

RTSTM ***ISDN 2005***

Dual ISDN Audio Codec

Hardware/Software Manual



PRELIMINARY

TELEX[®]

RTS ISDN 2005

Dual ISDN Audio Codec

Hardware/Software Manual

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INTRODUCTION

The system *RTS ISDN 2005* is implemented as Dual ISDN Audio Codec and has analogue and digital AES/EBU Audio interfaces.

The configuration of the system can be carried out via the Windows application included in delivery or via the front keypad of the unit. Optionally, the *RTS ISDN 2005 Keypad* is available for separate operation without PC.

S A F E T Y

Introduction

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

In 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 own 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.

The functions of the *RTS ISDN 2005* are implemented in a single unit. The system is designed for mounting in a half 19" rack (1 U).

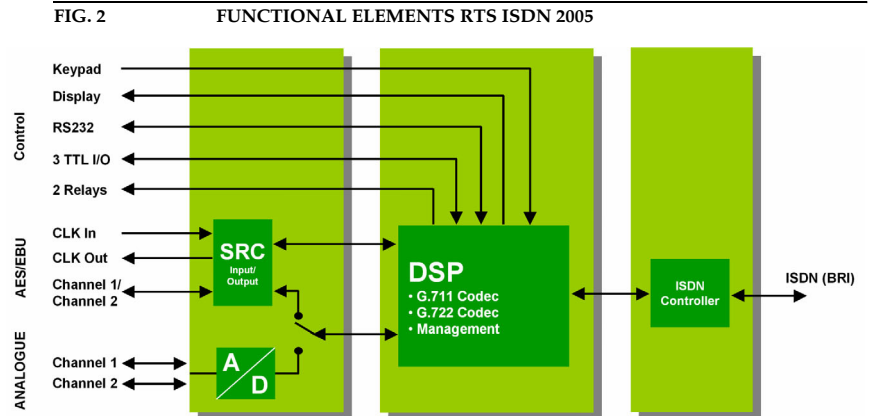
Optionally, a *RTS ISDN 2005 DUAL 19" Mounting Kit* is available for the installation of two *RTS ISDN 2005* Systems next to each other.

FIG. 1

FRONT VIEW: RTS ISDN 2005 DUAL ISDN AUDIO CODEC



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



2.1

Functionality

The *RTS ISDN 2005* System incorporates an *ISDN* telephone interface. The complete signal processing is taken over by two digital signal processors. In this way the following functions are realised:

DSP1:

- G.711 Audio encoding and decoding
- G.722 Audio encoding and decoding
- Signalising management
- Control of the complete system (Keypad, display, relays, TTL, RS232)

Via the Audio channels 1 & 2 the Audio signal is inserted or output analogue or digitally. If the digital AES/EBU Audio interface is used, two separate Sample Rate Converters are available for automatic clock synchronisation. For external clocking a clock input and a clock output are 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 *RTS ISDN 2005 Windows PC Software* which is included in delivery and which communicates with the system via the RS232 interface.

The basic operating functions like accepting a call, dropping a connection and establishing a connection with a preprogrammed number can be carried out via three programmable *TTL contacts*. Two *relays* are available for status indication.

Optionally, the system can also be operated separately via the *RTS ISDN 2005 Keypad* that can be connected to the RS232 interface instead of the *PC Software*.

3 PUTTING THE RTS ISDN 2005 INTO OPERATION

3.1 Mounting

With its dimensions (W × H × D) of 220 mm × 44,5 mm (1 U) × 220 mm the **RTS ISDN 2005** System can be used either as desktop device or mounted in 19 inch racks. Corresponding 19" mounting brackets are included in delivery. Optionally, a mounting kit to install two **RTS ISDN 2005** next to each other is available.

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 **RTS ISDN 2005** Audio Codec 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 INFORMATION** see CHAPTER A1.4, Page 41))

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 via the external power supply included in delivery. The line frequency can vary from 45 Hz to 65 Hz. The maximum power consumption is 15W. The rack must be earthed according to the VDE Regulations. The earthing can be carried out via the earthing screw on the back side of the unit.

The unit does not have a circuit closer and a circuit breaker. After plugging in the external power supply the system boots within a few seconds. In standby mode the RTS logo is shown on the display.

3.3 Earthing of the system

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

ATTENTION Earthing

A lacking earthing can cause functional deficiencies within the unit.

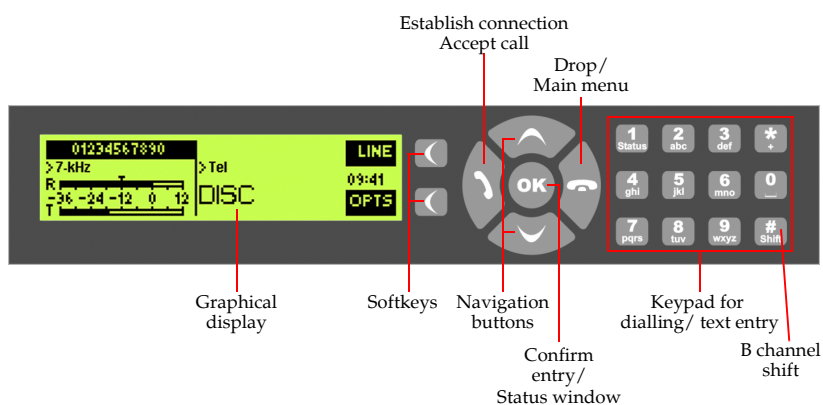
3.4**Operational elements on the front side**

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

On the right next to the display there are two softkeys whose current functions are indicated on the display. In the middle there are two buttons for navigation (selection upwards/downwards), two buttons for accepting/dropping calls as well as an **OK** button. The numerical pad supports in addition to the 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

Operating modes of the system

The figures below show the systems in the different operating modes and their wirings.

3.5.1

ISDN operation

In the ISDN operating mode two independent B channels are available which can be used separately for two transmissions.

