MAGIC AE1 DAB
DAB Audio Encoder

Hardware/Software Manual

AVT **Audio Video Technologies**

.

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Subject to changes.

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Content

INTRODUCTION

The system *MAGIC AE1 DAB* is implemented as DAB Audio Encoder and has analogue and digital AES/EBU audio interfaces. For monitoring each system contains an own decoder which allows a control of the system and to asses the audio quality.

The ISO/MPEG2 Layer II audio encoder is an implementation of the IRT (Institut für Rundfunktechnik) in Munich.

The configuration of the system can be carried out via the Windows application included in delivery or via the front keypad and display of the unit.

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 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 to a minimum, 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 manual.

– 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 specially 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 one risk. Use of external software can affect the operation of the system.

– Use only tested and virus-free data carriers.

Text Conventions

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

Accentuation: 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** marks information which facilitates the operation of the system in its daily use.

NOTICE

The symbol **NOTICE** marks general notes to observe.

ATTENTION

The symbol **ATTENTION** marks 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 the *MAGIC AE1 DAB* are implemented in a single unit. The system is additionally equipped with a module for MPEG Coding. The system is designed for mounting in a 19" rack (1 U). 19" brackets are part of the delivery.

FIG. 1   FRONT VIEW: MAGIC AE1 DAB DAB AUDIO ENCODER

2   SYSTEM DESCRIPTION

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

FIG. 2   FUNCTIONAL ELEMENTS OF MAGIC AE1 DAB DAB AUDIO ENCODER
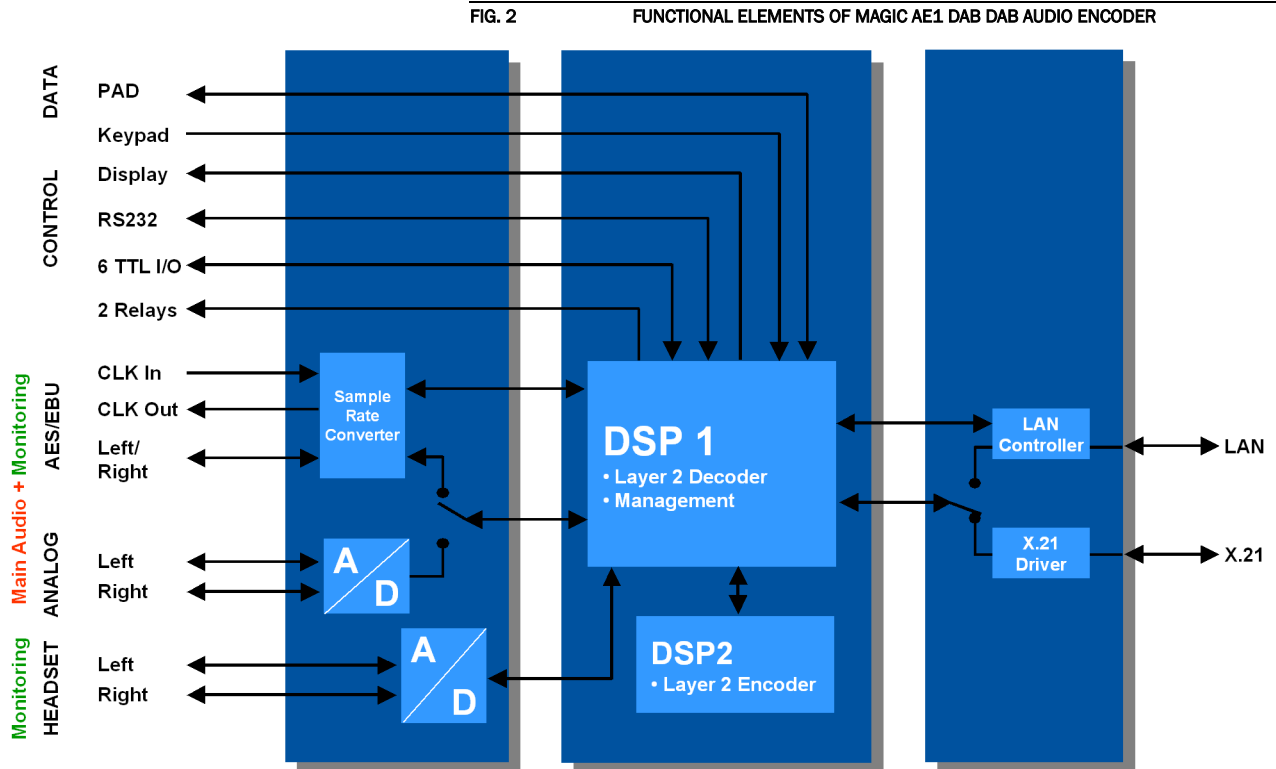
2.1   Functionality

The **MAGIC AE1 DAB** System incorporates a **X.21** interface[1] for a direct connection to the e.g. **DM-001** Ensemble Multiplexer from Rohde & Schwarz. The X.21 clock is derived from the Ensemble Multiplexer clock.

The complete signal processing is taken over by two digital signal processors. In this way the following functions are realised:

DSP1:

– ISO/MPEG2 Layer II Decoder

– digital audio router

– Signalling management

– Control of the complete system (Keypad, display, relays, TTL, RS232)

– PAD multiplexer

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[1] The LAN interface for control & management will be supported in a later release.

DSP2:

– ISO/MPEG2 Layer II Encoder

Via the main audio channel the high quality Stereo or Mono audio signal is inserted analogue or digitally. If the digital AES/EBU audio interface is used, two separate Sample Rate Converters are available for automatic clock synchronisation between network and audio source. For external clocking a clock input and a clock output are available.

The audio outputs can be used for monitoring purposes. The encoded signal is looped at every time to the MPEG decoder. The decoded audio signal is available as analogue or digital audio output. As second audio monitoring interface a headphone interface is available.

The configuration and operation can be primarily carried out via the *front keypad* and the illuminated *display*.

Configuration and control is especially comfortable with the *MAGIC AE1 DAB Windows PC Software* which is included in delivery and which communicates with the system via the RS232 interface[1].

Six programmable *TTL contacts* can be used for external signalling. Two *relays* are available for status indication.

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[1] LAN control is planned.

3 PUTTING THE SYSTEM INTO OPERATION

3.1 Mounting

With its dimensions (W × H × D) of 431 mm × 44,5 mm (1 U) × 250 mm the **MAGIC AE1 DAB** system can be used either as desktop device or mounted in 19 inch racks. 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 AE1 DAB** audio encoder is installed, please make sure that there is sufficient 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 thresholds are especially to observe if the system is inserted in a rack. The system works **without** ventilation.

TIP

The system temperature can be indicated on the display (*MENU STATUS INFORMA-TION* (see CHAPTER A1.4, Page 63))

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 voltages in the range from 90 V to 253 V. The frequency can vary from 45 Hz to 65 Hz. The maximum power consumption is 15W (typically 12W).

After plugging the mains connector and switching on the system boots within a few seconds. In standby mode the **MAGIC AE1 DAB** logo is shown on the display.

3.3 Earthing of the system

For EMC reasons an earthing via the earthing screw of the system is recommended.

ATTENTION

⚠️

Earthing
A lacking earthing can cause functional deficiencies within the unit.

3.4   **Operational elements on the front side**

The system has an illuminated graphical display with a resolution of 160 x 32 Pixels and 19 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 (and), two buttons for establishing ( )/dropping ( ) connections as well as an *OK* button. The numerical pad supports in addition to the numerics *0...9* the '***' and '*#*' key. For text entries the numerical pad can also be used as normal keypad.

The operation is similar to standard mobile telephones.

FIG. 3   OPERATIONAL ELEMENTS ON THE FRONT SIDE
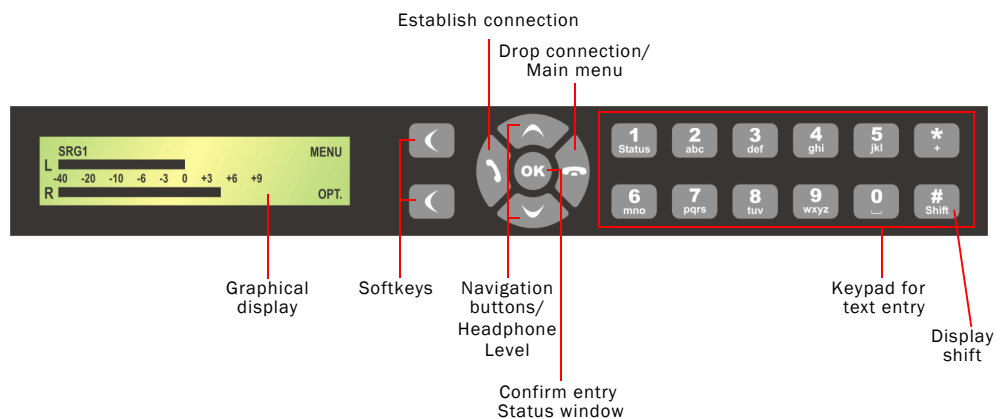
3.5   Wiring diagram

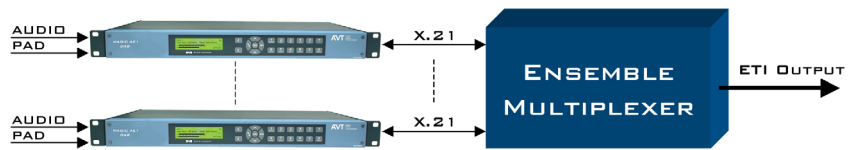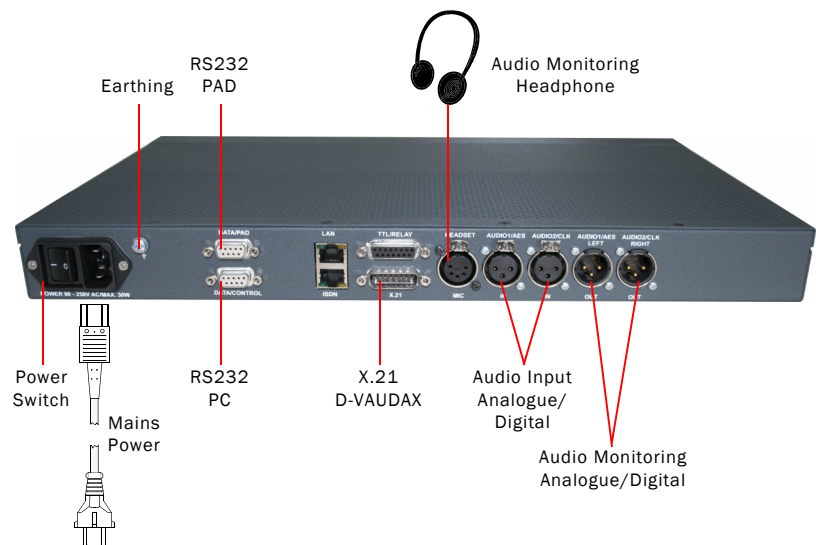The figure below show the typical wiring diagram of a DAB system.

FIG. 4   **WIRING DIAGRAM**

The standard interfacing of the system is shown Fig. 5.

FIG. 5   **WIRING & CONNECTION DIAGRAM**

4   OPERATION VIA DISPLAY AND KEYPAD

In this chapter all basic configurations for the operation of the **MAGIC AE1 DAB** system are explained. An overview of the menu structure you will find in the annex under CHAPTER A1.

Of course, all configurations can also be comfortably made via the **MAGIC AE1 DAB Software** included in delivery.

NOTICE   For the details of most functions please see the PC Software description from CHAPTER 5.

4.1   Standard functions

Keypad lock

To avoid that keys are pressed accidentally you can enable a keypad lock. For activation please press the **MENU** key followed by the ***** (star) button. If the keypad lock is enabled the display illumination is turned off immediately.

The keypad lock is deactivated by entering the key sequence **MENU *** a second time.

