MAGIC

ISDN Standard/Triple Telephone Hybrid

Hardware/Software Manual

Audio Video Technologies

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Telephone Hybrid

Hardware/Software Manual

A Publication of

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C o n t e n t

The ***MAGIC ISDN Telephone Hybrid*** system enables the forwarding of telephone calls to analogue or optional digital AES/EBU audio-interfaces. Since the system is based on a modular construction it is possible to expand it as desired. The Basic system supports the simultaneous Hybrid-function up to three or four callers, as well as call forwarding to a selected number.

In contrast to previous systems, great emphasis was put on using as little external wiring as possible. The system is able to realise functions such as digital mixing of callers, digital ***Mix Minus***, ***Echo-Cancelling***, ***AGCs*** etc.

System configuration is carried using a simple Windows Application. The operation can either be done by this software or by the optional ***MAGIC Hybrid Keypad***.

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.

All safety instructions have a unifom appearance. This appearance is described in detail in the following CHAPTER.

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 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 rsik. The use/installation of non-system software can adversely affect the normal functioning of the system.***
- Only use tested and virus-free data carriers!

Appereance of the safety instructions

All safety instructions include a ***signal word*** that classfies the danger and a ***text block*** that contains descriptions of the type and cause of the danger, the consequences of ignoring the safety instruction and the measures that can be taken to minimise the danger. In some safety instructions, a warning symbol is placed underneath the signal word (see TAB. 2, page 12)

Signal word	*Type and cause of danger* Possible consequences of ignoring the safety instruction Measures to minimise the danger.

Classification of danger

There are five classes of safety instructions: "danger“, "warning“, "caution“, "notice“ and "important“. The classification is shown in the following table.

TAB. 1 SIGNAL WORDS AND EFFECTS WHEN IGNORING THE SAFETY INSTRUCTIONS

result / signal word	Death			Serious injury			Minor injury			Material damage[a]			Fault[b]		
	definite	likely	possible	definite	likely	possible	definite	likely	possible	definite	likely	possible	definite	likely	possible
DANGER[c]															
WARNING															
CAUTION															
NOTICE															
IMPORTANT															

a damage to product or product environment

b considerable impairment to operation

c this danger class is not required for MAGIC ISDN Telephone Hybrid

The signal word "Note“ is also used in the Operator Manual. Text passages marked in this way do not describe a danger, but rather contain reminders, tips and general information to ensure optimum operation of the system.

Symbols

The following symbols are used:

TAB. 2 WARNING SYMBOL

Symbol	common usage
	General warning about a danger Important advice

TAB. 2	WARNING SYMBOL
Symbol	**common usage**
	Warning about a dangerous electrical voltage

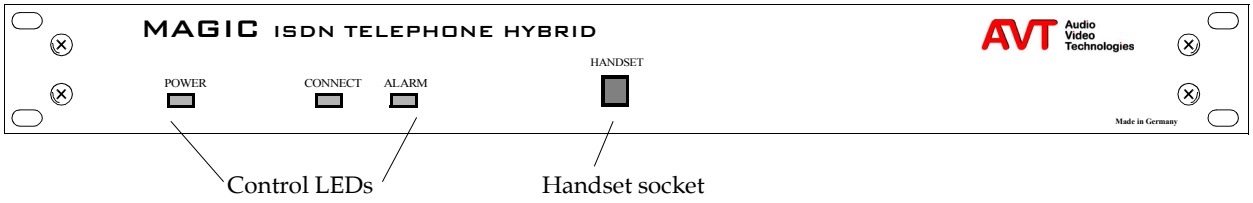
The safety instructions classified as „danger“, „warning“ and „caution“ always include a warning symbol. „Notice“ and „important“ safety instructions sometimes include a warning symbol.

1 CONSTRUCTION

The functions of the ***MAGIC ISDN Telephone Hybrid*** are included in a single unit. The system has a 19" rack (1 HE).

The system can be expanded with the ***AES/EBU/Analogue Module*** when required. This module provides two additional analogue inputs/outputs as well as two digital inputs/outputs (physically: one digital AES/EBU interface).

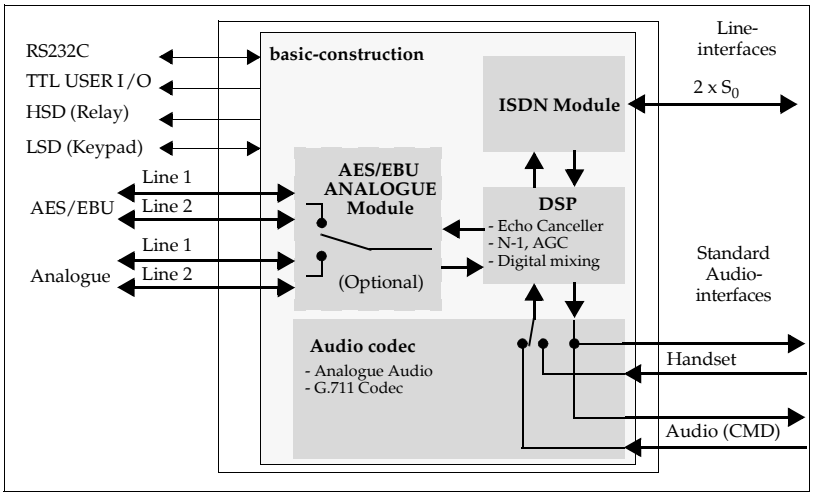
FIG. 1 FRONT VIEW: MAGIC ISDN TELEPHONE HYBRID



2 SYSTEM DESCRIPTION

The block diagram of the system is shown in Fig. 2.

FIG. 2 THE BLOCK DIAGRAM OF THE MAGIC ISDN TELEPHONE HYBRID



2.1 Functionality

Via the Telephone Hybrid system three or four callers pre selected can go ***On Air*** simultaneously. Additionally there is a call forwarding function to fixed numbers. The signal receivedby the caller can either be from the analogue audio interface or from the handset. The caller's signal is always available at the handset or and simultaneously at the audio-interface.

For each of the maximum of four callers, a digital Echo Canceller is available. This Echo Canceller is necessary to suppress disturbing echo when normal analogue telephones are used by the caller.

Likewise, the Automatic Gain Control (***AGC***) can be turned on for each caller.

To suppress disturbing noise of callers who are currently not speaking, the ***Expander*** can be activated.

In the conference mode there is the possibility of mixing all callers digitally and connecting the mixed signal to one interface. The callers get the digitally generated ***Mix Minus*** signal.

Three relays (HSD interface) are available for external signalling. The following conditions can be displayed:

– at least one caller is ***ON AIR***

– at least one caller is in ***PRE TALK***

– at least one B-Channel has an ***incoming call***

The configuration is realised by the included Windows Software. Control can also be carried out by this software. In parallel to the operating software the ***MAGIC Hybrid Keypad*** can be connected as an option. This keypad with an illuminated display, makes easy operation of the system possible. The recording level for each caller shown on the display, provides immediate information about the volume of the incoming signals.

An optional ***AES/EBU/Analogue Module*** is available which expands the system by two further analogue or two digital AES/EBU inputs/outputs (switchable). Then for example, the ***PRE TALK*** and ***ON AIR*** functions can be used simultaneously.

3 PUTTING THE SYSTEM INTO OPERATION

3.1 Mounting

With its dimensions (W × H × D) of 439 mm × 44,5 mm (1 HE) × 300 mm the MAGIC ISDN Telephone Hybrid can be operated as a table-top device or be inserted into 19'' racks. Additionally, mounting brackets are provided for the installation into an ETSI rack.

During the installation care should be taken to ensure that the bending radius of the cables is always greater than the minimum allowed value.

If the ***MAGIC ISDN Telephone Hybrid*** is installed in a rack, it should be ensured that sufficient ventilation is provided. It is recommended that approx. 3 cm clearance is left next to the openings. As a rule, the ambient temperature of the system should not lie outside the range +5°C to +40°C. These limits are of particular importance if the system is inserted in a rack.

During operation, the humidity must lie between 5% and 85%.

NOTICE

Incorrect ambient temperature and humidity can lead to equipment failure.
Operation of the unit outside the above limits invalidates the warranty.

The operation of the system must therefore lie within the specified limits.

3.2 Connection to the mains supply

The system can be operated with a system voltage between 90 V and 253 V and a mains frequency between 45 Hz and 65 Hz. The power consumption has a maximum value of approximately 35 W. In accordance with safety regulations, the housing must be earthed (grounded). This earthing is usually realised via the protective (earth or ground) conductor of the mains cable. If the mains cable does not have a protective conductor, however, the device must be earthed via the earthing bolt.

WARNING

Dangerous voltage in case of wrong earthing!
If the earthing is defective or lacking, hazardous voltages can be present on the housing in the event of a fault.

Do not use extension cable without an earthing contact!
In case of doubt provide additional earthing!

After switching the system on, the green ***POWER*** LED should light up. An internal reset is then triggered. When the ***ALARM*** LED stops blinking the system is ready for operation (approx. 45 seconds).

3.3 Alarm indication LEDs

The MAGIC ISDN Telephone Hybrid has three LEDs for signalling.

(1) ***POWER*** green
Lights up when system is ready for operation (only +5V).

(2) ***CONNECT*** 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 (see page 25).

3.4 Controls on the front side

The system has no controls on the front side; there is only a socket for the handset (not included in the delivery).

3.5 Changing the fuse

The mains system is protected with help of a fuse, which is soldered into the power supply. ***Only expert personnel*** are allowed to change the fuse.

WARNING

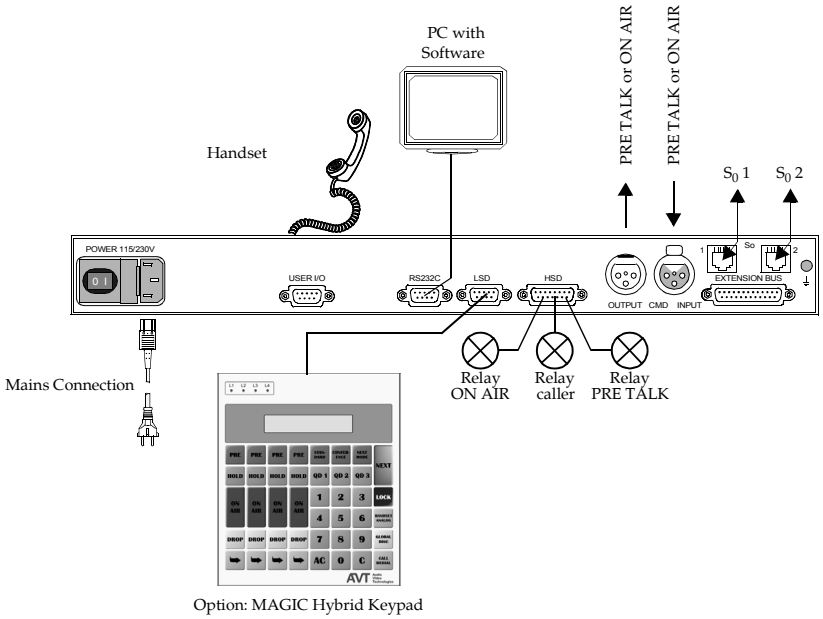
Dangerous voltage when the equipment is opened!
The unit should only be repaired by experienced technicians or our expert personnel.

3.6 Connecting the system

The following diagram shows how the system is connected.

