RTS Digital Matrix Intercom

Innovating the Future of Communications

SIP-ISDN

Dual ISDN Audio Codec

Dual IP Audio Codec

Hardware/Software Manual

Proprietary Notice

Copyright Notice

Warranty Notice

See the enclosed warranty card for further details.

Customer Support

Technical questions should be directed to:

Customer Service Department
Bosch Security Systems, Inc.
12000 Portland Avenue South
Burnsville, MN 55337 USA
Telephone: 877-863-4169
Fax: 800-323-0498
Info@rtsintercoms.com

Technical Questions EMEA:
Bosch Security Systems Technical Support EMEA
http://www.rtsintercoms.com/contact_main.php

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Telephone: 402-467-5321
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Factory Service Department
Bosch Security Systems, Inc.
8601 East Cornhusker Hwy.
Lincoln, NE 68507 U.S.A.
Attn: Service

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C O N T E N T

The system ***RTS SIP-ISDN*** is implemented as Dual ISDN and IP 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 SIP-ISDN Keypad*** is available for separate operation without PC.

Introduction

The unit described has been designed to the latest technical paramenters and complies with all current national and international safety reqirements. 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.

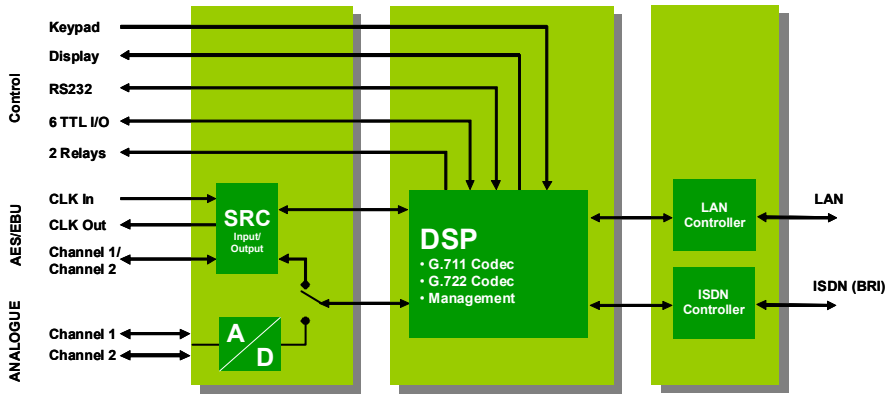
The functions of the ***RTS SIP-ISDN*** are implemented in a single unit. The system is designed for mounting in a half 19" rack (1 U).

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

FIG. 1 FRONT VIEW: RTS SIP-ISDN DUAL ISDN AUDIO CODEC

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

FIG. 2 FUNCTIONAL ELEMENTS RTS SIP-ISDN



2.1 Functionality

The ***RTS SIP-ISDN*** System incorporates an ***ISDN*** telephone interface and a ***LAN*** interface. The complete signal processing is taken over by a 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 SIP-ISDN Windows PC Software*** which is included in delivery and which communicates with the system via the RS232 or LAN interface.

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

Optionally, the system can also be operated separately via the ***RTS SIP-ISDN Keypad*** that can be connected to the RS232 interface.

3.1 Mounting

With its dimensions (W × H × D) of 220 mm × 44,5 mm (1 U) × 220 mm the ***RTS SIP-ISDN*** 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 SIP-ISDN*** 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 SIP-ISDN*** 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 71))

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.

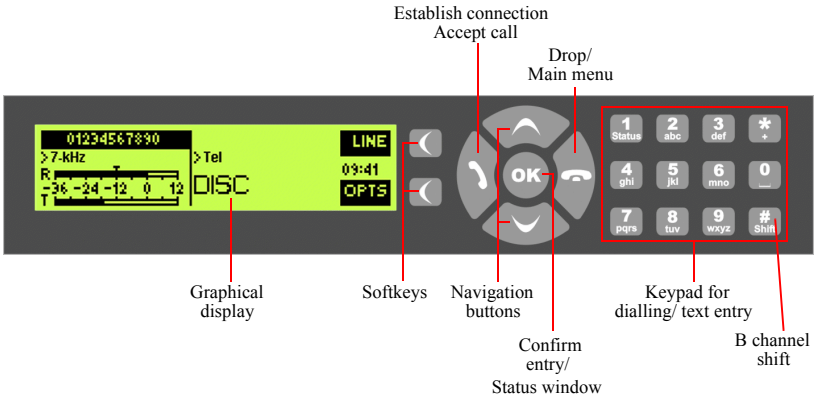
3.4 Operational elements on the front side

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 similiar to standard mobile telephones.

FIG. 3 OPERATIONAL ELEMENTS ON THE FRONT SIDE



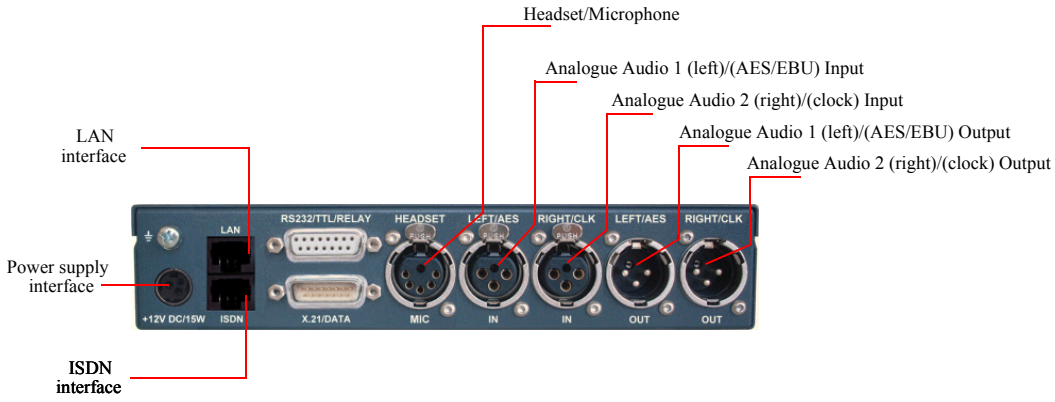
3.5 Operating modes of the system

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

3.5.1 ISDN operation

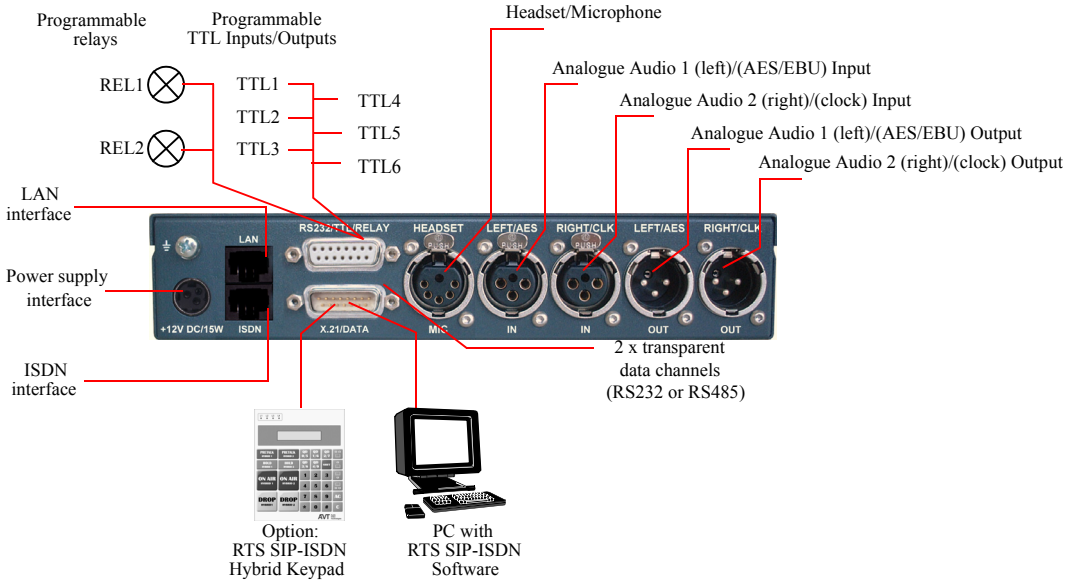
In the ISDN operating mode two independent B channels are available which can be used separately for two transmissions.

FIG. 4 MINIMUM WIRING FOR ISDN OPERATION



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

FIG. 5 MAXIMUM WIRING FOR ISDN OPERATION



3.5.2 IP operation

In the IP operation mode the independent 64 kbit/s channels can be realised for two transmissions.

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

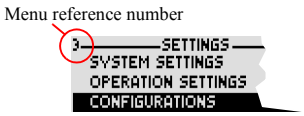
Of course, all configurations can also be comfortably made via the ***RTS SIP-ISDN Software*** included in delivery.

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 SIP-ISDN*** are decribed in detail.



NOTICE

All menus can be reached directly via a ***Quick Menu*** 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 SIP-ISDN 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 v and press again **Select**. Now the options **Analogue** and **Digital** are displayed.

– Select the desired interface with the help of the cursor keys ^ and v 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 ☎ 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**

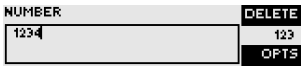
4.2 Working with the RTS SIP-ISDN

In the next chapters basic functions like establishing a connection, dropping a connection, accepting calls etc. are decribed 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 4.3.2, Page 23) or stored as Quick Dial Number see CHAPTER 4.3.2, Page 23).

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

If the ***RTS SIP-ISDN*** receives a call, it is automatically signalised in the status window by **Callin**.

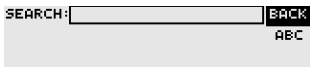
NOTICE Additionally, a system ringing tone can be enabled.

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



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***.

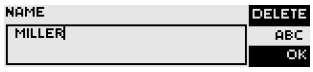
4.3.2 Using the phone book

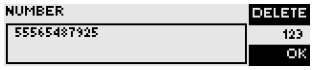
The system incorporates a comfortable phone book function. You reach the phone book from the main menu via the softkey **Names**.

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 Dial numbers on the numerical keys '**0**' ... '**9**'. Please select the key from the list on which you want to programme the phone number.
To activate a Quick Dial 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 SIP-ISDN*** 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, 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 Processor (> 500 MHz) recommended
- Windows 2000/XP
- ca. 600 kilobyte 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 SIP-ISDN*** 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 SIP-ISDN*** on the CD.

Please follow the instructions of the installation routine.

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

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)***

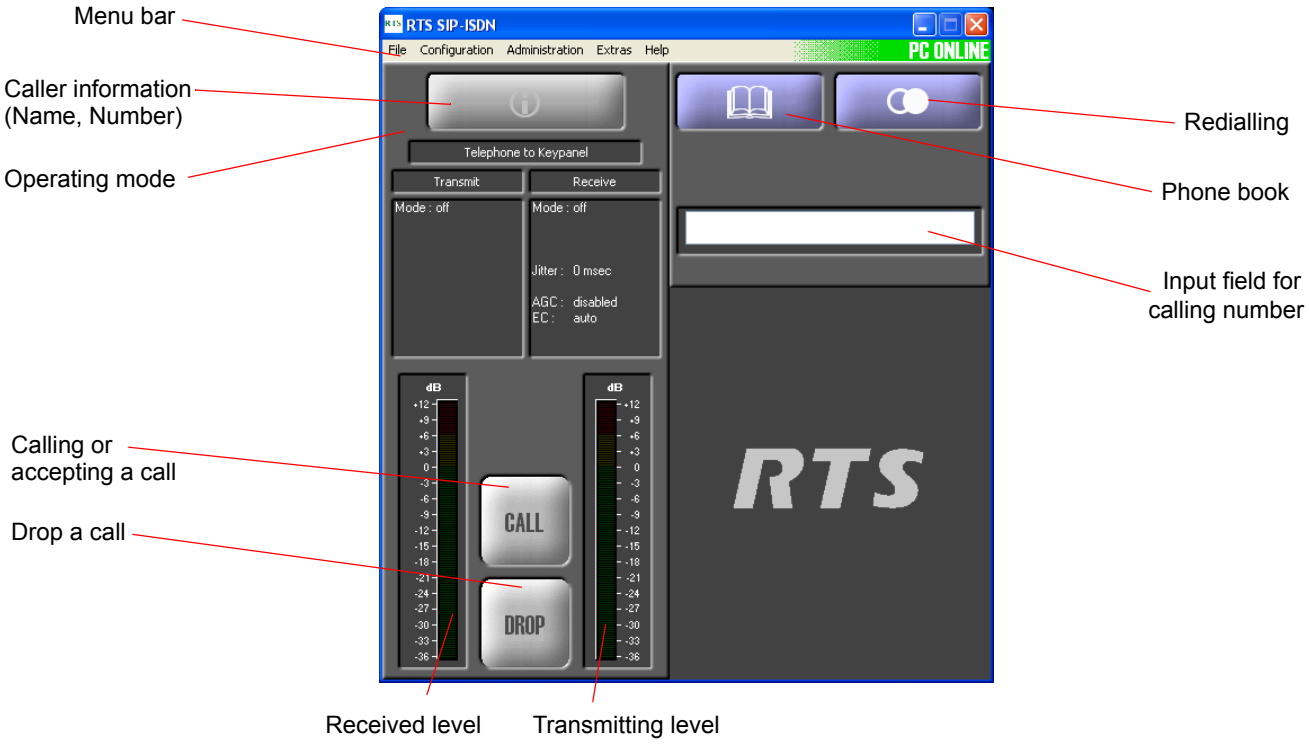
In the following chapters all functions of the PC software are described in detail.

5.3 The RTS SIP-ISDN main window

After starting the RTS SIP-ISDN software, the main window is displayed automatically.

The connection status between the PC and the system is displayed in the upper right corner of the window.

FIG. 6 RTS SIP-ISDN MAIN WINDOW



5.3.1 Operating elements

5.3.1.1 Info button

On the ***INFO*** button the information about the caller is shown. If transmitted the phone number of the caller is displayed. If additionally a phone book entry is available, the caller's name is displayed.

During Call In or Call Out the ***INFO*** button will be displayed in yellow, during a connection the ***INFO*** button is red.

By pressing the ***INFO*** key the ***phone book*** (see CHAPTER 5.3.1.3) is opened and the entry can be edited immediately.

5.3.1.2 Level indicators

The outgoing transmitting level as well as the received level of the callers are displayed via separate level meters.

5.3.1.3 Telephone book

With the use of the phone book button telephone numbers can be saved comfortably in the phone book.

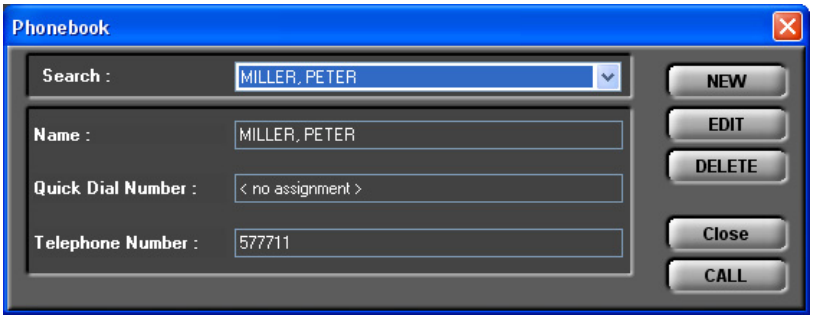
NOTICE

The phone book is stored in the ***RTS SIP-ISDN*** system and **not** in the PC. Via the menu ***File*** → ***Phone Book*** → ***Import/Export*** a phone book can be imported from a data file or exported as data file (see CHAPTER 5.4.1).

To open the phone book, please press the phone book button.

Via the ***Search*** field you can search directly for a name in the phone book using the drop down list. When an entry is selected, ***Name***, ***Telephone Number*** and if assigned ***Quick Dial Number*** of the entry are displayed.

FIG. 7 TELEPHONE BOOK



- To create a new entry, please press the button ***NEW.*** Now, a window is displayed where you can enter the ***Name*** and the ***Telephone Number*** of the new entry and if desired assign a ***Quick Dial Number***. To save the new entry, please click on the ***OK*** button.

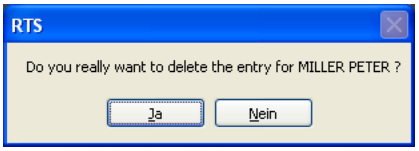
ATTENTION

The name entered in the phone book has to be unique. Identical names are not permitted. The best way to provide a clear identification is to enter the last name and the first name.
If the name already exists, an error message is displayed asking you if you want to overwrite the already existing name. If you want to overwrite the old entry and save your new entry, select ***OK***. If you do not want to overwrite the old entry, select ***Cancel***.

- Via the ***EDIT*** button, an already existing entry can be edited. Please select the entry you want to edit from the drop down list (***SEARCH***) and press the ***EDIT*** button. Now, a window is displayed where you can change the details of the entry. To save your changes, press the ***OK*** button.

- With the use of the ***DELETE*** button you can delete an entry from the telephone book. Please select the entry you want to delete from the drop down list (***SEARCH***) and press ***DELETE***. For safety reasons you have to confirm that you really want to delete the entry.