Softkey Menu

Using the softkey **MENU** you can change all parameters of the system at any time. The menu structure is given in CHAPTER A1.1 ... CHAPTER A1.5 (see Page 60).

4.2   Basic configurations

In the following some specific basic configurations of **MAGIC AE1 DAB** are described in detail.

Menu reference number

NOTICE   All menus can be reached directly via a **QuickMenu** key sequence. For this purpose each menu item is marked with a cypher in the upper left corner (in the example on the left it is e. g. **3**). To reach a certain menu directly please enter from the main menu the key sequence **MENU <DIGIT> <DIGIT>** whereby <digit> marks the respective menu reference number. Please notice that the menu reference number can change depending on the configuration.

4.2.1 Setting the Audio interface: Analogue or digital

MAGIC AE1 DAB incorporates analogue as well as digital Audio interfaces which you can adjust separately. The digital **AES/EBU interfaces** have integrated **Sample Rate Converters** to adjust the digital Audio source to the transmission clock. Additionally, clock inputs/outputs are also available. To configure the Audio interface please follow the instructions below:

NOTICE

If you are not in the main menu please press the 📞 button first.

– First press the softkey 🌙 *MENU* and select *BASIC SETTINGS* via the softkey 🌙 *SELECT*.

– With the use of the *SELECT* softkey you reach the option *AUDIO SETTINGS*.

– Please mark the option *AUDIO INPUT* or *AUDIO OUTPUT* using the cursor keys ⌃ and ⌄ and press again *SELECT*. Now the options *ANALOGUE* and *DIGITAL* are displayed.

– Select the desired interface with the help of the cursor keys ⌃ and ⌄ and by pressing the softkey *SELECT*.

– Confirm your entry by pressing the 🆗 button or the softkey *OK*.

– To get back to the main menu please press the 📞 button. Now you are asked if you want to *SAVE SETTINGS?*. Via the softkey *YES* the setting is stored permanently in the system.

TIP

You reach the settings for the *AUDIO INPUT* or *AUDIO OUTPUT* via the key sequence: *MENU 1 1 1* or *MENU 1 1 2*

4.2.2 Configuring of the ISO/MPEG Encoder

All settings of the encoder behaviour can be configured under the menu *MPEG PARAMETER*. For more information please refer to CHAPTER 5.5.2.1.1, Page 34.

NOTICE

If you are not in the main menu please press the 📞 button first.

– First press the softkey 🌙 *MENU* and select *OPERATION SETTINGS* via the softkey 🌙 *SELECT*.

– With the use of the *SELECT* softkey you reach the option *MPEG PARAMETER*.

– Please mark the option *MAX MONO RATE* using the cursor keys ⌃ and ⌄ and press again *SELECT*. Now the desired maximum Mono data rate can be set.

– Confirm the selection with *SELECT* and press *OK*.

– Select now *MAX LSF RATE* to configure the maximum data rate using the Low Sampling Frequency (LSF)[1] option. If you don't want to use LSF select the lowest possible data rate.

– Confirm the selection with *SELECT* and press *OK*.

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[1] Using LSF (24-kHz) increases the audio quality especially for lower bitrates. We recommend to use LSF for data rates lower than 64-kbit/s.

– To configure the desired Mono mode select the menu *MONO MODE*. Three possibilities are available: *MONO L+R/2*, *MONO LEFT*, *MONO RIGHT*.

– Confirm the selection with *SELECT* and press *OK*.

– Please mark now the option *STEREO MODE* and select the desired Stereo mode: *STEREO*, *JOINT STEREO*, *DUAL CHANNEL*.

– Confirm the selection with *SELECT* and press *OK*.

– To get back to the main menu please press the 📞 button. Now you are asked if you want to *SAVE SETTINGS?*. Via the softkey *YES* the setting is stored permanently in the system.

TIP   You reach the settings for the *MPEG PARAMETER* via the key sequence: *MENU 2 1*.

4.2.3   Activating and configuring the PAD interface

To enable the transmission of PAD you must activate the PAD mode and configure the right baudrate. For more information please refer to CHAPTER 5.5.2.1.2, Page 36.

NOTICE   If you are not in the main menu please press the 📞 button first.

– First press the softkey 🄵 *MENU* and select *OPERATION SETTINGS* via the softkey 🄵 *SELECT*.

– With the use of the *SELECT* softkey you reach the option *PAD INTERFACE*.

– Please mark the option *ACTIVATE PAD* using the cursor keys ⌃ and ⌄ and press again *SELECT*. Now the option *ACTIVE* can be set to activate the PAD interface.

– Press the softkey 🄵 *BACK* and select then *BAUDRATE*. After pressing the softkey *SELECT* you can configure the desired baudrate (*38400*, *57600*, *115200*), which must be consistent to your PAD inserter.

– Confirm the selected baudrate with *SELECT*.

– Select the desired interface with the help of the cursor keys ⌃ and ⌄ and by pressing the softkey *SELECT*.

– Confirm your entry by pressing the 🅾🅺 button or the softkey *BACK*.

– To get back to the main menu please press the 📞 button. Now you are asked if you want to *SAVE SETTINGS?*. Via the softkey *YES* the setting is stored permanently in the system.

TIP   You reach the settings for the *PAD INTERFACE* via the key sequence: *MENU 2 2*.

4.3   **The Status Display - Operation during a connection**

TIP   The status window can always be reached by pressing the [OK] button.
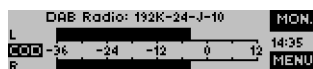
When the connection is established the level meter as well as the status for the selected monitoring signal is displayed.

In the first row the program name, audio bitrate, coding mode (M=Mono, S=Stereo, D=Dual Channel, J=Joint Stereo) and PAD bitrate (in kbit/s) is shown.

Softkey Monitor (*MON.*)

During a connection you can switch via the softkey *MON.* between original audio signal which is feed into the encoder and the decoded audio signal. Both the audio output (XLR) and the headphone will be switched to the selected audio signal. The display shows the monitoring status as follows:

– *ORG*, if you monitor the audio input signal

– *COD*, if you monitor the coded audio signal
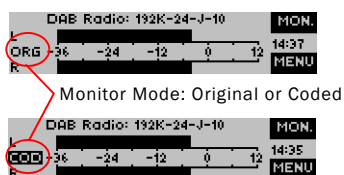
Softkey Menu

Using the softkey *MENU* you can change all parameters of the system at any time.

Headphone Level

If a connection is established you can adjust the headphone level with the navigation buttons ⌃ and ⌄. The current selected level will be shown in the display.
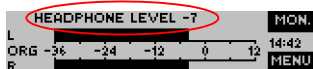
Dropping a connection

The connection is dropped by pressing the telephone receiver button [🎧]. If no connection exists, the main menu is displayed after a few seconds. To avoid errors you must confirm the drop request.

Establishing a connection

The connection is normally establishing automatically if a clock is available on the X.21 line interface. After dropping a connection manually you can reconnect the line by pressing the telephone receiver button ↘.

4.4   Working with Presets

The *MAGIC AE1 DAB* differentiates between *BASIC SETTINGS* and *OPERATION SET-TINGS*.

Basic Settings are settings that do **not** change during normal operation like e.g. display contrast, date/time etc. These parameters **cannot** be saved as preset since a configuration is usually only required when the system is put into operation.

Operation Settings need to be reconfigured depending on the application. To easily recall recurring configurations you can store up to 10 presets in the system.

You reach the menu for the Presets by pressing the *MENU* softkey once, the cursor key ⌄ twice and by pressing the softkey *SELECT* once as confirmation.

In the input field *PRESETS* you can search for a certain Preset. As soon as you enter a character, the corresponding entries of the Preset list are filtered out.

Alternatively, you can select a Preset from the list using the cursor keys ⌃ and ⌄.

If you now press the (OK) button, the selected Preset is loaded immediately.

By the softkey *OPT.* (Options) the following functions which you can select via the softkey *SELECT* are realised:

–   *LOAD*: The stored Preset is loaded.

–   *NEW*: With the help of this function you can create a new Preset. All current Operation Settings are stored.

–   *SAVE*: The currently selected Preset is overwritten with the current Operation Settings. For safety reasons a confirmation is required.

–   *DELETE PRESET*: The currently selected Preset is deleted. For safety reasons a confirmation is required.

NOTICE   If the configuration has changed, you are asked if you want to *SAVE SETTINGS?* when you leave the Preset menu. Via the *YES* softkey the configuration is stored permanently in the system. This Preset is loaded automatically by the system after the unit is connected to the power supply.

5 WINDOWS PC SOFTWARE

The configuration of the system is particularly comfortable via the Windows PC Software included in delivery.

5.1 Hardware requirements

The PC must meet the following minimum requirements:

– IBM PC AT, IBM PS/2 or 100% compatible

– Pentium Prozessor (> 1 GHz) recommended

– Windows 2000/XP

– ca. 600 kByte available RAM

– 5 MB available hard disk space

– Screen resolution with 800 x 600 Pixels

– at least one available serial interface RS-232

– Microsoft, IBM PS/2 or 100% software compatible mouse

5.2 Installing the Windows PC Software

Please insert the CD included in delivery in your CD-ROM drive. The software automatically starts your Internet browser. Possible safety warnings can be ignored for the moment. Please press under *Install Software* the *MAGIC AE1 DAB* button. Subsequently, the setup program is executed.

Alternatively, you can install the software directly from the CD. You will find the installation file *setup.exe* in the folder *Software\MAGIC AE1 DAB* on the CD.

Please follow the instructions of the installation routine.

After the installation the software can be started by clicking on the *MAGIC AE1 DAB* icon.

Please connect your PC via a serial 1:1 cable (only Pin 2 and Pin 3 are used, Pin 5=ground) with the system.

The standard *COM-Port* settings are: *38400 Baud*

Operation via Windows PC software

In the following chapters all functions of the PC software are described in detail.

5.3   MAGIC AE1 DAB main window

After starting the **MAGIC AE1 DAB** application, the main window is displayed automatically (see Fig. 6).

The connection status between PC and system is displayed in the top right corner of the window:

PC ONLINE: Connection is okay.

