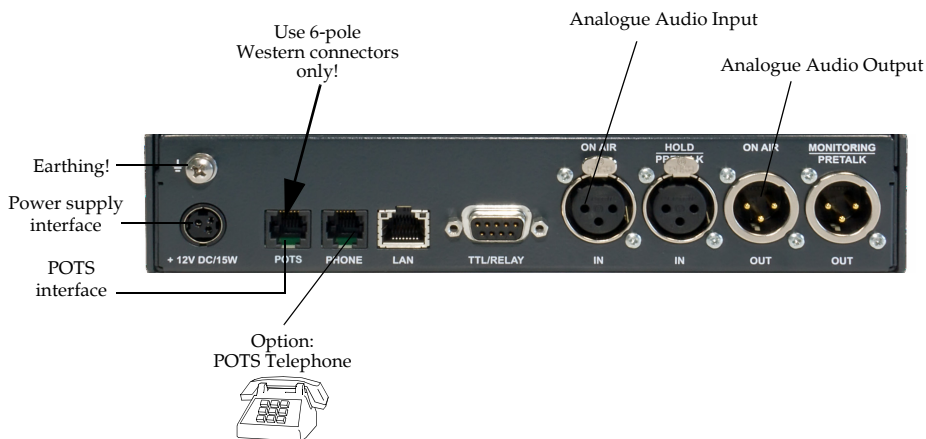
The minimal wiring for the operation with an analogue telephone line (*MAGIC TH1potsGo*) is pictured in Fig. 4. Via the PHONE Interface a POTS telephone can be connected.

ATTENTION Connection of a POTS Telephone



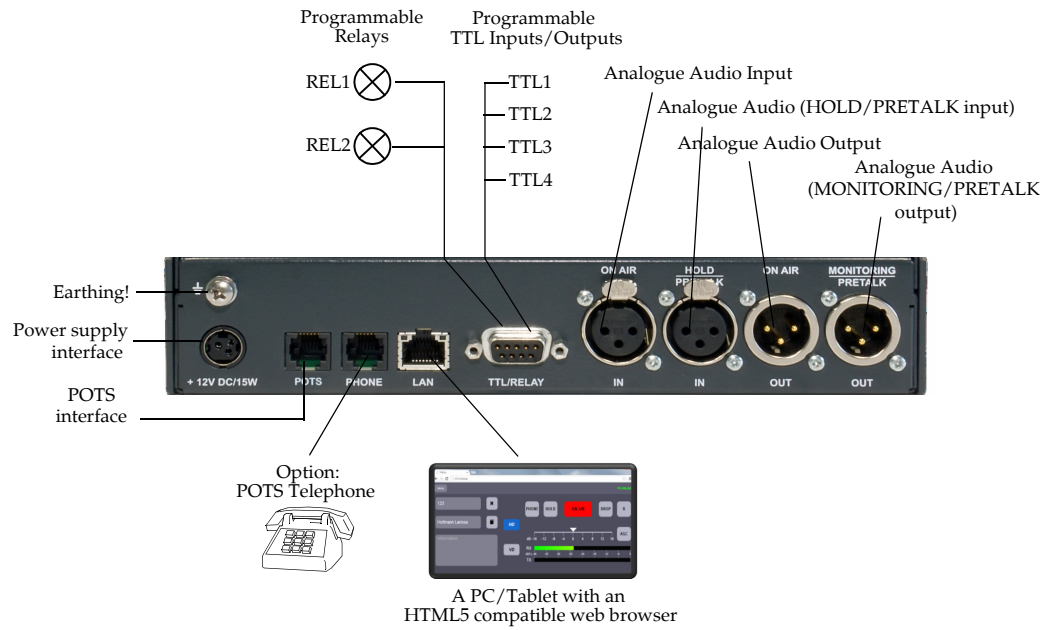
Please note that the *PHONE* interface is implemented as **6-pole** Western sockets. Standard telephones with 4-pole Western connectors must **not** be used because otherwise the contacts in the socket will be destroyed.