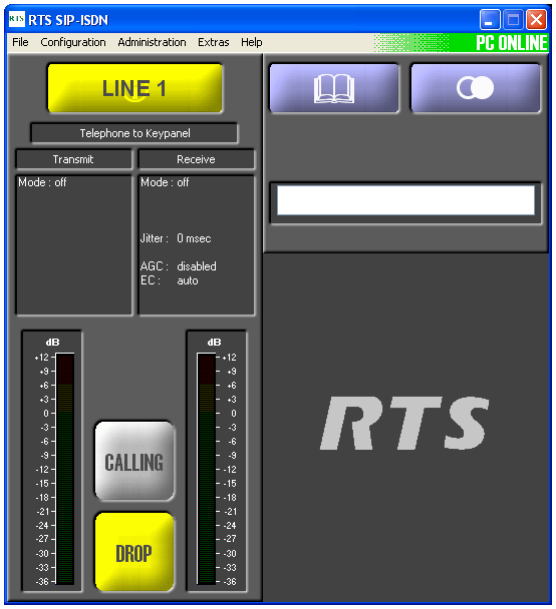
FIG. 8 SAFETY CONFIRMATION TO DELETE A PHONE BOOK ENTRY



- Via the ***CLOSE*** button you can exit the telephone book.

- If you want to call an entry directly from the telephone book, you can use the ***CALL*** button. Please select the entry you want to call from the drop down list (***SEARCH***) and press the ***CALL*** button. The telephone book window is closed and the system calls the selected entry. In the main window of the PC software the CALL button changes to CALLING and the DROP button is blinking in yellow.

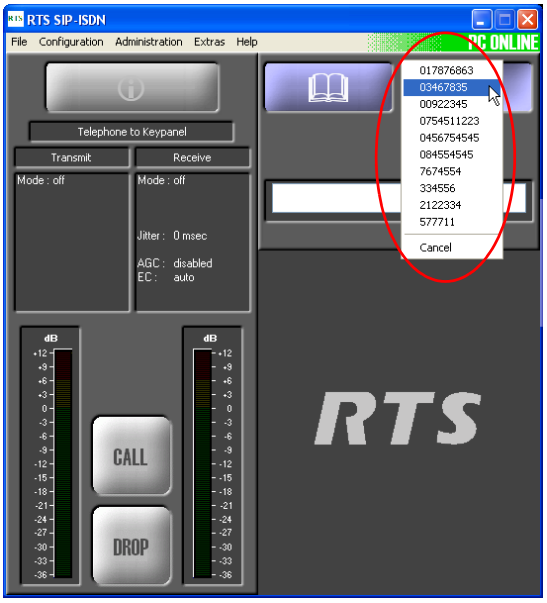
FIG. 9 CALLING A PHONE BOOK ENTRY



5.3.1.4 Redialling

If you click on the Redialling button, the ten most recently dialled numbers are displayed and can be selected for redialling. To call one of the displayed numbers, you only need to click on it with the left mouse key.

FIG. 10 TEN MOST RECENTLY DIALLED NUMBERS



5.4 Menu File

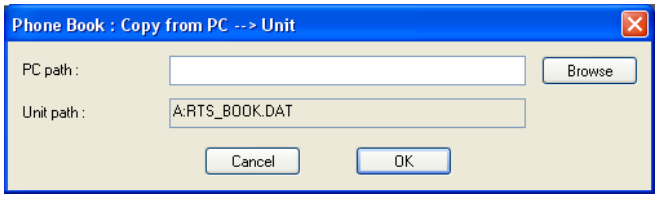
Under File you will find the function for importing and exporting phone book files and the exit.

5.4.1 Submenu Phone Book

To import a phone book from PC please select ***File → Phone Book → Import.***

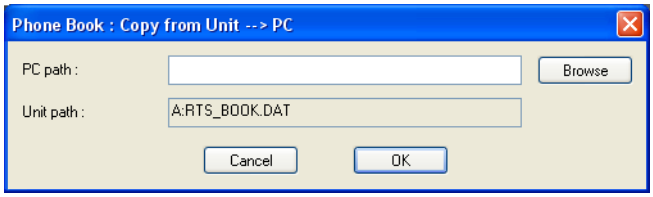
With ***Browse*** you can select the phone book which is to be imported. The file extension of a phone book is '***.csv***'. Such a file can be edited with e.g. MS® EXCEL.

FIG. 11 IMPORTING A PHONE BOOK



To export a phone book, please select ***File → Phone Book → Export***. The file is saved with '***.csv***' extension. The desired directory in which the file is saved can be selected via ***Browse***.

FIG. 12 EXPORTING A PHONE BOOK



5.4.2 Submenu Exit

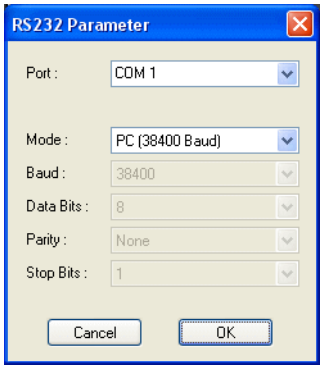
Via the submenu ***Exit*** you can exit the RTS SIP-ISDN software.

5.5 Menu Configuration

5.5.1 Submenu COM Port

The system is connected to a PC via the serial RS232 interface and a 1:1 connecting cable or via tha LAN interface. The settings of the PC COM Port can be adjusted under ***Configuration → COM Port***.

FIG. 13 RS232 PARAMETER OF THE COM PORT



Please select under ***Port*** the interface of your PC with which the ***RTS SIP-ISDN*** is connected.

Under ***Mode*** the desired operating mode can be chosen:

– ***PC & Keypad (9600 Baud)***: To connect a keypad or a PC

– ***PC (19200 Baud)***: To connect a PC

– ***PC (38400 Baud)***: To connect a PC

– ***PC (57600 Baud)***: To connect a PC

– ***PC (115200 Baud)***: To connect a PC

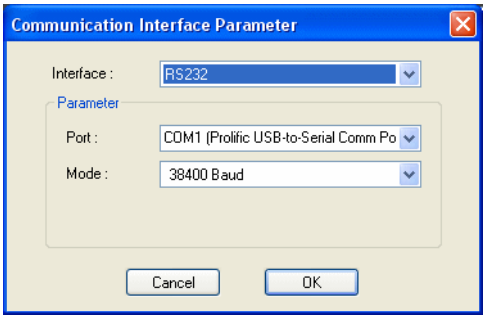
All further parameters like ***Data Bits***, ***Parity*** and ***Stop Bits*** cannot be configured.

5.5.1.1 Control via RS232

If you want to use the RS232 interface, connect the serial RS232 interface (via enclosed adapting cable DATA1/PC) with a 1:1 connecting cable with your PC.

Please select now under ***Interface → RS232***. Under ***Parameter → Port*** the ***COM-Port*** of your PC, which is connected with the system and under ***Mode*** the desired baud rate (standard: ***38400 Baud***).

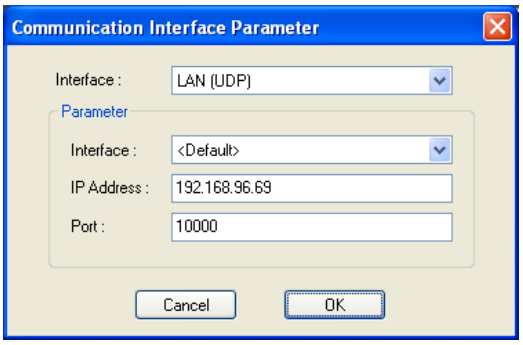
FIG. 14 RS232 INTERFACE PARAMETER



5.5.1.2 Control via LAN

For controlling the system via the LAN interface please select ***Interface*** → ***LAN/ UDP***.

FIG. 15 LAN INTERFACE PARAMETER



Under ***Parameter*** → ***Interface*** edit ***<Default>***. If there should be more than one network interface card in your PC, select the desired one.

5.5.2 Submenu RTS SIP-ISDN

Via the submenu ***RTS SIP-ISDN*** the system can be configured completely.

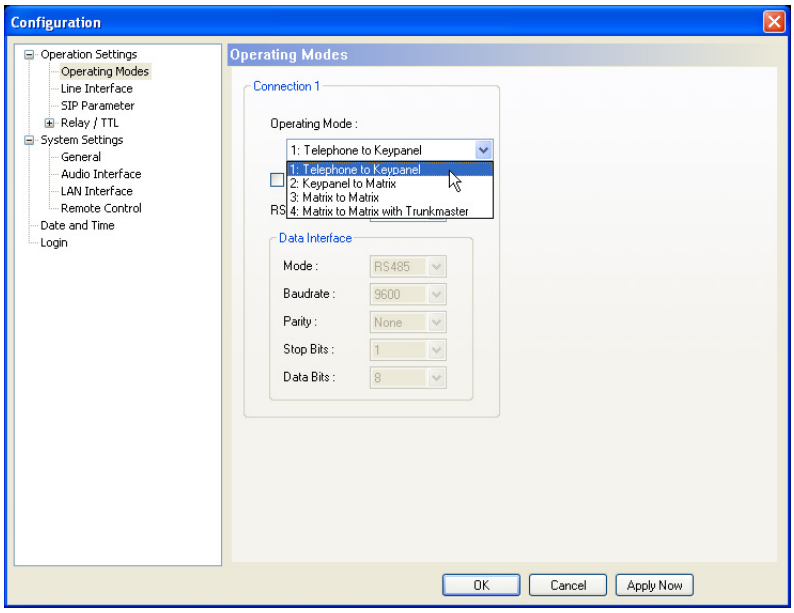
After changing a setting the following options are available:

- With ***OK*** the configuration window is closed and all settings made are saved.
- The function ***Apply Now*** allows to save the current settings without closing the configuration window.
- ***Cancel*** cancels all settings made.

5.5.2.1 Configuration

5.5.2.1.1 Operating Modes

FIG. 16 SELECTION OF OPERATING MODE



Connection 1/ Connection 2

Under ***Operating Modes*** the operating modes for both channels (***Connection 1*** and ***Connection 2***) can be selected. The available options are:

– ***1: Telephone to Keypanel***

– ***2: Keypanel to Matrix***

– ***3: Matrix to Matrix***

– ***4: Matrix to Matrix with Trunkmaster***

– ***5: ELA Mode***

- The option ***Automatic Mode*** can only be activated for Mode ***1: Telephone to Keypanel*** or Mode ***3: Matrix to Matrix***. If the box is checked, the system will detect if Mode 1 or Mode 3 is needed when a connection is established and select the required operating mode automatically.

- If Mode ***1: Telephone to Keypanel*** or Mode ***3: Matrix to Matrix*** is selected, you need to select which ***RS 485*** address is to be used.

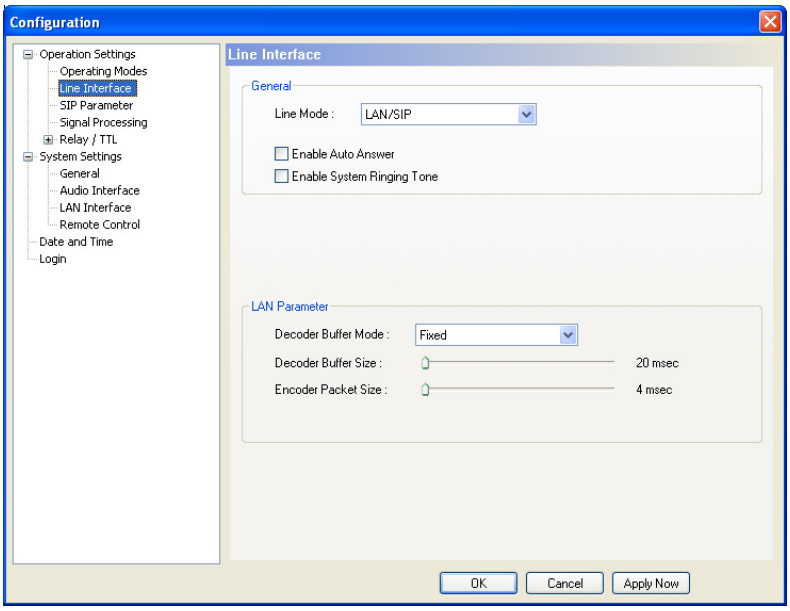
Data Interface

The settings for the ***Data Interface*** (Mode and Baudrate) can be adjusted if Mode ***4: Matrix to Matrix with Trunkmaster*** is selected. If Mode 1, 2, 3 or 5 is selected, the settings under ***Data Interface*** cannot be changed.

5.5.2.1.2 Line Interface

The option Line Interface allows the configuration of the Line interface.

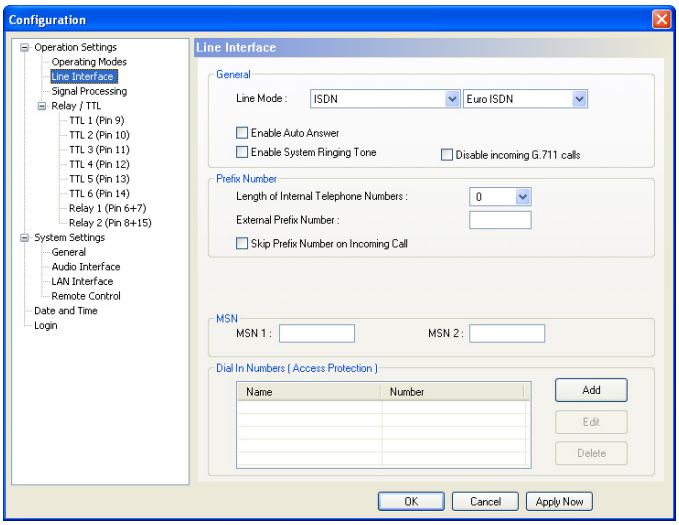
FIG. 17 LINE INTERFACE LAN/SIP



General

- With ***Line Mode*** you can select the line mode. Two options are possible:
  - ***ISDN***: The system is connected to an ISDN network and two independent channels are available.
  - ***LAN/SIP***: The system is connected to a LAN network with SIP server.
- The option ***Enable Auto Answer*** allows the system to automatically accept incoming calls.
- If the ***Enable Auto Answer*** is selected, the acceptance can be delayed for ***0*** to ***31*** seconds with the use of the controller ***Delay***. The default setting is ***0 s***.
- If the option ***Enable System Ringing Tone*** is activated, the system signals incoming calls with a ringing tone.

FIG. 18 LINE INTERFACE ISDN



Prefix Number

NOTE

The following settings are only necessary if the system is used with a PABX.

- Under ***Length of Internal Telephone Numbers*** you indicate the length of your internal telephone numbers. In this way, the prefix number is dialled automatically, if the length of the calling number is bigger than the length indicated here. If you do not want to use this functionality, or if you use the system with a main connection, please enter a ***0*** into the respective field.

  Examples: Length of internal telephone numbers: 3
  Calling number entered: 130
  It is dialled: 130

  Length of internal calling numbers: 3
  Calling number entered: 5271130
  It is dialled: **0** 5271130

- Under ***External Prefix Number*** you enter the external prefix number which you must dial to get an outside line. In most cases it is ***0.***

ATTENTION

You must enter the external prefix number at any case if you operate the system with a PABX since only in this case the system waits for a dial tone. Without an external prefix number, the calling number is transmitted too fast and the connection cannot be established.

- Some PABXs transmit the calling number with prefix number to the system. If you want to transfer the displayed calling number without the prefix number directly into the telephone book, you can enable the function ***Skip prefix number on incoming call***.

MSN (Multiple Subscriber Number)

Usually the entry of a MSN is not necessary. However, if several systems (e.g. RTS ISDN 2005, fax, telephone, etc.) are operated with one ISDN interface, you can allocate a certain calling number to a certain system by entering a MSN.

Example: A telephone, an ISDN PC card and a ***RTS SIP-ISDN*** unit are operated with one ISDN interface. From your provider you got the following MSN: 5271011, 5271012, 5271013.
Without a MSN entry, all three units respond to the incoming call - no matter which of the three calling numbers was dialled. However, if a different MSN is allocated to each unit, the system only responds if exactly this MSN was dialled by the caller. If you enter e.g. the MSN '5271013' for the ***RTS SIP-ISDN***, the system will only signal the call, if the caller dialled '5271013'. However, precondition for this example is that you enter the same MSN for ***MSN 1*** and ***MSN 2***.

Enter the desired MSN under ***MSN 1*** respectively ***MSN 2***. Of course, the same MSN can be allocated for both B channels. Please notice that a MSN is always entered **without** area code.

NOTE

Some PABX require the entry of a ***MSN*** since otherwise no operation is possible.
If you cannot establish a connection between the ***RTS SIP-ISDN*** system and a partner system, but you are sure that the ISDN line is working, you should try if it works after entering a MSN.

Dial In Numbers (Access Protection)

Via the ***Dial In Numbers*** function an access protection for the system can be activated. All calling numbers which are entered in the list can establish a connection with the system. Please enter ***Name*** and ***Number*** for each list entry.