FIG. 4

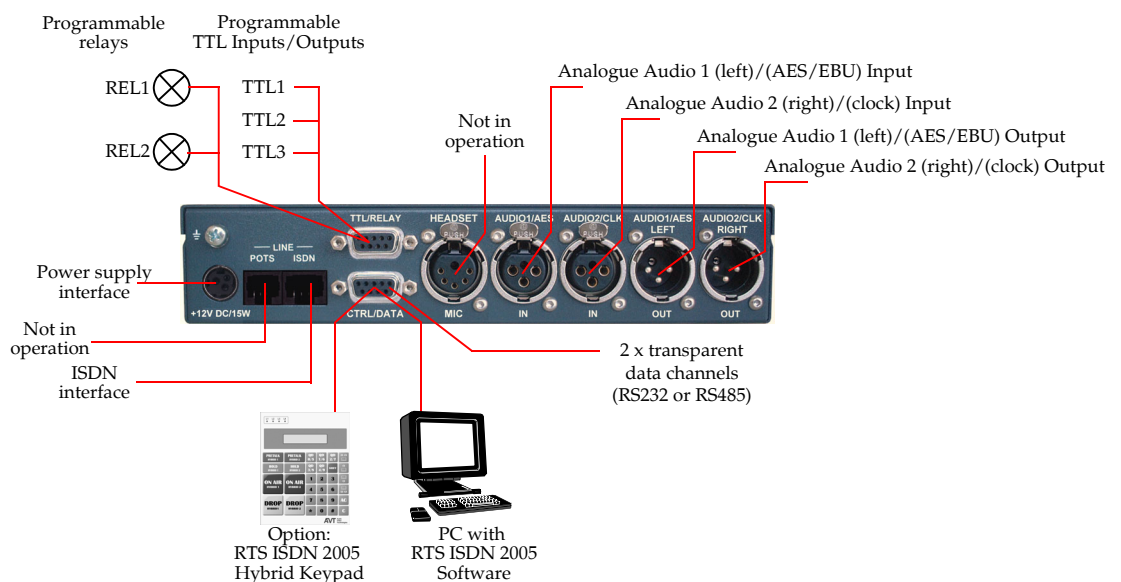
MINIMUM WIRING FOR ISDN OPERATION



The maximum wiring with all options is shown in Fig. 5. Via the RS232 control interface a PC with *RTS ISDN 2005 Software* or a *RTS ISDN 2005 Keypad* can be connected as alternative to the operation by the front keypad and display.

FIG. 5

MAXIMUM WIRING FOR ISDN OPERATION



4 OPERATION VIA DISPLAY AND KEYPAD

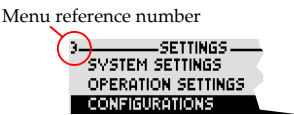
In this chapter all basic configurations for the operation of the *RTS ISDN 2005* system are explained. An overview of the menu structure you will find in the annex under CHAPTER A1.

Of course, all configurations can also be comfortably made via the *RTS ISDN 2005 Software* included in delivery.

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

4.1 Basic configurations

In the following some specific basic configurations of *RTS ISDN 2005* are described in detail. The configurations for *MAGIC DC7* and *MAGIC AC1* differ only in a few aspects. Major differences are marked in the text.



NOTICE All menus can be reached directly via a *QuickMenu* key sequence. For this purpose each manu 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.

4.1.1 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.

4.1.2 Setting the Audio interface: Analogue or digital

RTS ISDN 2005 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 *SYSTEM 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 **OK** button or the softkey **OK**.
- To get back to the main menu please press the **END** 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 111** or **MENU 112**

4.2

Working with the RTS ISDN 2005

In the next chapters basic functions like establishing a connection, dropping a connection, accepting calls etc. are described in detail.

NOTICE

If you are not in the main menu please press the  button first.
From the main menu you reach the status window via the **OK** button.

4.2.1

Calling a partner



From the main menu just enter the phone number using the keys **0...9**. The input field for the phone number is displayed automatically after entering the first cypher.

With the softkey **DELETE** misentries can be corrected.

The connection is established after the entry of the phone number by pressing the telephone receiver button .

Under the softkey **OPT.** (Options) the entered phone number can be saved in the phone book see CHAPTER 4.3.1, Page 25) or stored as QuickDial number see CHAPTER 4.3.2, Page 25).

4.2.2

The Status Display - Operation during a connection

After the telephone receiver button is pressed the partner is called and the status window is displayed automatically.

TIP

The status window can always be reached by pressing the **OK** button.

During a stereo connection the number of the connected B channels is displayed to the left of the level indication.

In the **ISDN** operating mode the window is split if two independent connections have been established.

To switch between the two connections, please press the **SHIFT** key (**#**). The name of the selected channel is displayed inversely.

An outgoing call is signalised by **DIALLING...**. The dialled number (or the name if a phone book entry is selected) is displayed in the first line.

When the connection is established the level indication for the incoming signal(**R**eceive) and for the outgoing signal(**T**ransmit) is displayed.

With the use of the softkey **OPT.** the displayed phone number can be stored and it is also possible to directly switch to the phone book.

4.2.3

Dropping a connection

The connection is dropped by pressing the telephone receiver button . If no further connection exists, the main menu is displayed after a few seconds.

NOTICE

Please make sure that you have selected the right channel if you want to drop a connection.

4.2.4

Accepting a call

09115271130		LINE
>ON AIR	>ON AIR	07:55
CALLIN	DISC	OPT.

If the *RTS ISDN 2005* receives a call, it is automatically signalised in the status window by **CALLIN**.

NOTICE

Additionally, a system ringing tone can be enabled.

The call can be directly accepted with the telephone receiver button .

If you want to reject the call, please press the following telephone receiver button .

4.3

Comfort Functions

4.3.1

Redialling

SUCHEN:		ZURÜCK
		ABC

You reach the redialling function by pressing again the telephone receiver button  for the line on which no connection currently exists. The recently called partners are displayed in a list. In the input field **SEARCH** you can search for a certain partner or select a partner from the list using the cursor keys  and .

To call a partner please press again the telephone receiver button .

NOTICE

To enter characters you can use the alphanumeric keypad. You reach the desired character by pressing the respective key several times. To type e.g. a '**K**' you need to press the button '**5**' twice. Misentries can be corrected with the help of the softkey **DELETE**.

To switch between upper and lower case please press the **SHIFT** key. The display changes from **ABC** to **abc**.

4.3.2

Using the phone book

SUCHEN:		ZURÜCK
Emma Flemming		ABC
John Updike		
Mark Smith		OPT.

SUCHEN:	M	LÖSCHEN
Mark Smith		ABC
Mauro Ficotto		OPT.

The system incorporates a comfortable phone book function. You reach the phone book from the main menu via the softkey **NAMES**.

In the input field **SEARCH** you can search for a certain partner. As soon as you enter a character the corresponding phone book entries are filtered out.

Alternatively, you can select a partner from the list using the cursor keys  and .

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

- **NEW ENTRY:** With the help of this function you create a new phone book entry.
First enter the name and confirm your entry with **OK**.

Then enter the phone number of the partner and confirm it as well with **OK**.
- **EDIT:** This function allows you to edit already existing phone book entries.
- **DISPLAY:** The selected phone book entry is displayed with name and phone number.
- **DELETE ENTRY:** The selected phone book entry is deleted. For safety reasons you are asked if you really want to delete the entry.
- **SAVE AS QUICK DIAL:** Your 10 most important phone numbers can be programmed as Quick Dialling numbers on the numerical keys '**0**' ... '**9**'.
Please select the key from the list on which you want to programme the phone number.