NO CONNECTION: Connection with PC is faulty

Following further status messages are possible:

PC ONLINE ALARM: Upcoming alarm (see **System Monitor**, green-dark green blinking)

NOTICE

If the connection is faulty, please check the following points:
– External power supply of the system is plugged in (display available)
– Serial 1:1 cable is connected with PC and system
– Correct COM port and same baud rate are selected in the software as well as in the system (**Configuration** → **COM Port**, see Page 49)

FIG. 6   MAIN WINDOW OF THE MAGIC AE1 DAB DAB AUDIO ENCODER SOFTWARE
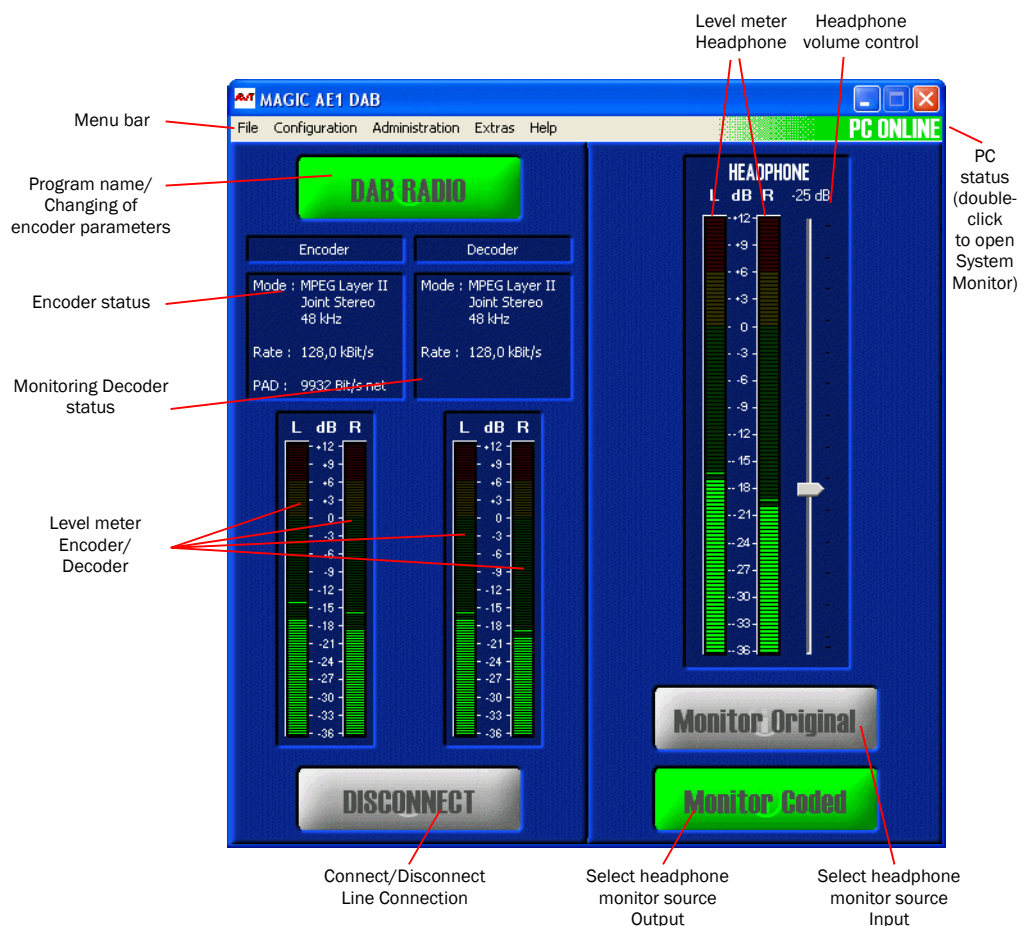
5.3.1 Operating elements

Program button

On the **Program** button the information about the current program is shown. The program name can be configured via **Configuration** → **Basic settings** → **General** → **Program Name** (see Page 38).

By pressing the button it is possible to change the encoder parameter on the fly.

Connect/Disconnect button

To stop the transmission you can press the **Disconnect** button. For security reasons you must confirm ....

Monitoring Input/Output

Via the **Monitoring Input** and **Output** buttons you can select the source for the headphone. The currently selected source is highlighted in green.

To adjust the headphone level use the **Headphone Volume Control**, which allows an adjustment in a of range of -40 ... 0 dB.

5.4 Menu file

FIG. 7 MENU FILE

5.4.1 Operation Settings Presets

To *Import*/*Export* the different presets please use the submenu *Operation Settings Presets*. The file format is binary and cannot be edited.

5.4.2 Basic Settings

To *Import*/*Export* the system configuration please use the submenu *Basic Settings*. The file format is binary and cannot be edited.

5.4.3 Submenu Exit

Via the submenu *Exit* you exit the *MAGIC AE1 DAB* software.

5.5	Menu Configuration

FIG. 8   MENU CONFIGURATION

5.5.1	Submenu COM Port

The system is connected via the serial RS232 interface with a 1:1 connecting cable to a PC. The configuration of the COM Port of the PC can be carried out under **Configuration → COM Port**.

FIG. 9   RS232 PARAMETER OF THE COM PORT
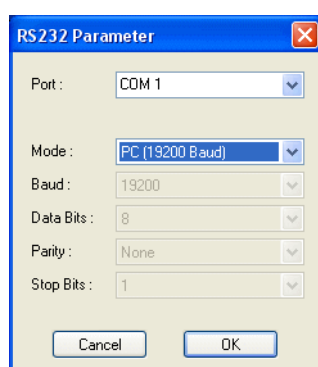
As **Port** you select the interface of your PC which is connected to the **MAGIC AE1 DAB**.

Under **Mode** you can set the desired operating mode:

– **9600 Baud**

– **19200 Baud**

– **38400 Baud**

– **57600 Baud**

– **115200 Baud**

All further parameters like **Data Bits**, **Parity** and **Stop Bits** cannot be configured.

5.5.2   **Submenu MAGIC AE1 DAB**

Via the submenu *MAGIC AE1 DAB* the system can be configured comfortably. It is distinguished between *Basic Settings*, which do not have to be changed during the operation and the actual *Configuration* for the current application. In contrast to a configuration, the basic settings cannot be saved as *Preset* (see CHAPTER 5.5.3).

5.5.2.1   **Operation Settings**

NOTICE   All listed settings made under *Operation Settings* can be saved as *Preset*.

5.5.2.1.1   **MPEG Parameter**

Via the option *MPEG Parameter* all MPEG settings can be configured in dependence of the bitrate.

FIG. 10   MPEG PARAMETERS
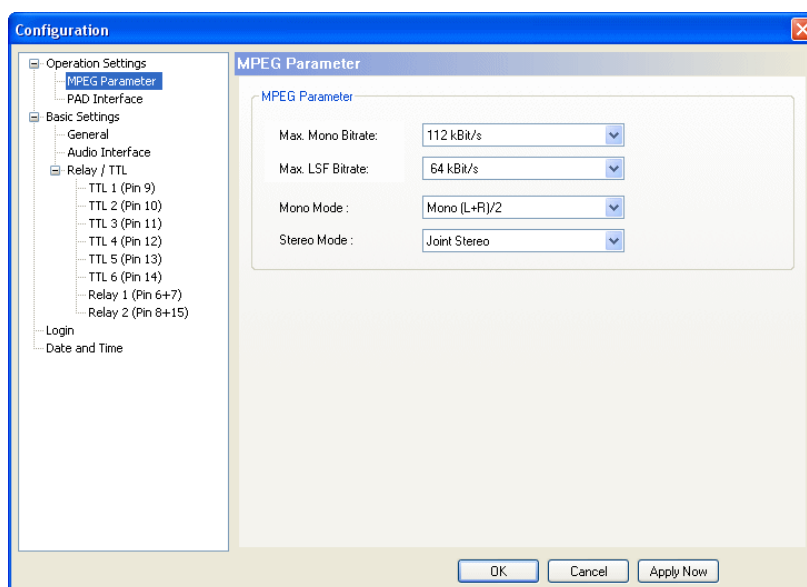
MPEG Parameter

All possible bitrates, modes and sampling frequencies you can see in TAB. 1, Page 35.

- *Max. Mono Bitrate*: With this setting you can define the maximum bitrate for the Mono mode. If the X.21 clock reach this limit, the coding mode will be automatically set to Mono.

- *Max. LSF Bitrate*: With this setting you can define the maximum bitrate for LSF[1] encoding. If the X.21 clock reach this limit, the internal encoder sampling frequency will be automatically set to LSF. Note that the bandwidth will be limited in this case to approximately 12-kHz. LSF is recommended only for lower bitrates.

- *Mono Mode*: This setting allows to configure the Mono mode. Three options are available:

  – *Mono L*: Only the left channel of the audio input will be encoded

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[1] LSF= Low Sampling Frequency (24-kHz) instead of 48-kHz.

    – **Mono R**: Only the right channel of the audio input will be encoded

    – **Mono (L+R)/2**: If you have connected a Stereo signal this setting allows the generation of a Mono signal.

• **Stereo Mode**: This option define the Stereo mode of the encoder. Three possibilities are available:

    – **Stereo**: This mode is recommended for data rates from 192-kbit/s or higher.

    – **Joint Stereo**: This mode offers more efficiency and best quality for stereo signals if the bitrate is 160-kbit/s or lower.

NOTICE

Note that the ISO/MPEG encoder will switch automatically to pure Stereo mode, if the bitrate is adequate. This behaviour you can see on a decoder: An alternate switching between Stereo and Joint Stereo can be recognised. Of course this switching is a feature of the ISO/MPEG Layer II encoder and is not audible.

    – **Dual Channel:** There are no audible differences between Stereo and Dual Channel mode. Only the multiplexing as well as the signalling in the ISO/MPEG header is different. Select this mode if you insert totally different signals on the left and the right channel.

TAB. 1　　　　　POSSIBLE DATA RATES AND MODES

Bitrate kbit/s	Possible Coding Mode	Possible Sampling Frequency kHz
8	Mono	24
16	Mono	24
24	Mono	24
32	Mono	24, 48
40	Mono	24
48	Mono	24, 48
56	Mono	24, 48
64	All modes	24, 48
80	Mono	24, 48
96	All modes	24, 48
112	All modes	24, 48
128	All modes	24, 48
144	All modes	24
160	All modes	24, 48
192	All modes	48
224	Stereo, Joint Stereo, Dual channel	48
256	Stereo, Joint Stereo, Dual channel	48
320	Stereo, Joint Stereo, Dual channel	48
384	Stereo, Joint Stereo, Dual channel	48

5.5.2.1.2   PAD Interface

Via the configuration **PAD Interface** you can enable the PAD[1] Insertion from an external PAD inserter. The standard settings are compliant to the synchronous frame mode of the *IRT* Recommendation.

The data insertion works dynamically: If data are available the **audio bitrate** will be reduced automatically according the PAD bitrate. Otherwise the full frame is used for audio.

Maximum number of PAD bytes per frame depends on the baudrate:

38400 Baud	54 bytes/frame
57600 Baud	90 bytes/frame
115200 Baud	127 bytes/frame

FIG. 11   **PAD INTERFACE**
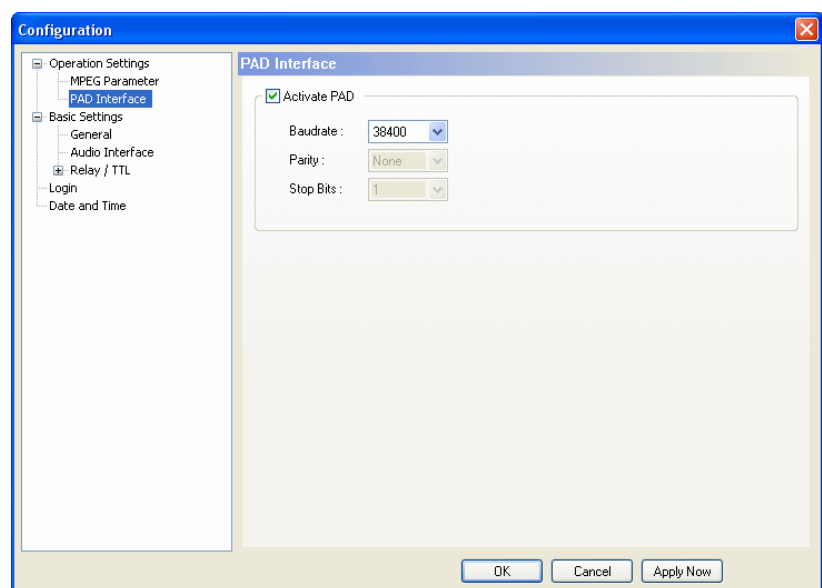
To enable the PAD transmission you must set the option **Activate PAD**. The RS232 interface parameter **Baudrate** must be conform to the connected PAD inserter. Available baudrates are **38400**, **57600**, and **115200** Baud. The **Parity** and **Stop Bits** cannot be changed. The standard settings are: 38400 Baud, Parity None and 1 Stop Bit.

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[1] PAD = Program Associated Data

5.5.2.2 **Basic Settings**

NOTICE All configurations made under **Basic Settings** cannot be saved as **Preset** (see CHAPTER 5.5.3).