NOTE

Please consider that only chyphers which are actually entered are analysed, i.e. if you only enter „130", all participants with a calling number which ends with „123" are allowed to call the system.

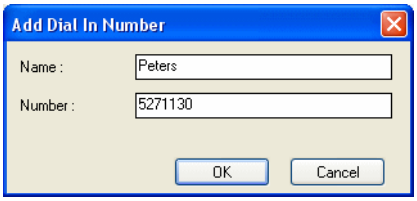
The total character length of all entered telephone numbers must not be higher than 127. With an average length of a telephone number of 12 characters about 10 calling numbers can be saved.

For this functionality the calling number of the participants in the list needs to be transmitted (CLIP[1] function).

1. Calling Line Identification Presentation

- With ***Add*** you can create a new entry

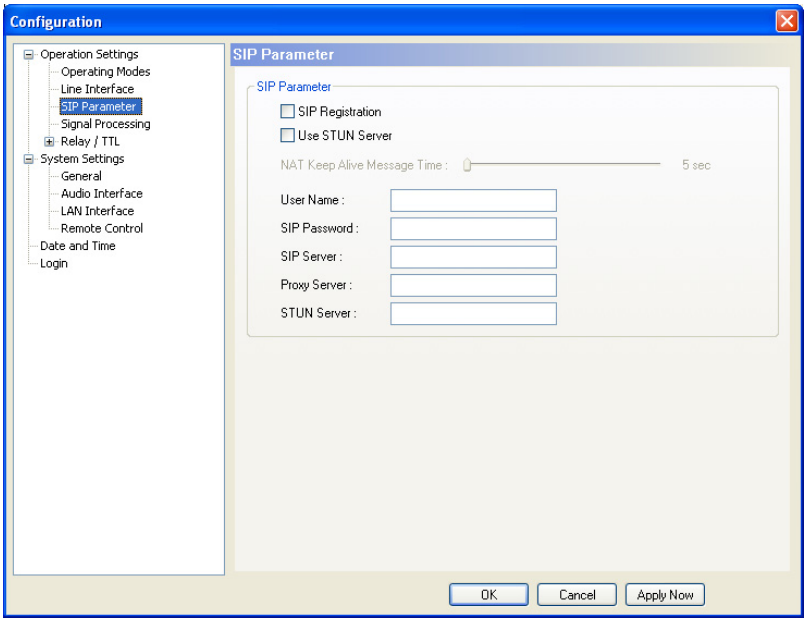
FIG. 19 CREATING A NEW ENTRY



- The button ***Edit*** allows to edit already existing entries
- With ***Delete*** an entry can be deleted. For safety reasons you must confirm that you really want to delete the entry

5.5.2.1.3 Configuration of the SIP Parameters for LAN/SIP Line interface

FIG. 20 SIP PARAMETER



For using Audio over IP it is necessary to set the parameters for SIP. Please enable SIP Registration.

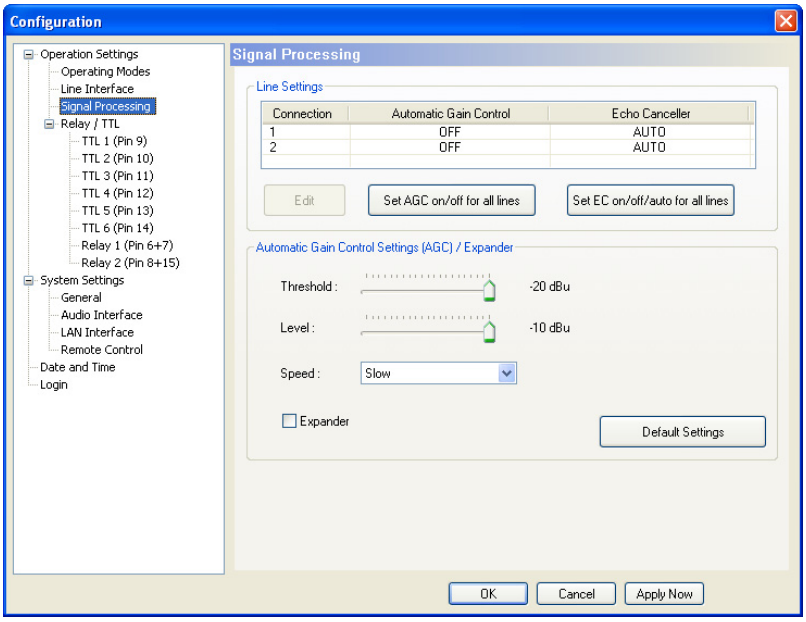
To get a connection with the SIP server please enter your User Name, SIP Password, and the IP address of the SIP Server.

If a firewall is installed „Use STUN server“ needs to be enabled and the IP address of the STUN server needs to be entered.

5.5.2.1.4 Signal Processing

Under Signal Processing the caller signal can be optimised by adjusting the Automatic Gain Control, the Echo Canceller and the Expander.

FIG. 21 SIGNAL PROCESSING

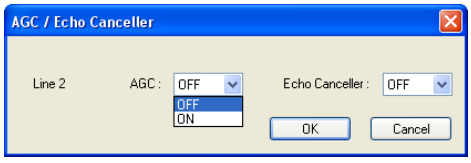


Line Settings

- A separate Automatic Gain Control can be switched on or off for each caller line.

  To configure the ***Automatic Gain Control*** (AGC) for ***Connection 1*** or ***Connection 2***, please select the desired line and click on the ***Edit*** button. A window is opened in which you can adjust the settings.

FIG. 22 CONFIGURATION AGC AND ECHO CANCELLER



Via the button ***Set AGC on/off for all lines*** you can set the Automatic Gain Control on/off for all lines with a single mouse click.

- For each caller line, a separate Echo Canceller is available which can be set ***ON***, ***OFF*** or is activated automatically (***AUTO***) if required.

NOTICE

In general, the use of the Echo Canceller is recommended. When a subscriber calls with an **analogue** telephone, a line echo is produced which can interfere with the incoming signal. Digital telephones (e.g. ISDN or mobile phones) do not produce these line echoes. In this case an Echo Canceller would worsen the incoming signal. For this reason the system sends a short test tone when a connection is established (only in the ***AUTO*** mode) and detects the level of the echo. If a certain threshold value is not exceeded, the Echo Canceller is set off because the use of a digital phone on the counterpart is anticipated. If the level is too high, the Echo Canceller is set on automatically.

But: Echo Cancellers can only suppress echoes if the delay of the signal lies within a certain scope. Telephone connections via satellite have such a long delay that the Echo Canceller cannot work properly anymore.

To configure the Echo Canceller, please select the desired line with your mouse and press the button ***Edit***, which opens the configuration window.

To generally set the ***Echo Canceller*** off select ***Off***.

If you always want to have the ***Echo Canceller*** activated, select ***Always ON***. In this case, no test tone to detect the echo is sent.

If the option ***Auto*** is selected, the Echo Canceller is switched on or switched off dynamically. The system sends a short test tone to determine if Echo Cancelling is required or not.

Via the button ***Set EC on/off/auto for all lines*** you can select the same operating mode of the ***Echo Canceller*** for all lines.

Automatic Gain Control (AGC) Settings/Expander

The functioning of the ***AGC*** can be optimised via several parameters.

- ***Threshold***: The ***AGC*** does not start before the signal exceeds the threshold value selected under Threshold. The default setting is -30 dBu.

- ***Level***: The level selected corresponds with the desired average level. Please consider sufficient head room. The default setting is -12 dBu.

- ***Speed***: Depending on the desired speed of the level adjustment (***Slow, Medium*** or ***Fast***) the setting of the AGC speed can be configured here. The faster the AGC must work the more noticeable are the inconsistencies. If the selected speed is too slow, the caller signal is too low or too loud on average. The default setting is ***Medium***.

- An ***Expander*** turns down the caller signal automatically, if its level falls below a certain threshold value. The aim is to completely filter out background noises of callers who are not currently speaking.The ***Expander*** is activated by checking the respective box.

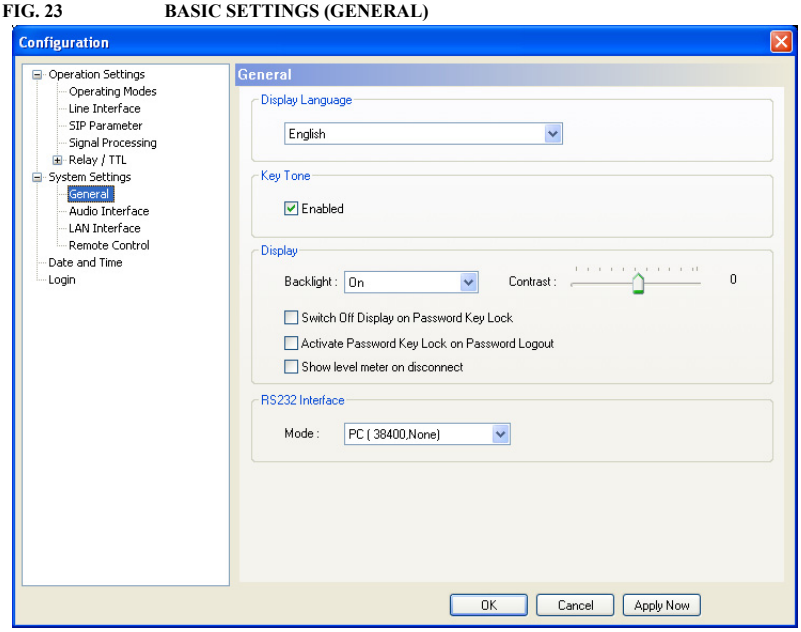
- With the use of the ***Default Settings*** button, the default settings indicated above are selected and the ***Expander*** is enabled.

5.5.2.2 Basic Settings

NOTE All settings made under ***Basic Settings*** cannot be saved as ***Configuration***.

5.5.2.2.1 General

FIG. 23 BASIC SETTINGS (GENERAL)



Display Language

- Currently the languages ***English*** and ***German*** are supported as display languages.

Key Tone

- To active the key tone for the system, please select the check box ***Enabled***.

Display

The ***Display*** has a backlight. Under ***Backlight*** you can set it on permanently if you select ***On***. If ***Auto off*** is selected, the backlight is automatically turned off **60** seconds after the last keystroke. The backlight can be activated again by pressing any key (e.g. **OK**)

NOTE Please notice that if the key lock is enabled, the backlight is not activated before you press the key sequence **MENU*****.

- With the slide controller ***Contrast*** you can set the desired contrast for the display within the range of ***-16 ... 15***. The default setting is 0.

NOTE To use the following functions a user or administrator password must be entered under ***Login*** (siehe ABSCHNITT 5.5.2.4).

- If the option ***Switch Off Display on Password Key Lock*** is selected, the display is automatically switched off after **60** seconds after logging out. Any keystroke activates the display. Dialling is possible.

- If the function ***Activate Password Key Lock on Password Logout*** is enabled, the key lock is automatically activated **60** seconds after logging out. Next to the clock a key symbol is displayed. In addition to the configuration lock by entering a password under ***Login***, dialling via the numerical keypad is no longer possible.

RS232 Interface

If you want to operate the system with a PC, you need to configure the data rate of the interface. The following five baud rates are available: ***PC & Keypad (9600, None)***, ***PC (19200, None)***, ***PC (38400, None)***, ***PC (57600, None)***, ***PC (115200, None)***. The default setting is ***PC (38400, None).***

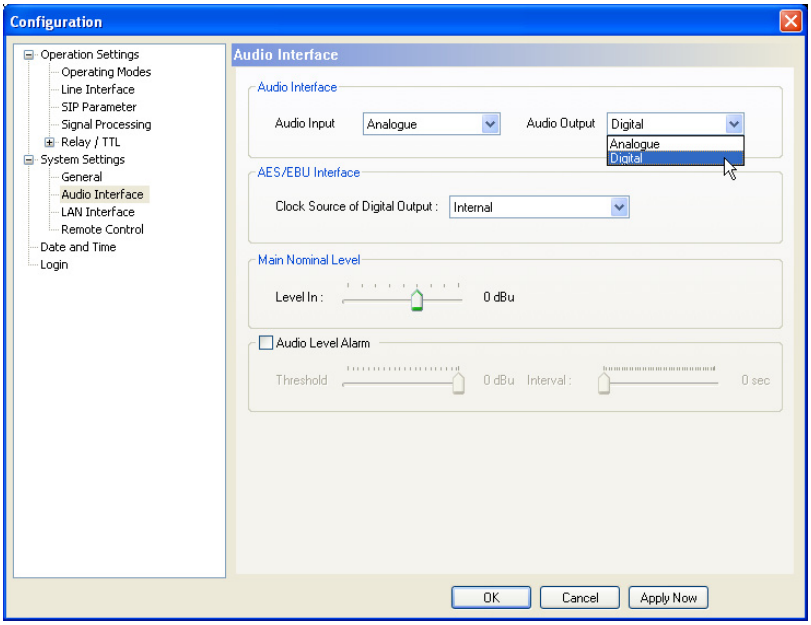
NOTE

The ***RTS SIP-ISDN Keypad*** supports only a baudrate of 9600 Baud. Therefore, if you use the keypads, always select ***PC & Keypad (9600, None)***. This baudrate can also be selected if a PC is used.
If a PC is connected via the RS232 interface, the selected baudrate must be identical with the baudrate of the COM interface.

5.5.2.2.2 Audio Interface

RTS SIP-ISDN supports analogue as well as optionally digital AES/EBU Audio interfaces. If the digital interface is used, separate Sample Rate Converters for input and output are available which supersedes external adjustments for different digital sources.

FIG. 24 CONFIGURATION OF THE AUDIO INTERFACES



Audio Interface

- The operating modes ***analogue*** or ***digital*** can be individually adjusted for the ***Audio Input*** and the ***Audio Output***.

AES/EBU Interface

- If you select the option ***digital*** for the output, the configuration for the ***AES/EBU Interface*** is displayed. Under ***Clock Source of digital output*** the following settings are available:

  – ***Internal***: The AES/EBU output clock is adapted to the internal system clock.

  – ***External***: The AES/EBU output clock is adapted to the external clock which is supplied by the ***Audio 2/CLK IN*** interface. The clock frequency of the supplied clock needs to be 48-kHz.

  – ***Recovered***: The AES/EBU output clock is recovered from the digital input signal of the ***Audio 1/AES IN*** interface. This configuration should be selected if you use the digital input of the system. In this way, a synchronous working of the transmission chain is ensured.

NOTE

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

Main Nominal Level

- If you select the analogue mode for input or output, the corresponding slide controller is displayed to set the nominal Audio level of the XLR Audio interfaces (***Main Nominal Level***). The main nominal level can be adjusted separately for the input (***Level In***) and for the output (***Level Out***) within a range of ***-3 ... +9 dBu*** in steps of 1-dB. The head room is **6 dB**. If you want to have the maximum level of 15 dBu for the system, you need to set 9 dBu as main nominal level. The default setting is 0 dBu.

5.5.2.2.3 Relay/TTL

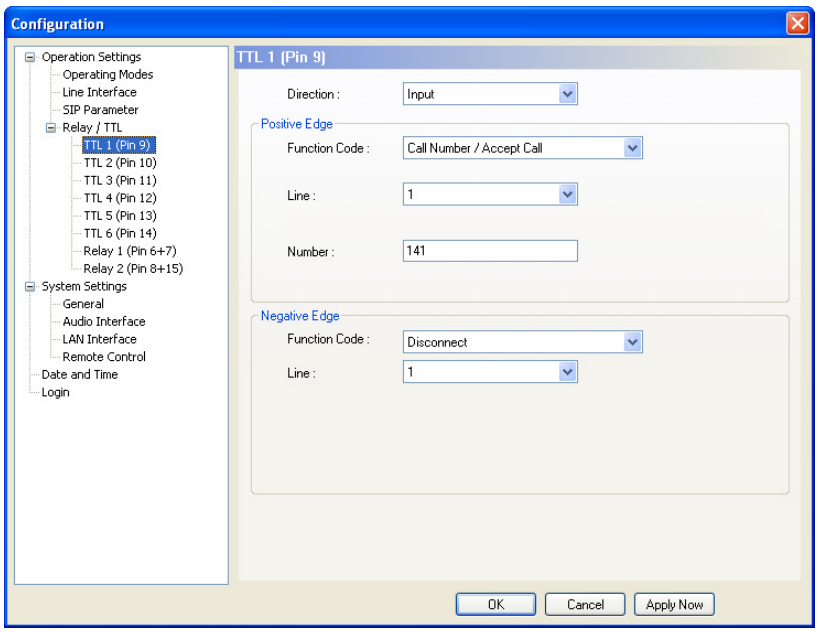
The ***RTS SIP-ISDN System*** provides six ***GPIO Pins*** (TTL) which can be individually programmed as input or output. Additionally, two ***Relays*** are available.

The functionality of a TTL Pin - ***Input*** or ***Output*** can be selected using the drop down list for ***Direction***.

