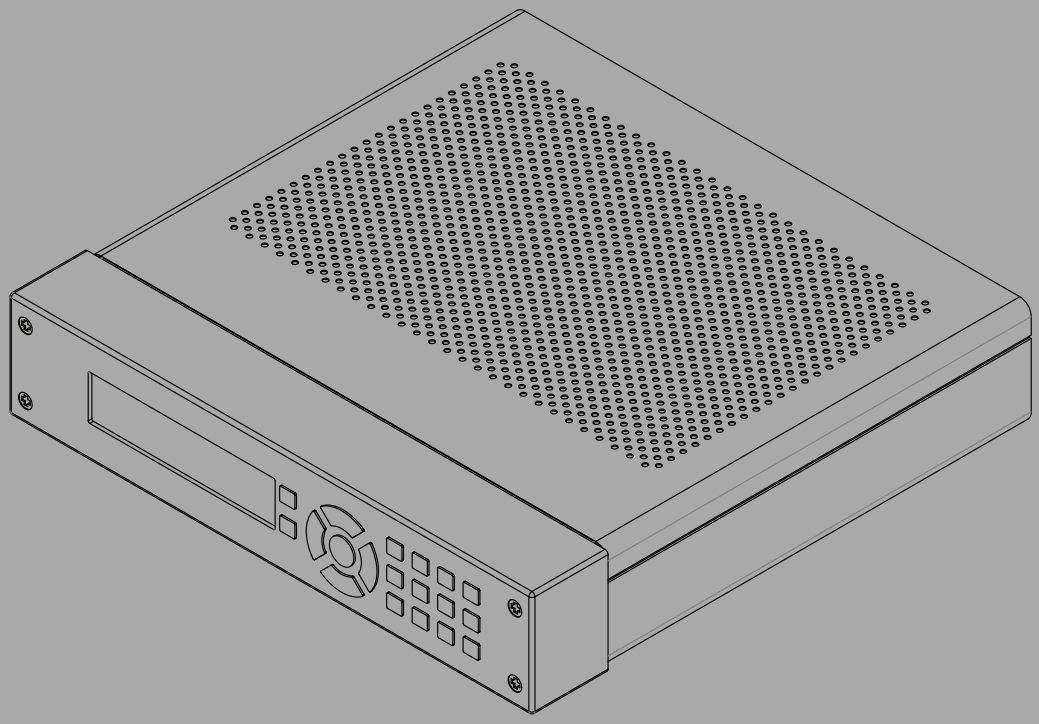
TIF-PRO2

TIF-PRO2



en Technical Manual

Table of contents

1 Safety

1.1 Copyright and Proprietary Notices

Proprietary notice

The product information and design disclosed herein were originated by and are the property of Bosch Security Systems, Inc. Bosch reserves all patent, proprietary design, manufacturing, reproduction, use and sales rights thereto, and to any article disclosed therein, except to the extent rights are expressly granted to others.

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
Email: Info@rtsintercoms.com

Return shipping instructions

Customer Service Department
Bosch Security Systems, Inc. (Lincoln, NE)
Telephone: 402-467-5321
Fax: 402-467-3279
Factory Service: 800-553-5992
Please include a note in the box, which supplies the company name, address, phone number, a person to contact regarding the repair, the type and quantity of equipment, a description of the problem and the serial number(s).

Shipping to the manufacturer

All shipments of product should be made via UPS Ground, prepaid (you may request from Factory Service a different shipment method). Any shipment upgrades will be paid by the customer. The equipment should be shipped in the original packing carton. If the original carton is not available, use any suitable container that is rigid and of adequate size. If a substitute container is used, the equipment should be wrapped in paper and surrounded with at least four (4) inches of excelsior or similar shock-absorbing material. All shipments must be sent to the following address and must include the Proof of Purchase for warranty repair. Upon completion of any repair the equipment will be returned via United Parcel Service or specified shipper, collect.
Factory Service Department
Bosch Security Systems, Inc.
8601 East Cornhusker Hwy.
Lincoln, NE 68507 U.S.A. Attn: Service

1.2 Notices

CE UL	CE Compliant and UL Certified

	**CAUTION** RISK OF ELECTRIC SHOCK DO NOT OPEN	
The lightning flash and arrowhead within the triangle is a warning sign alerting you of dangerous voltage inside the product.	Caution: To reduce the risk of electric shock, do not remove cover. No user-serviceable parts inside. Refer servicing to qualified service personnel	The exclamation point within the triangle is a warning sign alerting you of important instructions accompanying the product.
See marking on bottom/back of product.		