5.5.2.2.1 **General**

FIG. 12 **GENERAL**
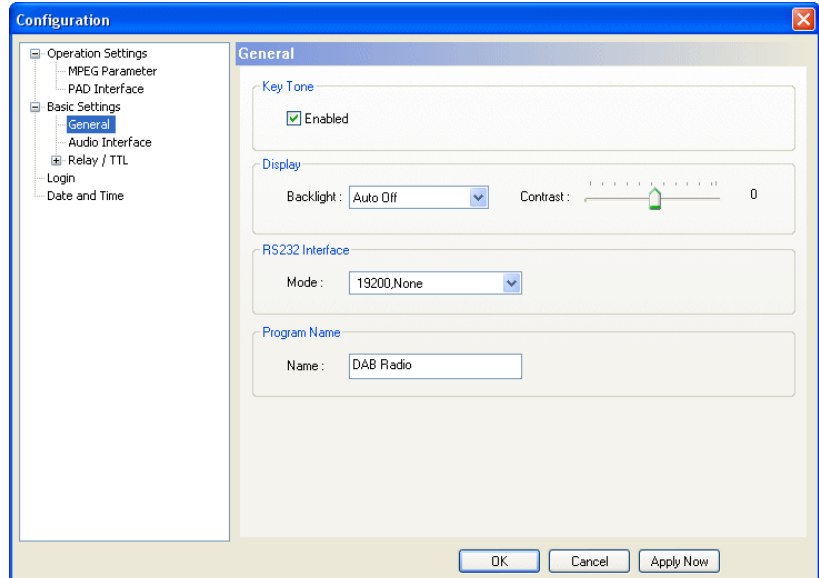
Key Tone

- To activate the **Key Tone** of the front keypad, check the **Enabled** box.

Display

- The **Display** has a backlight. Under the setting **Backlight** you can switch it **ON** permanently. If you select the option **Auto** the backlight is turned off automatically **60** seconds after the last keystroke. The backlight is activated again by pressing any key (e.g. **OK**).

NOTICE Please notice that if the keypad lock is activated, the backlight is only switched on again by pressing the key sequence **MENU ✱**.

- Via the slide control **Contrast** you can adjust the contrast in the range **-16 ... 15** for the display.

RS232 Interface

- If you want to operate the system with the PC, you must set under **Mode** the data rate in accordance with the interface of the system (see CHAPTER 5.5.1, Page 33). There are five baud rates available:

  – **9600, None**

  – **19200, None**

  – **38400, None**

  – **57600, None**

– *115200, None*

Program Name

- The entered **Name** of the program will be shown on the **Program button** (see Page 31) in the PC software main window as well as in the status line of the system display.

5.5.2.2.2   Audio Interface

MAGIC AE1 DAB supports analogue as well as digital AES/EBU Audio interfaces. If the digital interfaces are used, a separate Sample Rate Converter is available for the input and the output so that external adjustments are not required if there are different digital sources and drains.

FIG. 13   AUDIO INTERFACE
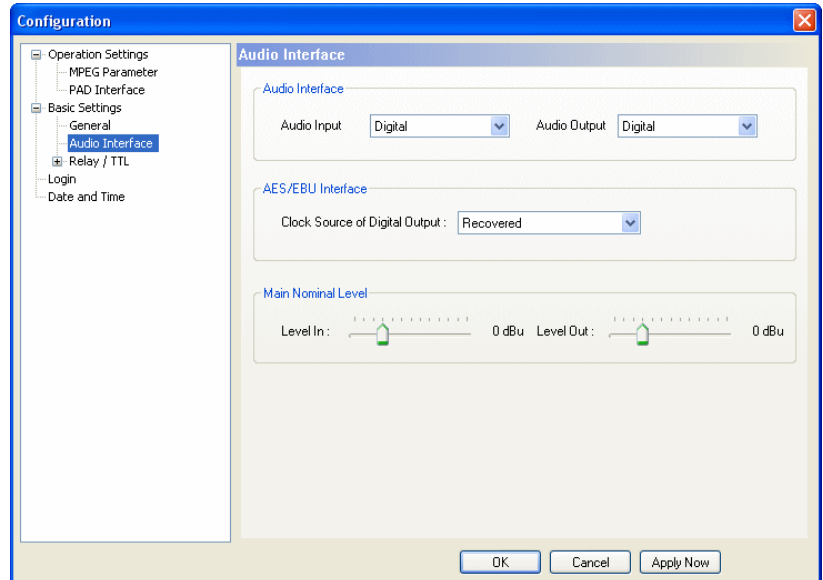
Audio Interface

- The operating mode *analogue* or *digital* can be set separately for the *Audio Input* and the *Audio Output*.

- If the output is set *digital*, additionally the configuration for the *AES/EBU Interface* is displayed. Under *Clock Source of digital output* you can select the following options:

    - *Internal*: The AES/EBU output clock is derived from the internal system clock.

    - *External*: The AES/EBU output clock is derived by the external clock connected via the interface *Audio 2/CLK IN*. The clock rate of the connected clock must be 48-kHz.

    - *Recovered*: The AES/EBU output clock is derived from the digital input signal of the interface *Audio 1/AES IN*. This configuration is usually to be selected if you use the digital input of the system. In this way a synchronous functioning of the transmission chain is ensured

NOTICE   The AES/EBU input always works with recovered clock, therefore a configuration of the output is required.
For clock synchronisation to other systems you can use the Audio output *Audio 2/CLK OUT*. The clock rate of the output clock is 48-kHz.

- If you operate the input or the output in an analogue mode, the corresponding slide control for adjusting the nominal Audio level of the Audio interface (*Main Nominal Level*) is displayed. The nominal level can be adjusted separately for the input (*Level In*) and for the output (*Level Out*) in the range of *-3 ... +9 dBu* in 1-dB steps. The head room is **6 dB** in general. If you want to have the maximum level of 15 dBu for the system, you must set 9 dBu as nominal level. The default settings are 0 dBu.

5.5.2.2.3   Relay / TTL

The **MAGIC AE1 DAB** system incorporates six **GPIO** Pins (TTL) which can be pro-
grammed separately as input or output. Additionally, two **Relays** are available.

The operating mode of a TTL-Pin - **Input** or **Output** is selected via the option **Di-
rection**.

The following specification accounts for all three configuration windows **TTL1** ...
TTL6.

TTL-Pin as input

FIG. 14   TTL-PIN AS INPUT
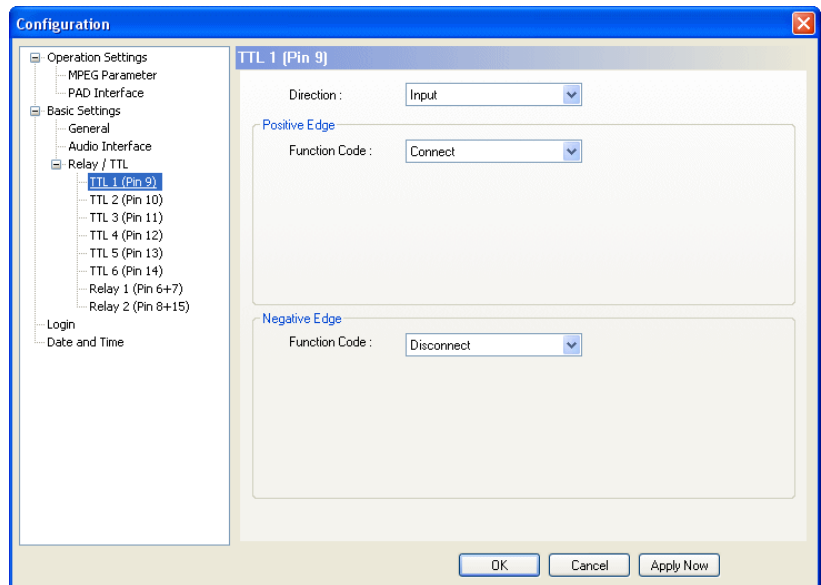
If you use a TTL-Pin as **Input**, you can program two different functions separately
when edges change:

- **Positive edge**: The event is activated when the voltage on the TTL-Pin
  changes from 0V to +5V.

- **Negative edge**: The event is activated when the voltage on the TTL-Pin
  changes from +5V to 0V.

  The following functions can be configured (**Function Code**):

  – **-**: No function, the negative edge is not used.

  – **Connect**:
    Via this function you can establish a connection.

  – **Connect (level triggered)**:
    Same function as **Connect**, but the event is activated level triggered and
    not edge triggered.

  – **Disconnect**: If you activate this function, a connection can be discon-
    nected.

  – **Load Preset**: Via this function it is possible to load a preset which you
    have to select under **Preset**.

  – **Information Base entry**: Reserved for future applications.

– **_String Command_**: Reserved for future applications.

Example:

You want to connect the X.21 line with TTL 1. After the transmission has been finished the connection is to be cleared with TTL 1.

Programming:

Positive egde:

Function Code: Disconnect

Negative egde:

Function Code: Connect

FIG. 15   **SEQUENCE OF EVENTS FOR THE EXAMPLE**

Switch

Switch is opened:
Pin 9 = TTL 1 is on +5 V (via internal 10 KOhm series resistance)

Switch is closed:
Pin 9 =TTL 1 is set to 0V (Pin 5):
Connection is established

Switch is opened:
Pin 9 =TTL 1 is set to +5V:
Line is disconnected

15-pol. SUB-D connector
to MAGIC AE1 DAB
(TTL/RELAY)
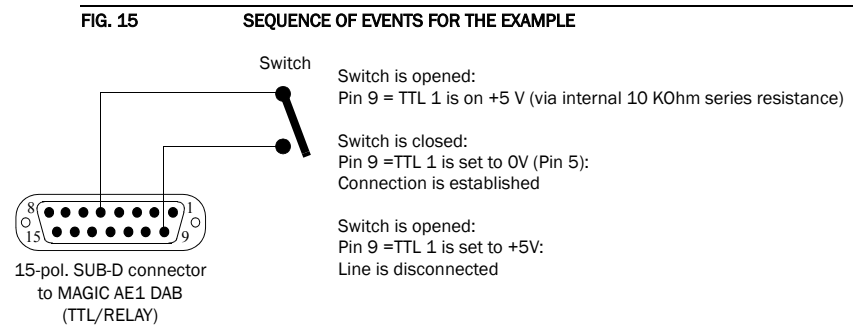
TTL-Pin as Output

ATTENTION

⚠

Please pay attention to the maximum switch current of 10 mA respectively the maximum switch voltage of 5V per TTL output.

FIG. 16   **TTL-PIN AS OUTPUT**
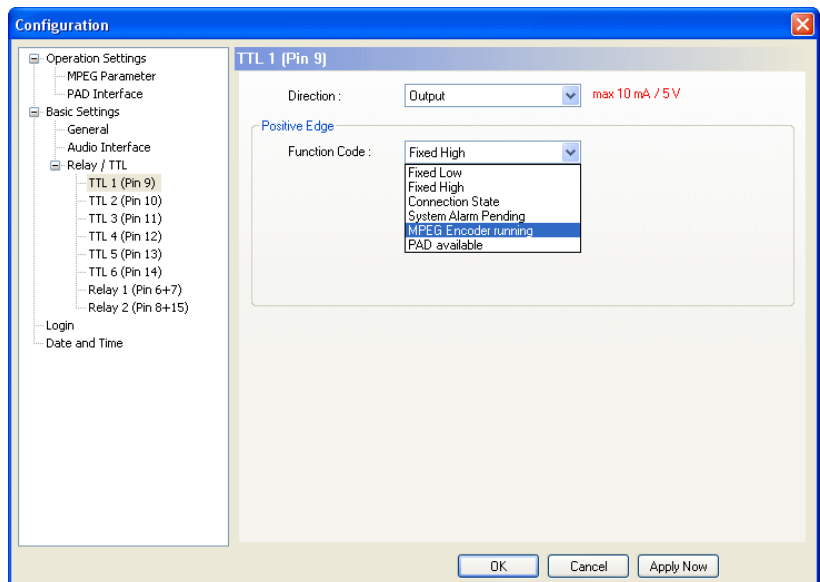
If a TTL-Pin is configured as *Output*, the event is signalised as change of voltage on the TTL-Pin from 0V to+5V.