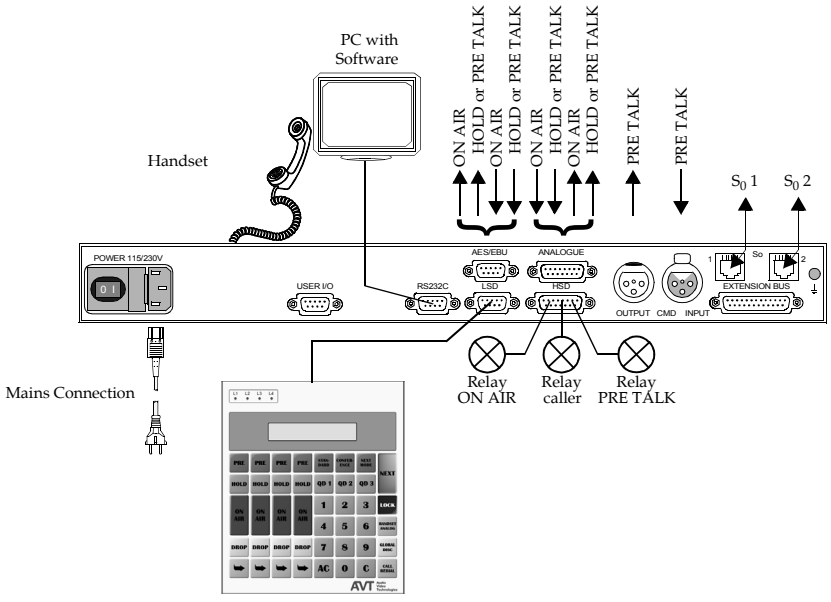
If an ***AES/EBU/Analogue Module*** is equipped, the audio interfaces can be configured by the user.

FIG. 3 CONNECTING THE SYSTEM WITHOUT AES/EBU/ANALOGUE MODULE



Option: MAGIC Hybrid Keypad

FIG. 4 CONNECTING THE SYSTEM WITH AES/EBU/ANALOGUE MODULE



Option: MAGIC Hybrid Keypad

FIG. 5 CONNECTING THE SYSTEM IN ALTERNATIVE LINE MODE

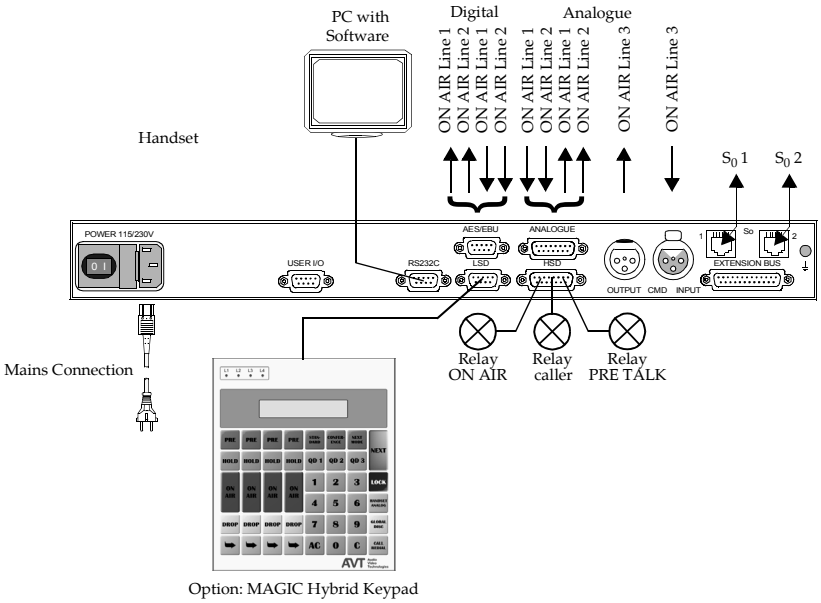
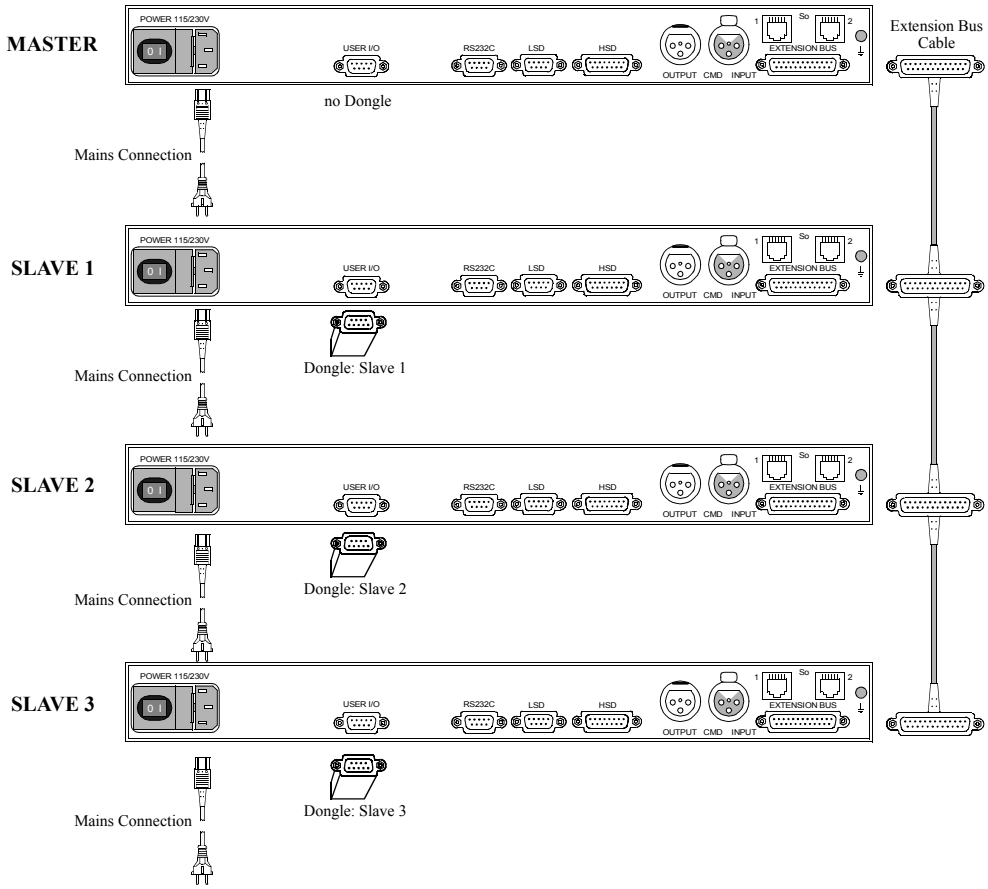


FIG. 6 CONNECTING OF MASTER AND SLAVE SYSTEMS



4 WINDOWS PC SOFTWARE

The configuration of the system is done by the Windows PC software included in the delivery.

4.1 Hardware requirements

The PC must fulfil the following minimum requirements:

- IBM PC AT, IBM PS/2 or 100% compatible
- Pentium Processor (> 133 MHz) recommended
- Windows 95B/98/ME/2000/XP operating system
- approx. 600-kByte available conventional memory
- 2-MB available hard disk memory
- screen resolution of 800 x 600 pixels
- at least one available RS-232 serial interface
- Microsoft, IBM PS/2 or 100% software compatible mouse

4.2 Connection to the PC

Place the included disk in the disk drive and press the ***START*** button on Windows 95B/98/ME/2000. Select the sub menu item **Run...**and insert into the command line

<drive name:>setup.exe

(e.g. A:setup.exe).

Follow the instructions of the installation program.

Start the software after the installation, by clicking the ***TELEPHONE HYBRID*** symbol.

Connect the PC via a null modem cable (pin 2 and pin 3 are crossed, pin 5 = GND) with the system.

Turn the system on.

The red blinking ***ALARM*** LED signals that the system is booting. After approx. 45 seconds the LED stops blinking. The system is ready for operation.

4.3 Operation of the system

The ***MAGIC ISDN Telephone Hybrid*** can either be operated with the simple windows PC software in a slightly limited way or it can be operated with the more user friendly ***MAGIC Hybrid Keypad*** option. Which operation is used depends on the type of application.

4.4 Control elements of the windows PC software

After starting the software the main menu of the ***MAGIC ISDN Telephone Hybrid*** application is displayed.

FIG. 7 MAIN MENU OF THE OPERATING SOFTWARE

The number is entered by the 0 ... 9 keys. Alternatively, the keypad of the PC can also be used.

Key AC deletes the complete entry, key C deletes only the last character of the entry.

These six keys represent the programmable quick dial numbers that can be programmed by the system configuration (see CHAPTER 4.9.2.6, page 49).

8 keys show the respective mode of the four B channels:
The CALL key establishes a connection.
An existing connection is represented by CON-NECT.

If there is an incoming call, a message appears on the display. Now the call can be accepted or rejected.

With the DROP key a connection can be dropped.

If the optional handset is available, it is possible to talk to the caller via this handset. The switchover is made by the  key (handset activated) or by the  key (audio input activated).

NOTE

Please note that the callers signal is also audible on the audio output and on the handset simultaneously. The switch operates only on the input.

4.5 Menu Configuration -> COM-Port

To enable the system to be configured the serial connection between the PC and the system has to be established.

In case of a faulty connection between PC and system the following error message appears after a short time:

FIG. 8 ERROR MESSAGE WHEN COMMUNICATION IS INTERRUPTED

To rectify the fault, the correct interface has to be chosen.

From the *configuration* menu select the ***COM Port*** sub menu.

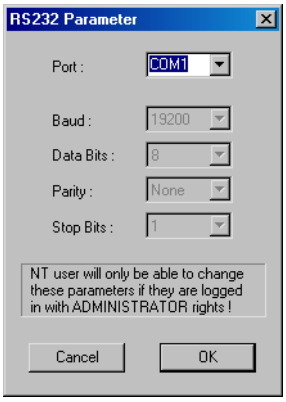
Set the ***Port*** on your PC to which the system is connected . After pressing the ***OK*** button, the error message should disappear. If the message does not disappear check the cable.

ATTENTION

Windows NT4.0/2000
Only an „Administrator“ is able to set the COM Ports when using Windows NT. Otherwise, the setting can be changed but it will not be stored.

For configuration always log on as an Administrator.

FIG. 9 SETTING OF RS232 PARAMETERS



4.6 Menu File -> Exit

Choosing ***File -> Exit***, exists the application.

4.7 Menu Administration

4.7.1 Submenu System Panel

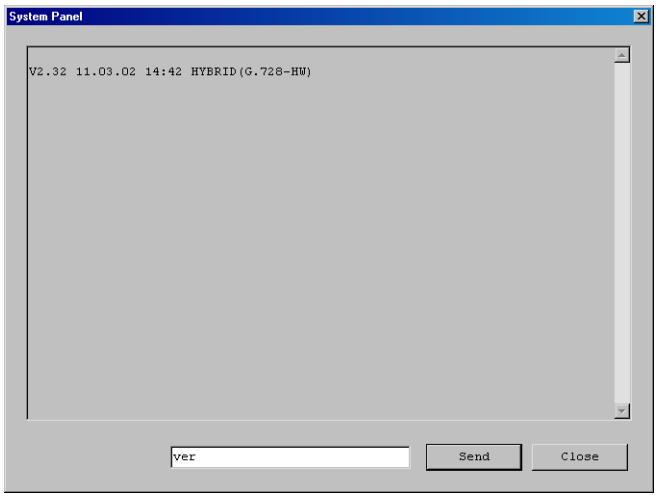
Clicking ***Administration -> System Panel*** opens the ***System Panel***. This is only for service purposes. Entries should only be made here by a technician.

ATTENTION

Faulty entries can lead to a system failure.

Only insert commands when asked to do so.

FIG. 10 SYSTEM PANEL



4.7.2 Submenu Software Download

With ***Administration -> Software Download*** open the window to load new Firmware on the system.

ATTENTION

New software downloaded, for example, from our internet website always includes the Windows PC Software and the Firmware for the System.

When making an update both the PC Software and the Firmware must be updated.