NAME	LÖSCHEN
PETERS	ABC
	OK

NUMMER	LÖSCHEN
0311571130	123
	OK

...ALS KURZWahl SPEICHERN	ZURÜCK
TASTE '0'	
TASTE '1'	
TASTE '2'	WAHLEN

To activate a Quick Dialling number just press from the main menu the desired Quick Dial key for at least 3 seconds. The connection to the partner is established automatically.

TIP

The phone book functions can also be reached directly via the *QuickBook* function. Please press the following key sequence: **NAMES OPT. <DIGIT>**
Example: **SAVE AS QUICK DIAL - NAMES OPT. 5**

4.3.3

Working with Presets

The *RTS ISDN 2005* differentiates between **SYSTEM SETTINGS** and **OPERATION SETTINGS**.

System Settings are settings that do **not** change during normal operation like e.g. language, 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 like e.g. the line interface ISDN or Analogue POTS, Ringing Tone, etc, 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.

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 (> 500 MHz) 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 **RTS ISDN 2005** 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\RTS ISDN 2005** on the CD.

Please follow the instructions of the installation routine.

After the installation the software can be started by clicking on the **RTS ISDN 2005**.

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: **PC (19200 Baud)**

Operation via Windows PC software

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

The optional *RTS ISDN 2005 Keypad* ensures a comfortable and simple operation of the system for users who do not want to use the front keypad and display and who do not want use a PC to operate the hybrid.

NOTICE

To use the Keypad with the *RTS ISDN 2005* you must adjust the interface parameters of the RS232 interface to 9600 Baud, no parity. Via the *Quick Menu* function you reach the settings for the R232 parameters directly by the key sequence ***MENU 14***. Please select ***KEYPAD 9600, NONE***.

The following figure shows the operational elements of the Keypad.

FIG. 6

KEYPAD ASSIGNMENT OF THE RTS ISDN 2005 KEYPAD

Please connect the 9 pole SUB-D connector of the *RTS ISDN 2005 Keypad* with the *RS232* interface see CHAPTER A4.2, Page 53) of the *RTS ISDN 2005* System. Since the *RTS ISDN 2005 Keypad* needs its own power supply please

connect the 230V external power supply to a power socket and connect the 6 pole Mini-DIN socket of the external power supply with the 6 pole Mini-DIN connector of the *RTS ISDN 2005 Keypad*. If everything is connected correctly, the display is now illuminated. After switching on¹ the system, the message you can see in our figures is displayed after booting.

- If there is a connection error, the ISDN provides various alarm messages.. Please see the following table for their meanings. The LCD display shows the relevant B channel first followed by the alarm message.

TAB. 1 ISDN ALARM MESSAGES	
Alarm message	Description
Unass. number	The number is not recognised by the ISDN. Please check your entry
No route	No route. When this message appears the ISDN is normally overloaded. Please dial again.
Normal disc.	The connection has been cleared.
User busy	The number called is busy.
No user resp.	The called number is not responding. Possibly the wrong number was dialled.
Call rejected	The call was rejected. Possibly the partner has rejected your call.
Number chang.	The dialled number has been changed.
Destin. error	The called end is not operational. Maybe the unit is switched off.
Inval. number	Invalid number.
No line avai.	No B channel available.
No Network	No ISDN available. Check your ISDN line.
Netw. failure	Temporary ISDN failure.
Congestion	ISDN network error. Maybe the wrong ISDN protocol is selected.
Bearer capab.	The wanted service is not available.
Bearer serv.	The wanted service is not implemented.
Remote disc.	Connection has been dropped by the partner
Procedure er.	Remote or local ISDN procedure error.
Cannot dial	System cannot dial.

¹ If the system has already been switched on, please press the button „C“ or „AC“ once.

6.1

Keypad functions

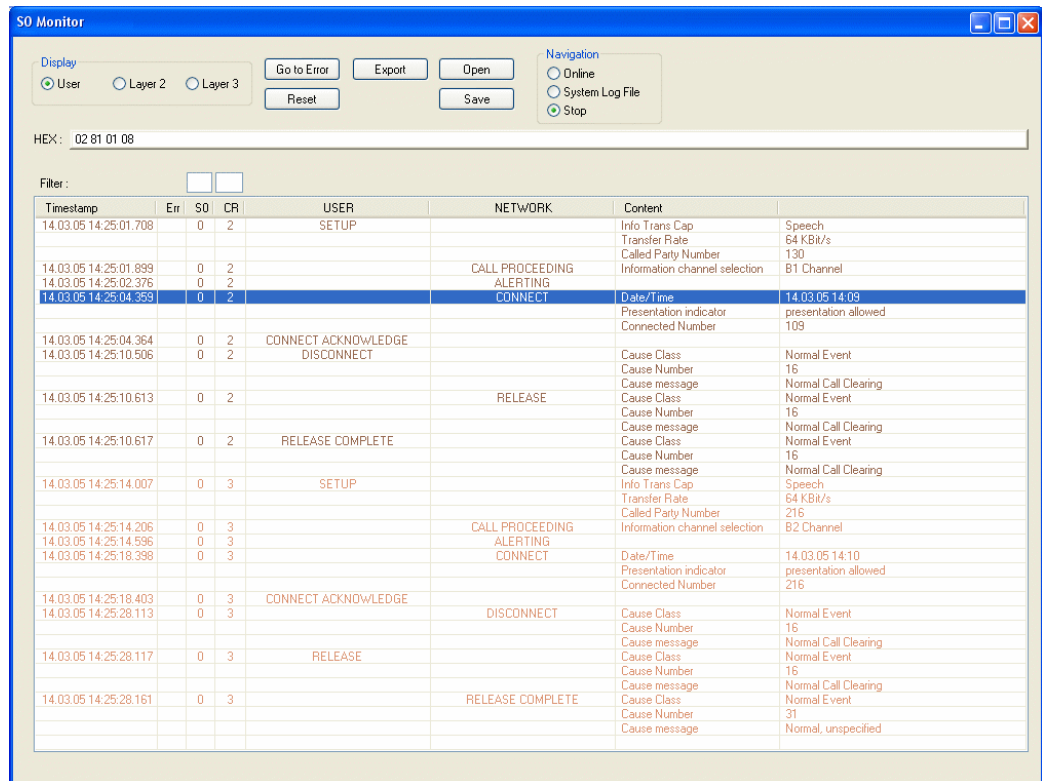
Below you will find the keypad functions listed in table form.

The fee-based *RTS ISDN 2005 Remote Control & ISDN Monitor Plug-In Software* enables you to access the *RTS ISDN 2005* System from any PC with an integrated ISDN card. A local *RTS ISDN 2005* System is not required. The software option is protected by an USB Dongle. A special highlight is the integrated *ISDN S₀ Monitor* which allows a detailed analysis of the D channel-locally as well as remotely.

7.1

The integrated S₀ Monitor

The integrated S₀ Monitor allows a detailed analysis of the D channel protocol.