Warning!
Apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.

Warning!
This is a CLASS A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

Warning!
To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

1.3 Important safety instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug the apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

2 Introduction

The TIF-PRO2 provides increased IP/digital/analog connection density in a compact half-rack-unit form factor. The device offers seamless interoperability with the latest RTS IP/digital keypanels and matrices, along with legacy IP/digital/analog RTS intercom hardware. It comes equipped with two SIP IP lines, each with a 64 kbps data rate (with overhead 100 kbps); additional features and functions are available via chargeable software upgrades
Quiet, fan-free operation further enhances sound quality. Connectors include two analog AUDIO I/O or one digital AES/EBU I/O (software configurable), two TTL I/O, two relay outputs (all software configurable), two RS-485 with RTS control protocol, and two relay outputs. System configuration can be carried out via the front panel or remotely via the various software options.
In the 7kHz operation mode for each 7kHz (G.722) audio codec, separate transparent data channels with an RS-485 interface are available. These data channels are used for remote keypanel control.

Features

- Dual VoIP (SIP) as standard, PSTN, BRI-ISDN, and AES67 ready; and multiple modes for enhanced connectivity between keypanels and matrices.
- Fully interoperable with RTS digital/IP keypanels/matrices and legacy RTS hardware.
- User friendly, while maintaining quiet, fan-free operation; easy to control and configure via the front panel or remotely via specialized software.
- Standard package includes a single-unit rack-mount kit (dual-unit kit available), a desktop power supply (12 V), four adhesive rubber feet, an RS-485/audio adapter cable, and a USB stick with the TIF-PRO2 PC software and user manual.
- Designed to deliver superior audio performance, with 3.1 kHz audio bandwidth and 7 kHz of audio bandwidth in HD quality using the G.722 codec.

3 System overview

3.1 System safety

Introduction

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

In normal operation, the unit is safe.

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

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

General Safety Requirements

To keep the technically unavoidable residual risk to a minimum, it is 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 based on the respective manual.
- The unit must be operated by competent and authorized 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 authorized by the manufacturer. Any conversions or alterations carried out by other persons lead to a complete exemption of liability.
- Only specially qualified personnel is authorized to remove or override safety measures, and to carry out the maintenance of the system.
- External software is used at one’s own risk. Use of external software can affect the operation of the system.
- Use only tested and virus-free data carriers.

3.2 Functionality

The RTS TIF-PRO2 system incorporates a LAN interface, an ISDN telephone interface, and a POTS interface. A digital signal processor does the complete signal processing.
DSP 1:

- G.711 Audio encoding and decoding
- G.722 Audio encoding and decoding
- Signal processing
- Control of the complete system (Display, Relays, TTL)

Audio channels 1 and 2 take the input audio signal and convert it to analog or digital audio output. If using the digital AES / EBU audio interface, a sample rate converter at the input is available for automatic clock synchronization.
Use the front keypad and illuminated display to configure and operate the device.
Configuration and control is simple using the RTS TIF-PRO2 Windows PC software (included). The software communicates with the system via the LAN interface.
Complete basic operating functions like accepting a call, dropping a connection, and establishing a connection with a preprogramed number can be controlled using two programmable TTL contacts. There are two relays available for status indication.