NOTE

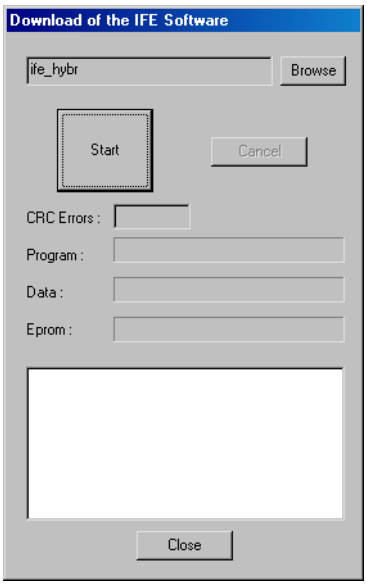
The latest software can be found on

http://www.avt-nbg.de

Then switch to *Service* and *Software Registration.*

The software has the Ident.No. ***430144***

FIG. 11 SOFTWARE DOWNLOAD



To download new firmware, choose the file ***IFE_HYBR*** with help of the ***Browse*** button.Then press the ***Start*** button to start the download. This procedure takes approximately 5 min. Afterwards, a reset of the system is done. Close the window with the ***Close*** button. After booting the system, the new functions are available.

4.8 Menu Help -> About Telephone Hybrid

Selecting ***Menu -> About Telephone Hybrid*** displays the information on the software and firmware versions.

For questions or remarks, the contact address is also shown.

The ***OK*** button closes the window.

FIG. 12 ABOUT TELEPHONE HYBRID

4.9 Menu Configuration -> System

With the ***Configuration -> System*** menu an experienced user is able to set the configuration via the ***Standard*** submenu. Each tab is selectable.

For inexperienced users, configuration with the help of the ***Wizard*** is recommended since it shows the configuration step by step.

The following configuration description is divided into

- **without** ***MAGIC Hybrid Keypad***

and

- **with** ***MAGIC Hybrid Keypad,***

since there are significant differences when operating the system.

See CHAPTER 4.9.1. for more about the use **without** keypad.

When **using** a keypad (and additional PC Software) see CHAPTER 4.9.2.

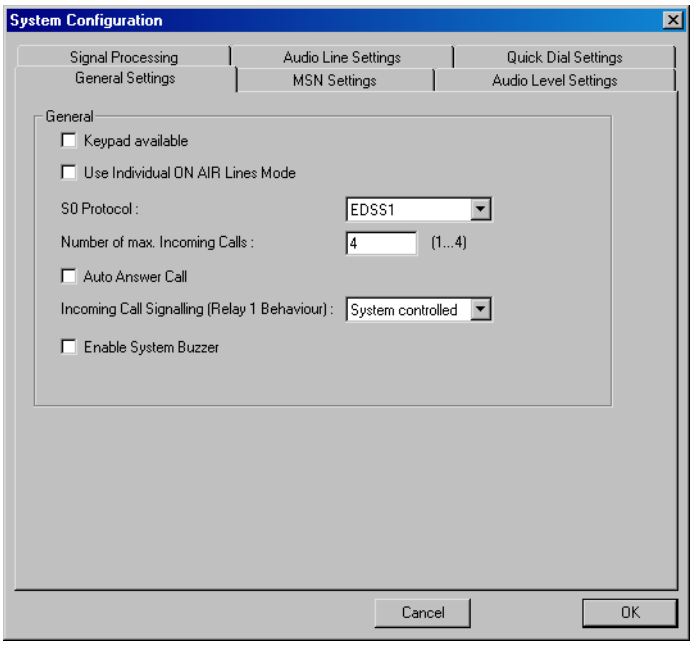
4.9.1 System configuration without keypad

Clicking ***Configuration*** -> ***System*** opnes system configuration window.

The configurations are summarized under different tabs. They are described in detail for use **without** the keypad.

4.9.1.1 General Settings

FIG. 13 GENERAL SETTINGS



Keypad available

When using the ***MAGIC*** without the ***Hybrid Keypad*** this option must not be set. This setting provides further functionalities as well as assignment of audio interfaces.

NOTE The audio interface assignment table without keypad can be found in CHAPTER A1, page 57.

Use Individual ON AIR Lines Mode

NOTE This function is only relevant for systems equipped with ***AES/EBU Analogue Modules*** (see Fig. 5, page 22)

With this option the hybrid can be switched to individual mode. All callers are then routed to their own audio interface. Now the hybrid can be used as triple ISDN Telephone Hybrid.

NOTE The audio interface assignment table for this configuration can be found in CHAPTER A1, page 57.

S_0 Protocol

Choose the correct S_0 protocol. In most cases it is the ***EDSS1*** (Euro ISDN).

In some cases in a PABX, the old ***1TR6*** German national protocol can be found.

Number of max. Incoming Calls

The ***MAGIC ISDN Telephone Hybrid*** has a maximum of four B channels that can be called simultaneously. This equipment permits a telephone conference with four participants.

When a single S_0 line is connected, enter ***2*** here. If the second S_0 line is also connected, enter ***4***. To prevent more than one caller dialling in simultaneously a ***1*** must be entered.

NOTE

If the individual mode is set, a maximum of 3 callers can dial in simultaneously.

Auto Answer Call

If there is an incoming call, the system can accept the call automatically. For this, set the appropriate check mark.

To prevent calls being auto answered do not set the check mark.

In the case of an incoming call, a relevant message appears on the PC.

Incoming Call Signalling (Relay 1 Behaviour)

The system has three relays one of which is used for external call signalling (Relay 1, see CHAPTER A2.5).

The combination field permits the following settings:

- ***always open***: The relay is always open.
- ***always closed***: The relay is always closed.
- ***System controlled***: If there is an incoming call on any channel the relay is closed.

Enable System Buzzer

Incorrect operations or cautions can be signalled in the system by a buzzer. To turn on the warning signal, set the appropriate check mark.

4.9.1.2 MSN Settings (Multiple Subscriber Number)

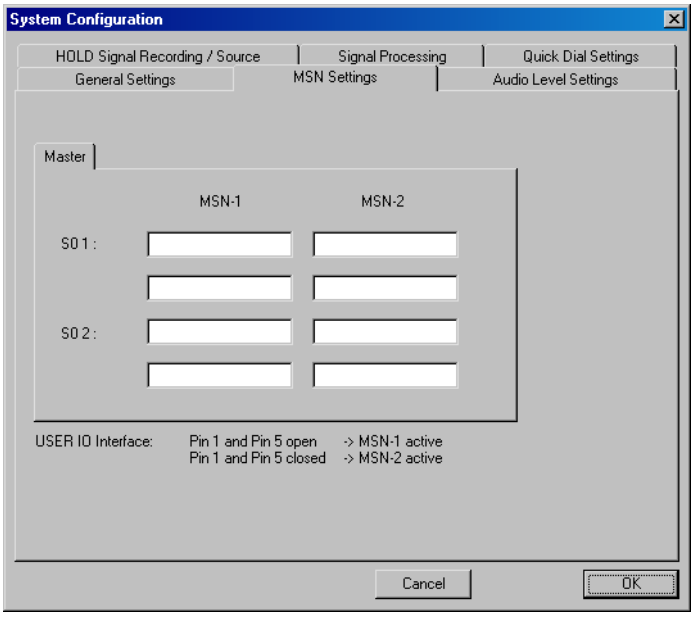
ATTENTION

MSN usage

MSN is used for addressing a particular unit on the ISDN Bus, which allows the operation of up to 8 units in parallel.

If only one unit is connected the entry of MSN is normally not necessary.

FIG. 14 SYSTEM CONFIGURATION TAP MSN SETTINGS



If an MSN has to be used, enter it in the ***MSN-1*** field. Per S_0 connection, two MSNs can be entered.

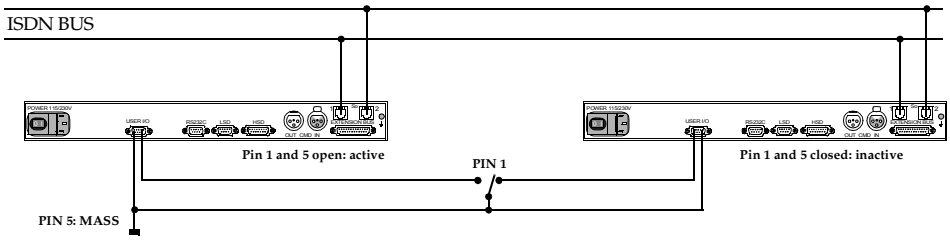
NOTE

With MSN the B channel of an ISDN connection cannot be addressed.

Use of the field ***MSN-2*** is intended for a redundant system. For security aspects many radio stations have a second studio that is completely identical to the first one. In case of a fault, calls can be switched immediately to the second studio. In general the switching to another ISDN number is quite difficult, but the Hybrid offers the possibility of choosing another MSN via a TTL operating signal.

For this, in principal two Hybrids are operated on the same ISDN Bus. Therefore without an MSN entry, both Hybrids would signal one caller. To always make sure that only one Hybrid is active, both systems must have a vaild number in ***MSN-1***. In ***MSN-2*** in both systems, enter an invalid number (e.g. 1111111). On both systems, connect pins 1 and 5 of the USER IO interface as shown in Fig. 15. When switching over, one system now gets the valid ***MSN-1*** block and the other one gets the invalid ***MSN-2*** block. Thus always, only one system is active.

FIG. 15 REDUNDANT OPERATION VIA MSN-BLOCK SWITCHING



TAB. 3 EXAMPLE FOR MSN-ENTRIES (VALID FOR BOTH SYSTEMS)

	MSN-1	MSN-2
S_0 1	5271189	1111111
	5271189	1111111
S_0 2	5271219	1111111
	5271219	1111111

4.9.1.3 Audio Level Settings

The nominal level of the system can be set separately for the input, ***Level In*** as well as for the output, ***Level Out***.

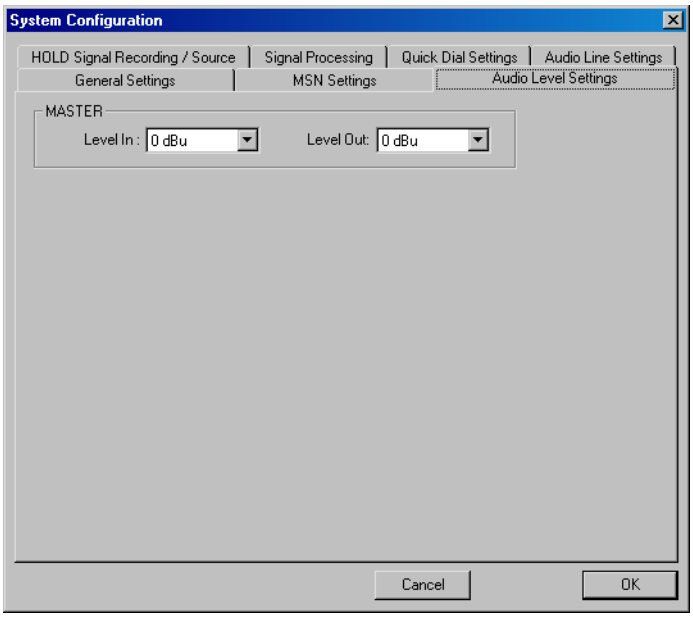
One of the following values can be set as the nominal level.

0 dBu, 3 dBu, 6 dBu, 9 dBu

The head room is always 6 dB so that, with a nominal level of 9 dBu a maximum level of 15 dBu can be achieved.

NOTE If the nominal ***Level In*** level is raised at the input, the level at the receiver will be correspondingly lowered.