FIG. 7 S₀ MONITOR USER

- The D channel protocol can be analysed **Online** or via the **System Log File** stored in the system. You can select the desired operating mode under **Navigation**. **Stop** stops the current logging.
- The option **Display** switches between the **User**, **Layer 2** and **Layer 3** display. The **User** view displays a summary of the most important information. Of course, for experts the options **Layer 2** and **Layer 3** are also informative.
- Errors in the log file are displayed red-shaded. Via the button **Go to Error** the next error in the log file is displayed.
- The button **Reset** resets the display window.
- With the use of the **Export** key the log file can be exported in the currently selected readout as RTF (Rich Text Format). This file can be read with MS WORD for instance.
- Via the **Open** button a previously stored log file can be opened and analysed offline.
- By pressing the button **Save** the current log file is stored as binary file.
- In the line **HEX** the binary data of the currently selected log file line is displayed in hexadecimal form.

- Using **Filter** you can filter the log file for certain criteria. **S0** selects the ISDN interface of the system. For the *RTS ISDN 2005* this value must always be „0“ respectively be empty since the system incorporates only one ISDN interface.

Using the filter **CR** (Call Reference) you can display all available entries for a transaction. Additionally, the colour in which the entries are displayed is changed for each new Call Reference.

FIG. 8 S₀ MONITOR LAYER 2

Timestamp	Err	S0	Direction	SAPI	TEI	C/R	Frame Type	P/F	N(S)	N(R)	Content
14.03.05 17:45:23.929	0		Ntw>Ustr	0	64	0	RR	0		18	
14.03.05 17:45:25.387	!	0	Ntw>Ustr	0	127	1	UI	0			
14.03.05 17:45:25.715	!	0	Ntw>Ustr	0	127	1	UI	0			
14.03.05 17:45:25.736	0		Ntw>Ustr	0	127	1	UI	0			
14.03.05 17:45:25.740	0		Ustr>Ntw	0	64	0	INFO	0	18	14	
14.03.05 17:45:25.753	0		Ntw>Ustr	0	64	0	RR	0		19	
14.03.05 17:45:26.886	!	0	Ntw>Ustr	0	127	1	UI	0			
14.03.05 17:45:27.206	!	0	Ntw>Ustr	0	127	1	UI	0			
14.03.05 17:45:28.706	!	0	Ntw>Ustr	0	127	1	UI	0			
14.03.05 17:45:33.371	0		Ntw>Ustr	0	64	1	INFO	0	14	19	
14.03.05 17:45:33.371	0		Ustr>Ntw	0	64	1	RR	0		15	
14.03.05 17:45:33.375	0		Ustr>Ntw	0	64	0	INFO	0	19	15	
14.03.05 17:45:33.391	0		Ntw>Ustr	0	64	0	RR	0		20	
14.03.05 17:45:35.852	0		Ntw>Ustr	0	64	1	INFO	0	15	20	
14.03.05 17:45:35.852	0		Ustr>Ntw	0	64	1	RR	0		16	
14.03.05 17:45:35.856	0		Ustr>Ntw	0	64	0	INFO	0	20	16	
14.03.05 17:45:35.873	0		Ntw>Ustr	0	64	0	RR	0		21	
14.03.05 17:45:43.869	0		Ntw>Ustr	0	64	1	RR	1		21	
14.03.05 17:45:43.869	0		Ustr>Ntw	0	64	1	RR	1		16	
14.03.05 17:45:51.878	0		Ntw>Ustr	0	64	1	RR	1		21	
14.03.05 17:45:51.878	0		Ustr>Ntw	0	64	1	RR	1		16	
14.03.05 17:45:59.887	0		Ntw>Ustr	0	64	1	RR	1		21	
14.03.05 17:45:59.887	0		Ustr>Ntw	0	64	1	RR	1		16	
14.03.05 17:46:07.896	0		Ntw>Ustr	0	64	1	RR	1		21	
14.03.05 17:46:07.896	0		Ustr>Ntw	0	64	1	RR	1		16	
14.03.05 17:46:15.905	0		Ntw>Ustr	0	64	1	RR	1		21	
14.03.05 17:46:15.905	0		Ustr>Ntw	0	64	1	RR	1		16	
14.03.05 17:46:23.915	0		Ntw>Ustr	0	64	1	RR	1		21	
14.03.05 17:46:23.915	0		Ustr>Ntw	0	64	1	RR	1		16	
14.03.05 17:46:31.922	0		Ntw>Ustr	0	64	1	RR	1		21	
14.03.05 17:46:31.923	0		Ustr>Ntw	0	64	1	RR	1		16	
14.03.05 17:46:39.931	0		Ntw>Ustr	0	64	1	RR	1		21	
14.03.05 17:46:39.932	0		Ustr>Ntw	0	64	1	RR	1		16	
14.03.05 17:46:47.940	0		Ntw>Ustr	0	64	1	RR	1		21	
14.03.05 17:46:47.940	0		Ustr>Ntw	0	64	1	RR	1		16	
14.03.05 17:46:55.949	0		Ntw>Ustr	0	64	1	RR	1		21	
14.03.05 17:46:55.949	0		Ustr>Ntw	0	64	1	RR	1		16	

FIG. 9

S₀ MONITOR LAYER 3

S0 Monitor

Display: ☐ User ☐ Layer 2 ☒ Layer 3

Go to Error Export Open Reset Save

Navigation: ☒ Online ☐ System Log File ☐ Stop

HEX: 02 81 18 1C 08 01 51 4D 08 02 81 90

Filter: [] []

Timestamp	Err	S0	CR	Direction	Message Type	Octet	BitMuster	Content	Expression
						2	00000001	IE Length	1 Octet(s)
						3		IE Content	0x81
						1	10100001	Information Element	Sending Complete
14.03.05 17:45:23.916		0	81	Utr>Ntw	ALERTING				
14.03.05 17:45:25.387	I	0		Ntw>Utr				(I) ERROR	
								Invalid Layer 3 PDU	Invalid Protocol Discriminator: ISDN 1TR...
								Invalid D-channel data	Content: 0x02 FF 03 41 01 12 05 18 01 8...
14.03.05 17:45:25.715	I	0		Ntw>Utr				(I) ERROR	
								Invalid Layer 3 PDU	Invalid Protocol Discriminator: ISDN 1TR...
								Invalid D-channel data	Content: 0x02 FF 03 41 01 13 05 18 01 8...
14.03.05 17:45:25.736		0	82	Ntw>Utr	SETUP	1	00000100	Information Element	Bearer Capability
						2	00000011	IE Length	3 Octet(s)
						3		Extension Bit	Not Continued
							00	Coding Standard	CCITT Standardized Coding
							_10000	Info Trans Cap	3.1 KHz Audio
						4	1_	Extension Bit	Not Continued
							00	Transfer Mode	Circuit Mode
							_10000	Transfer Rate	64 KBit/s
								Additional Attributes	Structure: 8 KHz Integrity, Configuration: P...
						5	1_	Extension Bit	Not Continued
							01	Layer Identification	User Info Layer 1 Protocol
							_00011	L1 Protocol Id.	Rec. G.711 A-law
						1	00011000	Information Element	Channel Identification
						2	00000001	IE Length	1 Octet(s)
						3	1_	Extension Bit	Not Continued
							0	Interface ID Present	Interface Implicitly Identified
							0	Interface Type	Basic Interface
							0	Spare	0
							1	Preferred/Exclusive	Exclusive: only the indicated channel is a...
							0	D-Channel Indicator	The Channel Identified is not the D-channel
							_10	Information channel selection	B2 Channel
						1	00011110	Information Element	Progress Indicator
						2	00000010	IE Length	2 Octet(s)
						3	1_	Extension Bit	Not Continued
							00	Coding Standard	CCITT Standardized Coding
							0	Spare	0
							_0001	Location	Private Network, serving the Local User