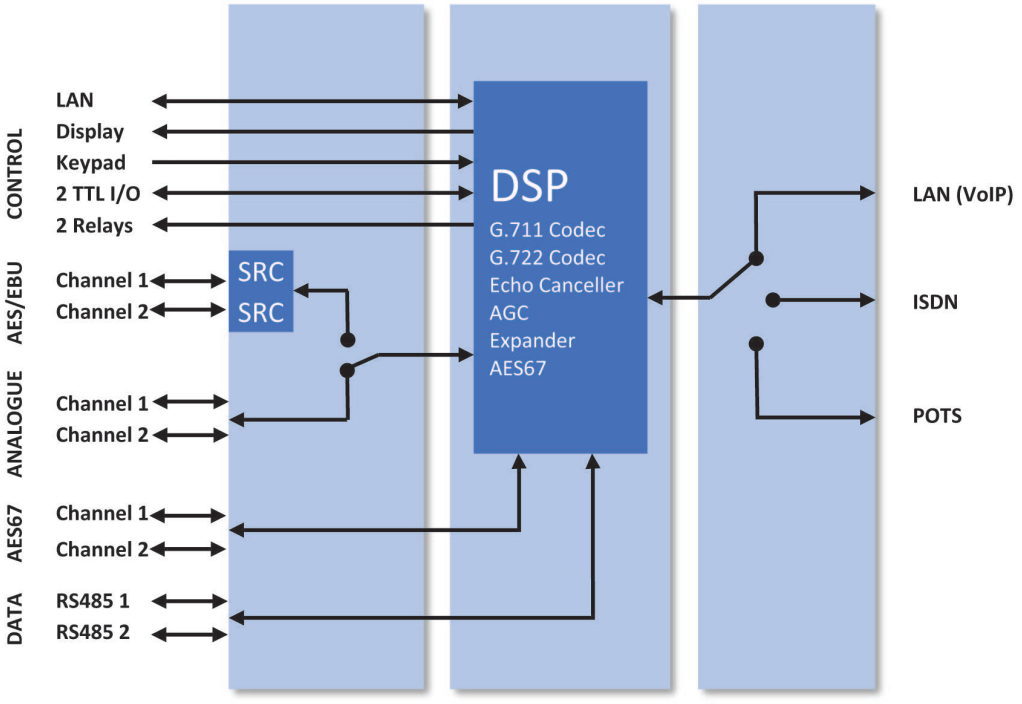
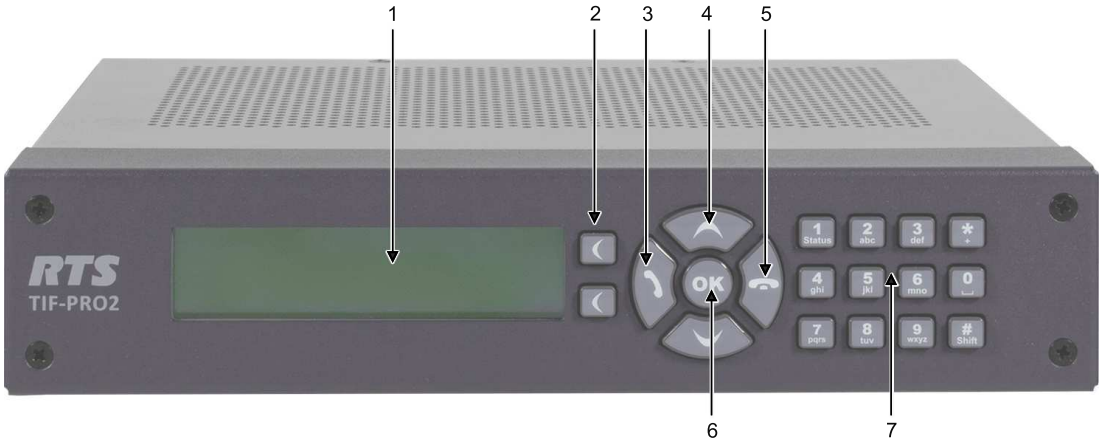