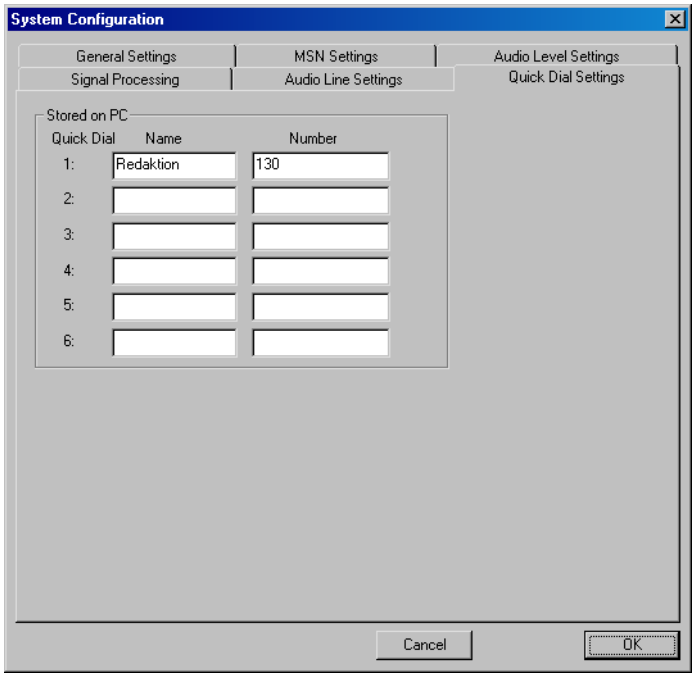
FIG. 16 SETTING OF THE AUDIO LEVEL



4.9.1.4 Quick Dial Settings

In the ***Stored on PC*** panel up to six different quick dial keys can be programmed. These quick dial keys are shown in the main menu of the user interface. Insert the corresponding name in the ***Name*** field against the number entered in the ***Number*** field.

FIG. 17 CONFIGURATION OF THE QUICK DIALS

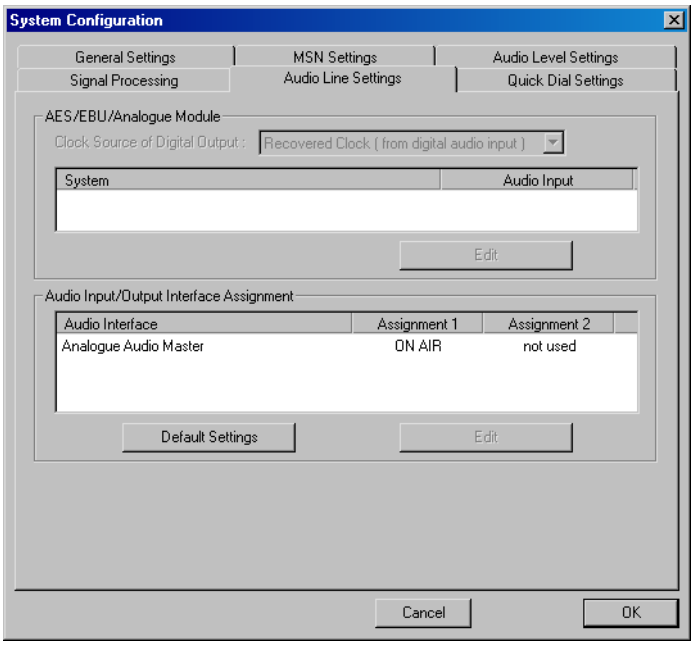


4.9.1.5 Audio Line Settings

Under ***Audio Line Settings,*** the audio interfaces of the system can be configured.

NOTE See CHAPTER A1, page 57 for the table of the audio interface assignment for different modes.

FIG. 18 CONFIGURATION OF THE AUDIO INTERFACES WITHOUT MODULE



If the ***AES/EBU/Analogue Module*** is not fitted, the system has only one analogue audio interface. The caller's ***On Air*** signal is stored under ***Assignment 1***.

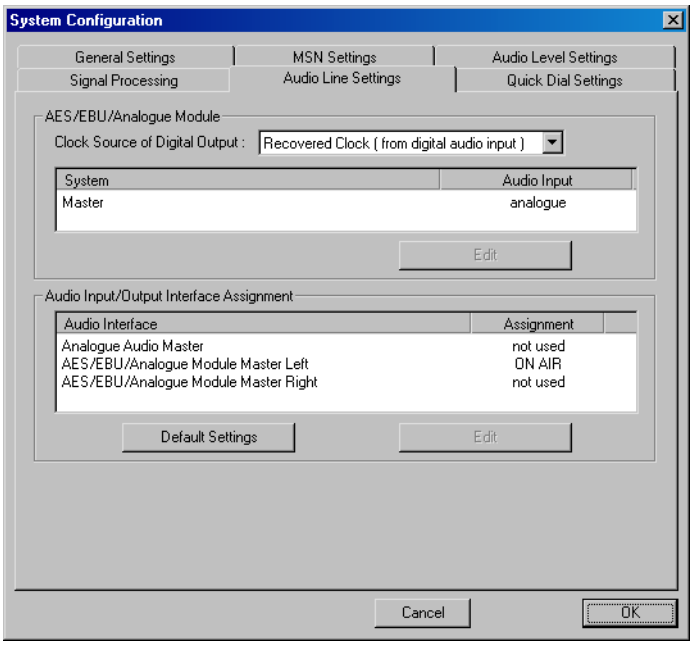
In addition when it is desired to use the optional ***handset*** on the same interface, the ***Pre Talk*** function can be selected under ***Assignment 2***.

The system has three relays. One of these relays is used for signalling the ***Pre Talk*** mode (see CHAPTER A2.5, table 13). The mixer can be connected via this relay.

NOTE If the ***AES/EBU/Analogue Module*** is not fitted in the system, no further settings can be made.

When the optional ***AES/EBU/Analogue Module*** (CHAPTER A2.7.1, page 65) is fitted, the system is expanded to two analogue or two digital AES/EBU audio inputs/outputs. In general these inputs and outputs can be configured as desired.

FIG. 19 CONFIGURATION OF THE AUDIO INTERFACES WITH MODULE



When using the digital AES/EBU outputs the clock which drives these interfaces should be set under ***Clock Source of Digital Output***. The following settings are possible:

– ***Recovered Clock (from digital audio input)***

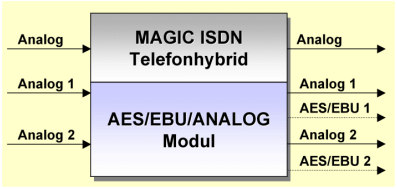
  This setting can only be used when the digital input is connected to a digital source. The digital output signal is then synchronised to the digital input signal.

– ***Internal Clock***

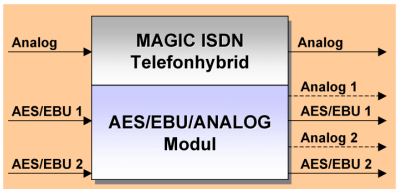
  The clock for the release of the digital output signal is generated internally. In this case the sampling rate is always 48-kHz.

– ***External Clock***

  With this setting the clock, which the digital output signa is fed, must be fed in via the BNC-socket. The sampling rate must be 48-kHz. The relevant „word“ clock is available by the BNC-socket as an output.



Select the system ***Master*** and press the ***Edit*** key to choose the ***analogue*** input audio-interfaces. Set ***analogue*** in the displayed panel.
Thus three analogue inputs (the already existing audio interface of the system + two other interfaces on the module) and three analogue audio outputs are available. The two analogue outputs on the module are additionally implemented in parallel on the digital output interfaces of the module. Set the clock source in ***Clock Source of Digital Output*** to ***Internal Clock***.



The ***digital***[1] inputs of the module are chosen by selecting the system ***Master***, pressing the ***Edit*** key and then setting ***digital***, there are one analogue and two digital audio inputs available. Additionally the system has two digital and one analogue output. The digital outputs of the module are also implemented in parallel on the analogue audio interfaces of the modules. The digital in- as

1 Please note that physically this is only **one** AES/EBU interface.

well as the output does have its own sample rate converter. Set as clock source in ***Clock Source of Digital Output*** one of the above mentioned operating modes (see page 39).

Audio Input/Output Interface Assignment

With this setting the function of each audio interface in the system is defined.

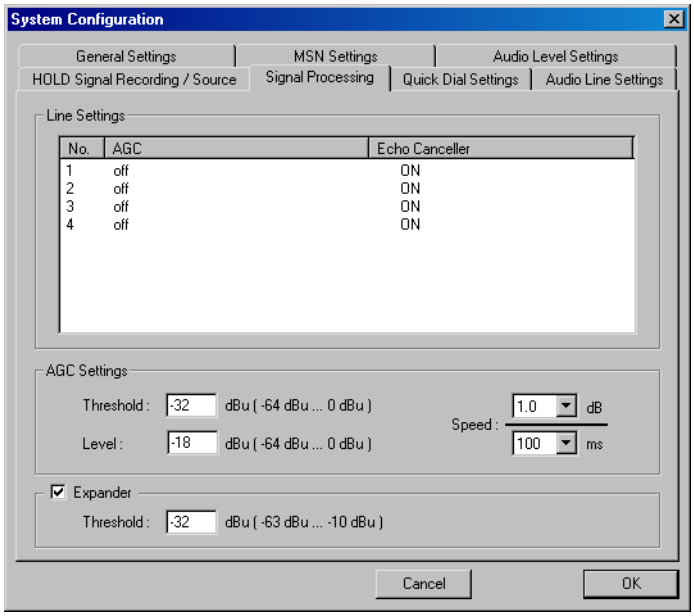
NOTE See CHAPTER A1, page 57 for the audio interface assignment table for different modes.

NOTE The assignment of the function always refers to the input **and** output.

4.9.1.6 Signal Processing

In this dialogue, the handling of incoming telephone signals can be configured.

FIG. 20 CONFIGURATION OF THE SIGNAL PROCESSING



AGC (Automatic Gain Control)

For each of the four channels, the Automatic Gain Control can be turned on (***AGC***) seperately.

Double click with the mouse on the appropriate channel to open the configuration window. To turn ***AGC*** off, choose ***Off***, to turn it on, select ***On***.

ATTENTION

Use of AGC
AGC is always useful for setting the correct level when it is not possible to talk to the caller in advance.

But: AGC is no wizard! There is no way that the volume of quiet callers can be turned up or the volume of very loud callers can be turned down.

AGC Settings

The correct functioning of the AGCs can be optimized using different parameters.

- ***Threshold***: The ***AGC*** only becomes active when the signal has exceeded the limit of the set value. The default setting is -32 dBu.
- ***Level*** : This set level meets the average expected level. Please allow enough space for head room. The default setting is -18 dBu.
- ***Speed*** : depending on how the ***AGC*** should re-adjust the level - slow or very fast- the setting for the speed can be made in this field. The faster the AGC is, the clearer the level steps can be heard. If the AGC is too slow, in general the caller is either too quiet or too loud. The default setting is 1dB/100ms.

Echo Canceller

An ***Echo Canceller*** can be turned on or off for each channel.

Double click with the mouse on the appropriate channel to open the configuration window. To turn the ***Echo Canceller*** off, choose ***Off***, to turn the echo-canceller on, select ***On***.

ATTENTION

Use of the Echo-Canceller
In general the use of the Echo Canceller is recommended. Always when a caller with an analogue telephone calls to the Hybrid there is an echo on the channel, which can interfere with the received signal. Digital telephones (e.g. ISDN or mobiles) do not cause this kind of echo. In this case, an Echo Canceller probably impairs the incoming signal. For this reason when establishing the connection the Hybrid sends a short test signal to the caller and measures the level of the echo. If the set value is not exceeded the Echo Canceller will be turned off since it is expected that the caller is using a digital telephone. If the level of the Echo is too high the Echo-Canceller turns on automatically.

However, each Echo Canceller can only cancel echoes if the signal delay lies within a certain range. Telephone connections via satellite have such a high range of delay that the Echo Canceller may not operate correctly.

Expander

The ***Expander*** adjusts a caller's signal automatically to a lower level when a certain threshold is reached. With this devise the background noise of callers who are not actually speaking, is completely filtered.

The ***Expander*** is turned on by setting the check mark. The threshold at which the noise suppression should start is defined in ***Threshold***. The default setting is -32 dBu.