FIG. 4 MINIMUM WIRING IN POTS OPERATING MODE



The maximum wiring with all options is shown in Fig. 5. The LAN interface allows the connection with a PC with an *HTML5 compatible web browser*.

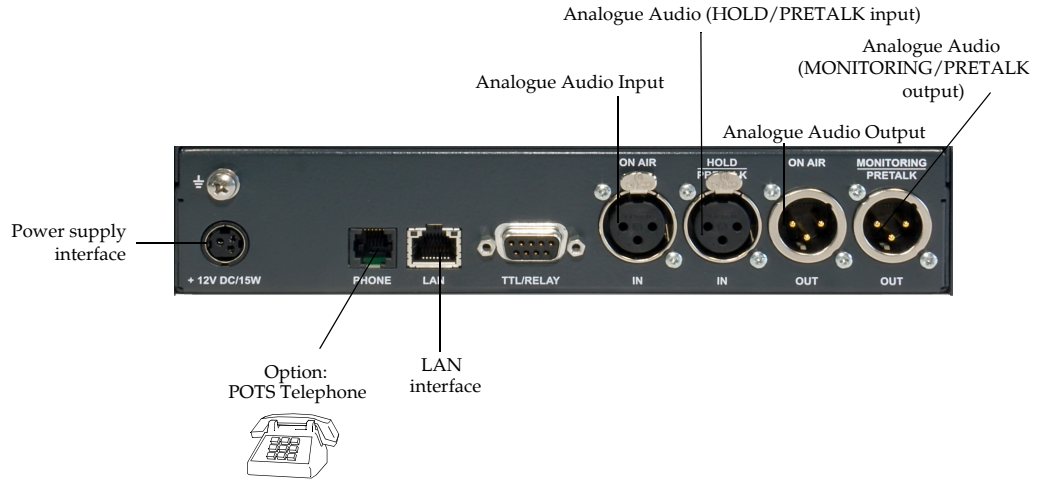
FIG. 5 MAXIMUM WIRING IN POTS OPERATING MODE



3.5.2 LAN operating mode

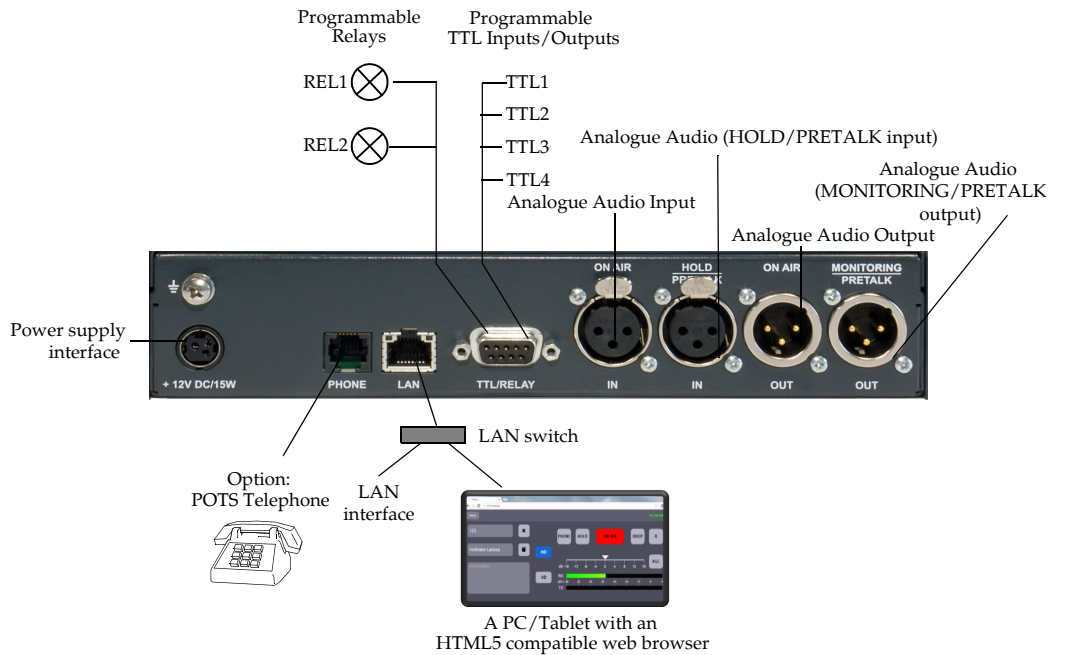
MAGIC TH1ipGo can be operated via the LAN interface as single *VoIP* hybrid. With the Software Option *MAGIC TH1 Extension VoIP & HD Voice* (ID: 430480) *MAGIC TH1potsGo* can be used also as *VoIP* Telephone Hybrid for a caller using the LAN interface. The functionality of the *POTS Telephone* is the same as in the *POTS* operating mode.