Figure 3.1: Functional elements

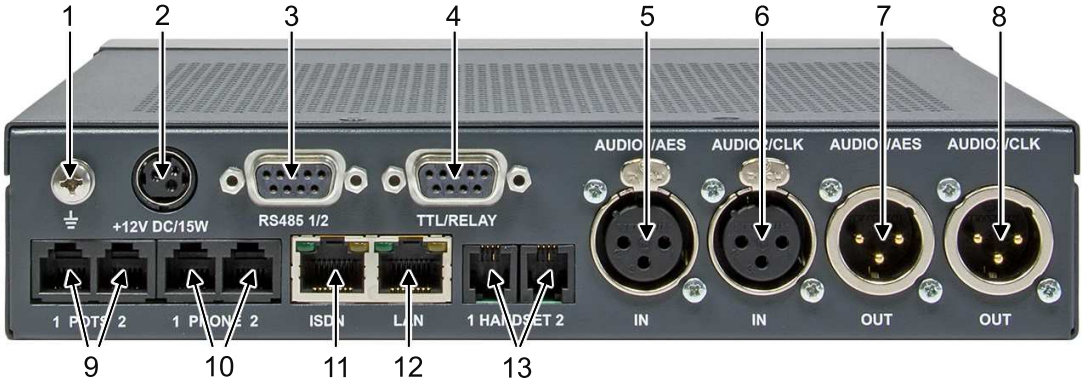
3.3 Controls and connections

Front panel



Callout	Description
1	Illuminated graphical display with a resolution of 160 x 32 pixels
2	Two soft keys whose current functions are indicated on the display
3	Navigation up and navigation down
4	Accept Call
5	Hang up call
6	OK button
7	Keypad that supports the numerals 0 through 9, *, and #. The keypad also supports alphanumeric entries.

Rear panel



Callout	Description
1	Grounding screw
2	Power supply
3	RS485 1 / 2
4	TTL/Relay

Callout	Description
5	Audio1 / AES Input
6	Audio2 / CLK Input
7	Audio1 / AES Output
8	Audio2 / CLK Output
9	POTS 1 / 2
10	Phone 1 / 2 (not used / reserved)
11	ISDN
12	LAN
13	Handset 1 / 2 (not used / reserved)

4 Construction

The functions of the RTS TIF PRO2 Software are implemented in a single unit. The system is designed for mounting in a half 19" rack (1 U).

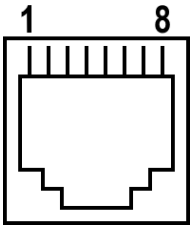
Figure 4.1: RTS TIF-PRO2 single unit

Optionally, an RTS TIF-PRO2 DUAL 19" mounting kit is available for the installation of two RTS TIF-PRO2 systems next to each other.

Figure 4.2: RTS TIF-PRO2 Dual 19" Mounting Kit

5 Interface pin assignments

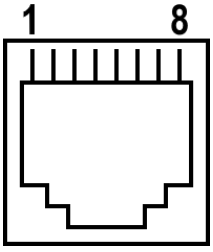
5.1 ISDN interface

	Type: RJ45		
	Pin	**Signal**	**Electrical characteristics**
	1	Not used	Recommendation: 1.430 Data rate: B channel: 2 x 64 kbit/s D channel: 16 kbit/s
	2	Not used	
	3	TX a Data out a	
	4	RX a Data in a	
	5	RX b Data in b	
	6	TX b Data out b	
	7	Not used	
	8	Not used	

Tab. 5.1: S0 Interface (ISDN Line)

5.2 LAN interface

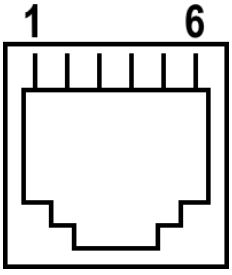
This interface supports the SIP protocol for building up two IP connections.

	Type: RJ45		
	Pin	**Signal**	**Electrical characteristics**
	1	TX+ Data out +	Recommendation: IEEE 802.3 / Ethernet Data rate: 10BaseT (10 Mbit/s) 100BaseTX (10 Mbit/s) Recommended cable: CAT5 Maximum cable length: 100 meters
	2	TX- Data out -	
	3	RX+ Data in +	
	4	Not used	
	5	Not used	
	6	RX- Data in -	
	7	Not used	
	8	Not used	

Tab. 5.2: LAN Interface

5.3 POTS 1 and 2 interface

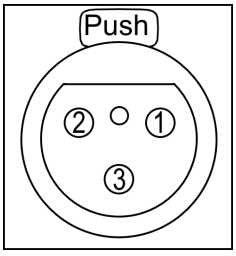
These interfaces are used to connect the system to analog telephone lines.