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:

- **SYSTEM 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

System Settings

A1.2

Operation Settingss

A1.3

Presets

A1.4

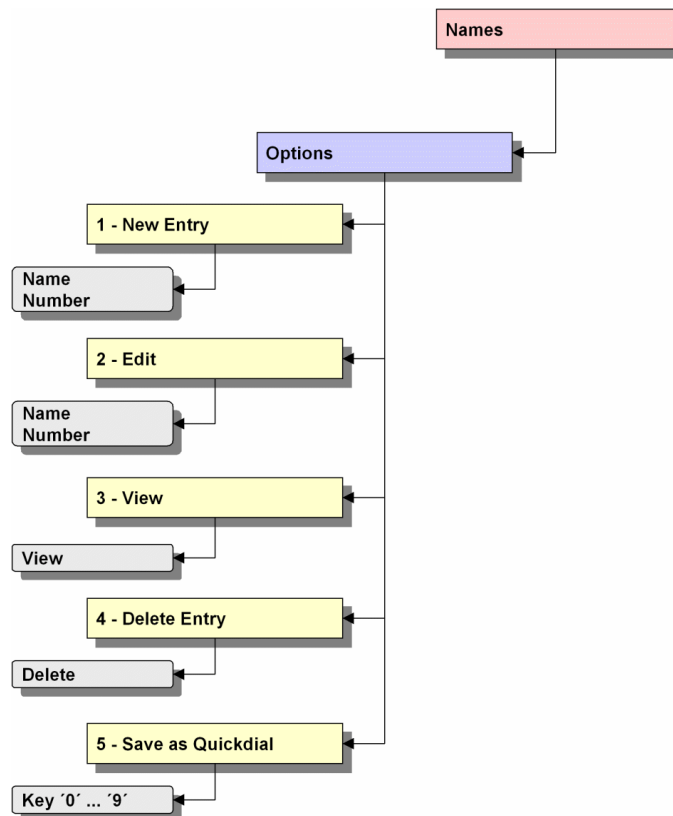
Status Information

A1.5

Login

A1.6

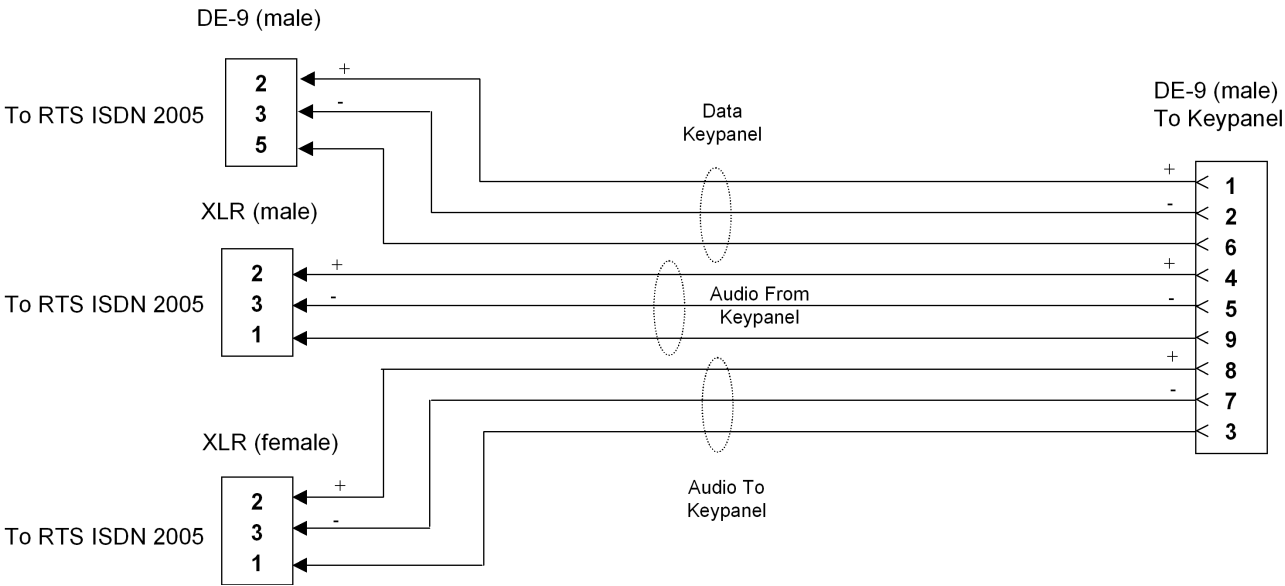
Names



A 2 RTS ISDN 2005 ADAPTER CABLE

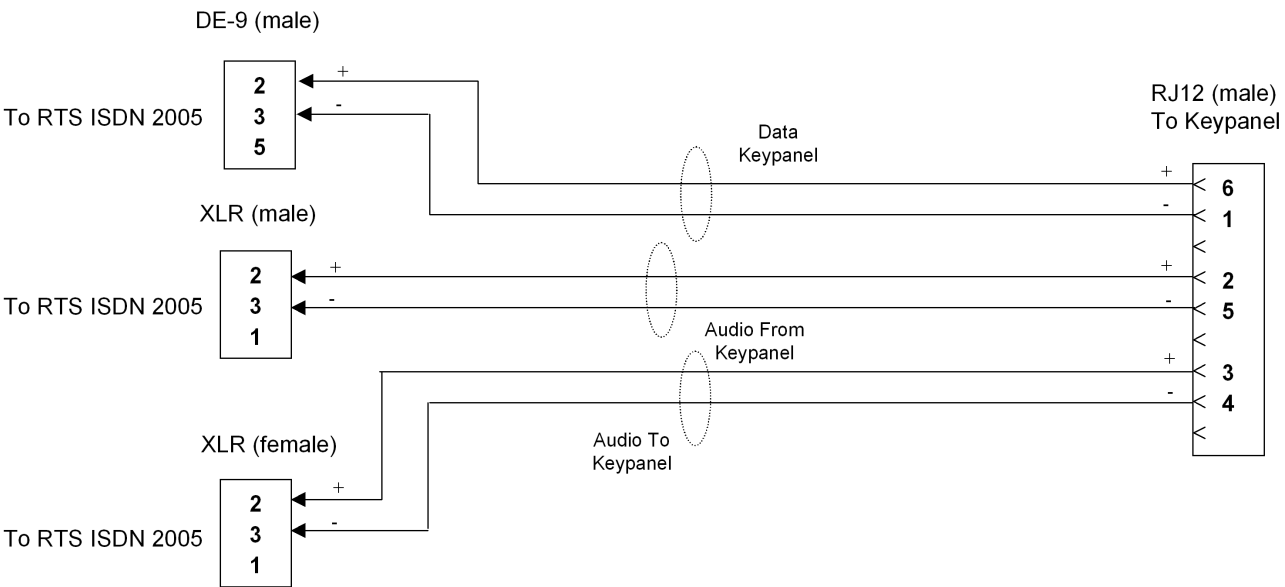
A2.1 Keypanel Cable DB9

FIG. 10 KEYPANEL CABLE DB9



A2.2 Keypanel Cable RJ12

FIG. 11 KEYPANEL CABLE RJ12

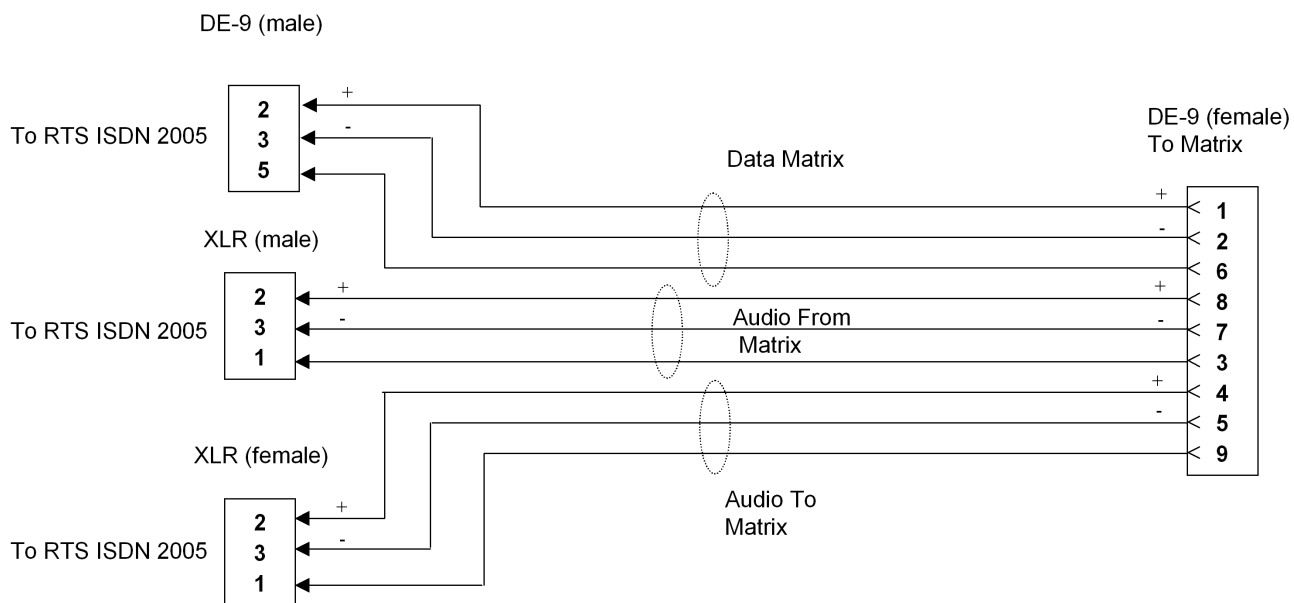


A2.3

Matrix Cable DB9

FIG. 12

MATRIX CABLE DB9

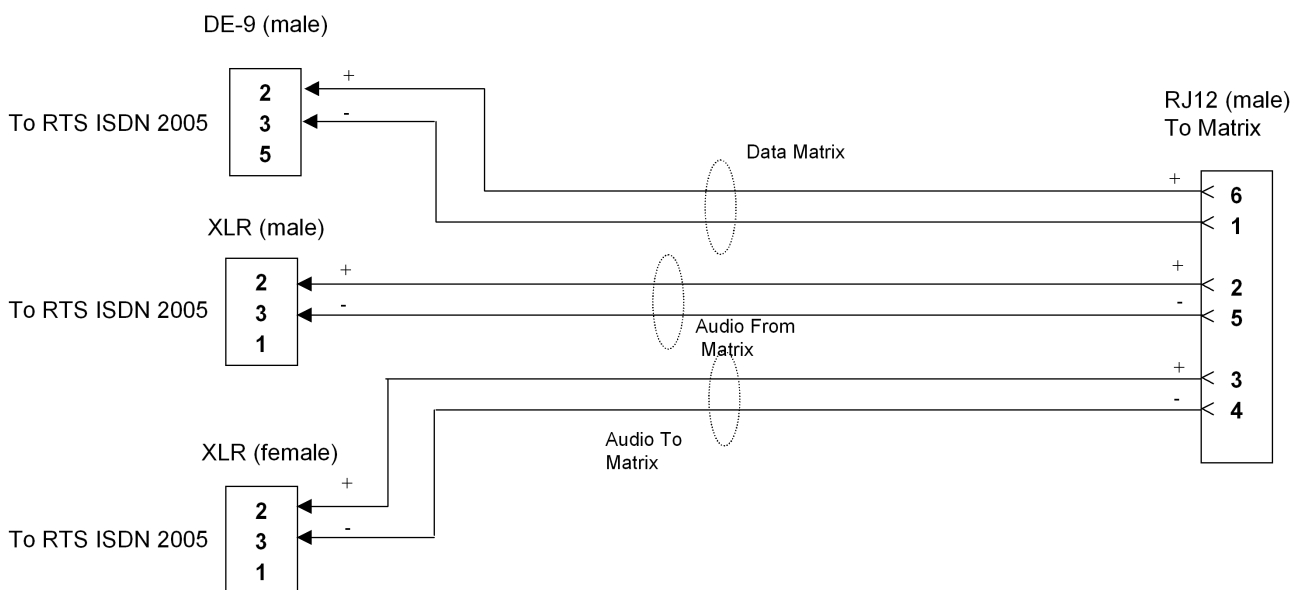


A2.4

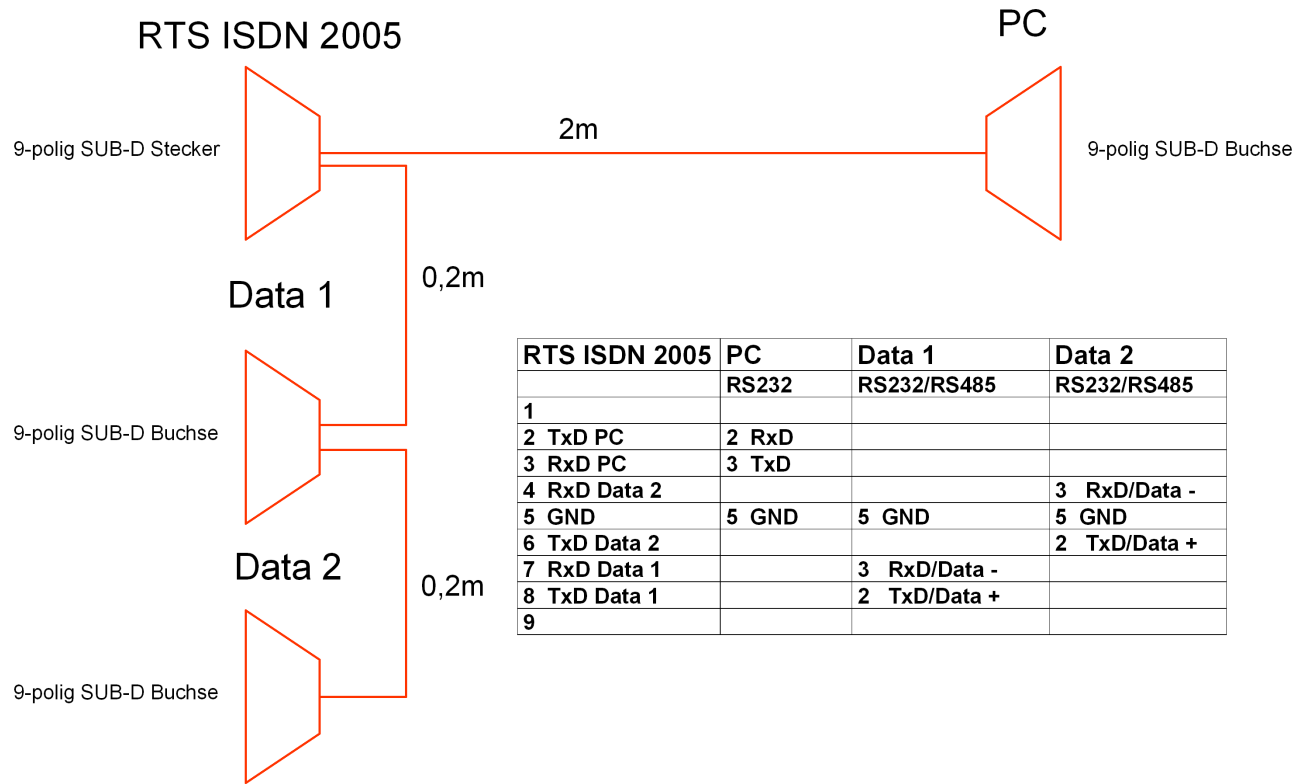
Matrix Cable RJ12

FIG. 13

MATRIX CABLE RJ12



A2.5 Data & Control Adapter Cable



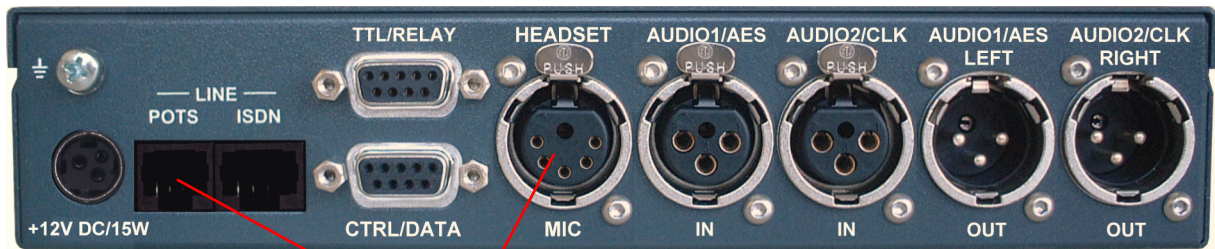
TAB. 2 T R O U B L E S H O O T I N G

Problem	Possible cause
The Echo Cancellor is not working.	If you switch callers via a Call-In Center to the hybrid the Echo Cancellor is possibly adjusted incorrectly. Enable the Echo Cancellor permanently (see ???). Please notice that echoes of more than 32 ms cannot be filtered out anymore.

A 4 I N T E R F A C E S

The interfaces of the system are pictured in Fig. 14.