FIG. 6 MINIMUM WIRING IN LAN OPERATING MODE



The maximum wiring with all options is shown in Fig. 6. Also in the LAN operation mode a *POTS Telephone* can be connected for *PRETALK* and control of the Hybrid. In addition the Hybrid can be operated with the use of a PC with an *HTML5 compatible web browser*.

FIG. 7 MAXIMUM WIRING IN LAN OPERATING MODE

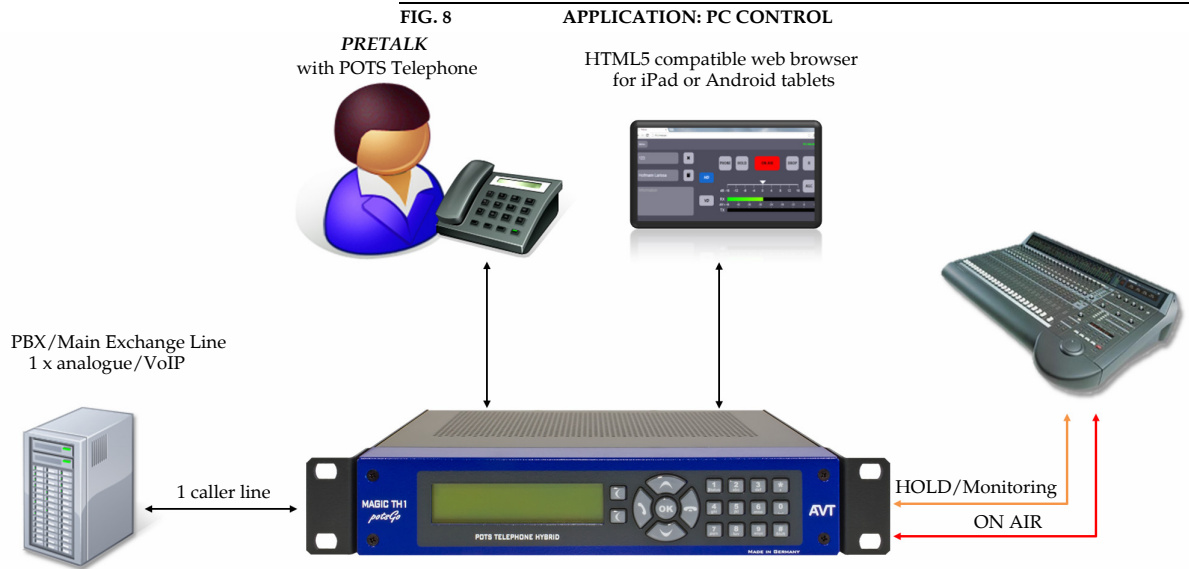


3.6 Applications

Below you will find some example applications with *MAGIC TH1Go*.

3.6.1 MAGIC TH1Go with PC control

In the following drawing you can see *MAGIC TH1potsGo* controlled with a PC connected via LAN and the *web browser*. A recorded Audio signal or the On Air input Audio signal can be used as Hold Signal. The same application is possible with *MAGIC TH1ipGo*.