	Type: RJ12		
	Pin	**Signal**	**Electrical characteristics**
	1	Not used	Typical: Bandwidth: 300 Hz to 3.3 kHz Signal to noise ratio: 45 dB Average level: -9 dBm (275 mV) Impedance: 600 Ω DC voltage: 48 V ±6 V (typ) DC current: 20 to 26 mA (typ) Ringing voltage: 90 Vrms Ringing frequency: 20 Hz (2 sec on, 4 sec off)
	2	Not used	
	3	TEL LINE a	
	4	TEL LINE b	
	5	Not used	
	6	Not used	

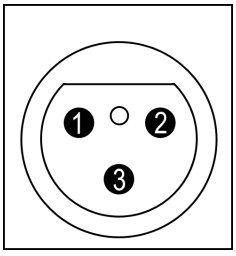
Tab. 5.3: POTS Telephone Interface (POTS Line)

5.4 Analog audio interface

The system incorporates analog and digital AES / EBU audio interfaces. Configure the interfaces via the front display and keypad or the PC software.

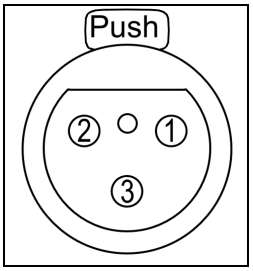
	Type: XLR		
	Pin	**Signal**	**Electrical characteristics**
	1	Analog GND	Incoming level : adjustable -3 to +9 dBu Impedance: >25 kΩ Head room: 6dB
	2	Audio IN a	
	3	Audio IN b	

Tab. 5.4: Analog Input (Audio 1 and 2 In)

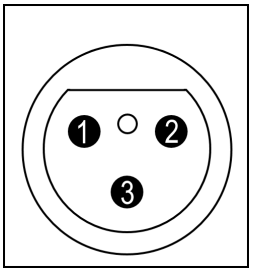
	Type: XLR		
	Pin	**Signal**	**Electrical characteristics**
	1	Analog GND	Incoming level : adjustable -3 to +9 dBu Impedance: 50 kΩ Head room: 6 dB
	2	Audio OUT a	
	3	Audio OUT b	

Tab. 5.5: Analog Output (Audio 1 and 2 Out)

5.5 Digital AES / EBU audio interface

	Type: XLR		
	Pin	**Signal**	**Electrical characteristics**
	1	Analog GND	IEC-958
	2	Audio IN a	
	3	Audio IN b	

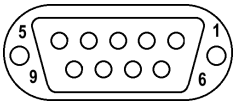
Tab. 5.6: Digital Input (AES In)

	Type: XLR		
	Pin	**Signal**	**Electrical characteristics**
	1	Analog GND	IEC-958
	2	Audio IN a	
	3	Audio IN b	

Tab. 5.7: Digital Output (AES Out)

5.6 RS485 1 and 2 interface

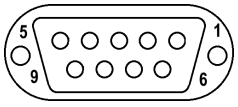
Two data interfaces for transparent data transmission are implemented by this interface.

	Type: D-SUB 8-pole female		
	Pin	**Signal**	**Electrical characteristics**
	1	Not used	Recommendation: V.11 Maximum cable length: 100 m
	2	In / Out A 1	
	3	In / Out B 1	
	4	Not used	
	5	GND	
	6	Not used	
	7	In / Out B 2	
	8	In / Out A 2	
	9	Not used	

Tab. 5.8: RS485 Interface

5.7 TTL / Relay interface

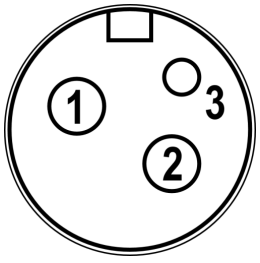
The TTL / Relay Interface provides two TTL contacts that can be configured as input or output and two relay contacts.

	Type: D-SUB 8-pole female		
	Pin	**Signal**	**Electrical characteristics**
	1	TTL 1	TTL Output: Output voltage: 3.3 V Maximum current: 10 mA Relay: Maximum voltage: 48 V Maximum current: 200 mA
	2	TTL 2	
	3	Not used	
	4	Not used	
	5	GND	
	6	Relay 1 a	
	7	Relay 1 b	
	8	Relay 2 a	
	9	Relay 2 b	

Tab. 5.9: TTL / Relay Interface

5.8 Power supply interface

The power supply uses an external power supply adapter to connect.