FIG. 14 REAR VIEW OF THE RTS ISDN 2005 AUDIO CODEC



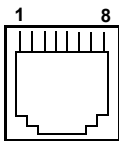
NOT IN OPERATION

All interfaces are described below.

A4.1 ISDN and analogue telephone interfaces

A4.1.1 S₀ interface

This interface supports two B channels in ISDN lines with EURO ISDN (DSS-1) protocol.



TAB. 3 PIN ASSIGNMENT: S₀ INTERFACE (LINE ISDN)

Socket: Western (8-pole) RJ45		
Pin	Signal	Electrical characteristics
1	not used	Recommendation: I.430 Data rate: B channel: 2x64 kbit/s D channel: 16 kbit/s
2	not used	
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	

A4.1.2 POTS¹ interface

Not in operation.

¹ POTS = Plain Old Telephone Service

A4.2 Control and data interfaces

A4.2.1 CTRL/DATA interface

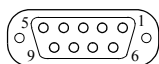
The CTRL/DATA interface is used for the configuration and operation of the *RTS ISDN 2005* System via a PC. To connect a PC you need a 1:1 connecting cable in which Pin 2 and Pin 3 are *not* crossed. Furthermore, Pin 5 GND must be connected.

Additionally, two further data interfaces for transparent data transmission are implemented by this interface. The two interfaces can be independently configured by software either as RS485 or as RS232 interface.