Under *Positive edge* you can select one of the following *Function Codes*:

– *Fixed to Low (0V)*: The TTL-Pin is set to 0V permanently.

– *Fixed to High (5V)*: The TTL-Pin is set to +5V permanently.

– *Connection State*: Via *Connection State* you can signalise the connection state of a line. The following configurations are possible:

  – *Disconnect*

  – *Connect*

– *System Alarm Pending*: If one of the possible system errors (see CHAPTER 5.7.1) occurs, it can be signalised by selecting this option.

– *MPEG Encoder running*: If the encoder detect **no** error, the TTL-Pin will be set.

– *PAD available*: If the PAD insertion is activated (see CHAPTER 5.5.2.1.2, Page 36) and the encoder receives data the TTL-Pin will be set.

Relay

ATTENTION

Please pay attention to the maximum switch current of 200 mA respectively the maximum switch voltage of 48V per relay output.

The following description applies for both configuration windows *Relay 1* and *Relay 2*.

FIG. 17   **RELAY**
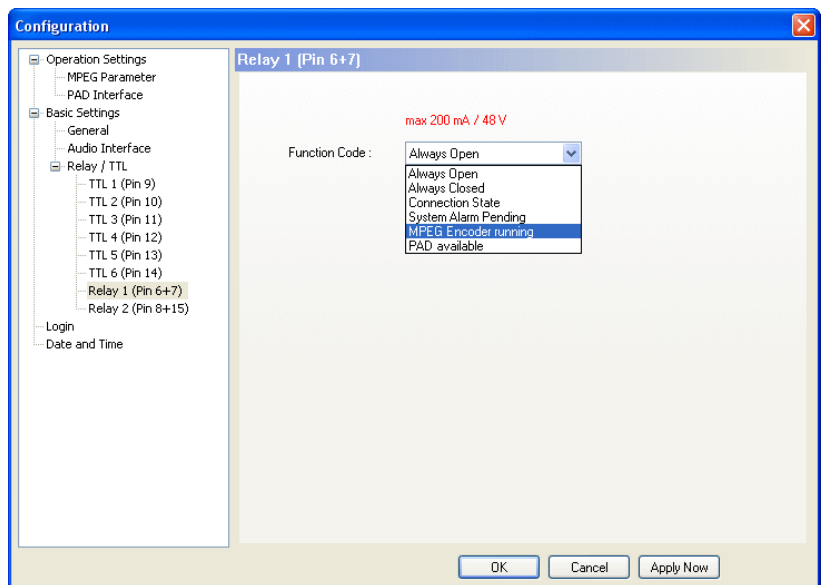
The options for the relay configuration are identical with the configuration of a TTL-Pin. The following *Function Codes* are available:

– *Always Open*: The relay is always open.

– *Always Closed*: The relay is always closed. This can be used for example for surveillance of the power supply.

– *Connection State*: Via Connection State you can signalise the connection state of a line. The following configurations are possible:

    – *Disconnect*

    – *Connect*

– *System Alarm Pending*: If one of the possible system errors (see CHAPTER 5.7.1) occurs, it can be signalised by selecting this option.

– *MPEG Encoder running*: If the encoder detect **no** error, the relay will be closed.

– *PAD available*: If the PAD insertion is activated (see CHAPTER 5.5.2.1.2, Page 36) and the encoder receives data the relay will be closed.

5.5.2.3   Login

To protect the system from re-configurations, two password levels with different user rights are available.

ATTENTION

⚠️

The entered password is saved in the system. It is highly important that you enter your password carefully. If you have forgotten your password, only the AVT Service can re-activate the system.

- Under *USER* you assign the user *Password*. For safety reasons you must confirm the password under *Confirm Password*.

- Under *ADMINISTRATOR* you assign the Administrator *Password*. For safety reasons you must confirm the password under *Confirm Password*.

NOTICE

There is no differentiation between upper and lower case for the password entry.

FIG. 18   LOGIN
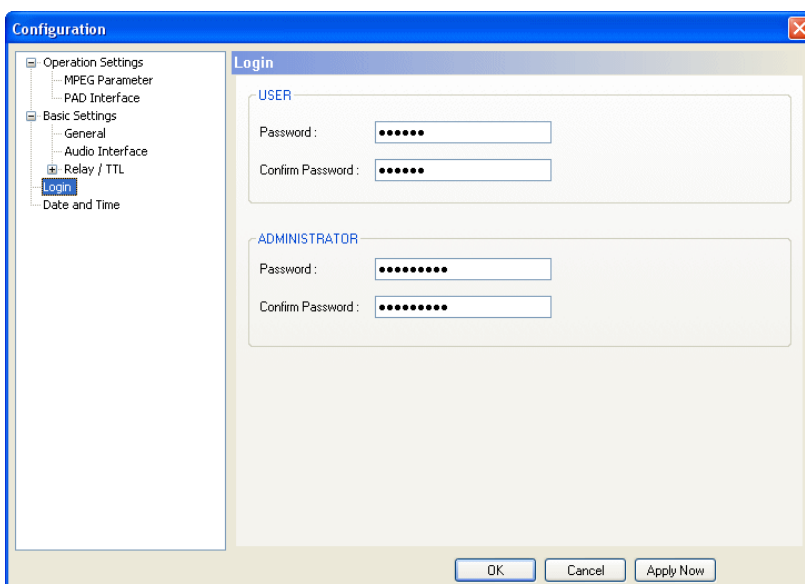
When you have assigned a password, the window for the password entry is automatically displayed when you click on a menu with password protection. Please enter the User Password or the Administrator Password.

FIG. 19   PASSWORD LOGIN
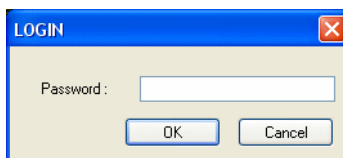
The authorisation levels are defined as follows:

(1)   Only **Administrator Password** is configured: The password must be entered for configuration changes. Immediately available menus:

– *File → Operation Settings Presets → Export*

- *File → Basic Settings → Export*

- *Configuration → Presets → „Configuration Name"*

- *Administration → Registration*

- *Extras → System Monitor*

- *Help → About MAGIC AE1 DAB*

(2)   Only **User Password** is configured: The password must be entered always. Afterwards all menus are available. Immediately available menus:

- *Help → About MAGIC AE1 DAB*

(3)   **User Password** and **Administrator Password** are configured: The password must always be entered.

User Password is entered:

Under **Configuration → Configuration → Login** the **USER** password can now be changed.

Via **Configuration → Presets** the desired configuration can be loaded.

Immediately available menus:

- *Extras → System Monitor*

Administrator Password is entered: All menus are available.

NOTICE   Please pay attention to the configuration options of the system if a password is assigned (see CHAPTER A1).

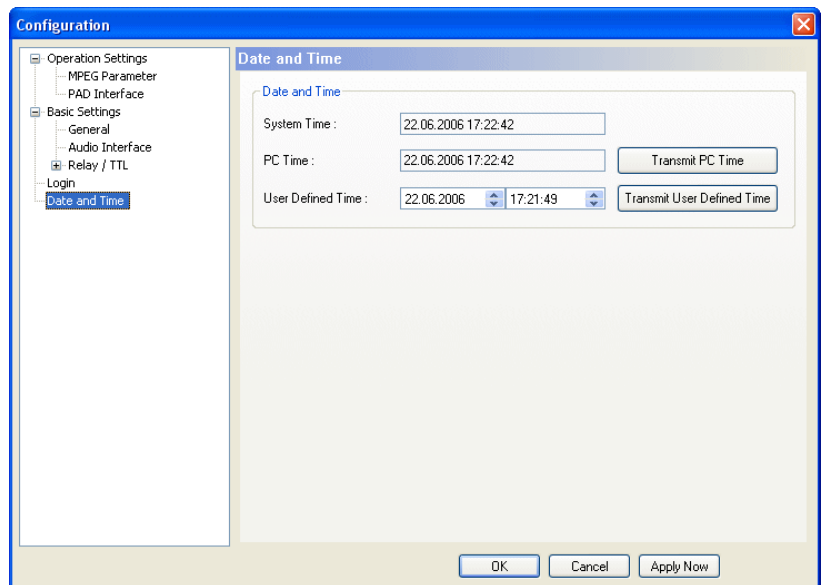### 5.5.2.4   Date and Time

Via the panel *Date and Time* it is possible set the internal clock of the system.

To synchronise the *System Time* to the *PC Time* press the button *Transmit PC Time*.

To setup another time e.g. for other time zones you can enter a *User Defined Time*. To set the time in the system press the button *Transmit User Defined Time*.

FIG. 20   **DATE AND TIME**

5.5.3 Submenu Presets

Via **Presets** you can load already created configurations.

5.5.3.1 Manage Presets

Your created **Presets** can be managed via the menu **Configuration** → **Presets** → **Manage Presets**.

FIG. 21   **MANAGE PRESETS**

All already existing configurations are displayed in the list.

- With the use of the **New** button you create a new configuration. The current configuration of the system is not changed or loaded by this function. First, select an expedient name. The length of the name must not surpass 8 characters. Special characters and space characters are **not** allowed. Please mind that you use unique names.

  Subsequently, the configuration dialogue is opened for the editing of the **Presets**. The current configuration is always displayed as basis of a **Preset** which you can adjust according to your wishes. The following configurations can be saved as Preset:

  – MPEG Parameter (see Page 34)

  – PAD Interface (see Page 36)

- By using the button **Edit** the currently selected configuration can be edited. The current configuration of the system is not changed or loaded with this function.

- Via the button **Delete** the configuration selected from the list is deleted. For safety reasons you have to confirm your selection.

- To activate a configuration selected from the list, press the **Select** button. For safety reasons you have to confirm your selection.

- Via the button **Import** a configuration can be imported from a data carrier (disk, USB stick etc.). The file extension of the configuration file is always '**.pst**'. A click on the button opens the file browser in which the desired file can be selected.

- Likewise, it is possible to export configurations to a data carrier. The button **Export** saves the configuration selected from the list as '.*pst*' file. By clicking on the button the file browser is opened and you can choose the location where the file is saved.

  With **Export All** all configurations displayed in the list are saved in a directory of your choice. A separate data file with the file extension '.*pst*' is generated for each configuration.

TIP
If you need to configure several systems in the same way, set up one system first and export all configurations to a disk. To configure all further systems easily, import the configurations from the disk.

This is also possible for the **Basic Settings**. Via the **Import/Export** function under **File** (see CHAPTER 5.4) you can comfortably save all information and load on other systems.
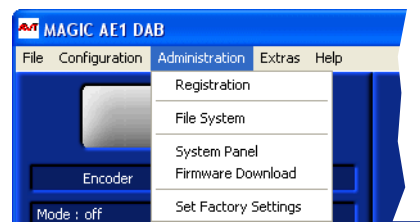
5.5.3.2   **Activation of a Preset**

All Presets are displayed under **Configuration** → **Presets** → **„Preset Name"** and can be activated with a click.

For safety reasons a confirmation is required.

5.6	Menu Administration

FIG. 22   MENU ADMINISTRATION

5.6.1	Submenu Registration

The data concerning production as well as the enabled options can be displayed under the submenu **Registration**.

FIG. 23   SUBMENU REGISTRATION

This number is required to enable software options supplementarily

The data of the unit include the following information:

– *Hardware*

– *Subject Number*

– *Factory Number*

– *Year* of production

– *Hardware Version*

• Under **Features** the available and activated **Software Options** of the **MAGIC AE1 DAB** are displayed. Deactivated options can be activated via a password. This password is assigned according to the **Factory Number**. If you bought an option supplementarily, please enter the password that you received from us under **Enter Password**.