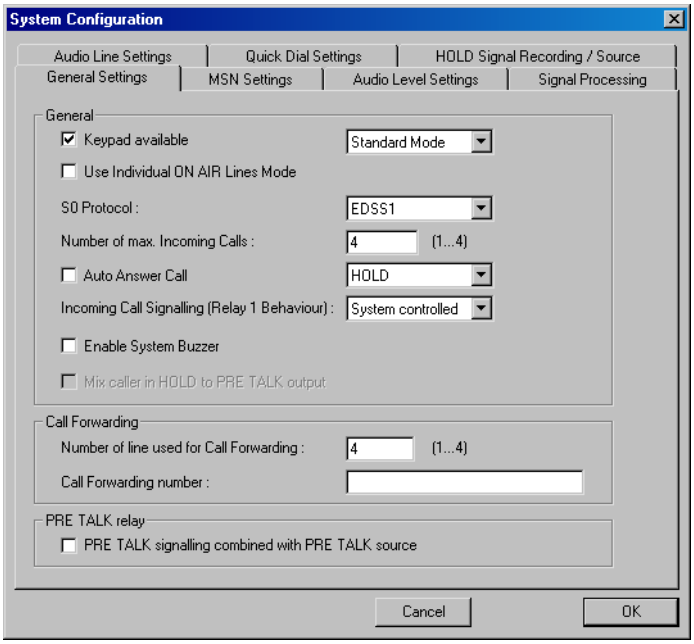
4.9.2 System Configuration with Keypad

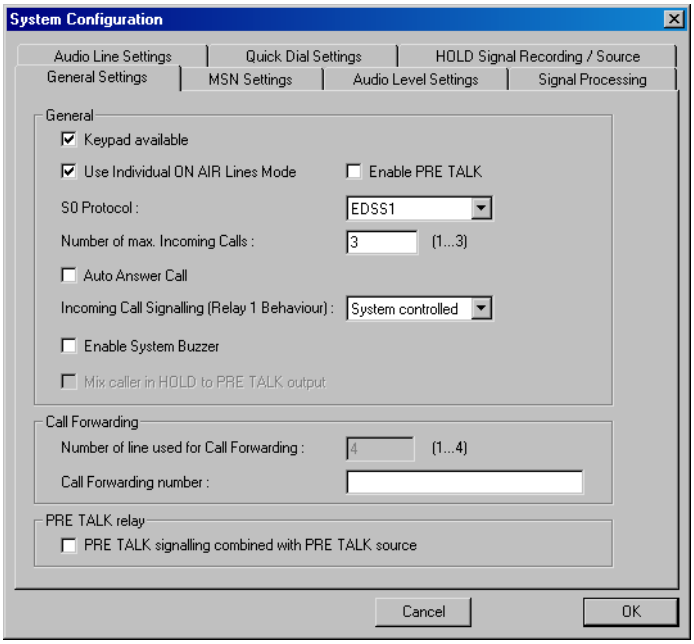
The configurations are summarised under different tabs which are now described in detail for the operation of the Hybrid **with** Keypad.

4.9.2.1 General Settings

When using the ***MAGIC Hybrid Keypad*** there are two different displays possible depending on the configuration of the ***General Settings*** tab. These settings depend on the configuration of ***Use Individual ON AIR Lines Mode***.

FIG. 21 SYSTEM CONFIGURATION TAB GENERAL SETTINGS





Keypad available

To use the ***MAGIC Hybrid Keypad*** this option must be set. This setting effects other functionalities as well as the assignments of the audio interfaces.

Additionally, when the keypad is active, the choice of using the standard operating mode is also available. The standard mode is automatically set up after turning on the system. The following modes can be chosen:

- ***Standard Mode***: if this setting is selected, only one of the caller is ***On Air***. All other callers hear the ***Hold*** Signal. On the display of the ***MAGIC Hybrid Keypad*** the message ***Standard*** is shown.
- ***Conference Mode***: all callers are automatically mixed in a conference and are ***On Air*** simultaneously. On the display of the ***MAGIC Hybrid Keypad*** the message ***Conference*** is displayed.
- ***Next Mode***: the callers are automatically put on ***Hold***. By pressing the ***Next*** key on the ***MAGIC Hybrid Keypad,*** the first caller is put ***On Air***. Pressing this key once again drops this connection and the next caller is put ***On Air,*** and so on. The ***MAGIC Hybrid Keypad*** shows ***Next on the display.***

NOTE The table of audio interface assignments with the keypad can be found in CHAPTER A1, page 57.

Use Individual On Air Lines Mode

NOTE This function is only relevant for systems equipped with ***AES/EBU/Analogue Modules***.

This option activates the Individual Mode of the Hybrid. All callers are routed to their individual audio interfaces. With this function, the Hybrid can be used as a triple ISDN Telephone Hybrid.

Enable Pre Talk

When the Individual Mode is turned on, there is additionally the possibility to activate the ***Pre Talk*** operating mode. Please note that the ***Pre Talk*** mode also needs an audio interface.

NOTE The table of audio interface assignments with this configuration can be found in CHAPTER A1, page 57.

S_0 Protocol

Select here the desired S_0 Protocol. In most cases it is ***EDSS1*** (Euro ISDN).

Sometimes the old German national ***1TR6*** protocol can be found in PABXs.

Number of max. Incoming Calls

The ***MAGIC ISDN Telephone Hybrid*** has a maximum of four B channels into which callers can dial in simultaneously. Therefore a telephone conference with up to four participants can be accomplished very easily.

Enter ***2*** when only one S_0 line is connected. Enter ***4*** when a second S_0 Line is connected. To prevent several callers calling in simultaneously, the value must be set to ***1***.

NOTE If the individual mode is activated, a maximum of 3 callers can dial into the system simultaneously.

Auto Answer Call

Incoming calls can be accepted by the system automatically. Set the relevant check mark.

To prevent auto calls being answered automatically, leave the box unchecked.

If there is an incoming call the relevant message is displayed on the PC.

If the individual mode is not configured another combination field appears. In this field it can be defined to which line the caller should be routed. The selection depends on the audio interfaces available.

Incoming Call Signalling (Relay 1 Behaviour)

The system has three relays. One relay is used for external call signalling (see A2.5, page 64).

The combination field allows the following settings:

- ***always open***: the relay is always open
- ***always closed***: the relay is always closed
- ***System controlled***: if there is an incoming call on any channel the relay is closed

Enable System Buzzer

Faulty operations or warning signals can be signalled in the system by a buzzer. To enable this system buzzer set the relevant check mark.

Mix caller in HOLD to PRE TALK output

NOTE

This function is only available for systems equipped with ***AES/EBU/Analogue Modules***. Additionally, a ***Hold*** Line must be configured.

If this function is activated the signal of callers in the ***Hold*** mode of the ***MAGIC Hybrid Keypad*** are mixed with the signal of the caller in ***Pre Talk***. These callers do not hear the outgoing ***Pre Talk*** signal. The purpose of this function is so that callers in ***Hold*** can immediately attract attention.

Call Forwarding

The system supports call forwarding. The Program Presenter only has to press one button on the ***MAGIC Hybrid Keypad*** to forward the call to the editorial department. This is quite useful for example, after a game show when the address of the caller is to be written down. To be independent from ISDN installations, the call forwarding is made to a B-channel on the system. The caller is still kept in the system. Thus the Program Presenter has the possibility get the caller back.

Number of line used for Call Forwarding

The last B channel of the last S_0 line should always be entered here. For one S_0 line, enter B channel ***2***, for two S_0 lines, enter B channel ***4***.

Call Forwarding number

When the call is to be automatically forwarded to a pre determined number, enter this number in this field. If the field is left blank any number can be dialled.

PRE TALK relay

The system has three relays. One relay is used for signalling the ***Pre Talk*** mode (see CHAPTER A2.5, Relay 1). As soon as a caller is in ***Pre Talk***, the relay activates. For example, an automatic switch over to the mixer can take place via this relay.

PRE TALK signalling combined with PRE TALK source

This function serves to activate the ***Pre Talk*** relay only when ***Pre Talk*** in addition to the audio input  and not the telephone handset  are used as the source.

4.9.2.2 MSN Settings (Multiple Subscriber Number)

Refer to CHAPTER 4.9.1.2, page 34

4.9.2.3 Audio Level Settings

Refer to CHAPTER 4.9.1.3, page 36

4.9.2.4 Signal Processing

Refer to CHAPTER 4.9.1.6, page 41

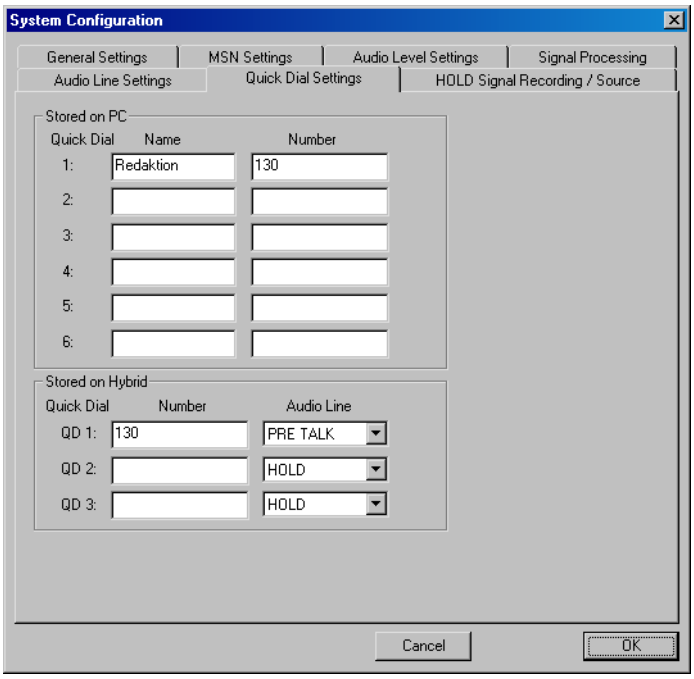
4.9.2.5 Audio Line Settings

Refer toCHAPTER 4.9.1.5, page 38

4.9.2.6 Quick Dial Settings

Depending on the mode of operation several quick dial keys can be programmed.

FIG. 22 CONFIGURATION OF QUICK DIALS



With ***Stored on PC,*** up to six different quick dial numbers can be programmed. The quick dial numbers are displayed on the main panel of the user interface. Enter in the ***Name*** field, a clear description for the number, which must be entered in the ***Number*** field.

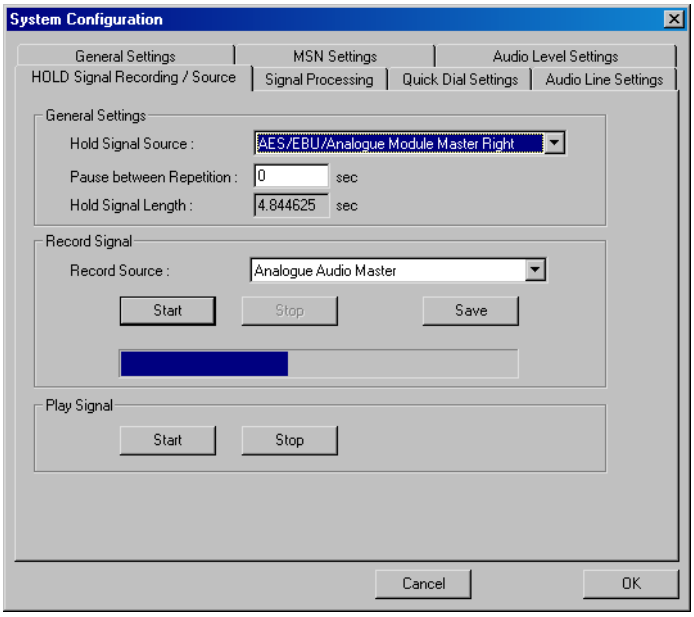
If the optional ***MAGIC Hybrid Keypad*** is also available, three additional quick dial numbers for the keys ***QD 1*** ... ***QD 3*** can be stored. Enter the desired numbers in the ***Number*** field. The ***Audio Line***[1] selection allows the automatic assignment of the caller to a particular audio line as soon as the call is answered. The possible audio lines depend on the configuration of the system.