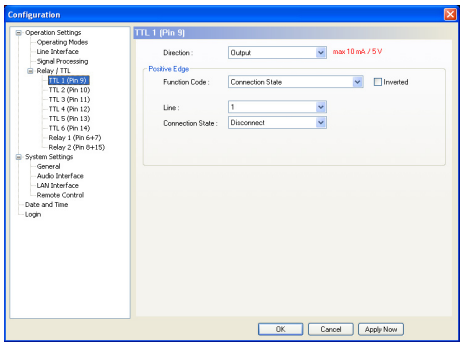
The following description is valid for all six configuration windows ***TTL1 (Pin 9)***, ***TTL2 (Pin 10)***, ***TTL3 (Pin 11)***, ***TTL 4 (Pin 12), TTL 5 (Pin 13) and TTL 6 (Pin 14)***.

TTL Pin as input

FIG. 25 TTL PIN AS INPUT



If you use a TTL Pin as ***Input***, you can configured two different functions[1] when the edges change:



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

The following ***Function Codes*** can be selected:

- **-** (Not used): No function, the Pin is not used. This option is to be selected for remote control via the function ***Output → Remote TTL Input*** (see page?).
- ***Call Number***: Using this function, a call can be accepted or a connection can be established with a certain ***Number***. Under ***Line*** you select which channel (***1*** or ***2***) is to be used to establish the connection.
- ***Call Number (level triggered)***: Identical function like above, however, only the level is analysed and not the edge.
- ***Disconnect***: By enabling this function a connection on the indicated line (***1*** or ***2***) can be disconnected.
- ***Set Information Base Entry***: Special function for projects.
- ***String Command***: Special function for projects.

1. Except function code ***Call Number (level triggered)***, if this code is selected only one edge can be used.

– ***Load Configuration***: Via this function a configuration which you must indicate under ***Configuration*** can be loaded.

Example:

Using ***TTL1*** a call is to be accepted on line 1. After the call is finished, it is to be disconnected also using ***TTL1***.

Programming:

Positive edge:

Function Code: Call Number
Line: 1
Number: -

Negative edge:

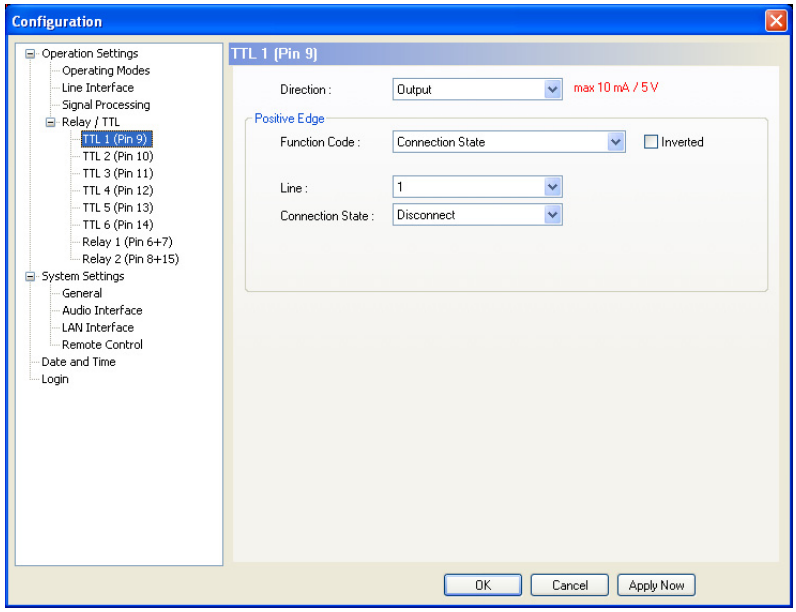
Function Code: Disconnect
Line: 1

TTL Pin as Output

ATTENTION

Please consider that the maximum switching current is 10 mA and the maximale switching voltage is 5V per TTL output.

FIG. 26 TTL PIN AS OUTPUT



If a TTL Pin is configured as ***Output***, the event is signalled when the voltage at the TTL Pin changes from 0V to +5V.

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

– ***Fixed Low (0V)***: The TTL Pin is fixed to 0V.

- ***Fixed High (5V)***: The TTL Pin is fixed to +5V.
- ***PC Controlled***: Special function for projects.
- ***Connection State***: Via this function you can signal the connection state of a line. Please select the desired connection state under ***Connection State***. The following options are available:
  - ***Disconnect***
  - ***Call Out***
  - ***Call In***
  - ***Connect***
  - ***Call Setup***

  Under ***Line*** you can select for which line you want to signal the connection state. In addition to line ***1*** and line ***2*** you can monitor the connection status of both lines if you select ***all***. As soon as one of the two lines meets the criteria, the signal is triggered at the TTL Pin.
- ***Information Base Entry***: Special function for projects.
- ***System Alarm Pending***: This function signals a pending system alarm (siehe ABSCHNITT 5.7.1).
- ***Remote TTL Input***: If this function is selected, you can signal the TTL status of the selected ***Remote TTL input*** Pin (***1***, ***2***, ***3***) of the remote system. In this way. remote systems can be controlled remotely or information about the hardware status can be transmitted. On the remote side the function ***Input → -*** (not used) must be programmed for the corresponding TTL Pin to enable remote control. If a TTL Pin of the remote side is configured as output, the status of the Pin is transmitted.
- ***Remote PC Controlled***: Special function for projects.

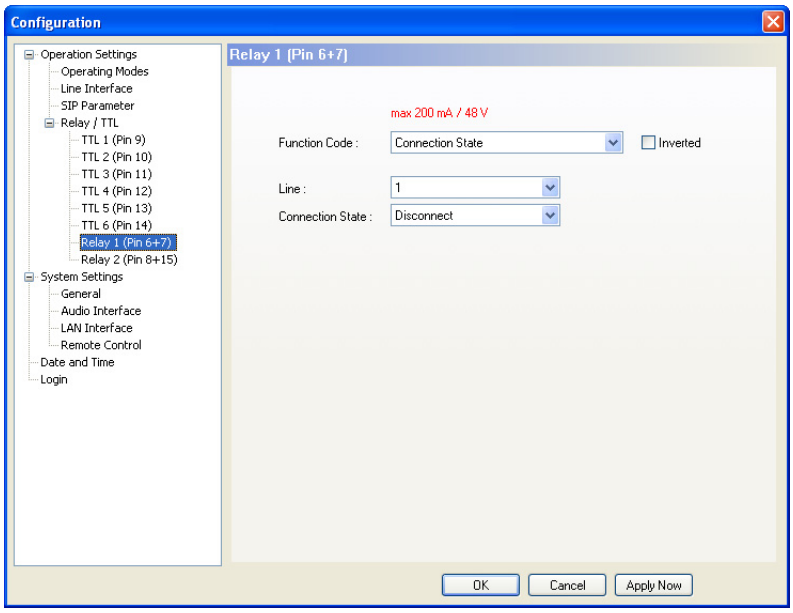
Relay

ATTENTION

Please consider that the maximum switching current is 200 mA and the maximum switching voltage is 48V per relay output.

The following description is valid for both configuration windows ***Relay 1 (Pin 6+7)*** and ***Relay 2 (Pin 8+15)***.

FIG. 27 RELAY



The functions for programming the relays are identical with the function codes for the TTL output. The following options (***Function Codes***) are available:

– ***Always open***: The relay contacts are always open.

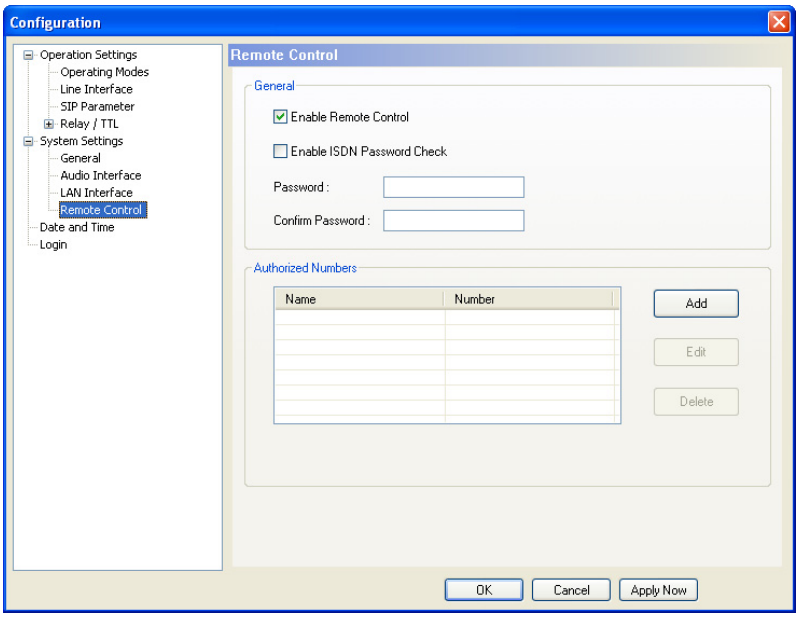
– ***Always closed***: The relay contacts are always closed.

All further function codes are explained under ***TTL Pin as Output*** (see page 44).

5.5.2.2.4 Remote Control

The ***RTS SIP-ISDN Remote Control Software*** is available as optional software. Via this software you can have remote access to the ***RTS SIP-ISDN*** System with the help of any PC with an integrated ISDN card. The software option is protected by a USB Dongle. A highlight is the integrated ***ISDN S_0 Monitor***, which allows a detailed analysis of the D channel protocol (see page 60).

FIG. 28 REMOTE CONTROL



General

- To allow remote control of your system, please select the option ***Enable Remote Control***.
- If you want to protect your system with a password from unauthorised access, you can activate the option ***Enable ISDN Password Check***. Under ***Password*** you must enter your password and confirm it under ***Confirm Password***.

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

Authorized Numbers

- If you only want to allow ISDN remote access/control via certain telephone numbers (e.g. support), you can enter these numbers together with a name under ***Authorized Numbers***.

  To add an entry, please click on ***Add***.

  If you want to change already existing entries, select the desired entry with your mouse and click on ***Edit***.

  To delete a number, select the desired number and click on ***Delete***. for safety reasons you have to confirm that you really want to delete the entry.

NOTICE If no numbers are entered under Authorized Numbers, remote access is possible via any telephone number. In this case, you should use a password to protect your system from unauthorised use.

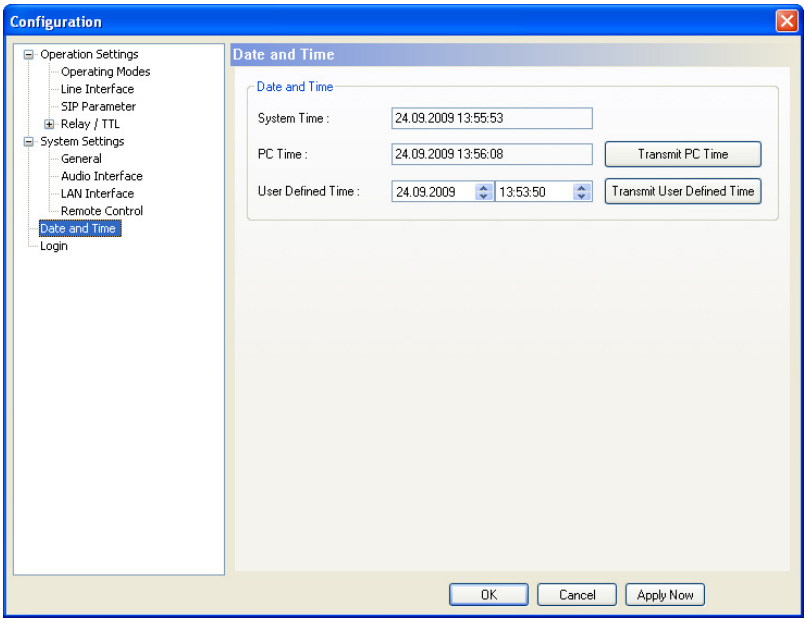
5.5.2.2.5 Quick Dial

t.b.d.

5.5.2.2.6 LAN

For setting the LAN interface please enter the requested data such as IP address and Default Gateway.

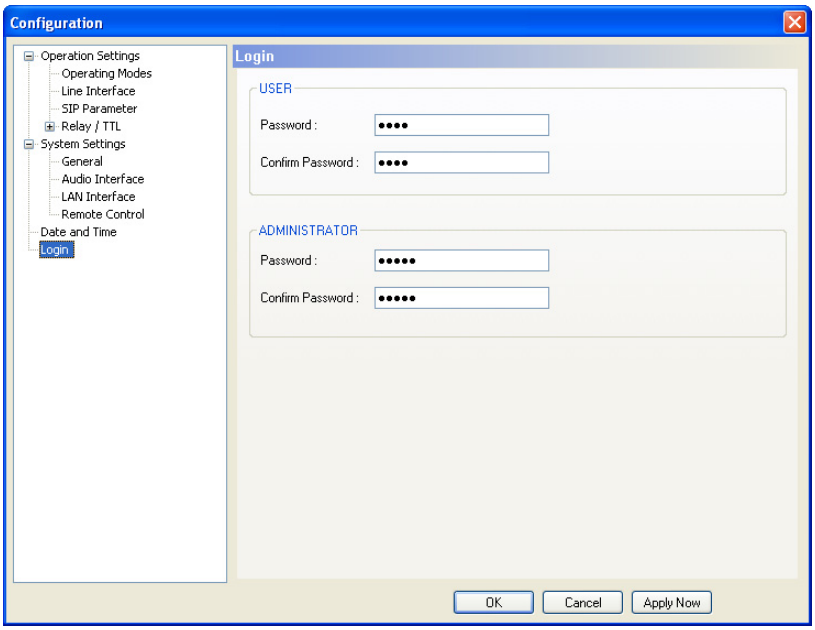
FIG. 29 LAN INTERFACE



5.5.2.3 Date and Time

The option Date and Time allows to select a date and time for the system.

FIG. 30 DATE AND TIME



There are two ways of setting date and time of the system.

- If you want to transmit the date and the time of the PC which is connected with the RTS SIP-ISDN system, please click on ***Transmit PC Time***.
- If you want to set date and time manually, please select the desired date and time under ***User Defined Time*** and click on ***Transmit User Defined Time***.

5.5.2.4 Login

To protect the system from reconfiguration, two password levels with different user rights are available

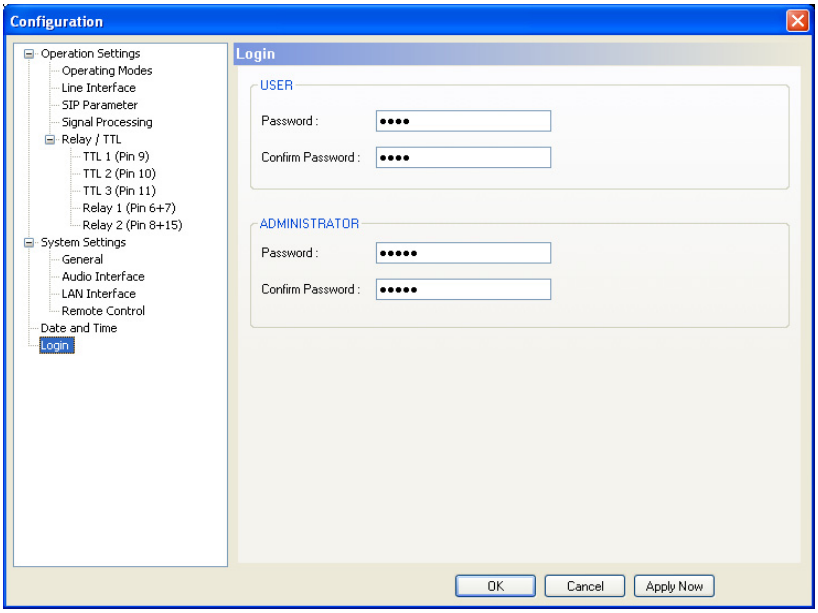
ATTENTION

The entered passwords are stored in the system. Take care in entering a password. If you forgot your password, the system can only be unlocked by the TELEX Service.

- Under ***USER*** you can assign the User ***Password***. For safety reasons the password needs to be confirmed under ***Confirm Password***.
- Under ***ADMINISTRATOR*** you can assign the Administrator ***Password***. For safety reasons the password needs to be confirmed under ***Confirm Password***.

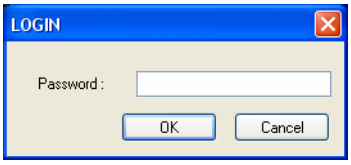
NOTE It is not differentiated between upper and lower case when a password is enterd.

FIG. 31 LOGIN



As soon as you assigned a password, a Login window is automatically displayed when you click on a menu which is protected by the password. Please enter the user or the administrator password there.