	Type: KYOC KPJ-S3		
	Pin	**Signal**	**Electrical characteristics**
	1	GND	Voltage: +12 V DC Power: 15 W maximum
	2	+12 V	
	3	Not used	

Tab. 5.10: Power Supply

6 Installation

6.1 Mounting

With its dimensions (W × H × D) of 220 mm × 44,5 mm (1 U) × 220 mm the RTS TIF-PRO2 System can be used either as desktop device or mounted in 19” racks. Corresponding 19” mounting brackets are included in delivery. Optionally, a mounting kit to install two RTS TIF-PRO2 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 TIF-PRO2 Audio Codec is installed, please make sure that there is sufficient ventilation: It is recommended to keep a spacing of at least 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 specially to observe if the system is inserted in a rack. The system works without ventilation.

Notice!
The system temperature displays on the front panel under MENU | STATUS INFORMATION | SYSTEM TEMPERATURE.

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

Caution!
Incorrect ambient temperature and humidity may cause functional deficiencies. Operation outside the threshold values may void the warranty.

6.2 Connection to the mains voltage

The system operates with mains voltages in the range from 100 V to 230 V (± 10 %) via the external power supply. The line frequency can vary from 43 Hz to 63 H. The maximum power consumption is 15W. It is necessary to ground the rack according to the VDE Regulations. Grounding is done out via the grounding screw on the rear panel.

The unit does not have a circuit closer or a circuit breaker. After plugging in the external power supply, the system boots within a few seconds. After the reboot, the RTS TIF-PRO2 logo shows on the front display. After a few seconds, the display switches to the LEVEL screen showing the status of channel 1.

6.3 Grounding the system

For EMC reasons, ground the system using the grounding screw on the rear panel of the unit.

Caution!
Not grounding the unit can cause unintended functional issues.

7 Line modes

The following illustrations show the systems in different operating modes and the corresponding wiring.

7.1 VoIP

In the VoIP mode, use the independent 64 kbit/s channels for two transmissions.

1	Grounding screw
2	Power supply
3	VOIP
4	Analog Audio 1 / AES/EBU Input
5	Analog Audio 1 / AES/EBU Output

Tab. 7.11: Minimum wiring for IP operation

Using the LAN interface, connect the PC running the RTS TIF PRO2 Software as an alternative to front panel operation.

1	Grounding screw
2	Power supply
3	RS485 1 RS485 2

4	TTL 1 TTL 2 Relay 1 Relay 2
5	VoIP PC
6	Analog Audio 1 and 2 / AES/EBU Input
7	Analog Audio 1 and 2 / AES/EBU Output

Tab. 7.12: Maximum wiring for IP operation

7.2 POTS (optional)

In the POTS operating mode, two independent telephone lines are available which can be used separately for two transmissions.

Notice!
If the POTS interfaces are in operation, it is necessary to ground the system using a grounding screw. If the system is not grounded, the caller can experience poor audio quality (i.e., humming).

1	Grounding screw
2	Power supply
3	POTS 1
4	Analog Audio 1 / AES/EBU Input
5	Analog Audio 1 / AES/EBU Output

Tab. 7.13: Minimum wiring for POTS operation

Using the LAN interface, connect the PC running the RTS TIF PRO2 Software as an alternative to front panel operation.

1	Grounding screw
2	Power supply
3	RS485 1 RS485 2
4	TTL 1 TTL 2 Relay 1 Relay 2
5	POTS 1
6	POTS 2
7	PC
8	Analog Audio 1 and 2 / AES/EBU Input
9	Analog Audio 1 and 2 / AES/EBU Output

Tab. 7.14: Maximum wiring for POTS operation

7.3 ISDN (optional)

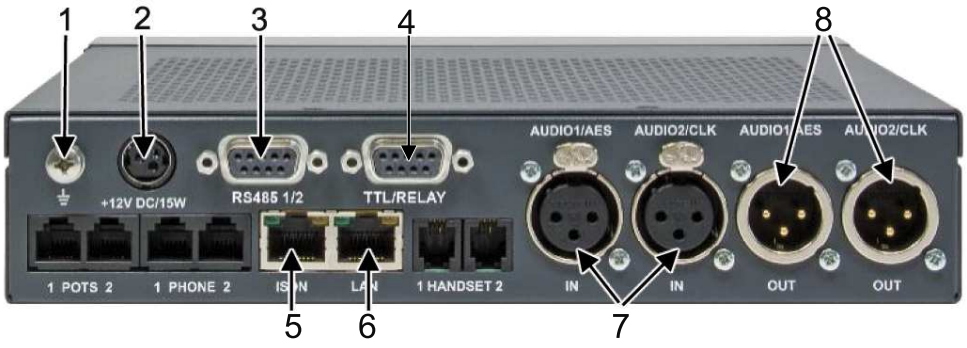
In ISDN operating mode, two independent B channels are available for two separate transmissions.