A 1 INTERFACES

The interfaces of the systems are pictured in Fig. 9 and Fig. 10.

FIG. 9 REAR VIEW OF THE MAGIC TH1POTSGO TELEPHONE HYBRIDS



FIG. 10 REAR VIEW OF THE MAGIC TH1IPGO TELEPHONE HYBRIDS

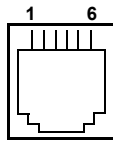


All interfaces are described below.

A1.1 POTS and LAN interfaces

A1.1.1 POTS interface (only MAGIC TH1potsGo)

This interface is used to connect the system to analogue telephone lines.



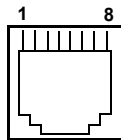
TAB. 1 PIN ASSIGNMENT: POTS TELEPHONE INTERFACE (LINE POTS)

Socket: Western (6 pin) RJ12

Pin	Signal	Electrical characteristics
1	not used	Typical characteristics:
2	not used	Bandwidth: 300 - 3.3 kHz
3	TEL LINE a	Signal to noise ratio: 45 dB
4	TEL LINE b	Average level: -9 dBm (275 mV)
5	not used	Impedance: 600 ohms
6	not used	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)

A1.1.2 LAN interface

Via this interface you can control the system via a PC. Both units *MAGIC TH1ipGo* and *MAGIC TH1potsGo* can be connected to a LAN network for *VoIP* if the fee-based software option *MAGIC TH1 Extension for VoIP & HD Voice (ID: 430480)* is enabled.



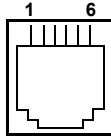
TAB. 2 PIN ASSIGNMENT: LAN INTERFACE (CONTROL + VOIP)

Socket: Western (8 pin) RJ45

Pin	Signal	Electrical characteristics
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 PRETALK interface**A1.2.1 PHONE interface**

A POTS Telephone can be connected for dialling and operation of the hybrid independent of the used line interface.



TAB. 3 PIN ASSIGNMENT: POTS TELEPHONE INTERFACE (PHONE)

Socket: Western (6 pin) RJ12

Pin	Signal	Electrical characteristics
1	not used	
2	not used	
3	TEL LINE a	
4	TEL LINE b	
5	not used	
6	not used	

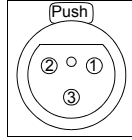
A1.3

Audio interfaces

The system incorporates analogue Audio interfaces. The interfaces can be configured via the front display and keypad or via the *web browser*.

A1.3.1

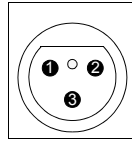
Analogue Audio interface



TAB. 4 PIN ASSIGNMENT: ANALOGUE INPUT (AUDIO IN)

Socket: XLR

Pin	Signal	Electrical characteristics
1	Analogue GND	Incoming level: adjustable -3 +9 dBu
2	AUDIO IN a	Impedance: > 25 kΩ
3	AUDIO IN b	Head room: 6 dB



TAB. 5 PIN ASSIGNMENT: ANALOGUE OUTPUT (AUDIO OUT)

Connector: XLR

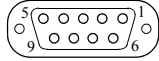
Pin	Signal	Electrical characteristics
1	Analogue GND	Outgoing level: adjustable -3 +9 dBu
2	AUDIO OUT a	Impedance: 50 Ω
3	AUDIO OUT b	Head room: 6 dB

A1.4 Control Interface**A1.4.1 LAN interface**

Please see A1.1.2, Page 24.

A1.4.2 TTL/RELAY interface

Via this interface external control signals can be used.