1 The system has different internal logical audio-lines like e.g. Pre Talk, On Air, Hold etc. The logical audio-lines can be routed in any way to the physical audio interfaces.

4.9.2.6.1 Hold Signal Recording/Source

The ***Hold***-signal can be configured via this dialog. Apart from the normal interface selection the possibility exists to store an individual signal of 8 seconds duration in the system. This signal is given in cycles.

FIG. 23 CONFIGURATION OF THE HOLD-SIGNAL



General Settings

Hold Signal Source

Specify here the source from which the ***Hold*** signal should be generated. Selection can be from the audio interfaces, which are configured as ***On Air*** or ***Hold*** (see 4.9.1.5, page 38).

However there is also the possibility of storing a particular ***Hold*** signal in the system and to output this signal. Choose ***Recorded Hold Signal*** for this.

Pause between Repetition

When using a generated ***Hold*** signal, the pause in seconds between the repetitions can be defined.

Hold Signal Length

The length of the recorded ***Hold*** signal is displayed here.

Record Signal

Record Source

Select here the source for the recording of the ***Hold*** signal.

Press the ***Start*** button to begin recording.

By pressing the ***Stop*** button recording is ended.

If the recording is acceptable it can be saved with the ***Save*** button.

ATTENTION

Stored Hold Signal
Please note that while making an update of the firmware, the ***Hold*** signal is erased from the system.

After every update the ***Hold*** signal must be recorded again.

Play Signal

At any time, the recorded ***Hold*** signal can be listened to before it is saved by pressing ***Save***.

With the ***Start*** button, the signal is present on all audio outputs.

The ***Stop*** button stops the replay.

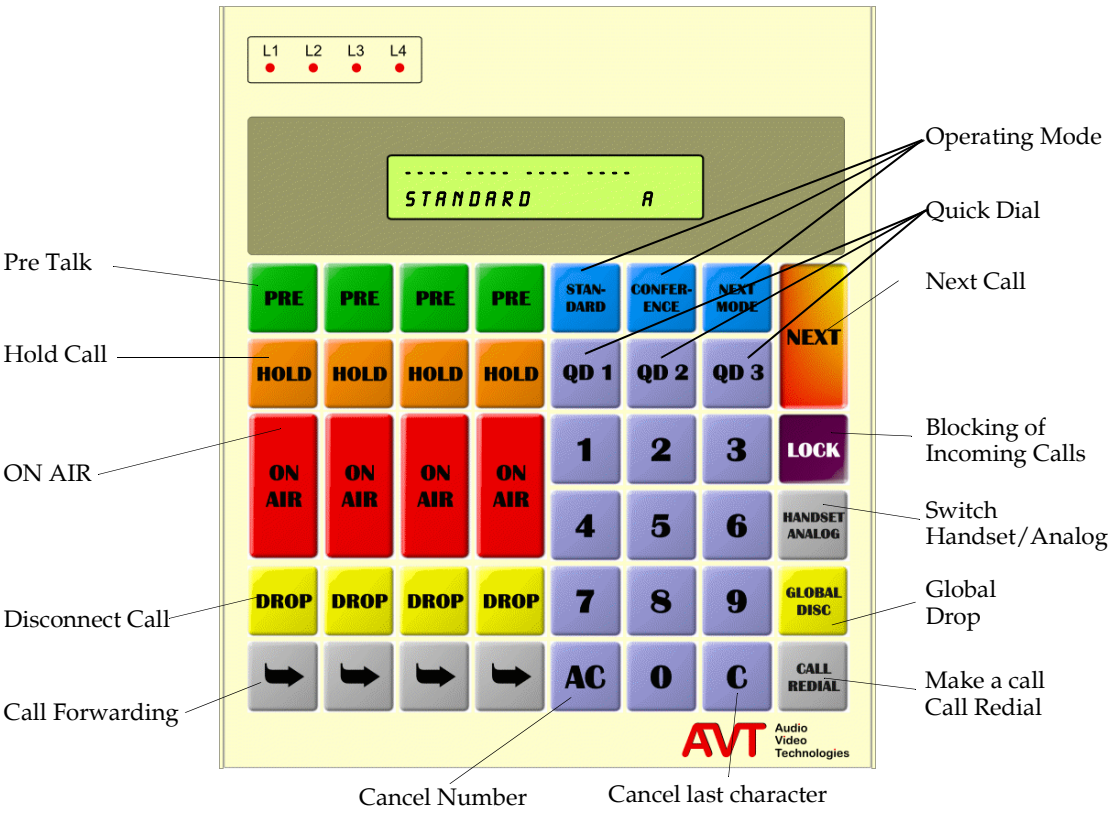
5 OPTION: MAGIC HYBRID KEYPAD

The optional ***MAGIC Hybrid Keypad*** supports a comfortable operation of the system for users who do not want to use a PC to control the Hybrid. However, it is possible to use a PC and the keypad in parallel as a redundancy on the system. The maximum number of incoming calls which can be displayed, is limited to *four* calls at the ***MAGIC Hybrid Keypad 4***, to *seven* calls at the ***MAGIC Hybrid Keypad 7*** and *12* calls at the ***MAGIC Hybrid Keypad 12.***
The ***MAGIC Hybrid Keypad*** requires its own power supply and the delivery includes a special adapter cable (see A2.4, page 64) to connect the ***MAGIC Hybrid Keypad*** to the ***MAGIC ISDN Telephone Hybrid*** and to the power supply.

Connect the 9-pin, SUB-D plug on the adapter cable to the 9-pin SUB-D ***LSD*** socket on the ***MAGIC ISDN Telephone Hybrid***. Plug the 8 pin mini DIN plug on the the adapter cable into the 8 pin mini DIN socket on the right rear of the ***MAGIC Hybrid Keypad***. Connect the PS-2 plug on the adapter cable into the PS-2 socket on the cable of the mains power supply unit. Finally plug the mains unit into the 230V AC mains. If everything is setup correctly the display lights up. After the system[1] has been turned on and it has been booted the following graphic can be seen on the display:

The following figure shows the control elements of the keypad.

FIG. 24 KEY ASSIGNMENT ON THE MAGIC HYBRID KEYPAD



1 If the system was already turned on, press once either the „C“ or the „AC“ key.

5.1 Working with the MAGIC Hybrid *Keypad*

Before operating the ***MAGIC Hybrid Keypad,*** the configurations described in chapter 4.4 first have to be properly set.

5.2 LCD-Display

General information about the current connection status and the available B channels is shown in the first line the 2 x 20 character LCD Display. The following displays are possible:

TAB. 4 INDICATION OVERVIEW OF THE FIRST LINE OF THE DISPLAY

Display	Meaning
> > > >	sent calls
% % % %	incoming calls
- - - -	no connection
AIR	caller is on air
HOLD	caller is in hold
PRE	caller is in pre talk
- - - >	caller is being forwarded
< - - -	forwarding connection
LN 1	caller is on audio line 1
LN 2	caller is on audio line 2
LN 3	caller is on audio line 3
LN 4	caller is on audio line 4
????	undefined condition

The second line changes its function according to the mode.

The last character of the second line always shows the status of the ***Pre Talk*** interface. This interface can be used either with the optional handset (display **H**) or with the analogue/digital (display **A**) XLR input. The switching of the ***Pre Talk*** source is made with this key 

.

- If there is no connection, the configuration of the Hybrid is displayed.

The following operating modes are possible:

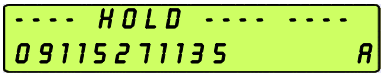
- ***Standard:*** only one caller is ***On Air*** or in ***Pre Talk***. All other callers are automatically in the ***Hold*** position.
- ***Conference:*** all callers in the ***On Air*** or ***Pre Talk*** modes are mixed.
- ***Next:*** the callers are automatically on ***Hold***. By pressing the ***Next*** key the first caller goes ***On Air***. By pressing this key once again, the connection with this caller will be dropped and automatically, the next caller goes ***On Air***.

NOTE Only when the system has the optional ***AES/EBU/Analogue Module Pre Talk*** and ***On Air*** can be used simultaneously.

– ***Individual:*** the Hybrid uses all B channels independently. The callers are not mixed, they are routed to pre-configured audio interfaces. (see 4.9.2.5, page 46).

NOTE

This operating system is only available when the Hybrid is equipped with the ***AES/EBU/Analogue Module*** and it can only be configured through the Windows PC Software (see 4.9.2.1, page 43).



– When dialling the telephone number the number dialled is displayed. The input of the number must be made by the : 0 ... 9 keys.

NOTE

The last entered number may be cancelled by pressing key C
The complete input can be cancelled by pressing key AC

– If there is an existing connection, the level meter is displayed. This display has a maximum of 4 characters and 5 segments. The smallest representable level is -34 dBu. The scale is divided into 2 dB steps. The maximum value is +6 dBu.

– If there is a faulty connection, ISDN provides a wealth of error messages. The meaning of the messages can be looked up in the following table. The message on the LCD Display shows the concerned B channel in first position followed by the error message.

TAB. 5 ISDN-ERROR MESSAGES

Error Message	Description
Unass. number	The number is not recognised by the ISDN. Check your input.
No route	No route. When this message appears the ISDN is normally overloaded. Dial again.
Normal disc.	The connection was disconnected normally.
User busy	The number called is busy.
No user resp.	User is not responding, Possibly the wrong number was dialled.
Call rejected	Call was rejected. Perhaps the person called has done this.
Number chang.	Dialled number has been changed.
Destin. error	Possibly the equipment is switched off. The called end is not operational.
Inval. number	Invalid number.
No line avai.	No B channel available.
No Network	No ISDN available. Check your ISDN connection.
Netw. failure	Temporary ISDN failure.
Congestion	ISDN network error. Possibly the wrong ISDN protocol is selected.
Bearer capab.	The wanted bearer is not available.
Bearer serv.	The wanted bearer is not implemented.
Remote disc.	Connection was disconnected by the remote end.
Procedure er.	Distant or local ISDN-procedure error.
Cannot dial	System cannot dial.

5.3 Function of the keypad.

The keypad functions can be seen in the following table.

TAB. 6 KEYPAD FUNCTIONS

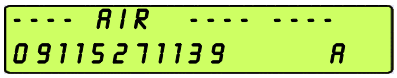
Key	Description
STAN-DARD	Standard operating mode: in this operating mode only one caller is On Air, all other callers receive the Hold signal. On the MAGIC Hybrid Keypad **Standard** is indicated on the display. The operating mode can also be configured by the PC software. (see 4.9.2.1, page 43). Note: If the **Individual** mode was configured by the PC, this key is locked.
CONFER-ENCE	In the On Air or Pre Talk mode all callers are automatically mixed. **Conference** is displayed on the MAGIC Hybrid Keypad. This operating mode can also be configured by the PC software. (see 4.9.2.1, page 43). Note: If the **Individual** mode was configured by the PC, this key is locked.
NEXT MODE	The callers are automatically put on Hold. By pressing the Next key on the MAGIC Hybrid Keypad the first caller is put On Air. Pressing this key once again disconnects the call and the next caller is put On Air, etc. **Next** is displayed on the MAGIC Hybrid Keypad. The operating mode can also be configured by the PC software. (see 4.9.2.1, page 43). Note: If the **Individual** mode was configured by the PC, this key is locked.
C	By pressing this key, the last character of an input is cancelled. This key is also used to stop a function.
AC	Pressing this key cancels the whole input.
0 9	The keys 0...9 are for the input of the number. The connection is established by pressing the Call/Redial, Pre Talk, Hold or On Air key. Pressing Call/Redial uses the next free channel. By pressing Pre Talk, Hold, On Air, the channel can be explicitly chosen.
QD 1 QD 3	The quick dial keys QD 1... QD 3 are used to call a stored number directly. The number can be stored either by the PC software (see 4.9.2.6, page 47) or by the Keypad (see 5.4, page 55).
 CALL REDIAL	With the forwarding key the caller can be put through to any previously stored or non-stored number. The programming of this key (see 4.9.2.1, page 43) can be done either by the PC-software (see 4.9.2.6, page 47) or by the Keypad (see 5.5, page 56). The caller can be forwarded at any time, even when the telephone is ringing. With this key, a call to the last dialled number is set up automatically on the first free channel. If the line is busy the number can be redialled by pressing the key once again.
GLOBAL DROP	All existing connections are dropped when this key is pressed. For confirmation the **Drop all?** message appears on the display. By pressing the key once again the connections are dropped. To cancel **Global Drop** press **C** and the connections will be retained.