FIG. 32 PASSWORD LOGIN



The user and administrator rights are allocated in the following way:

(1) Only **Administrator Password** configured: Password is required for changes in the configuration. Immediately available menus:

- ***Configuration → Configurations→ „Name of the Configuration“***
- ***Extras → System Monitor***

(2) Only **User Password** configured: The password is always required. Subsequently, all menus are available. Immediately available menus:

- ***Extras → System Monitor***

(3) **User** and **Administrator Password** configured. A password is always required.

- **User Password** is entered:

  Under ***Configuration → Configuration → Login*** only the ***USER*** Password can be changed.

  With ***Configuration → Configurations*** the desired Configuration can be loaded.

  Immediately available menus:

- ***Extras → System Monitor***

Administrator Password is entered: All menus are available.

NOTE

Please notice also the effect on the configurations menu, if a password is assigned.

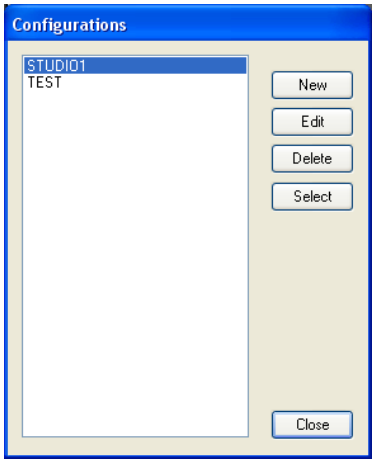
5.5.3 Submenu Configurations

Via the submenu configurations you reach the preset management. You can store, load and edit configuration presets.

5.5.3.1 Manage Configurations

Under ***Configuration*** → ***Confgurations*** → ***Manage Configurations*** you can manage your already existing configuration presets and create new configurations.

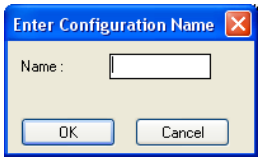
FIG. 33 MANAGE CONFIGURATIONS



In the list all already existing configurations are displayed.

With the button ***New*** you can create a new configuration. It has no effects on the current system configuration which is neither changed nor loaded. First, please assign a suitable name.

FIG. 34 CREATE NEW CONFIGURATION



NOTE

The length of the name must not exceed 8 characters. Special characters and space characters are **not** allowed. Please make sure that the same name is not assigned to several configurations, otherwise an alarm message will be displayed asking you if you want to delete the already existing configuration.

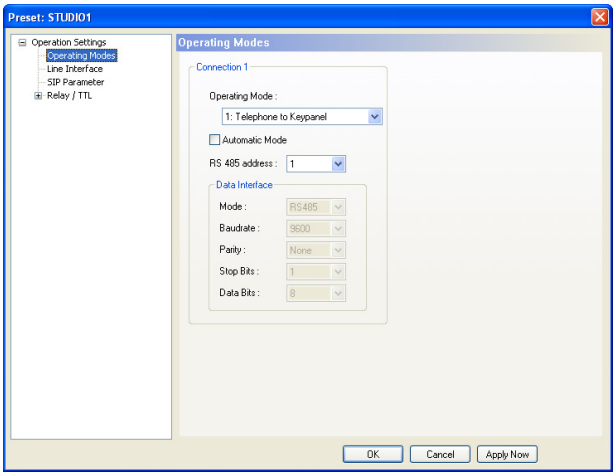
Subsequently, the menu for editing the ***Configuration*** is displayed. The current system configuration is always taken as basis for a new ***Configuration*** preset. This basis can be adapted as desired. The following settings can be stored in a configuration:

– ***Operating Modes*** (see page 33)

– ***Line Interface*** (see page 34)

– ***Signal Processing*** (see page 37)

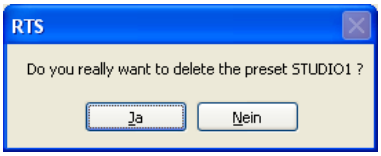
FIG. 35 EDIT PRESET



By pressing the ***Edit*** button the configuration selected from the list can be edited. The current configuration of the system is not changed or loaded when a configuration preset is edited.

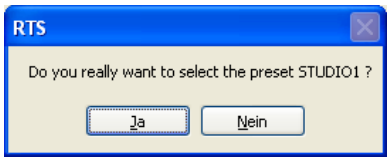
Via the ***Delete*** button you can delete the configuration selected from the list. For safety reasons a confirmation is required.

FIG. 36 CONFIRMATION TO DELETE A CONFIGURATION



To activate a configuration selected from the list, please press the ***Select*** button. For safety reasons a confirmation is required.

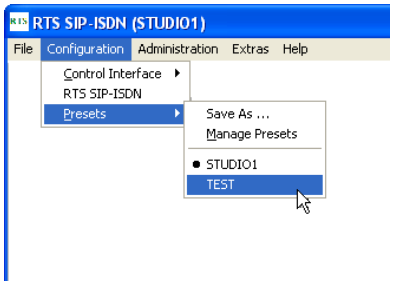
FIG. 37 CONFIRMATION TO SELECT A CONFIGURATION



5.5.3.2 Select a Configuration

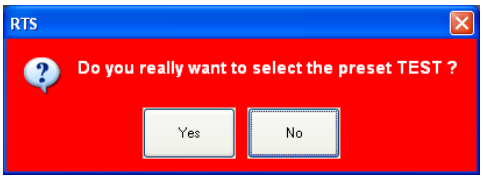
All Configuration presets are displayed under ***Configuration*** → ***Configurations*** → ***„Name of Configuration“*** and can be selected by clicking on the relevant configuration preset.

FIG. 38 SELECT A CONFIGURATION



For safety reasons a confirmation is required.

FIG. 39 CONFIRMATION TO SELECT A CONFIGURATION

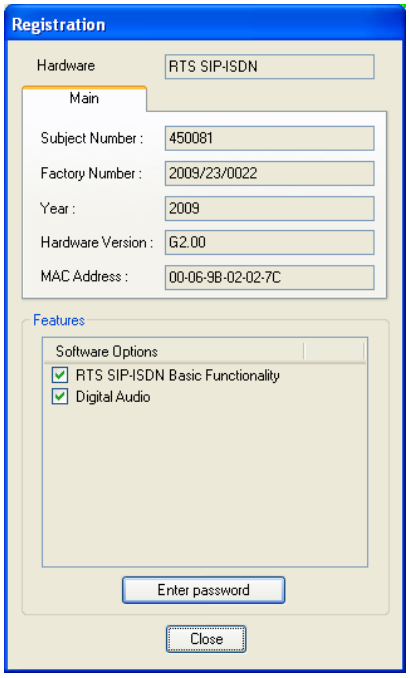


5.6 Menu Administration

5.6.1 Submenu Registration

Via the submenu Registration you can check the enabled firmware options.

FIG. 40 REGISTRATION



Under ***Hardware*** the system name is displayed (***RTS SIP-ISDN***). Under the ***Main*** tab all relevant information for identification like the ***Subject Number***, ***Factory Number***, ***Year*** of production and ***Hardware Version*** can be found.

Under ***Features*** all available software options are displayed.

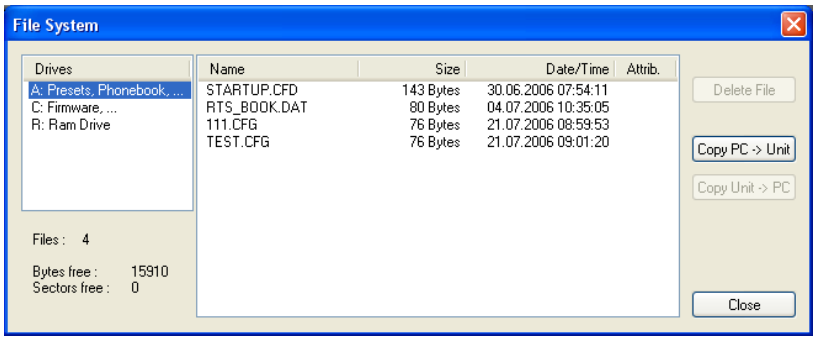
5.6.2 Submenu File System

By selecting the submenu ***File System*** the file directory of the system (similar to the harddisk of a PC) is displayed.

ATTENTION

Please do not carry out any actions under ***File System*** unless our support asked you to. All user import/export functions can be found under the menu ***File*** (see CHAPTER 5.4).

ABB. 41 SUBMENU FILE SYSTEM



Via the ***Delete File*** button the currently selected file is deleted.

ATTENTION

Do not delete a file unless our service told you to delete the file. Otherwise a malfunction of the system can occur.

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

ATTENTION

Please use only the ***Software Download*** function (see CHAPTER 5.6.4) or the import function under the ***File*** menu (siehe ABSCHNITT 5.4) to copy file to the systems.

The ***Copy Unit -> PC*** button allows you to copy a file from the system to the connected PC.

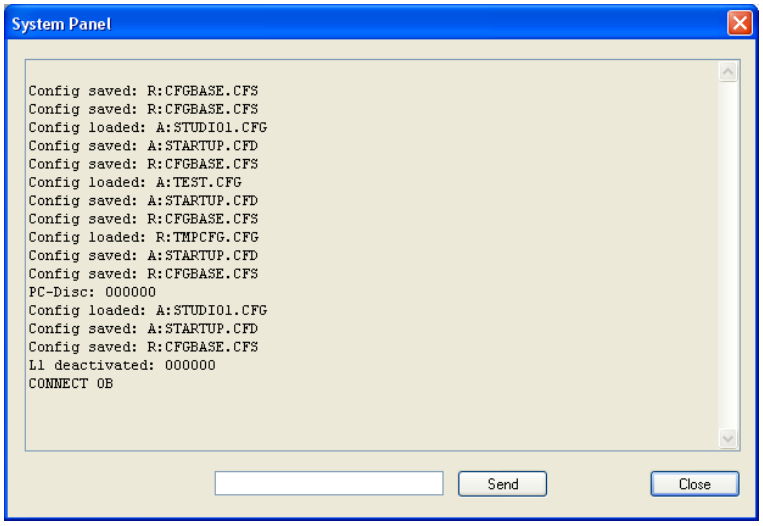
ATTENTION

Please use only the export function under the ***File*** menu (siehe ABSCHNITT 5.4) to copy files to a PC.

5.6.3 Submenu System Panel

The ***System Panel*** is only for service purposes. Please only enter commands in the prompt, if our support asked you to do so.

FIG. 42 SUBMENU SYSTEM PANEL



5.6.4 Submenu Software Download

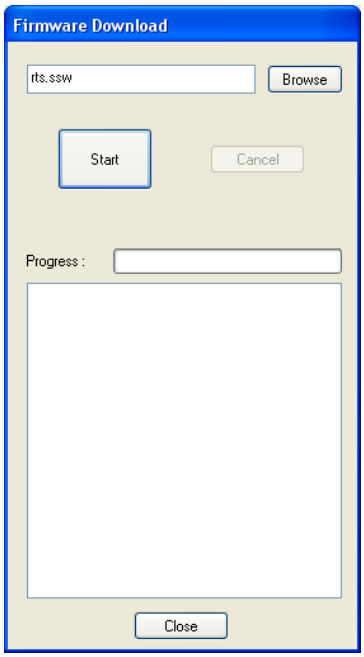
The Firmware required for the ***RTS SIP-ISDN*** system is always included in the PC software. Via the ***Software Download*** the firmware can be comfortably loaded on the system.

Via the ***Browse*** button you select the firmware file. The file is always stored in the directory in which you installed the ***RTS SIP-ISDN*** application. The standard installation directory is:

C:\Programmes\RTS SIP-ISDN

The name of the firmware file is „***rts.ssw***“.

FIG. 43 SUBMENU SOFTWARE DOWNLOAD



Please press the ***Start*** button to load the firmware on your system. The ***Progress*** bar shows the status of the download. After about three minutes the download will be finished. If the download had been successful, a message is displayed. After a confirmation the system executes a reset.

NOTE

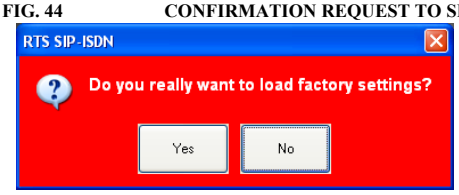
If a download had been faulty, you can simply switch off the unit and then switch it on again. The new software is only written in the flash memory, if a download had been successful. Otherwise the old firmware is maintained.

5.6.5 Submenu Set Factory Settings

Via the submenu ***Factory Settings*** all settings are reset to the factory settings.

For safety reasons a confirmation is required.

FIG. 44 CONFIRMATION REQUEST TO SET FACTORY SETTINGS



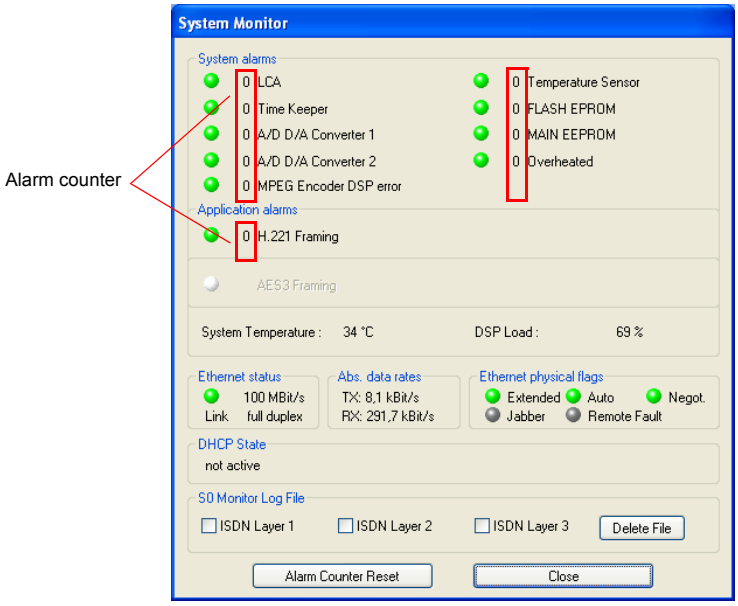
NOTE The telephone book and the Configuration presets are not deleted.

5.7 Menu Extras

5.7.1 Submenu System Monitor

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

FIG. 45 SYSTEM MONITOR



- Under ***System alarms*** all possible system alarms are displayed. A red LED signals a currently existing alarm. It is also displayed how often the alarm occured since the unit has been switched on.

NOTE

If an alarm occurs several times or for a longer period of time, please disconnect the system from electricity. If you switch on the unit and the alarm occurs again, there is probably a hardware defect.

The following alarms are signalled:

- ***LCA (Logic Cell Array)***: The communication with a programmed component is faulty.
- ***TIME KEEPER***: The communication with the integrated time keeper 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 non-volantile memory is faulty. Settings cannot be stored or read.
- ***MAIN EEPROM***: The communication with the non-volantile memory is faulty. Settings cannot be stored or read.

– ***Overheated***: The systems sets this alarms if the system temperature is higher than 57°C. Please disconnect the system from electricity or cool down the ambient air temperature.

TIP

You can also configure a system alarm as relay output (see page 45).

- Under ***Application alarms*** all possible application alarms are displayed. A red LED signals a currently existing alarm. It is also displayed how often the alarm occurred since the unit has been switched on.

  – ***H.221 Framing***: If the ITU-T J.52 inband signalling is used, faulty H.221 frames are displayed and filed.

  – If the optional, digital Audio output is selected, but no digital Audio signal is connected to **AUDIO1/AES/LEFT IN**, the ***AES3 Framing*** alarm occurs.

  – The actual system temperature can be found under ***System Temperature***. The temperature is measured in °C. A normal system temperature lies around 30...40°C.

  – Under ***DSP Load*** the load of the system is displayed. A normal DSP load is 30...60%.

- Under ***System Logfile*** a detailed ISDN logfile can be generated.

  – ***ISDN Layer 1***: (Physical Layer): All messages which concern the physical activation/deactivation of the ISDN interface are saved in Layer 1.

  – ***ISDN Layer 2***: (Data Link Layer): The Data Link Layer is responsible for packing the data from the physical layer into frames. It can detect and/or correct errors and manages the data flow between nodes. This layer is only to be activated for logging if problems are supposed to occur. Please notice that if it is activated every 8 seconds an entry is generated and therefore the memory is filled very fast.

  – ***ISDN Layer 3*** (Network Layer): The Network Layer handles the routing of the data (sending it in the right direction to the right destination on outgoing transmissions and receiving incoming transmissions at the packet level). For the logfile, this layer is the most important one since all connection data is recorded here.

  – The logfile can be deleted by pressing the ***Delete File*** button. For safety reasons a confirmation is required.

The system stores all messages of the activated ***ISDN Layer***. The internal memory capacity is 128-kByte[1]. The data is stored in a cyclic way.

NOTE

The data can be analysed using the optional ***RTS SIP-ISDN Remote Control & ISDN Monitoring Software*** (see CHAPTER 6). Our support is also able to read the data remotely. If you experience problems with your ISDN connection, please activate the desired ISDN Layer of the system logfile enabling us to analyse them.