TAB. 6 PIN ASSIGNMENT: TTL/RELAY INTERFACE (TTL/RELAY)

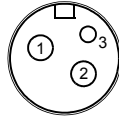
Socket: SUB-D (9 pin)

Pin	Signal	Electrical characteristics
1	TTL 1 IN/OUT	Capacity of the TTL inputs/outputs: Maximum voltage: 3.3 V Maximum current: 10mA
2	TTL 2 IN/OUT	
3	TTL 3 IN/OUT	
4	TTL 4IN/OUT	
5	GND	Capacity of the relays: Maximum voltage: 48V Maximum current: 200mA
6	Relay 1a	
7	Relay 1b	
8	Relay 2a	
9	Relay 2b	

A1.5

Power supply interface

The power supply is connected via an external power supply adapter.



TAB. 7 PIN ASSIGNMENT: POWER SUPPLY

Socket: KYCO KPJ-S3

Pin	Signal	Electrical characteristics
1	GND	Voltage: +12 V
2	+12 V	Power: max. 15 W
3	not used	

A 2 T E C H N I C A L D A T A M A G I C T H 1 G O**CODING ALGORITHMS**

- G.711 A-Law or μ -Law 3,1-kHz (Telephone algorithm)
- G.722 7 kHz (MAGIC TH1ipGo; optional for MAGIC TH1potsGo
with HD Voice Upgrade in VoIP mode)

LINE INTERFACES:

- POTS (only MAGIC TH1potsGo)
 - 1 x POTS RJ12
- LAN
 - 1 x LAN RJ45

PRETALK INTERFACES

- Telephone interface
 - 1 x PHONE RJ12

CONTROL INTERFACES

- LAN RJ45 (same as line interface)
- TTL/RELAY 9 pin SUB-D socket
 - 2 x Relay function can be programmed
Capacity 48V/200mA
 - 4x TTL Input/Output function can be programmed
Capacity 3.3V/10mA

AUDIO INTERFACES

Analogue Audio:

- Electronically balanced input XLR female
- Electronically balanced input XLR male
- Nominal level -3 ... +9 dBu (can be programmed)

- Head room 0 ... 15 dBr (can be programmed)
- Impedance Input: > 25 k Ω
Output: 50 Ω
- Frequency response 50 Hz ... 7 kHz
- Signal to Noise Ratio > 80 dB
- Noise - 92 dB

SIGNAL PROCESSING

- AGC per channel, configurable
- Level adjustment control during connection: -16 dB ... +16 dB
- Echo Canceller per channel (100 msec echo cancelling time)
- Expander per channel, configurable

DISPLAY

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

POWER SUPPLY VIA EXTERNAL ADAPTER

Direct Voltage (DC)

- +12 V

Power Consumption

- max. 15 W

DIMENSIONS

H x W x D

- 44 x 220 x 220 mm

WEIGHT

- ca. 1,7 kg

ADDITIONAL INFORMATION

EMC

- EN 55103

Electric safety

- EN 60950

Temperature Range

- +5 °C to 45 °C

Relative humidity

- 5 % to 85 %

A 3 GENERAL

A3.1

Order numbers

MAGIC TH1potsGo Telephone Hybrid	802010
MAGIC TH1ipGo Telephone Hybrid	802020

Accessories

POTS Telephone with Display	490101
GSM Adapter ¹	490135

Software Options for MAGIC TH1potsGo

MAGIC TH1 Extension for VoIP&HD Voice	430480
MAGIC TH1 Extension for VoIP	430478
MAGIC TH1 HD Voice Upgrade	430479

¹ Can only be used in POTS mode (when the POTS line interface is used)

A3.2 Scope of delivery

- MAGIC TH1potsGo / MAGIC TH1ipGo Telephone Hybrid
 - External Power Supply Adapter
 - Input: 100-240 V/24 W, 50-60 Hz
 - Output: 12 V
 - Self adhesive feet
 - 19" Mounting brackets
 - Manual
 - 1 x POTS telephone cable (MAGIC TH1potsGo)

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**

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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 TH1potsGo Telefonhybrid 802010
MAGIC TH1ipGo Telefonhybrid 802020

Product name(s): MAGIC TH1potsGo Telephone Hybrid 802010
MAGIC TH1ipGo Telephone Hybrid 802020

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, 01.06.2014
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.