1	Grounding screw

2	Power supply
3	ISDN
4	Analog Audio 1 / AES/EBU Input
5	Analog Audio 1 / AES/EBU Output

Tab. 7.15: Minimum wiring for ISDN operation

Using the LAN interface, connect the PC running the RTS TIF PRO2 Software as an alternative to front panel operation.



1	Grounding screw
2	Power supply
3	RS485 1 RS485 2
4	TTL 1 TTL 2 Relay 1 Relay 2
5	ISDN
6	PC
7	Analog Audio 1 and 2 / AES/EBU Input
8	Analog Audio 1 and 2 / AES/EBU Output

Tab. 7.16: Maximum wiring for ISDN operation

8 Operation modes

8.1 Mode 1: Telephone to keypanel

Use the RTS TIF-PRO2 to transmit audio between external telephones and a matrix.

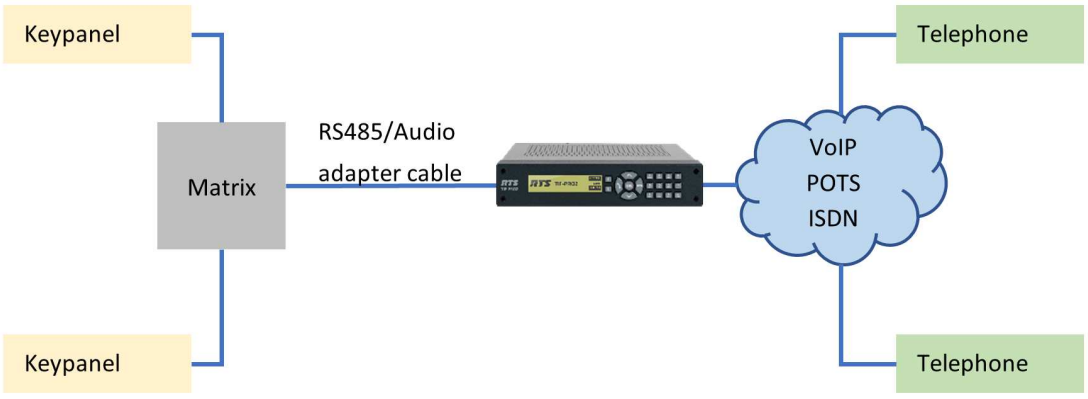


Figure 8.1: Telephone to keypanel

8.2 Mode 2: Keypanel to matrix

Use two RTS TIF-PRO2 to transmit audio between two matrixes (only available in VoIP mode).

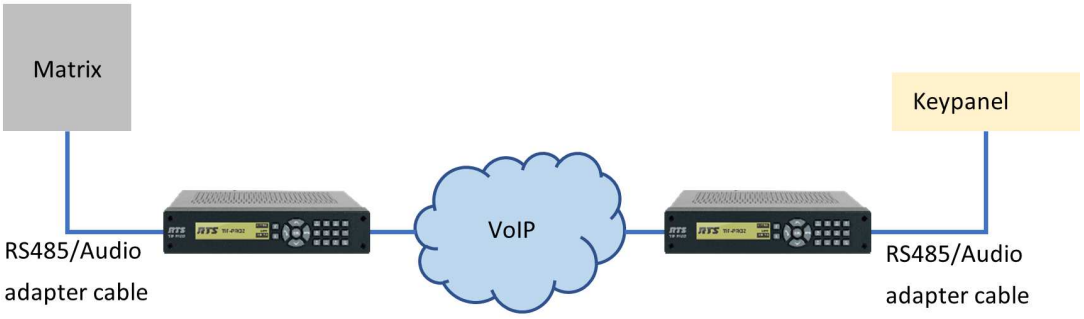


Figure 8.2: Keypanel to matrix

8.3 Mode 3: Matrix to matrix

Use two RTS TIF-PRO2 to transmit audio and data between a matrix and a remote keypanel over the telephone network. (Only possible in VoIP or ISDN mode.)