1. An entry of the ISDN protocol is about 15 Byte on average.

5.8 Menu Help

5.8.1 Submenu RTS SIP-ISDN

In the ***About RTS SIP-ISDN*** dialogue you can find the software versions of the PC Software (***PC Version***) and of the system (***Firmware Version***). Furthermore, our contact information is displayed.

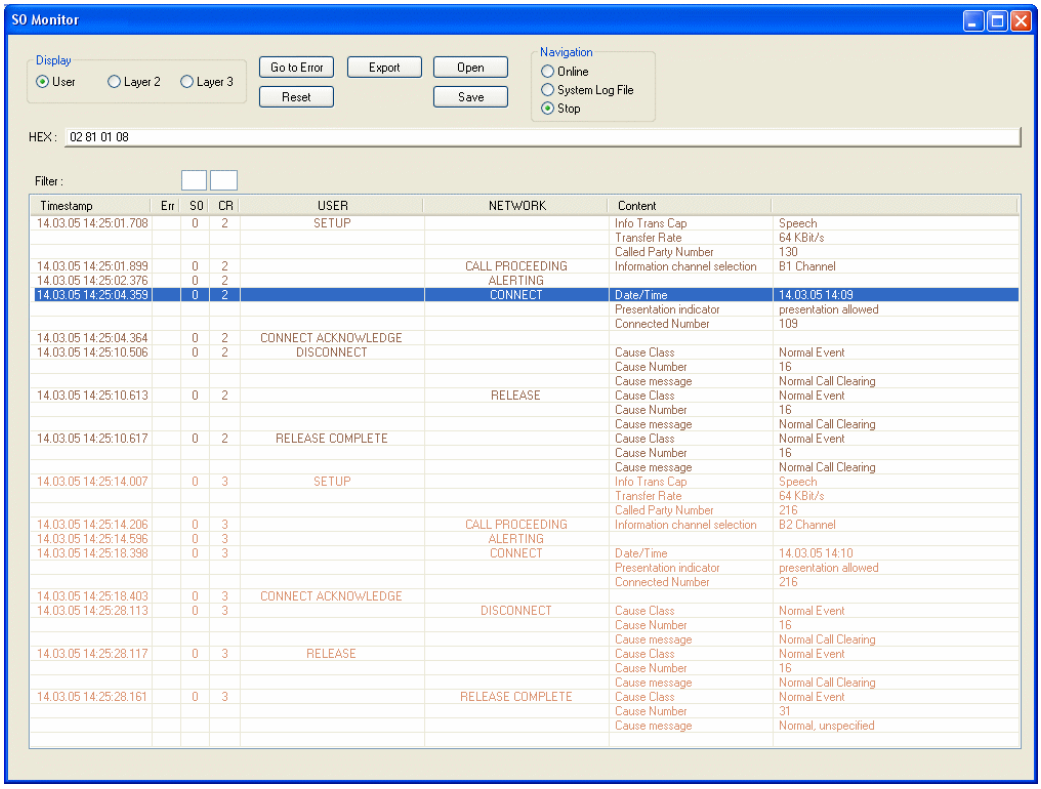
FIG. 46 SUBMENU ABOUT RTS ISDN 2005

The fee-based ***RTS SIP-ISDN Remote Control & ISDN Monitor Plug-In Software*** enables you to access the ***RTS SIP-ISDN*** System from any PC with an integrated ISDN card. A local ***RTS SIP-ISDN*** System is not required. The software option is protected by an USB Dongle. A special highlight is the integrated ***ISDN S_0 Monitor*** which allows a detailed analysis of the D channel- locally as well as remotely.

6.1 The integrated S_0 Monitor

The integrated S_0 Monitor allows a detailed analysis of the D channel protocol.

FIG. 47 S_0 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 SIP-ISDN*** 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. 48 S_0 MONITOR LAYER 2

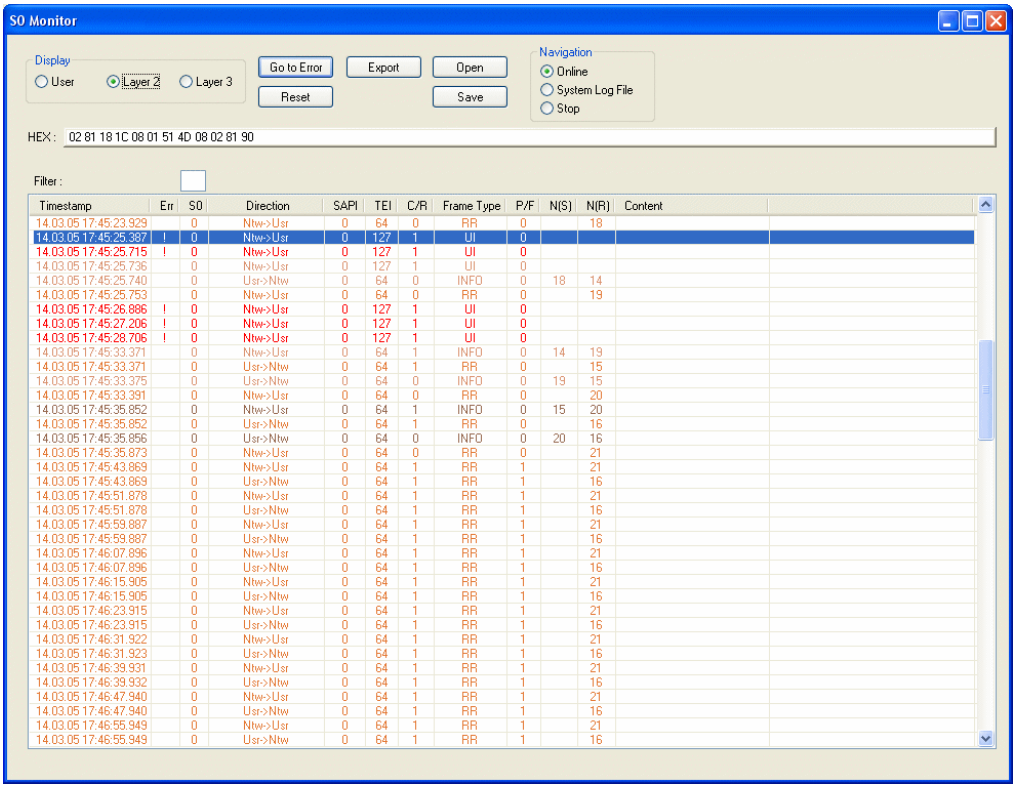
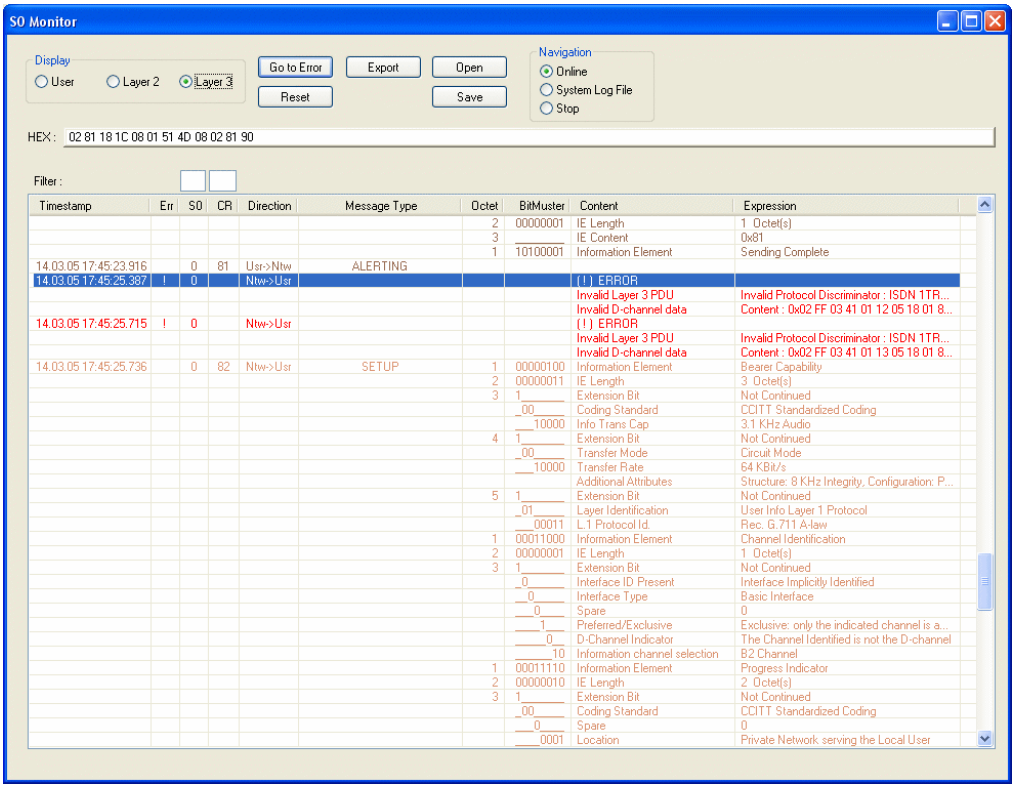


FIG. 49 S_0 MONITOR LAYER 3



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	Usr->Ntw	ALERTING				
14.03.05 17:45:25.387	!	0		Ntw->Usr				(!) 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	!	0		Ntw->Usr				(!) 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->Usr	SETUP	1	00000100	Information Element	Bearer Capability
						2	00000011	IE Length	3 Octet(s)
						3	1_____	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

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.

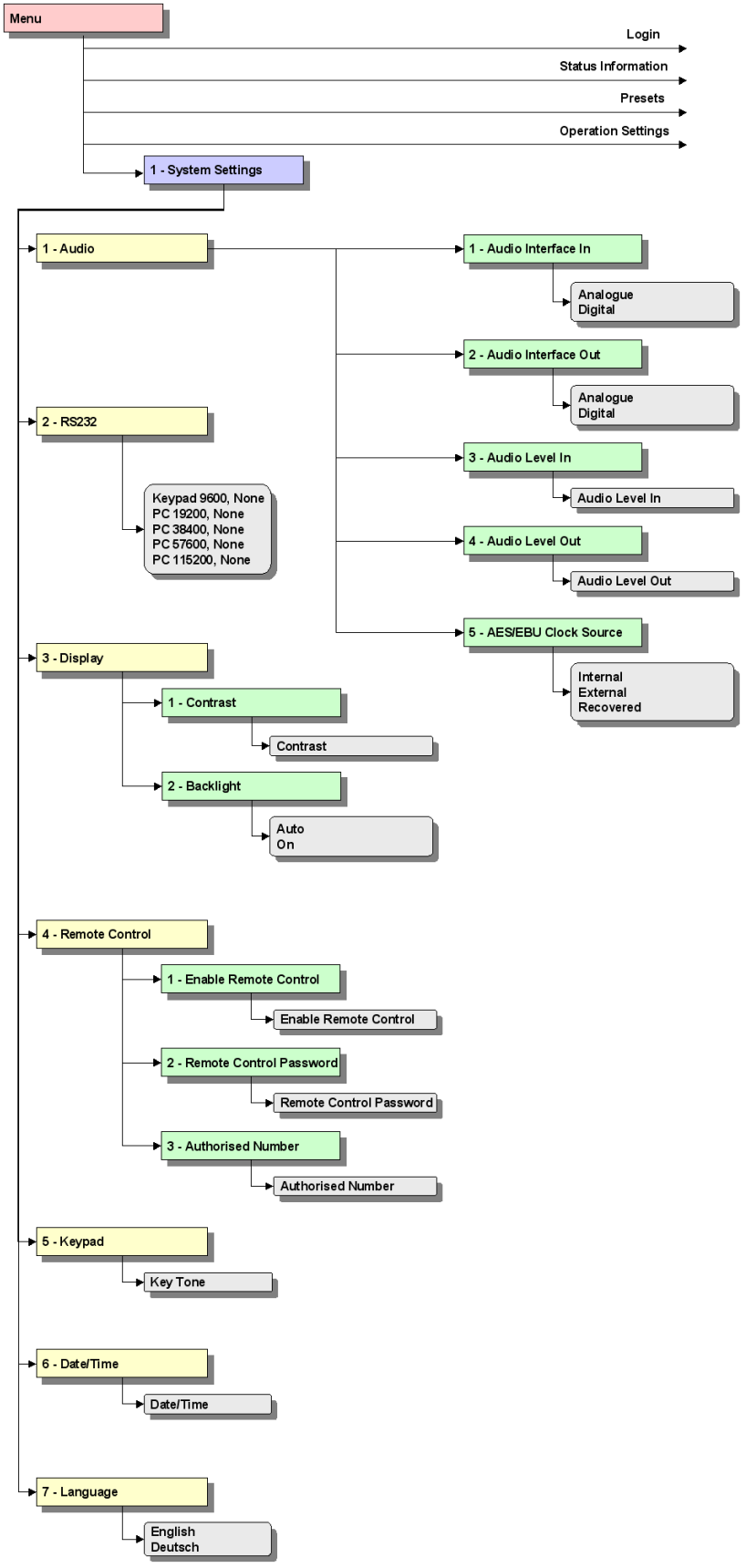
(3) **User** and **Administrator Password** configured (instead of **Menu Login** is displayed):

– **User Password** is entered: The menus **Presets**, **Status information** and **Login** are available

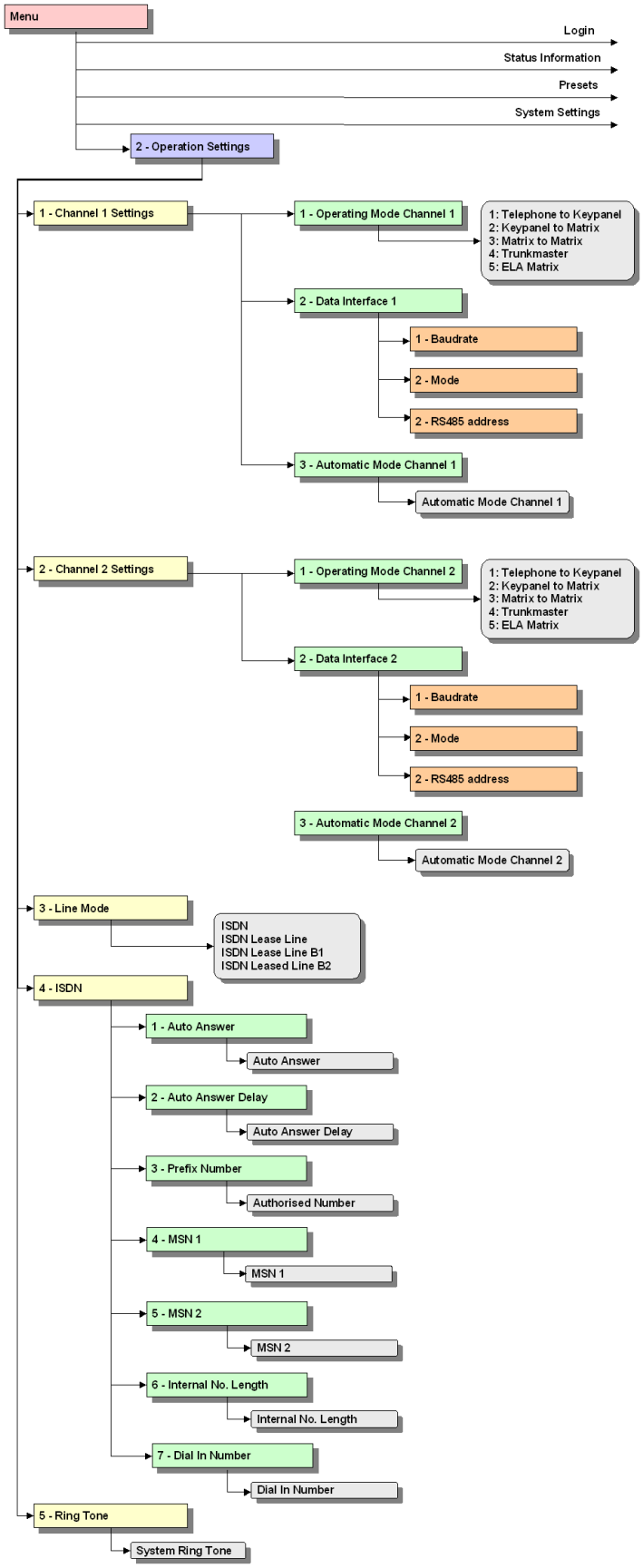
– **Administrator Password** is entered: Alle menus are available.