TAB. 6 KEYPAD FUNCTIONS

Key	Description
	This key drops the connection. There is no pre-confirmation on the appropriate channel.
	Puts the caller in Pre Talk. The physical audio interface is configured by the PC software. (see 4.9.2.5, page 46) If the optional AES/EBU/Analogue Module is not fitted, the master audio interface will be used for Pre Talk and On Air simultaneously. In this case, only a changeover of the signalling relay is made (see A2.5, page 64). Working in the **Individual** mode the Pre Talk function explicitly has to be set.
	Puts the caller on hold. The physical audio interface is configured by the PC software.(see 4.9.2.5, page 46). The signal heard in this mode can be specified by the PC software (see 4.9.2.6.1, page 48).
	Puts the caller on On Air. The physical audio interface is configured in the PC software. (see 4.9.2.5, page 46). If the optional AES/EBU/Analogue Module is not fitted, the master audio interface will be used for Pre Talk and On Air simultaneously. In this case only a changeover of the signalling relay is made (see A2.5, page 64).
	This key selects the Pre Talk source. If the optional handset is connected, it is possible to switch between the audio input and the handset-microphone for Pre Talk. On the display **H** appears for handset and **A** for audio input. If the optional AES/EBU/Analogue Module is not fitted and a digital input for Pre Talk was configured, the handset can only be used when the analogue master audio interface of the system was also configured for Pre Talk.
	This key enables the system to be blocked for incoming calls. Outgoing calls are still possible. **Locked** (blocked) appears on the display.
	When the NEXT mode is activated pressing this key puts the next caller On Air. Pressing it once again disconnects the call and the next caller is automatically put On Air and so on.

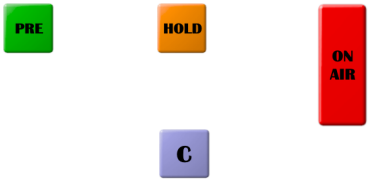
5.4 Programming of the quick dial keys

The quick dial keys *QD 1*... *QD 3* can either be programmed by the PC Software or directly by the keypad.



First enter the number to be programmed.

Then press any forwarding key.



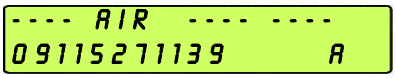
On the display, the question ***Save Quickdial?*** appears.

Now either ***Pre Talk***, ***Hold*** or ***On Air*** can be pressed to get the desired mode you want to have when the call is accepted by the called person.

To store no number press key ***C***.

5.5 Programming of the forwarding

The forwarding can either be programmed by the PC software or directly by the keypad.



First enter the number to be programmed.

Then press any forwarding key.

On the display, the question ***Save Forwarding No.?*** appears.

By pressing it once again the number is saved.

To store no number press key

A1 AUIDIO-INTERFACE ASSIGNMENT

The assignment of the audio interfaces depends on the following parameters:

- MAGIC Hybrid Keypad
- AES/EBU/Analogue Module
- Analogue or digital input
- Individual Mode
- Pre Talk

Depending on these parameters, the software configures the system automatically with a useful default audio interface assignment.

If the ***MAGIC Hybrid Keypad*** and the ***AES/EBU/Analogue Modul*** are fitted the appropriate allocation selected is that the first two channels of the keypad are routed to the first two channels of the module.

For ***Pre Talk,*** the analogue interface of the master system is always chosen. In case ***Pre Talk*** is to be used through the digital interface, it can be configured by the ***Audio Line Settings***. If additionally, the handset is to be used, ***Pre Talk*** must be installed for both interfaces (analogue and digital) in parallel.

NOTE

Yes in the ***config.*** column means that the configuration of the interfaces can be changed.

A1.1 Assignment with an analogue input

TAB. 7 AUDIO INTERFACE ASSIGNMENT: ANALOGUE INPUT

Module	Individual	Keypad	Pre Talk	Interface Assignment	config.
no	no	no	no	Audio Interface: Analogue Audio Master — Assignment 1: ON AIR — Assignment 2: not used	yes
no	no	yes	yes	Audio Interface: Analogue Audio Master — Assignment 1: ON AIR — Assignment 2: PRE TALK	yes
yes	no	no	no	Audio Interface: Analogue Audio Master — Assignment: not used AES/EBU/Analogue Module Master Left — ON AIR AES/EBU/Analogue Module Master Right — not used	yes
yes	no	yes	yes	Audio Interface: Analogue Audio Master — Assignment: PRE TALK AES/EBU/Analogue Module Master Left — ON AIR AES/EBU/Analogue Module Master Right — not used	yes
yes	yes	no	no	Audio Interface: Analogue Audio Master — Assignment: Line 3 : ON AIR AES/EBU/Analogue Module Master Left — Line 1 : ON AIR AES/EBU/Analogue Module Master Right — Line 2 : ON AIR	no
yes	yes	yes	no	Audio Interface: Analogue Audio Master — Assignment: Line 3 : ON AIR AES/EBU/Analogue Module Master Left — Line 1 : ON AIR AES/EBU/Analogue Module Master Right — Line 2 : ON AIR	no
yes	yes	yes	yes	Audio Interface: Analogue Audio Master — Assignment: PRE TALK AES/EBU/Analogue Module Master Left — Line 1 : ON AIR AES/EBU/Analogue Module Master Right — Line 2 : ON AIR	no

A1.2 Assignment with a digital input

To use the digital input, the ***AES/EBU/Analogue Module*** must be fitted.

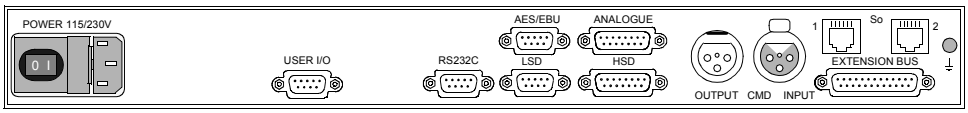
TAB. 8 AUDIO-INTERFACE ASSIGNMENT: DIGITAL INPUT

Individual	Keypad	Pre Talk	Interface Assignment	config.
no	no	no	Audio Interface / Assignment Analogue Audio Master — not used AES/EBU/Analogue Module Master Left — ON AIR AES/EBU/Analogue Module Master Right — not used	yes
no	yes	yes	Audio Interface / Assignment Analogue Audio Master — PRE TALK AES/EBU/Analogue Module Master Left — ON AIR AES/EBU/Analogue Module Master Right — PRE TALK	yes
yes	no	no	Audio Interface / Assignment Analogue Audio Master — Line 3 : ON AIR AES/EBU/Analogue Module Master Left — Line 1 : ON AIR AES/EBU/Analogue Module Master Right — Line 2 : ON AIR	no
yes	yes	no	Audio Interface / Assignment Analogue Audio Master — Line 3 : ON AIR AES/EBU/Analogue Module Master Left — Line 1 : ON AIR AES/EBU/Analogue Module Master Right — Line 2 : ON AIR	no
yes	yes	yes	Audio Interface / Assignment Analogue Audio Master — PRE TALK AES/EBU/Analogue Module Master Left — Line 1 : ON AIR AES/EBU/Analogue Module Master Right — Line 2 : ON AIR	no

A 2 INTERFACES

The following figure shows the system interfaces of the Telephone Hybrid:

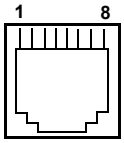
FIG. 25 REAR VIEW OF THE MAGIC ISDN TELEPHONE HYBRID



All interfaces are described as follows:

A2.1 S_0 Interface

This interface supports 2 B channels in ISDN networks. The system has two ISDN interfaces for a maximum of 4 B channels.



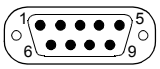
TAB. 9 PIN ASSIGNMENT: S_0-INTERFACE

Socket: Western (8-pole) RJ45

Pin	Signal		Electrical Characteristics
1	Not used		Recommendation: I.430
2	Not used		Data Rate: B-channel: 2x64 kbit/s D-channel: 16 kbit/s
3	TX a	Data out a	
4	RX a	Data in a	
5	RX b	Data in b	
6	TX b	Data out b	
7	Not used		
8	Not used		

A2.2 RS232C-Interface

The RS232C interface is used for configuring and monitoring the MAGIC ISDN Telephone Hybrid system with a PC. To connect the system to the PC a null modem cable, in which pin 2 and pin 3 are crossed is required. Additionally, pin 5 GND, must be connected. All other pins are not essential.



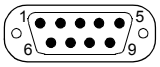
TAB. 10 PIN ASSIGNMENT: RS-232-INTERFACE

Connector: RS232C (SUB-D, 9-pole, male)

Pin	Signal		Electrical Characteristics	
1		Not used	Type:	DTE
2	RXD	Receive Data	Level:	V.24
3	TXD	Transmit Data	Data Rate:	19200 Baud
4	DTR	Data terminal ready	Transmission Range:	max. 15 m
5	GND	Ground	Protocol:	1 Start bit
6	DSR	Data set ready		8 Data bits
7	RTS	Request to send		1 Parity bit
8	CTS	Clear to send		1 Stop bit
9		Not used		

A2.3 TTL USER I/O Interface

External operating signals can be sent through this interface. Three signals are always used to drive the relay within in the system.



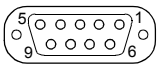
TAB. 11 PIN ASSIGNMENT: USER I/O-INTERFACE

Connector: TTL USER-I/O (SUB-D, 9-pin, male)

Port	Signal	Electrical Characteristics	
1	MSN switchover input +5V: MSN-1 (level without switching) GND: MSN-2	Level: Rating:	TTL/CMOS 20 mA
2	Used for relay 1		
3	TTL 3 IN/OUT		
4	Used for relay 2		
5	GND		
6	TTL 5 IN/OUT		
7	used for relay 3		
8	TTL 7 IN/OUT		
9	TTL 8 IN/OUT		

A2.4 LSD (Keypad) Interface

Via the LSD interface the system can optionally be operated using the ***MAGIC Hybrid Keypad***.



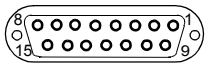
TAB. 12 PIN ASSIGNMENT: LSD INTERFACE

Socket: LSD (SUB-D, 9-pole)

Port	Signal		Electrical Characteristics
1	CD	Carrier Detect	Level: V.24
2	RxD	Receive Data	
3	TxD	Transmit Data	Transmission Range:max. 15 m
4	DTR	Data Terminal Ready	
5	GND	Ground	
6	DSR	Data Set Ready	
7	RTS	Request To Send	
8	CTS	Clear to Send	
9	RI	Ring Indication	

A2.5 HSD (Relay) Interface

Three relays with floating outputs are available on this interface.