FIG. 24   **PASSWORD ENTRY TO ENABLE AN OPTION**
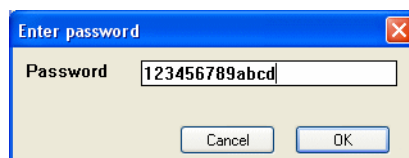
Subsequently, the system executes a warm start. Afterwards, the functions are activated.

ATTENTION

Please enter the password carefully.

If you enter a wrong password **three times**, you must switch off the system and switch it on again.

5.6.2 Submenu File System

Selecting the submenu **File System** the storage system (similar to a PC's hard drive) of the system is displayed.

ATTENTION

⚠️

Please do not use the File System unless our Service requested a specific action.

FIG. 25 SUBMENU FILE SYSTEM
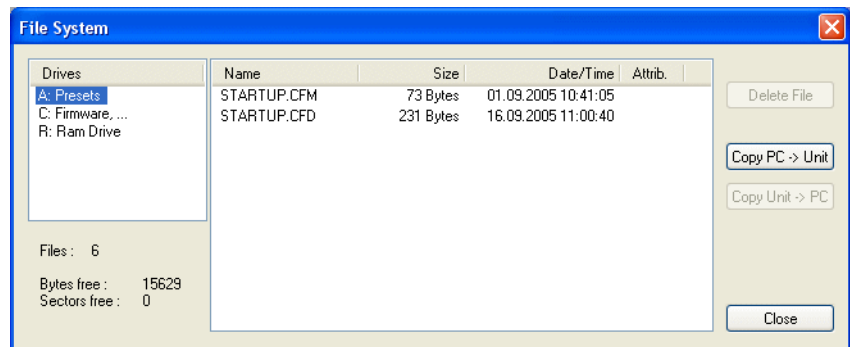
- The button **Delete File** deletes the currently selected file from the system.

ATTENTION

⚠️

Please do not delete any file unless our Service requested a specific action. Otherwise a disfunction of the system is possible.

- Via the button **Copy PC -> Unit** you can copy a file from the PC to the system.

ATTENTION

⚠️

Please use the Software Download and the File Import functionalities respectively to copy files to the system.

- Via the button **Copy Unit -> PC** you can copy a file from the system to the PC.

ATTENTION

⚠️

Please use the File Export functionalities to copy files to the PC.

5.6.3 Submenu System Panel

The **System Panel** is only for service purposes. Please enter only commands in the prompt, if our Support requested it from you.
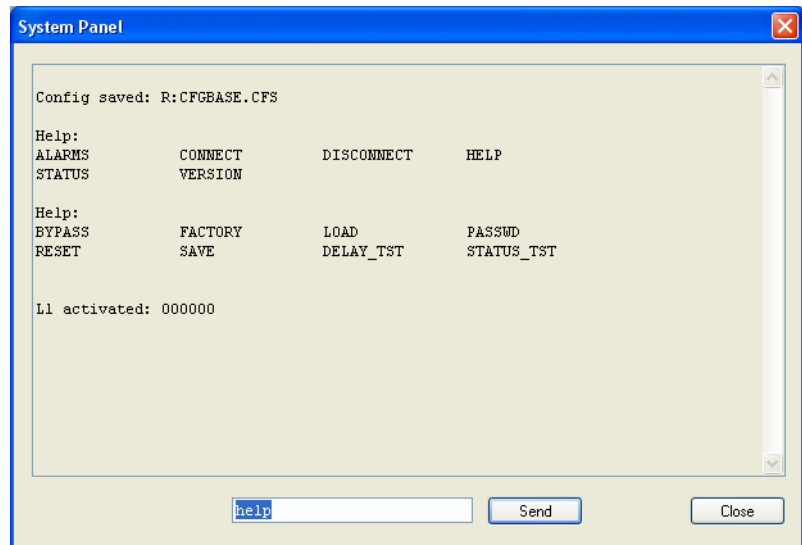
FIG. 26   **SUBMENU SYSTEM PANEL**

5.6.4 Submenu Software Download

The required firmware for the **MAGIC AE1 DAB** system is always included in the PC software: Via the **Software Download** you can comfortably download the firmware on your system.

By using the **Browse** button you select the firmware file. It is always located in the same directory in which you installed the **MAGIC AE1 DAB** application. The standard installation directory is:

C:\Program Files\MAGIC AE1 DAB

The file name of the firmware is „**ae1dab.ssw**".

FIG. 27 **SUBMENU SOFTWARE DOWNLOAD**
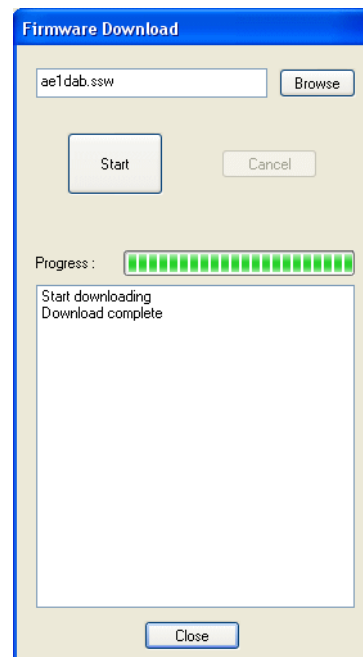
Please press the **Start** button to download the firmware. The **Progress** bar displays the progress of the download. The process is finished after about two minutes. If the download was successful, a corresponding message is displayed. After your confirmation the system is reset.

NOTICE

If the download was not successful, you can simply switch off the unit and switch it on again. The new software is only written in the flash memory if the download was successful. Otherwise the old firmware is maintained.

5.6.5 Submenu Set Factory Settings

By using the submenu **Set Factory Settings** the system can be reset to the initial state.

For safety reasons you have to confirm your selection.

5.7   Menu Extras

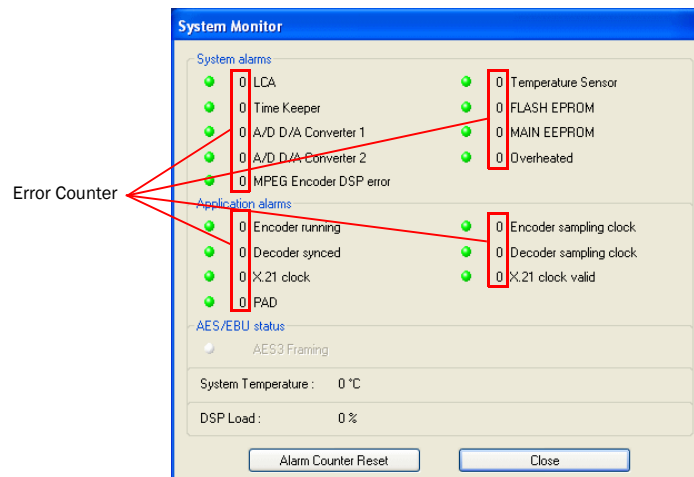**FIG. 28**   **MENU EXTRAS**

5.7.1   Submenu System Monitor

Via the menu **System Monitor** you receive information about the system status.

FIG. 29   **SUBMENU SYSTEM MONITOR**

TIP

A system alarm can also be configured as relay output (see Page 40).

A red LED signalises a currently existing alarm. How often the error occurred since switching on is displayed by the corresponding error counter.

To reset all error counter press the button **Alarm Counter Reset**.

NOTICE

If an alarm occurs frequently or over a longer period disconnect the unit from electricity. If the error occurs again after switching on, there is probably a hardware defect.

- Under **System alarms** all potential system alarms are displayed:

    - **LCA**: The communication with a programmable component is faulty.

    - **Time Keeper**: The communication with the integrated clock module is faulty.

    - **A/D D/A Converter 1**: The communication with the first ADDA converter is faulty.

    - **A/D D/A Converter 2**: The communication with the second ADDA converter is faulty.

    - **Temperature Sensor**: The communication with the temperature sensor is faulty.

    - **FLASH EPROM**: The communication with the permanent memory is faulty. Configurations cannot be saved or read anymore.

– **MAIN EEPROM**: The communication with the permanent memory is faulty. Configurations cannot be saved or read anymore.

– **Overheated**: The system sets this alarm if the system temperature is higher than 57 °C. Disconnect the unit from electricity or cool down the ambient temperature.

– **MPEG Encoder DSP error**: This alarm occurs, if an error on the DSP module is detected.

• Under **Application alarms** all ISO/MPEG alarms are centralised:

– **Encoder running**: If the encoder is not running, this alarm will be set.

– **Decoder synced**: For monitoring purposes the coded signal is decoded at any time via the integrated ISO/MPEG decoder.

– **X.21 clock**: This alarm occurs, if the external X.21 line clock is not available.

– **X.21 clock valid**: This alarm occurs, if the external X.21 line clock is not locked to one of the available bitrates (see TAB. 1, Page 35)

– **PAD**: If PAD is activated, but no data are available at the PAD interface, this alarm will be set.

– **Encoder sampling clock**: This alarm occurs if the hardware sampling clock do not fit with the expected sampling clock of the encoder.

– **Decoder sampling clock**: This alarm occurs if the hardware sampling clock do not fit with the expected sampling clock of the decoder.

• The **AES/EBU status** shows the current status of the AES/EBU input if the digital audio input is selected (see CHAPTER 5.5.2.2.2).

The actual system temperature is displayed in °C under **System Temperature**. The regular system temperature ranges from 30...45 °C.

Under **DSP Load** the load of the system is displayed. The usual load is about 55 to 65%.

5.8 Menu Help

FIG. 30   **MENU HELP**
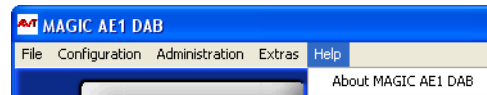
5.8.1 Submenu About MAGIC AE1 DAB

In the **About MAGIC AE1 DAB** dialogue you find the software versions of the PC software (**PC Version**) and of the systems (**Firmware Version**). Besides, you can find our contact details there.

FIG. 31   **SUBMENU ABOUT MAGIC AE1 DAB**

A 1 MENU STRUCTURE

On the following pages you will find the complete menu structure if you select *ENGLISH* as menu language

From the main menu you reach the phone book directly via the softkey *NAMES*. With the use of the softkey *MENU* you get to the configuration of the system.