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

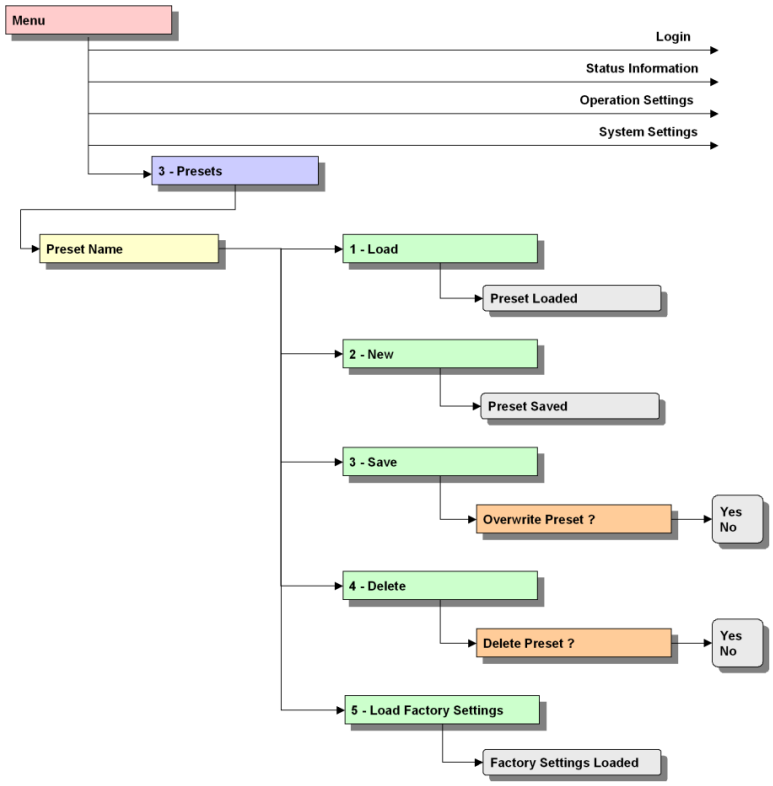
A1.1 System Settings



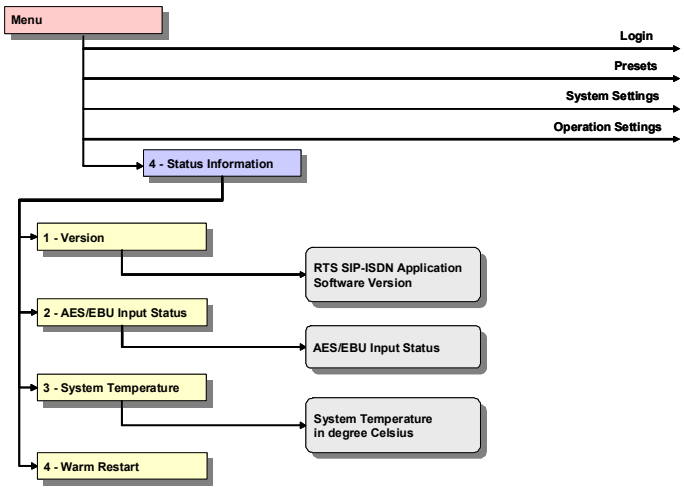
A1.2 Operation Settingss



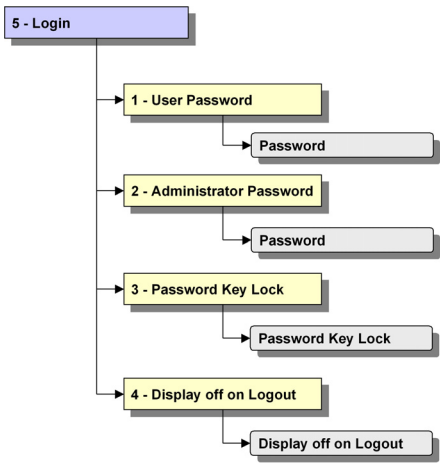
A1.3 Presets


Menu
Login
Status Information
Operation Settings
System Settings
3 - Presets
Preset Name
1 - Load
Preset Loaded
2 - New
Preset Saved
3 - Save
Overwrite Preset ?
Yes
No
4 - Delete
Delete Preset ?
Yes
No
5 - Load Factory Settings
Factory Settings Loaded

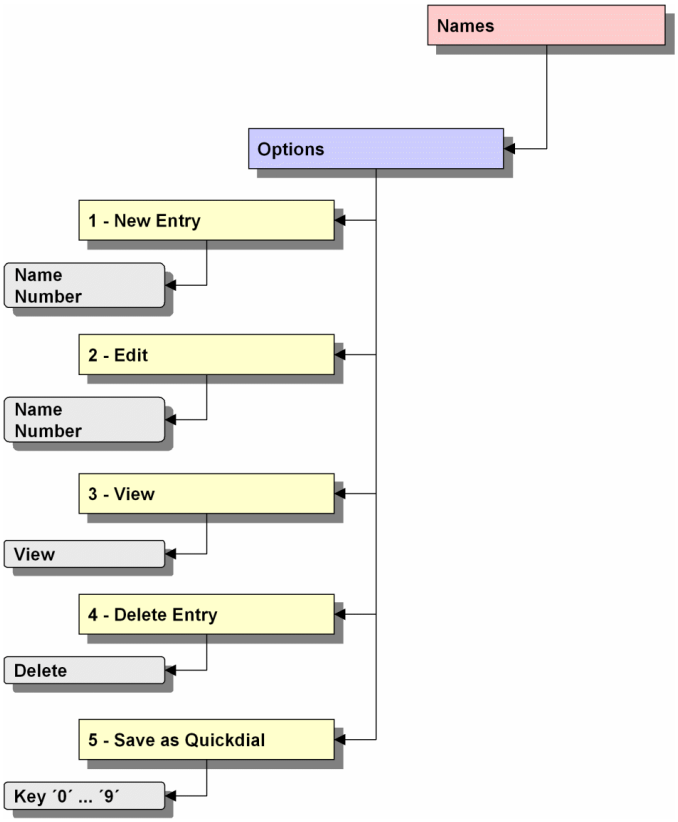
A1.4 Status Information



A1.5 Login

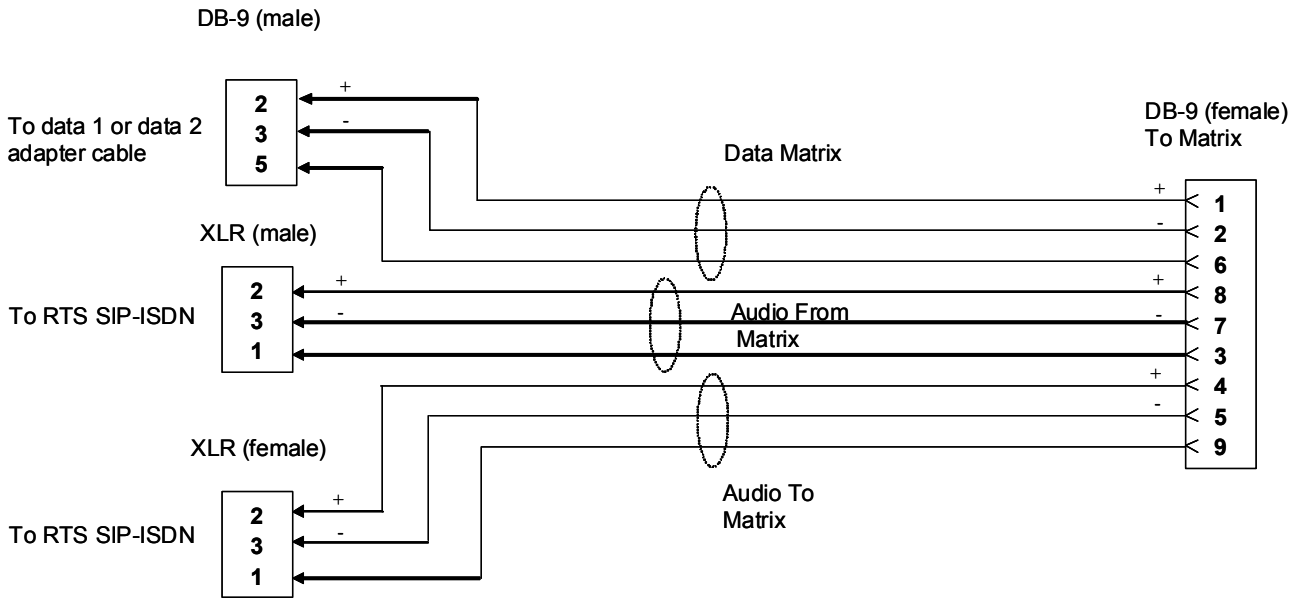

5 - Login
1 - User Password
Password
2 - Administrator Password
Password
3 - Password Key Lock
Password Key Lock
4 - Display off on Logout
Display off on Logout

A1.6 Names


Names
Options
1 - New Entry
Name
Number
2 - Edit
Name
Number
3 - View
View
4 - Delete Entry
Delete
5 - Save as Quickdial
Key ´0´ ... ´9´

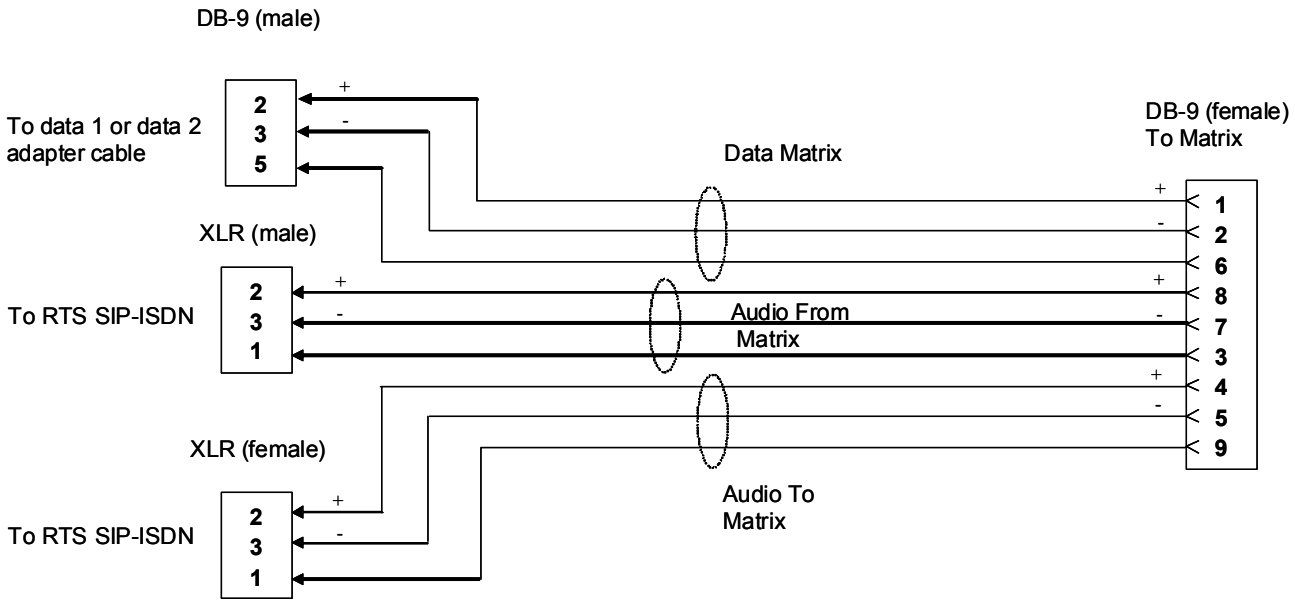
A2.1 Keypanel Cable DB9

FIG. 50 KEYPANEL CABLE DB9



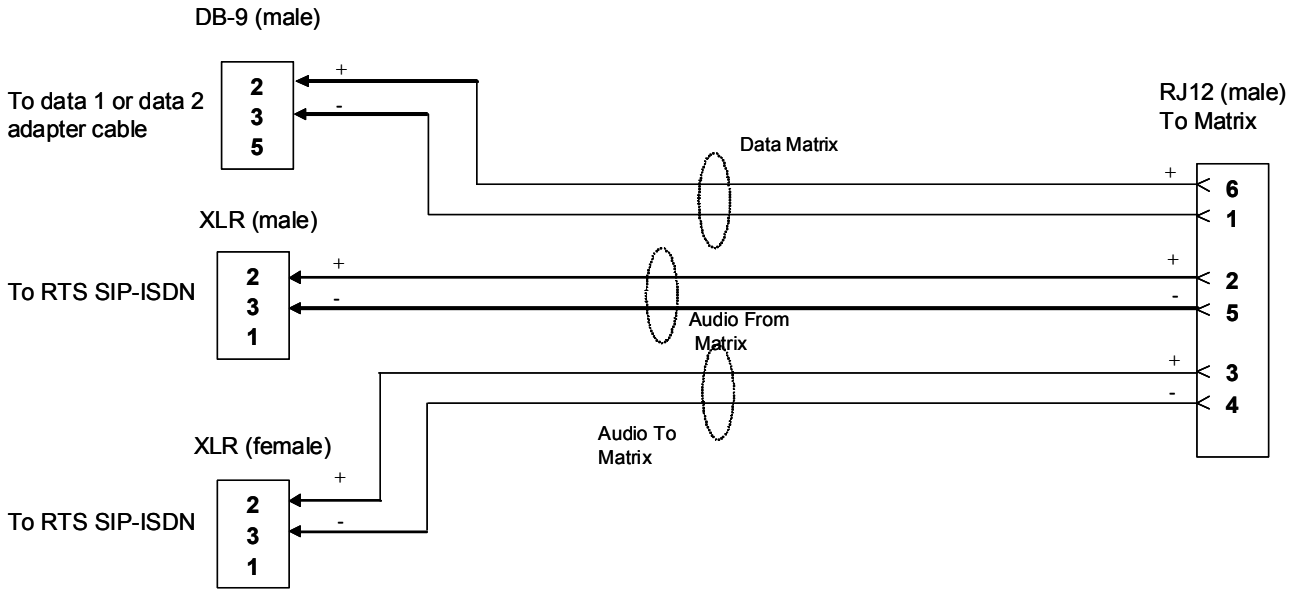
A2.2 Matrix Cable DB9

FIG. 51 MATRIX CABLE DB9

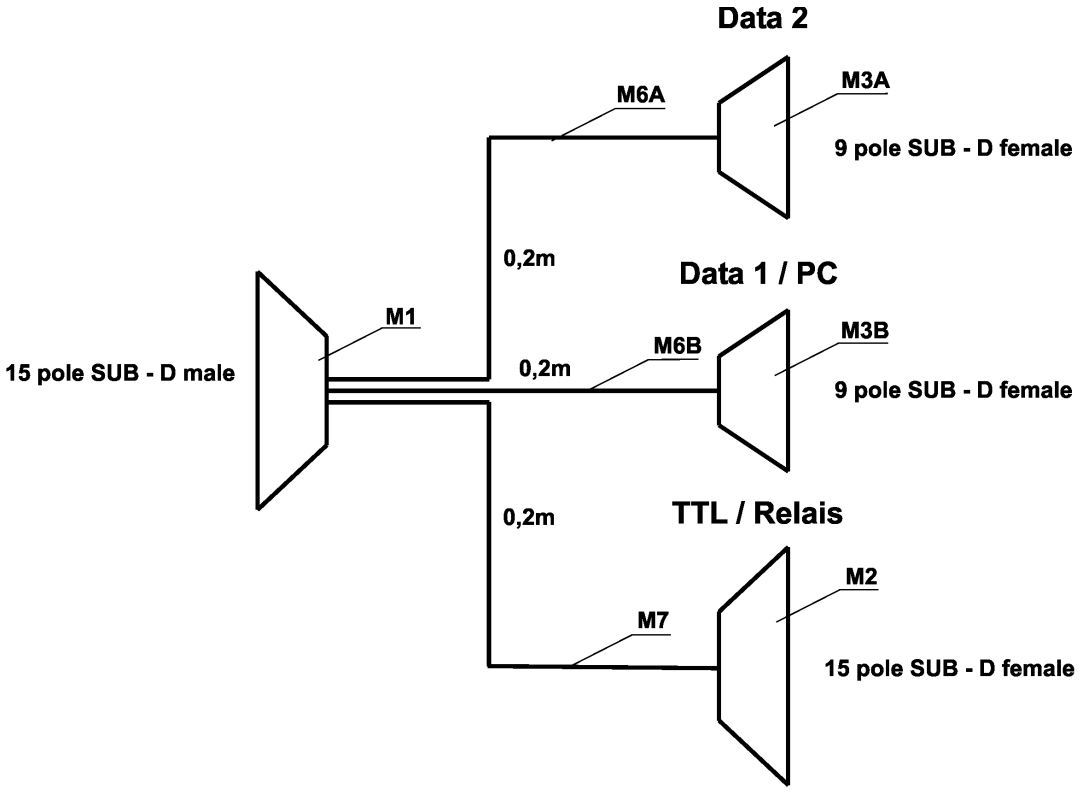


A2.3 Matrix Cable RJ12

FIG. 52 MATRIX CABLE RJ12



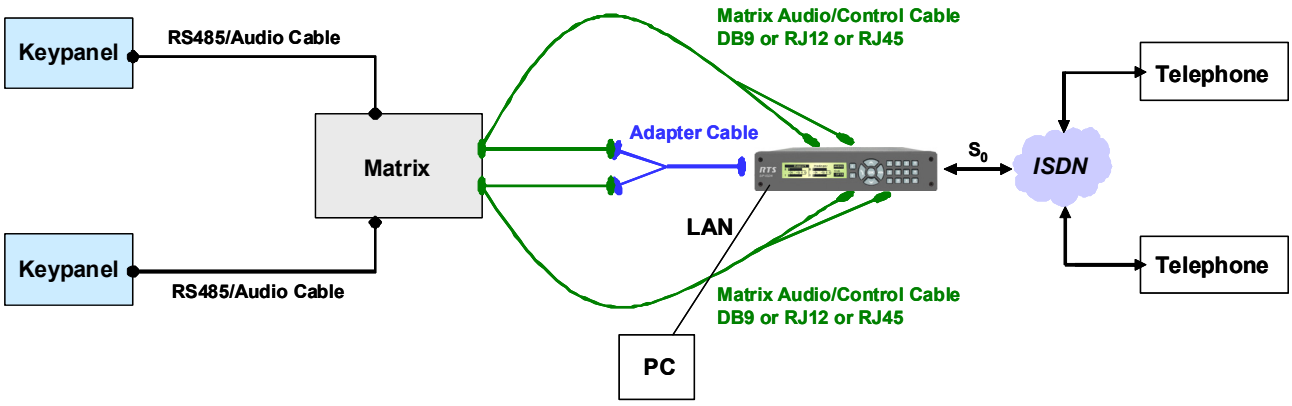
A2.4 Data & Control Adapter Cable



RTS SIP-ISDN	TTL/Relais	Data 1 / PC	Data 2
		RS232/RS485	RS232/RS485
1 TXD 2			2 TxD/Data +
2 TXD 1		2 TXD / Data +	
3 RXD 1		3 RXD / Data -	
4 RXD 2			3 RxD/Data -
5 GND	5 GND	5 GND	5 GND
6 Relais 1	6 Relais 1		
7 Relais 1	7 Relais 1		
8 Relais 2	8 Relais 2		
9 TTL 1	9 TTL 1		
10 TTL 2	10 TTL 2		
11 TTL 3	11 TTL 3		
12 TTL 4	12 TTL 4		
13 TTL 5	13 TTL 5		
14 TTL 6	14 TTL 6		
15 Relais 2	15 Relais 2		