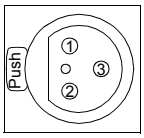


TAB. 13 PIN ASSIGNMENT: HSD (RELAY)-INTERFACE

Socket: HSD (SUB-D, 15-pole)

Port	Signal		Electrical Characteristics
1	Shield		max. Rating: 100mA
2		not used	
3	Relay 1a	signalling incoming call a	
4		not used	
5	Relay 2a	ON AIR a	
6		not used	
7	Relay 3a	PRE TALK a	
8	GND	Ground	
9		not used	
10	Relay 1b	signalling incoming call b	
11		not used	
12	Relay 2b	ON AIR b	
13		not used	
14	Relay 3b	PRE TALK b	
15		not used	

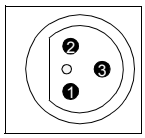
A2.6 Audio Interface



TAB. 14 PIN ASSIGNMENT: AUDIO INTERFACE (INPUT)

Socket: input (XLR)

Port	Signal	Electrical Characteristics
1	Shield	Input level: 0, +3, +6, +9 dBu
2	Audio in a	Impedance: > 15 kΩ
3	Audio in b	Head Room: 6 dB



TAB. 15 PIN ASSIGNMENT: AUDIO-INTERFACE (OUTPUT)

connector: output (XLR, male)

Port	Signal	Electrical Characteristics
1	Shield	Output level: 0, +3, +6, +9 dBu
2	Audio out a	Impedance: < 20 Ω
3	Audio out b	Head Room: 6 dB

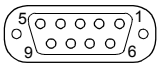
A2.7 Audio Interfaces on the optional AES/EBU/Analogue Module

There are two digital inputs/outputs or two additional analogue inputs/outputs available on the AES/EBU/Analogue Module. The configuration is made using the Windows PC software.

NOTE The digital and analogue audio outputs on the modules are connected in parallel. Consequently the signal can be used on both interfaces simultaneously.

A2.7.1 AES/EBU Audio Interface

The AES/EBU digital Audio Interface is implemented as a 9-pole SUB-D socket. Therefore the ISDN Telephone Hybrid has two digital inputs/outputs on one physical AES/EBU interface. Optionally an XLR adapter can be supplied. The input as well as the output have their own sample rate converters. With these, a digital source of 32, 44.1 or 48-kHz can be connected directly. For synchronisation to an external clock (only 48-kHz) the word clock input or output may be used.This is implemented on the adapter as a BNC socket.



TAB. 16 PIN ASSIGNMENT: AES/EBU AUDIO INTERFACE

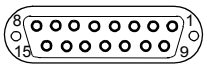
socket: AES/EBU (SUB-D, 9-pole)

Port	Signal	Electrical Characteristics
1	AES/EBU IN a	IEC958 Professional
2	AES/EBU IN b	
3	GND word clock 48-kHz	Word clock: TTL level 5V
4	AES/EBU OUT a	
5	AES/EBU OUT b	
6	GND AES/EBU IN	
7	Word clock 48-kHz IN	
8	Word clock 48-kHz OUT	
9	GND AES/EBU OUT	

NOTE An ***AES/EBU Adapter Cable*** SUB-D, 9-pole to XLR is available (ID:490091)

A2.7.2 Analogue Audio Interfaces

The additional analogue audio interfaces on the module are available at a 15-pole SUB-D socket. Optionally, an adapter cable with XLR sockets or plugs is available.



TAB. 17 PIN ASSIGNMENT: ANALOGUE AUDIO INTERFACES

Socket: HSD (SUB-D 15-pole)

Port	Signal	Electrical Characteristics
1	Channel 1[a] IN a	Input:
2	Channel 1[a] IN b	Rated Level: 0, +3, +6, +9 dBu
3	Channel 2[b] IN a	Impedance: > 15 kΩ
4	Channel 2[b] IN b	
5	Channel 1[a] OUT a	Output:
6	Channel 1[a] OUT b	Rated level: 0, +3, +6, +9 dBu
7	Channel 2[b] OUT a	Impedance: < 20 Ω
8	Channel 2[b] OUT b	
9	GND channel 1[a] IN	Head Room: 6 dB
10	GND	
11	GND channel 2[b] IN	
12	GND	
13	GND channel 1[a] OUT	
14	GND	
15	GND channel 2[b] OUT	

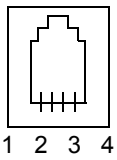
a On the AES/EBU audio interface, Channel 1 corresponds to the right channel

b On the AES/EBU audio interface, Channel 2 corresponds to the left channel

NOTE An ***Analogue Adapter Cable*** SUB-D, 15-pole to XLR is available (ID:490090)

A2.8 Receiver

The optional handset is connected here.



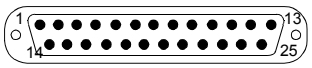
TAB. 18 PIN ASSIGNMENT: RECEIVER

RI11 Socket: handset(Western 4-pole)

Port	Signal	Electrical Characteristics
1	Audio Out a	
2	Audio In a	
3	Audio In b	
4	Audio Out b	

A2.9 Extension Bus (internal data bus and control bus)

The Extension Bus socket is used for the cascade connection of single ***MAGIC ISDN Telephone Hybrids.*** This function is not used for the ***MAGIC Triple ISDN Telephone Hybrid***. The system can be upgraded at any time.



TAB. 19 PIN ASSIGNMENT: EXTENSION BUS-INTERFACE

connector: Extension Bus (SUB-D, 25-pole, male)

Port	Signal		Electrical Characteristics
1	Shield		Data Rate:
2	TXa	Transmit Data	64kbit/s up to 2.048Mbit/s
3	Ca	Control	Level: V.11, symmetrical
4	RXa	Receive Data	Protocol for RS.485:
5	CLK48a[a]	Clock 256×48 kHz	1 Start bit
6	CLKa	Clock Receive	8 Data bits
7			1 Parity bit
8	GND	Ground	1 Stop bit
9	TXb	Transmit Data	Data Rate: 19200 Bd
10	Cb	Control	
11	RXb	Receive Data	
12	CLK48b	Clock 256×48 kHz	
13	CLKb	Clock Receive	
14	CTa	Control RS485 Bus	
15	CTb	Control RS485 Bus	
16	C_DATAa	RS485 Bus	
17	C_DATAb	RS485 Bus	
18	RXD_Va	Receive_D_Valid	
19	RXD_Vb	Receive_D_Valid	
20	TXD_Va	Transmit_D_Valid	
21	TXD_Vb	Transmit_D_Valid	
22	FSa	Frame_Sync	
23	FSb	Frame_Sync	
24	CLK48a	Clock 256×48 kHz	
25	CLK48b	Clock 256×48 kHz	

a Is only used if more than four units of a system are connected together.

A 3 TECHNICAL DATA

NETWORK INTERFACES:

– 2 x S_0	I.430	RJ45
– Protocols	DSS-1, 1TR6	

Additional data interfaces

– HSD:	3 x Relay	15-pin SUB-D, female

User interfaces

– RS232C	V.24, 19200 Bd for PC	9-pin SUB-D male
– USER I/O[1]	Control signal TTL	9-pin SUB-D male
– LSD:	V.24 for Keypad	9-pin SUB-D female

Coding algorithms

– G.711	3.1-kHz (telephone algorithm)

Audio-interface

– electronic, balanced input		XLR, female
– electronic, balanced output		XLR, male
– Nominal level	0, +3, +6, +9 dBu (can be programmed)	
– Head room	6 dB	
– Impedance	Input: Output:	> 15 kΩ < 20 Ω

- AGC per B Channel, configurable
- Echo Canceller per B channel (128 taps, 16ms Echo cancel time)
- Expander per B channel, configurable
- Digital Mixing
- Digital Mix-Minus

POWER SUPPLY:

Alternating voltage

- 90 to 253 V (50/60 Hz)

1 is used to identify the hardware

Power consumption

– max. 30 VA

MEASUREMENTS:

H x W x D

– 44 x 449 x 450 mm (1U x 19" x 450 mm)

WEIGHT:

– approx. 6 kg

ADDITIONAL INFORMATION:

EMC

– VDE 0878, limit value B

Electrical safety

– EN 60950

Temperature

– +5°C to 40°C

Relative Humidity.

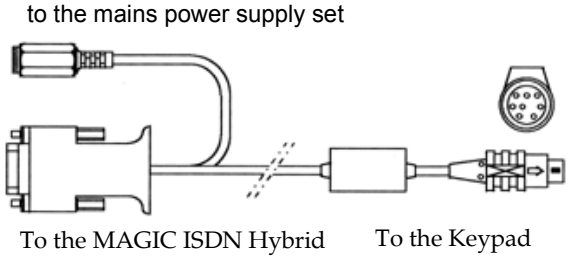
– 5% up to 85%

A 4 TECHNICAL DATA MAGIC HYBRID KEYPAD

A4.1 Keypad

MAGIC Hybrid Keypad 4:	Matrix:	8 x 6
	43 keys	
MAGIC Hybrid Keypad 7:	Matrix:	8 x 12
	58 keys	
MAGIC Hybrid Keypad 12:	Matrix:	8 x 12
	84 keys	

FIG. 26 CONNECTING CABLE- MAGIC SYSTEM KEYPAD

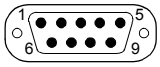


Protocol:

9600 Baud
no parity

Port MAGIC:

9-pole SUB-D connector, male

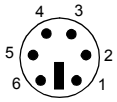


Assignment:

Pin 2	RXD
Pin 3	TXD
Pin 5	GND (earth)

Power supply connector:

6-pole PS/2 connector, male

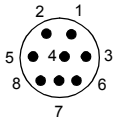


Assignment:

Pin 2:	GND
Pin 5:	+5V

Keypad connector:

8-pole MINI DIN connector, male



Assignment:

Pin 2:	RX Data
Pin 3:	GND
Pin 5:	+5V
Pin 8:	TX Data

A4.2 LCD Display

2 x 20 characters

illuminated

A4.3 Mains power supply unit:

5V, max. 1500 mA

Connector:

6-pole PS/2 connector, female

Pin Assignment:

Pin 2:	GND
Pin 5:	+5V

A 5 GENERAL FACTS

A5.1 Ordering numbers

MAGIC ISDN Telephone Hybrid Standard	800053
Option: AES/EBU/ANALOGUE Module	450030
MAGIC ISDN Triple Telephone Hybrid	800057
Windows PC Software Update	403144

Accessories

Handset, light grey with holder	715012
MAGIC Hybrid Headset	490087
Analogue Adapter Cable	490090
AES/EBU Adapter Cable	490091
MAGIC Hybrid Keypad 4	800054
MAGIC Hybrid Keypad 7	800058
MAGIC Hybrid Keypad 12	800056

A5.2 Included in delivery

- MAGIC ISDN Telephone Hybrid
  - Windows PC Software
  - Mains cable
  - Self adhesive feet
  - ETSI-mounting brackets
  - Manual
  - RS232 Control Cable
  - 2 x S_0 Telephone cables

A5.3 Declaration of Conformity

The Declaration of Conformity is at the end of this description.

NOTE Please note that the MAGIC ISDN Telephone Hybrid (800053) and MAGIC ISDN Triple Telephone Hybrid (800057) product has the hardware identification number 229711.

AVT Audio Video Technologies

CE-Konformitätserklärung

Declaration of Conformity

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

Anschrift des Anbieters:
Supplier's address: Rathsbergstrasse 17
D-90411 Nürnberg

erklärt, daß das Produkt
declares, that the product

Produktname(n):	**MAGIC ISDN Telefonhybrid**	**229711**
Product name(s):	**MAGIC ISDN Telephone Hybrid**	**229711**

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

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

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

Harmonisierte Europäische Normen: EN 55022/08.94, EN 50082-1/01.92
Harmonized European Standards: EN 61000-3-2/95, EN 61000-3-3/95

Ort, Datum:
Place, date: Nürnberg, den **10.04.01**

Name(n):
Name: Wilfried Hecht

Rechtsverbindliche Unterschrift(en):
Legally binding signatures:

Telefon:
Phone: +49 911 5271-120

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.