NOTICE

Please note that the function of the Pins RXD1 and TXD1 - 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.

For both data interfaces RXD serves as receive path and TXD serves as transmit path.



TAB. 4 PIN ASSIGNMENT: CTRL/DATA INTERFACE

Socket: SUB-D, 9-pole

Pin	Signal	Electrical characteristics
1	not used	PC interface RS232: Type (Pin 2, 3): DCE ¹ Level: V.24 Data rate: 38400 Baud Range: max. 15 m Protocol: 1 start bit 8 data bits 1 stop bit
2	RXD1 ² PC RS232 Receive Data	
3	TXD1 ³ PC RS232 Transmit Data	
4	RXD3 Data RS232 (input)/RS485 (b)	
5	GND Earth	
6	TXD3 Data RS232 (output)/RS485 (a)	Data interfaces: Level: V.24 (RS232) V.11 (RS485) Data rate: 38400 Baud Range: max 15m (RS232) max. 100 m (RS485) Protocol: 1 start bit 8 data bits 1/2 stop bit Parity adjustable
7	RXD2 Data RS232 (input)/RS485 (b)	
8	TXD2 Data RS232 (input)/RS485 (a)	
9	not used	

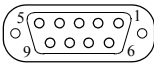
1 DCE = Data Communication Equipment: to connect a PC a 1:1 cable is required

2 ATTENTION: on this Pin the RTS ISDN 2005 **transmits** data

3 ATTENTION: on this Pin the RTS ISDN 2005 **receives** data

A4.2.2 **TTL/RELAY interface**

Via this interface external control signals can be used.