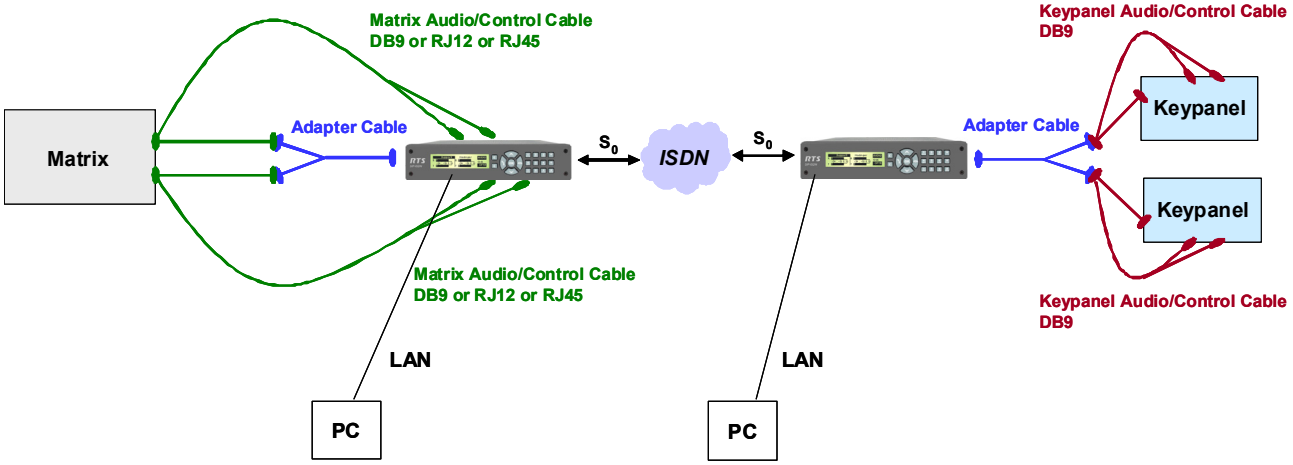
A3.1 Cabling Mode 1: Telephone to Keypanel

FIG. 53 CABLING MODE 1



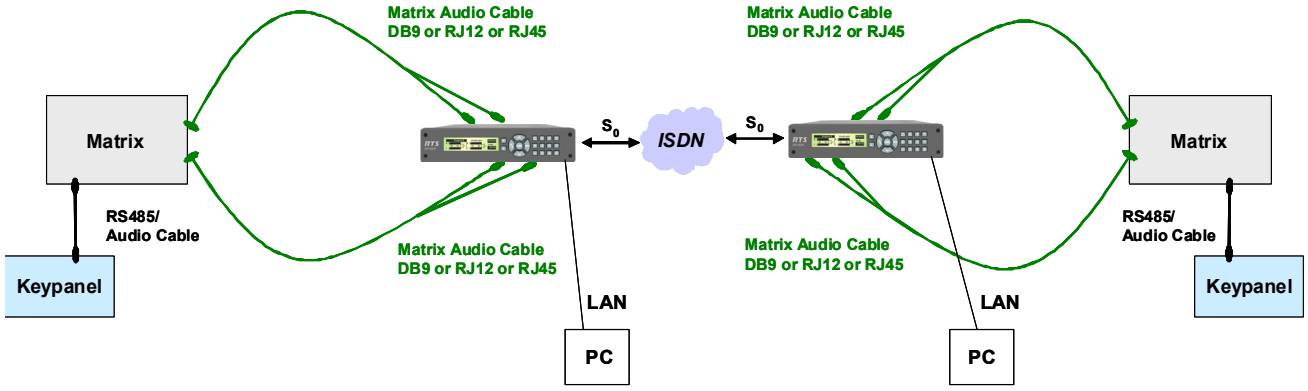
A3.2 Cabling Mode 2: Keypanel to Matrix

FIG. 54 CABLING MODE 2



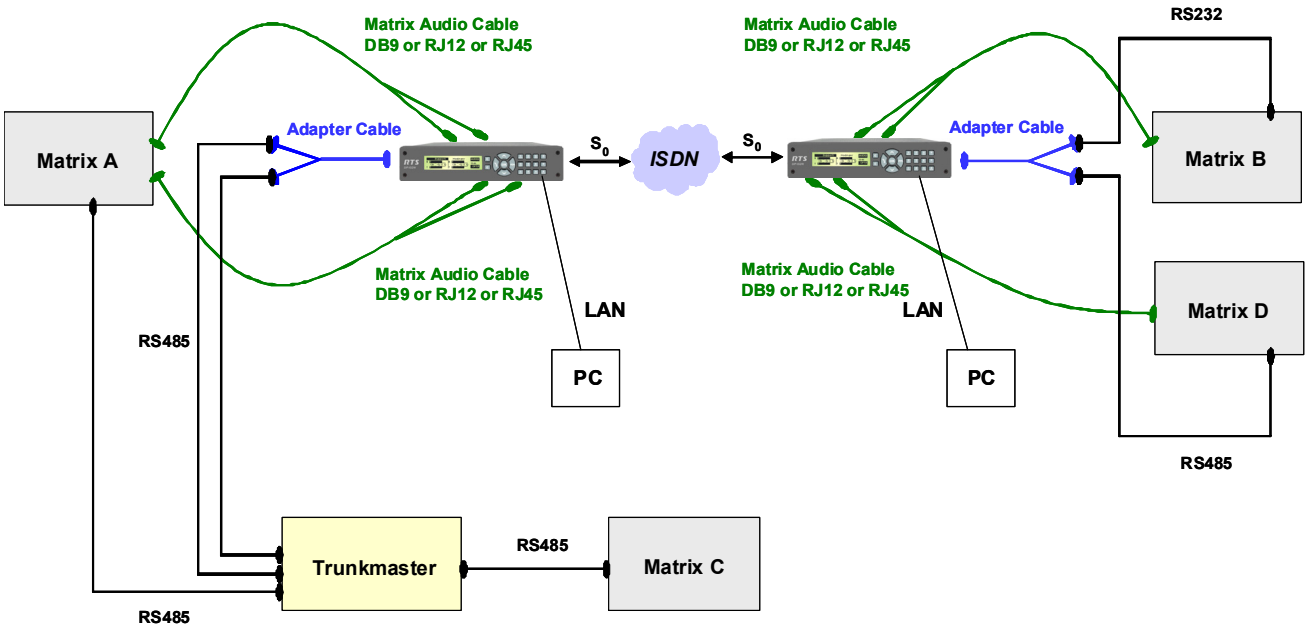
A3.3 Cabling Mode 3: Matrix to Matrix

FIG. 55 CABLING MODE 3



A3.4 Cabling Mode 4: Matrix to Matrix with Trunkmaster

FIG. 56 CABLING MODE 4

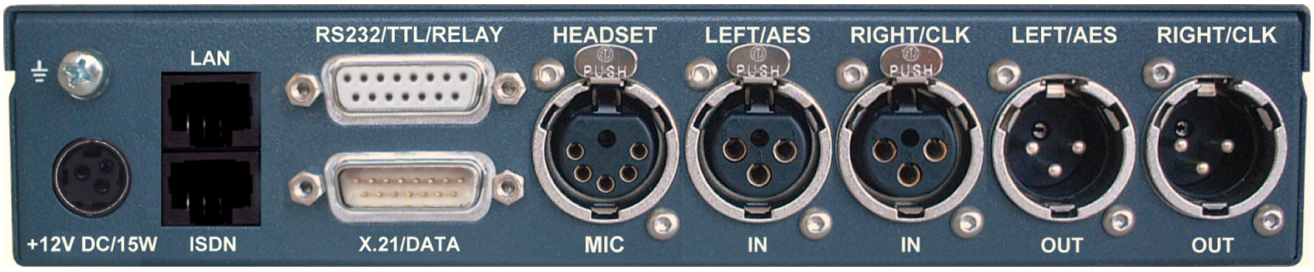


TAB. 1 TROUBLE SHOOTING

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

The interfaces of the system are pictured in Fig. 57.

FIG. 57 REAR VIEW OF THE RTS SIP-ISDN AUDIO CODEC

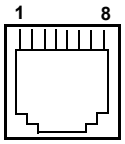


All interfaces are described below.

A5.1 Line interface

A5.1.1 S_0 ISDN interface

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



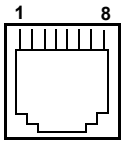
TAB. 2 PIN ASSIGNMENT: S_0 INTERFACE (LINE ISDN)

Socket: Western (8-pole) RJ45

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

A5.1.2 LAN interface

This interface supports the SIP protocol for building up two IP connections.



TAB. 3 PIN ASSIGNMENT: LAN INTERFACE

Socket: Western (8-pole) RJ45

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

A5.2 Control and data interfaces

A5.2.1 CTRL/DATA/TTL/Relay interface

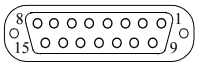
The CTRL/DATA interface is used for the configuration and operation of the ***RTS SIP-ISDN*** System via a PC. To connect a PC you need a 1:1 connecting cable in which Pin 2 and Pin 3 are ***not*** crossed. Furthermore, Pin 5 GND must be connected.

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.

NOTE

Please note that the function - input or output - of the Pins RXD1/2 and TXD1/2 are determined by the interface type DCE or DTE. The labelling of the Pin is always RXD for Pin 2 and TXD for Pin 3.

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



TAB. 4 PIN ASSIGNMENT: CTRL/DATA/TTL/RELAY INTERFACE

Socket: SUB-D 15 pole

Pin	Signal	Direction	Electrical characteristics
1	RXD2[a] RS232/RS485 Data (a)	output/E-A[b]	PC interfaceRS232:
2	RXD1[a.] RS232/RS485 Data (a)	output/E-A[b.]	Type (Pin 2, 3): DCE[c] Level: V.24 Data rate: max. 115200 Baud Range: max. 15 m Protocol: 1 start bit 8 data bit 1 stop bit
3	TXD1[d] RS232/RS485 Data (b)	input/E-A[b.]	
4	TXD2[d.] RS232/RS485 Data (b)	input/E-A[b.]	
5	GND		
6	RELAY 1 (A)	output	RS232/RS485 data interface:
7	RELAY 1 (B)	output	Level: V.24 (RS232) V.11 (RS485) Data rate: max. 115200 Baud Range: max 15m (RS232) max. 100 m (RS485) Protocol: 1 start bit 8 data bit 1/2 stop bit Parity adjustable
8	RELAY 2 (A)	output	
9	TTL1	input/output	
10	TTL2	input/output	
11	TTL3	input/output	
12	TTL4	input/output	**TTL interface:**
13	TTL5	input/output	Capacity of the TTL outputs: Maximum voltage: 5V Maximum current: 10mA
14	TTL6	input/output	
15	RELAY 2 (B)	output	**Relay interface:** Capacity of the relays: Maximum voltage: 48V Maximum current: 200mA

a. ATTENTION: on this Pin the RTS SIP-ISDN **transmits** data

b. E-A: input and output at RS485 (bus interface)

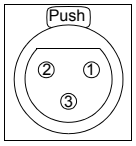
c. DCE = Data Communication Equipment

d. ATTENTION: on this Pin the RTS SIP-ISDN receives data

A5.3 Audio interfaces

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

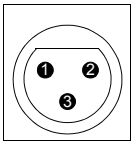
A5.3.1 Analogue Audio interface



TAB. 5 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	



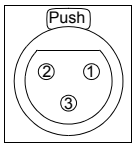
TAB. 6 PIN ASSIGNMENT: ANALOGUE OUTPUT (AUDIO 1/2 OUT)

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	

A5.3.2 Digital AES/EBU Audio interface

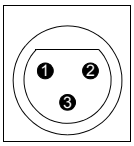
The ***RTS SIP-ISDN*** System incorporates two digital inputs/outputs which are physically one AES/EBU interface. The input as well as the output has its own sample rate converter providing that a digital source with 32, 44.1 or 48-kHz can be connected directly. For external clocking (48-kHz only) the word clock input or output may be used.



TAB. 7 PIN ASSIGNMENT: DIGITAL INPUT (AES IN)

Socket: 3-pole XLR

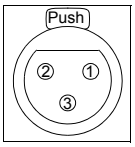
Pin	Signal	Electrical characteristics
1	GND	IEC-958
2	AUDIO IN a	
3	AUDIO IN b	



TAB. 8 PIN ASSIGNMENT: DIGITAL OUTPUT (AES OUT)

Connector: 3-pole XLR

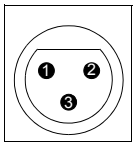
Pin	Signal	Elektrical characteristics
1	GND	IEC-958
2	AUDIO OUT a	
3	AUDIO OUT b	



TAB. 9 PIN ASSIGNMENT: CLOCK INPUT (CLK IN)

Socket: 3-pole XLR

Pin	Signal	Elektrical characteristics
1	GND	TTL
2	CLOCK IN	
3	not used	



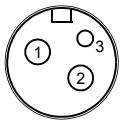
TAB. 10 PIN ASSIGNMENT: CLOCK OUTPUT (CLK OUT)

Connector: 3-pole XLR

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

A5.4 Power supply interface

The power supply is connected via an external power supply.



TAB. 11 PIN ASSIGNMENT: POWER SUPPLY

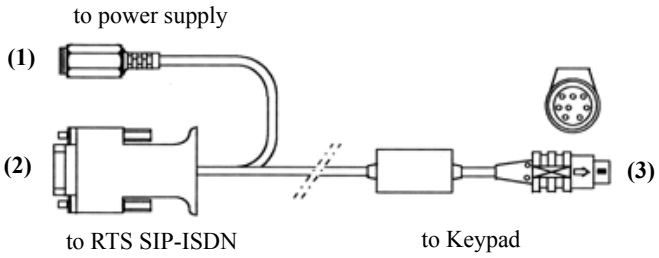
Socket: KYCO KPJ-S3		
Pin	**Signal**	**Elektrical characteristics**
1	GND	Voltage: +12V
2	+12V	Power: max. 15W
3	not used	

A7.1 Keypad

Matrix: 8 x 6

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

FIG. 58 CONNECTING CABLE MAGIC SYSTEM - KEYPAD

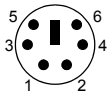


Protocol:

9600 Baud
no parity

Connection to external power supply (1):

6-pole Mini-DIN connector

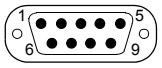


Assignment:

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

Connection to RTS SIP-ISDN (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)

A7.2 LCD Display

2 x 20 characters

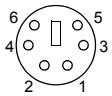
illuminated

A7.3 Power supply:

5V, max. 500 mA

Connection:

6-pole Mini-DIN socket



Assignment:

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

A8.1 Ordering numbers

RTS SIP-ISDN System	800252
Windows PC Software Update	XXXXX[1]

Accessories

RTS SIP-ISDN Keypad	800240
RTS SIP-ISDN DUAL 19“ Mounting Kit	800242

Software Options

RTS SIP-ISDN Remote & ISDN Monitor Plug-In[2]	430231

A8.2 Scope of delivery

- RTS SIP-ISDN
  - 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 S_0 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