The configuration menu is divided in five submenus:

– *BASIC SETTINGS*

– *OPERATION SETTINGS*

– *PRESETS*

– *STATUS INFORMATION*
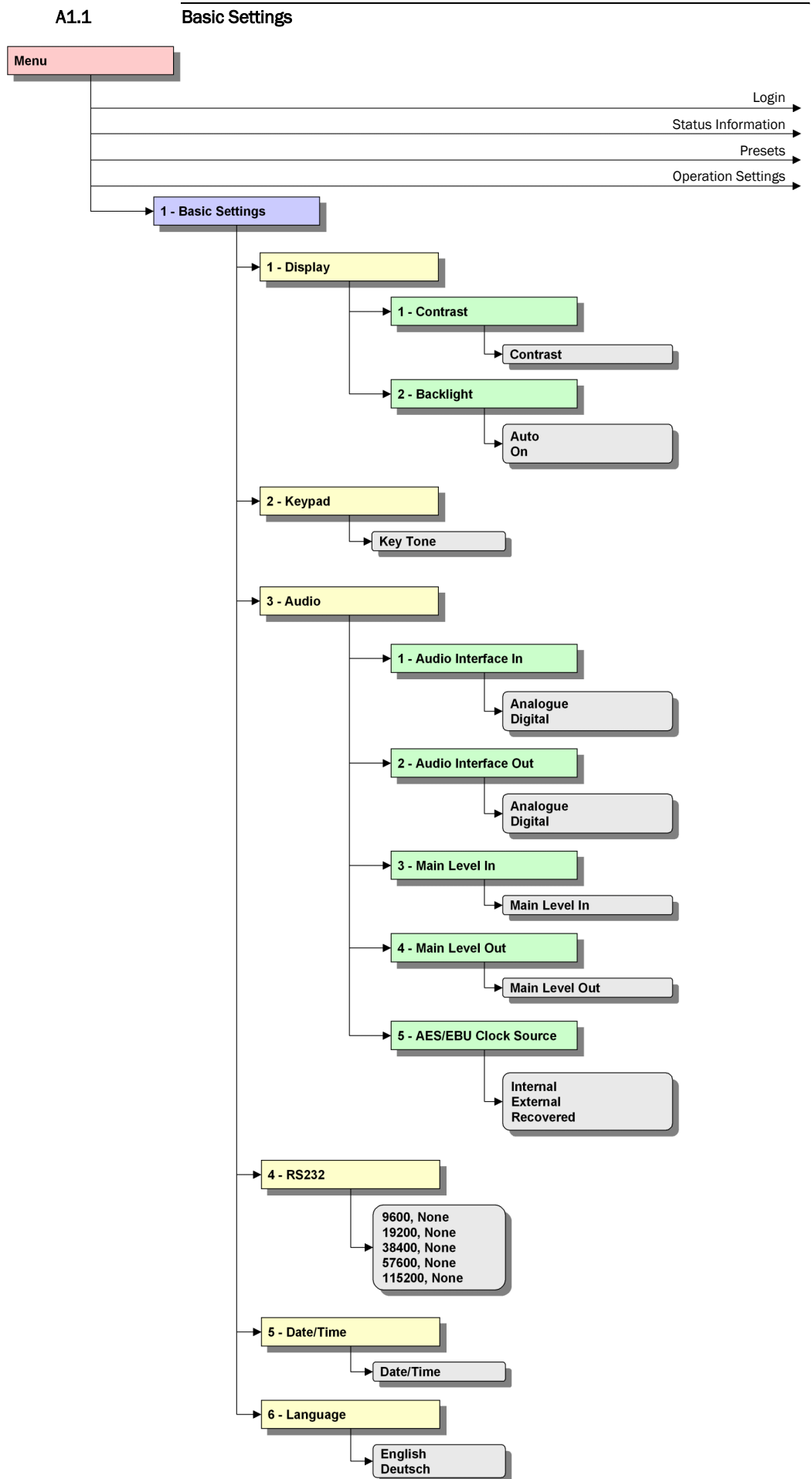
– *LOGIN*

NOTICE Please note that depending on the selected operating mode some menu items are not displayed.

If you use an Administrator and/or User Password, the display looks as it is described below:

(1) Only **Administrator Password** configured: The password must be entered for changes to the basic settings and operation settings only. Immediately available menus:

 – *PRESETS*

 – *STATUS INFORMATION*

 – *LOGIN*

(2) Only **User Password** configured (instead of *MENU, LOGIN* is displayed): The password must always be entered. Subsequently, all menus are available.

(3) **User** and **Administrator Password** configured (instead of *MENU LOGIN* is displayed):

 – **User Password** is entered: The menus *PRESETS, STATUS INFORMATION* and *LOGIN* are available

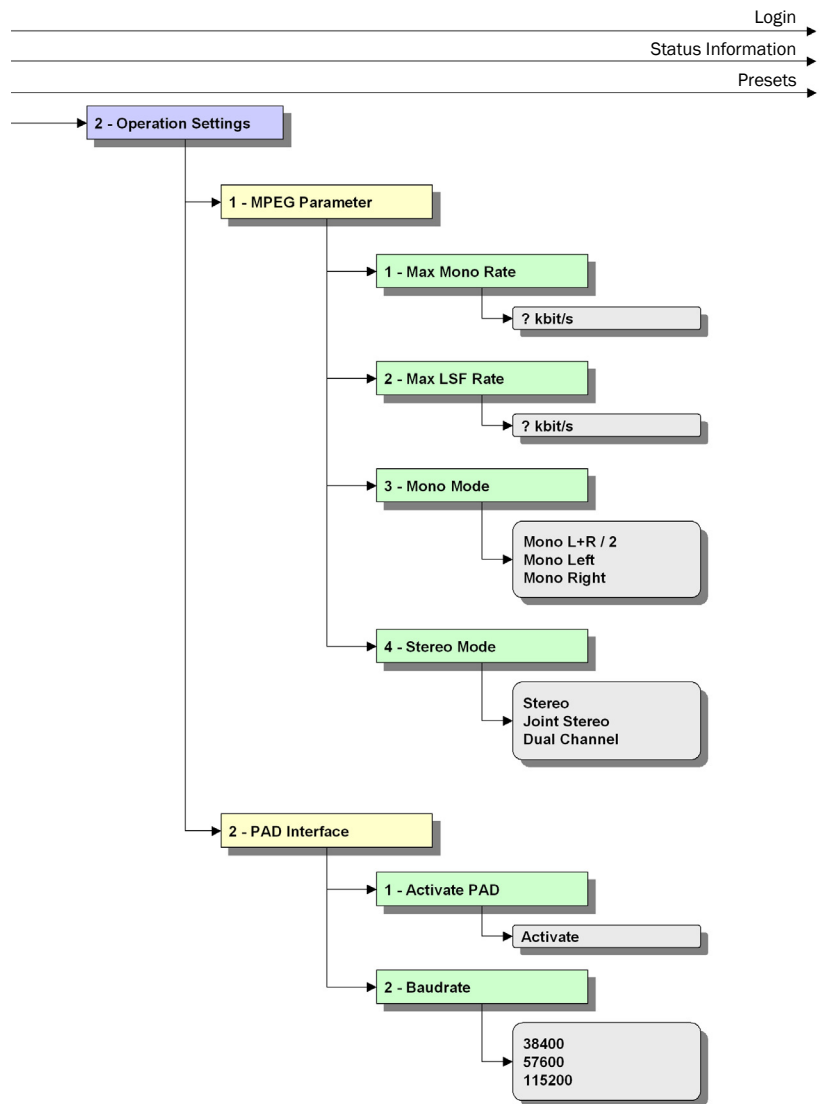 – **Administrator Password** is entered: All menus are available.

NOTICE There is no differentiation between upper and lower case for the password entry.
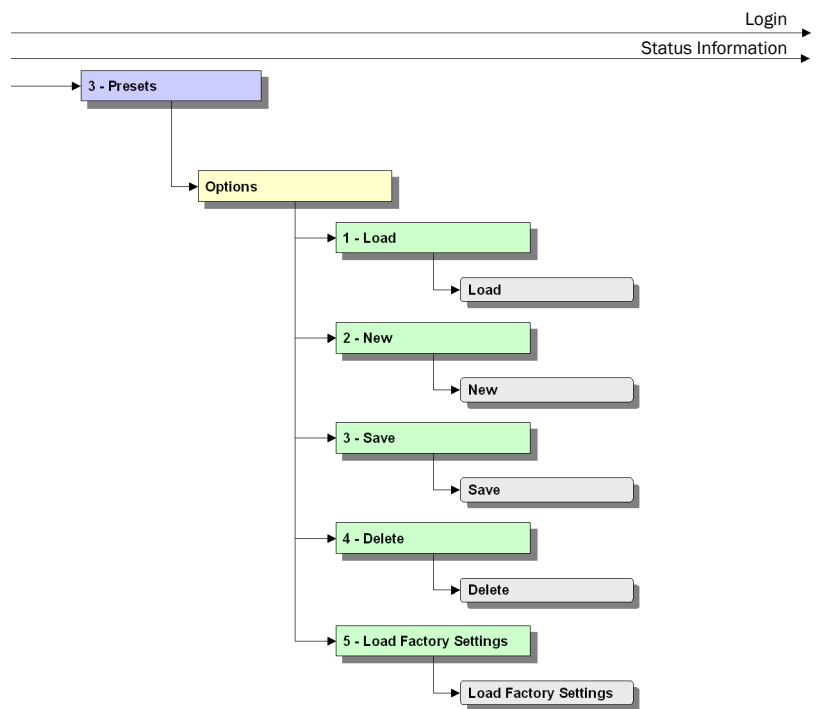
A1.1   Basic Settings

Menu

Login

Status Information

Presets

Operation Settings

1 - Basic Settings

1 - Display

1 - Contrast

Contrast

2 - Backlight

Auto
On

2 - Keypad

Key Tone

3 - Audio

1 - Audio Interface In

Analogue
Digital

2 - Audio Interface Out

Analogue
Digital

3 - Main Level In

Main Level In

4 - Main Level Out

Main Level Out

5 - AES/EBU Clock Source

Internal
External
Recovered

4 - RS232

9600, None
19200, None
38400, None
57600, None
115200, None

5 - Date/Time

Date/Time

6 - Language

English
Deutsch

A1.2   Operation Settings

Login

Status Information

Presets

2 - Operation Settings

1 - MPEG Parameter

1 - Max Mono Rate

? kbit/s

2 - Max LSF Rate

? kbit/s

3 - Mono Mode

Mono L+R / 2
Mono Left
Mono Right

4 - Stereo Mode

Stereo
Joint Stereo
Dual Channel

2 - PAD Interface

1 - Activate PAD

Activate

2 - Baudrate

38400
57600
115200

A1.3   Presets

Login

Status Information

```
3 - Presets
   │
   └──► Options
           │
           ├──► 1 - Load
           │        │
           │        └──► Load
           │
           ├──► 2 - New
           │        │
           │        └──► New
           │
           ├──► 3 - Save
           │        │
           │        └──► Save
           │
           ├──► 4 - Delete
           │        │
           │        └──► Delete
           │
           └──► 5 - Load Factory Settings
                    │
                    └──► Load Factory Settings
```

A1.4   Status Information

Login

4 - Status Information

1 - Version

Version

2 - AES/EBU Input Status

AES/EBU Input Status

3 - System Temperature

System Temperature

4 - Warm Restart

Warm Restart

5 - Registration

Registration

A1.5 Login

A2   INTERFACES

The interfaces of the system are pictured in Fig. 32.

FIG. 32   REAR VIEW OF THE MAGIC AE1 DAB AUDIO ENCODER

All interfaces are described below.

Interfaces

A2.1 Control and data interfaces

A2.1.1 DATA/CONTROL interface

The DATA/CONTROL interface is used for the configuration and operation of the *MAGIC AE1 DAB* system via a PC.

To connect a PC you need a 1:1 connecting cable in which Pin 2 and Pin 3 are *not* crossed. Furthermore, Pin 5 GND must be connected.

NOTICE   Please note that the function of the Pins RXD and TXD - input or output - is determined by the interface type DCE or DTE. The pin assignment for Pin 2 is always RXD and for Pin 3 it is always TXD.
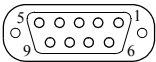
TAB. 2   PIN ASSIGNMENT: DATA/CONTROL INTERFACE

Socket: SUB-D, 9-pole

Pin	Signal		Electrical characteristics
1	not used		PC interface RS232:
2	RXD[b]	PAD Receive Data	Type (Pin 2, 3): DCE[a]
3	TXD[c]	PAD Transmit Data	Level: V.24 Data rate: 115200 Baud Range: max. 15 m
4	not used		Protocol: programmable
5	GND	Earth	
6	not used		
7	not used		
8	not used		
9	not used		

a   DCE = Data Communication Equipment: to connect a PC a 1:1 cable is required

b   ATTENTION: On this Pin the MAGIC AE1 DAB **transmits** data

c   ATTENTION: On this Pin the MAGIC AE1 DAB **receives** data

PAGE 66

A2.1.2   DATA/PAD interface

The DATA/PAD interface is used for the transmission of Program Associated Data (PAD). The interface is realised compliant to *IRT Recommendation*[1].

ATTENTION

Please note that the maximum number of PAD bytes per frame is 127. In this case a baudrate of 115200 Baud must be configured.

To connect a standard PAD inserter you need a 1:1 connecting cable in which Pin 2 and Pin 3 are *not* crossed. Furthermore, Pin 5 GND must be connected.