TAB. 5 PIN ASSIGNMENT: TTL/RELAY INTERFACE (TTL/RELAY)		
Socket: SUB-D, 9-pole		
Pin	Signal	Elektrical characteristics
1	+5V/300mA output	Capacity of the TTL outputs: Maximum voltage: 5V Maximum current: 10mA
2	TTL 1 IN/OUT	
3	TTL 2 IN/OUT	
4	TTL 3 IN/OUT	
5	GND	Capacity of the relays: Maximum voltage: 48V Maximum current: 200mA
6	Relay 1a	
7	Relay 1b	
8	Relay 2a	
9	Relay 2b	

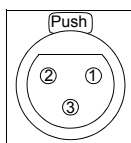
A4.3

Audio interfaces

The system incorporates analogue and digital AES/EBU Audio interfaces. For switching you can use display and keypad or the PC software.

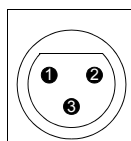
A4.3.1

Analogue Audio interface



TAB. 6 PIN ASSIGNMENT: ANALOGUE INPUT (AUDIO 1/2 IN)

Socket: 3-pole XLR		
Pin	Signal	Elektrical characteristics
1	GND	Input level: adjustable -3 +9 dBu
2	AUDIO IN a	Impedance: > 25 kΩ
3	AUDIO IN b	Head room: 6 dB



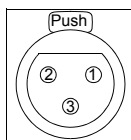
TAB. 7 PIN ASSIGNMENT: ANALOGUE OUTPUT (AUDIO 1/2 OUT)

Connector: 3-pole XLR		
Pin	Signal	Elektrical characteristics
1	GND	Output level: adjustable -3 +9 dBu
2	AUDIO OUT a	Impedance: < 50 Ω
3	AUDIO OUT b	Head room: 6 dB

A4.3.2

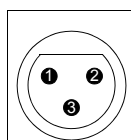
Digital AES/EBU Audio interface

The *RTS ISDN 2005* System incorporates two digital inputs/outputs which are physically one AES/EBU interface. 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.



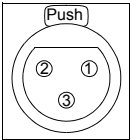
TAB. 8 PIN ASSIGNMENT: DIGITAL INPUT (AES IN)

Socket: 3-pole XLR		
Pin	Signal	Electrical characteristics
1	GND	IEC-958
2	AUDIO IN a	
3	AUDIO IN b	

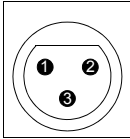


TAB. 9 PIN ASSIGNMENT: DIGITAL OUTPUT (AES OUT)

Connector: 3-pole XLR		
Pin	Signal	Elektrical characteristics
1	GND	IEC-958
2	AUDIO OUT a	
3	AUDIO OUT b	



TAB. 10 PIN ASSIGNMENT: CLOCK INPUT (CLK IN)		
Socket: 3-pole XLR		
Pin	Signal	Elektrical characteristics
1	GND	TTL
2	CLOCK IN	
3	not used	



TAB. 11 PIN ASSIGNMENT: CLOCK OUTPUT (CLK OUT)		
Connector: 3-pole XLR		
Pin	Signal	Elektrical characteristics
1	GND	TTL
2	CLOCK OUT	
3	not used	

A4.4

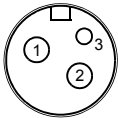
Headset/Micro Audio interface

Not in operation.

A4.5

Power supply interface

The power supply is connected via an external power supply.



TAB. 12 PIN ASSIGNMENT: POWER SUPPLY		
Socket: KYCO KPJ-S3		
Pin	Signal	Elektrical characteristics
1	GND	Voltage: +12V
2	+12V	Power: max. 15W
3	not used	

A 5

TECHNICAL DATA RTS ISDN 2005

A 6

TECHNICAL DATA RTS ISDN 2005
KEYPAD

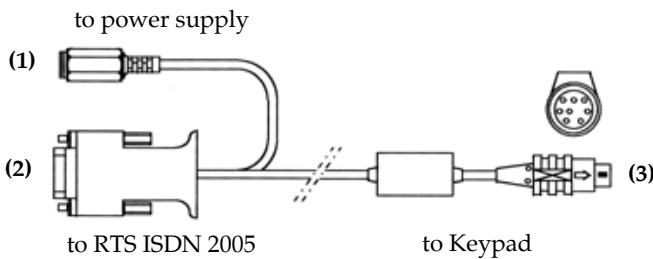
A6.1

Keypad

Matrix: 8 x 6

32 keys
(4 quad keys, 4 double keys, 24singlekeys)

FIG. 15 CONNECTING CABLE MAGIC SYSTEM - KEYPAD

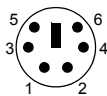


Protocol:

9600 Baud
no parity

Connection to external power supply (1):

6-pole Mini-DIN connector

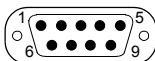


Assignment:

Pin 3: GND (ground)
Pin 4: +5V

Connection to RTS ISDN 2005 (2):

9-pole SUB-D connector



Assignment:

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

Connection to Keypad (3):

8-pol. MINI DIN connector

Assignment:

- Pin 2: clock
- Pin 3: +5V
- Pin 4: data
- Pin 5: GND (ground)

A6.2 LCD Display

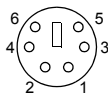
- 2 x 20 characters
- illuminated

A6.3 Power supply:

5V, max. 500 mA

Connection:

6-pole Mini-DIN socket



Assignment:

- Pin 3: GND (ground)
- Pin 4: +5V

A 7 G E N E R A L

A7.1

Ordering numbers

RTS ISDN 2005 System	800241
Windows PC Software Update	XXXXX ¹

Accessories

RTS ISDN 2005 Keypad	800240
RTS ISDN 2005 DUAL 19" Mounting Kit	800242

Software Options

RTS ISDN 2005 Remote & ISDN Monitor Plug-In ²	430231
--	--------

A7.2

Scope of delivery

- RTS ISDN 2005
 - CD Windows PC Software
 - External power supply

Input:	100 - 240V/24W, 50 - 60 Hz
Output:	12V
 - Self adhesive feet
 - 19" Mounting Brackets
 - Manual
 - 1 x S₀ cable

¹ also available in the internet under this identity number

² An ISDN PC card and at least one USB interface are required for the Software Dongle

A 8

SERVICE INFORMATION

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