NOTICE

Please note that the function of the Pins RXD and TXD - input or output - is determined by the interface type DCE or DTE. The pin assignment for Pin 2 is always RXD and for Pin 3 it is always TXD.
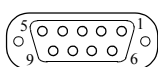
TAB. 3   PIN ASSIGNMENT: DATA/PAD INTERFACE

Socket: SUB-D, 9-pole

Pin	Signal		Electrical characteristics
1	not used		PC interface RS232:
2	RXD[b]	PAD Receive Data	Type (Pin 2, 3): DCE[a]
			Level: V.24
3	TXD[c]	PAD Transmit Data	Data rate: 115200 Baud
			Range: max. 15 m
4	not used		Protocol: programmable
5	GND	Earth	
6	not used		
7	not used		
8	not used		
9	not used		

a   DCE = Data Communication Equipment: to connect a PC a 1:1 cable is required

b   ATTENTION: On this Pin the MAGIC AE1 DAB **transmits** data

c   ATTENTION: On this Pin the MAGIC AE1 DAB **receives** data

---

[1] Synchronous transmission mode: In the beginning of each ISO/MPEG frame the encoder transmit a SYN character (0x16). To realise frame synchronous PAD insertion the connected PAD inserter must transmit all data inside of this frame.

A2.2   ISDN interface

NOTICE   This interface is not supported in the *MAGIC AE1 DAB* system.
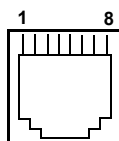
TAB. 4   **PIN ASSIGNMENT: S_0 INTERFACE (ISDN)**

1   8

Socket: Western (8-pole) RJ45			
Pin	**Signal**		**Electrical characteristics**
1	not used		Recommendation: I.430
2	not used		Data rate: B channel: 2 x 64-kbit/s D channel: 16-kbit/s
3	TX (A)	Data out (A)	Max. cable length: 100 m
4	RX (A)	Data in (A)	
5	RX (B)	Data in (B)	
6	TX (B)	Data out (B)	
7	not used		
8	not used		

A2.3   LAN interface

The LAN interface can be used for control and monitoring purposes.

NOTICE   The implementation of the LAN interface is planned for a later release.
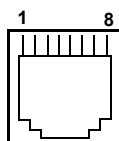
TAB. 5   **PIN ASSIGNMENT: S_0 INTERFACE (ISDN)**

1   8

Socket: Western (8-pole) RJ45			
Pin	**Signal**		**Electrical characteristics**
1	TX (A)	Data out (A)	**Standard Ethernet /10Base-T (IEEE-802.3)** Speed: 10 MBit/s
2	TX (B)	Data out (B)	Cable type: Twisted Pair (CAT3) Max. cable length: 100 m
3	RX (A)	Data in (A)	
4	not used		**Fast Ethernet /100Base-T (IEEE-802.3u)** Speed: 100 MBit/s
5	not used		Cable type: Twisted Pair (min. CAT5) Max. cable length: 100 m
6	RX (B)	Data in (B)	
7	not used		
8	not used		

A2.4 **X.21 interface**

The X.21 interface is realised as DCE (Data Communications Equipment) interface. The *MAGIC AE1 DAB* can be connected via an X.21 cable (part of the delivery) directly to the Ensemble Multiplexer (e.g. DM-001 from Rohde & Schwarz).
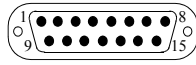
TAB. 6 **PIN ASSIGNMENT: X.21 INTERFACE**

Connector: 15-pole SUB-D

Pin	Signal		Direction	Electrical characteristics	
1	SHIELD	Screen		Type:	DCE with Gender Changer
2	TX (A)	Transmit Data (A)	In	Level:	V.11, balanced
3	CTL (A)	Control (A)	In	Data rates:	8, 16, 24, 32, 40, 48, 56, 64, 80, 96, 112, 128, 144,160, 192, 224,256, 320, 384-kbit/s
4	RX (A)	Receive Data (A)	Out		
5	IND (A)	Indicate (A)	Out		
6	SCLK (A)	Signal Element Timing (A)	Out		
7	BCLK (A)[a]	Byte Timing (A)	Out	Range:	100 m
8	GND	Ground			
9	TX (B)	Transmit Data (B)	In		
10	CTL (B)	Control (B)	In		
11	RX (B)	Receive Data (B)	Out		
12	IND (B)	Indicate (B)	Out		
13	SCLK (B)	Signal Element Timing (B)	Out		
14	BCLK (B)[a]	Byte Timing (B)	Out		
15	not used				

a   Normally not used

A2.5   TTL/RELAY interface

Via this interface external control signals can be used. The programming of the available functions is possible via the Windows PC Software.
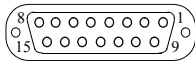
TAB. 7   **PIN ASSIGNMENT: TTL/RELAY INTERFACE**

Socket: 15-pole SUB-D

Pin	Signal	Direction	Electrical characteristics
1	not used		Specification of the TTL outputs: Maximum voltage: 5V
2	not used		Maximum current: 10mA
3	not used		Specification of the relays:
4	not used		Maximum voltage: 48V Maximum current: 200mA
5	GND		
6	RELAY 1 (A)	Out	
7	RELAY 1 (B)	Out	
8	RELAY 2 (A)	Out	
9	TTL1	In/Out	
10	TTL2	In/Out	
11	TTL3	In/Out	
12	TTL4	In/Out	
13	TTL5	In/Out	
14	TTL6	In/Out	
15	RELAY 2 (B)	Out	

A2.6   Audio interfaces

The system incorporates analogue and digital AES/EBU audio interfaces. For switching you can use display and keypad or the Windows PC software. The output interfaces can be used for monitoring purposes.

A2.6.1   Analogue Audio interface
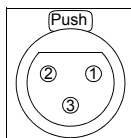
TAB. 8   PIN ASSIGNMENT: ANALOGUE INPUT (AUDIO 1/2 IN)

Socket: 3-pole XLR

Pin	Signal	Electrical characteristics
1	GND	Input level: adjustable -3 .... +9 dBu
2	AUDIO IN (A)	Impedance: > 25 kΩ
3	AUDIO IN (B)	Head room: 6 dB
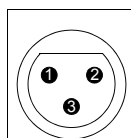
TAB. 9   PIN ASSIGNMENT: ANALOGUE OUTPUT (AUDIO 1/2 OUT)

Connector: 3-pole XLR

Pin	Signal	Electrical characteristics
1	GND	Output level: adjustable -3 .... +9 dBu
2	AUDIO OUT (A)	Impedance: < 50 Ω
3	AUDIO OUT (B)	Head room: 6 dB

A2.6.2   Digital AES/EBU Audio interface

The **MAGIC AE1 DAB** system incorporates a digital AES/EBU input and output. The input as well as the output has its own sample rate converter providing that a digital source with 32, 44.1 or 48-kHz can be connected directly. For external clocking (48-kHz only) the word clock input or output may be used.
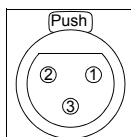
TAB. 10   PIN ASSIGNMENT: DIGITAL INPUT (AES IN)

Socket: 3-pole XLR

Pin	Signal	Electrical characteristics
1	GND	IEC-958
2	AUDIO IN (A)	
3	AUDIO IN (B)	
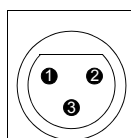
TAB. 11   PIN ASSIGNMENT: DIGITAL OUTPUT (AES OUT)

Connector: 3-pole XLR

Pin	Signal	Electrical characteristics
1	GND	IEC-958
2	AUDIO OUT (A)	
3	AUDIO OUT (B)	

A2.6.2.1 Digital AES/EBU Clock interface
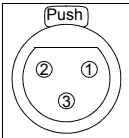
TAB. 12   PIN ASSIGNMENT: CLOCK INPUT (CLK IN)

Socket: 3-pole XLR

Pin	Signal	Electrical characteristics
1	GND	TTL
2	CLOCK IN	
3	not used	
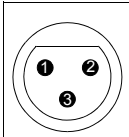
TAB. 13   PIN ASSIGNMENT: CLOCK OUTPUT (CLK OUT)

Connector: 3-pole XLR

Pin	Signal	Electrical characteristics
1	GND	TTL
2	CLOCK OUT	
3	not used	

A2.6.3 HEADSET/MIC interface

This interface allows a monitoring of the decoded audio signal as well as the audio inputs.

NOTICE   The microphone input is not available in this system.
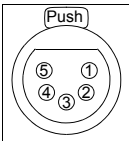
TAB. 14   PIN ASSIGNMENT: HEADSET/MICRO AUDIO INTERFACE

Socket: 5-pole XLR

Pin	Signal	Electrical characteristics
1	not used	Output Power: 0,15 W Load (Min.): 8 Ω
2	not used	THD+N@1kHz: 0,25% (half power) PSRR[a]: 83 dB
3	GND	Level adjustment: 0 ... -40 dB
4	HEADPHONE left channel	
5	HEADPHONE right channel	

a   PSRR: Power Supply Rejection Ratio

A3   TECHNICAL DATA

Coding Algorithm

ISO/MPEG Layer II (IRT Licence)
DAB EN 300401

Sampling Frequencies:

24-kHz, 48-kHz

Data Rates:

8, 16, 24, 32, 40, 48, 56, 64, 80, 96, 112-kbit/s
128, 144, 160, 192, 224, 256, 320, 384-kbit/s

Audio Interface Encoder:

XLR, analogue, electronically balanced
digital AES/EBU with integrated Sample Rate Converter

Audio Level:

-3 ... +9 dBu

Headroom:

6 dB (maximum level: 15 dBu)

Impedance:

600 Ohm/15 KOhm

THD+N:

~86 dB

Linearity:

± 0,3 dB

Monitoring Output:

XLR, analogue, electronically balanced
digital AES/EBU with integrated Sample Rate Converter
Headphones output

Line Interfaces:

X.21[1]

Data Interfaces:

PAD
V.24/RS232 IRT Rec. compliant
38400, 57600, 115200 Baud
max. 127 bytes per frame @ 115200 Baud

Control Interface:

LAN[2]
PC   V.24/RS232
GPIO   6 x TTL programmable
               2 x Relays, programmable

Power Supply:

90...253V AC

Frequency:

50/60 Hz

Power Consumption:

typical 12W, max. 15W

Dimensions (H x W x D):

45 (1U) x 451 x 250 mm
with brackets system fits into a 19" rack

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[1] ISDN interface is not in use

[2] planned for a later release

A4   GENERAL

A4.1   Ordering numbers

MAGIC AE1 DAB   800401

Accessories

-

Software Options

-

A4.2   Scope of delivery

–   MAGIC AE1 DAB

  –   CD MAGIC AE1 DAB Updates   (ID: 430283)

  –   Mains power supply cable

  –   RS232 cable

  –   X.21 interface cable 15-pole SUB-D, 2 x Socket

  –   19'' Mounting Brackets

  –   Manual

A4.3   Declaration of Conformity

You will find the declaration of conformity at the end of this manual.

A 5   SERVICE INFORMATION

A5.1   **Software Updates**

Free Software Updates you will find on our Homepage under

http://www.avt-nbg.de

Ident No.:   430282

A5.2   **Support**

You can contact our Support via email or by telephone:

support@avt-nbg.de

+49 911 5271-160   (09:00h - 17:00h)

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

A5.3   **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

DECLARATION OF CONFORMITY

Supplier's name: AVT Audio Video Technologies GmbH

Supplier's address: Nordostpark 12
D-90411 Nuernberg
Germany

declares, that the product

Product name(s):   MAGIC AE1 DAB

conforms to the standards of the following European directives:

Number/title: EN 60950 A4 Safety

The conformity is evidenced by strictly meeting the following standards:

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

Place, date: Nuernberg, 20.06.2006

Name: Wilfried HECHT (Managing Director)

Legally binding signatures:

Phone: +49 911 5271-0

This declaration includes no warranty of properties.

The safety instructions specified in the product documentation delivered must be observed.