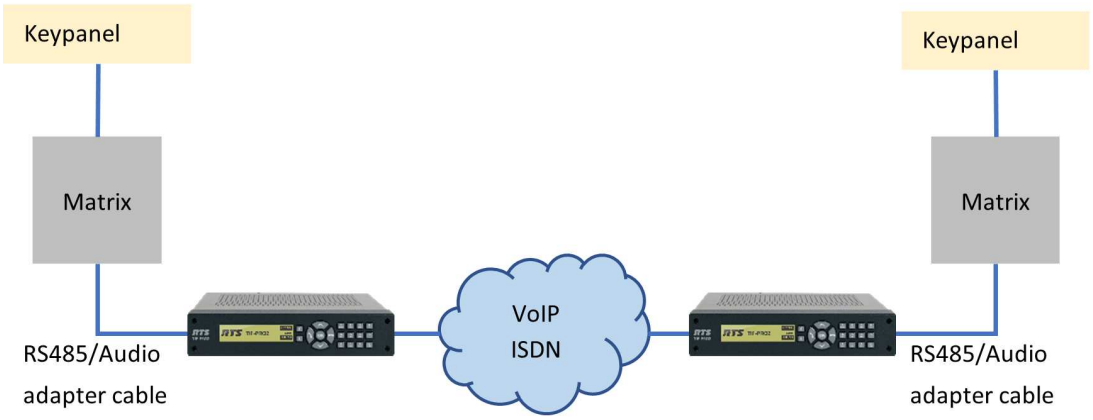


Figure 8.3: Matrix to matrix

9 Display and keypad operation

In this chapter, the operation of the RTS TIF-PRO2 as well as the basic configuration of the system via front display and keypad are described.

Notice!
The RTS TIF-PRO2 Software included in delivery is more convenient to use and provides additional configuration options.

9.1 Front panel navigation

The current function of the softkeys is displayed next to them on the display.
Navigate the front display via the **softkeys** and the **arrow-keys**. The whole display structure can be found in *Display structure, page 31*.

Refer to
– *Display structure, page 31*

9.2 Initial start-up

When starting the RTS TIF-PRO2 for the first time, you must configure an administrator password from the front display.

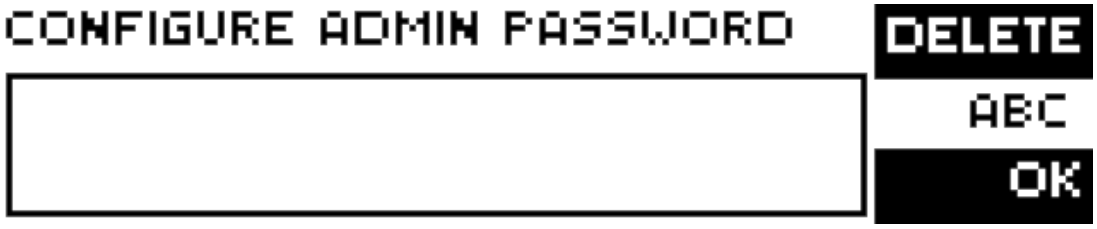


Figure 9.1: Configure the Administrator Password

Password configuration is mandatory to access the PC software. For more information see, *Secure login, page 30*.

9.3 Logo screen

After starting up, the RTS TIF-PRO2 displays the **Logo** screen for a few seconds.

Figure 9.2: Logo screen

Press **MENU** to:
– **Configure** the unit (only available if logged in).
– **Manage** presets.
– **Get** status information (Version, Licenses, LAN Status, ...).
– **Manage** the login passwords.
– **Log** in to the unit.

Press the **hang up button** to display device information such as:
– System name.

- Current IP address.
- VLAN status.
- SIP registration status and username.

After a few seconds, the display automatically switches to the level screen that can also be activated with the **LEVEL** softkey.

9.4 Level screen

This is the default screen of the RTS TIF-PRO2. It is displayed when the unit is in idle state.

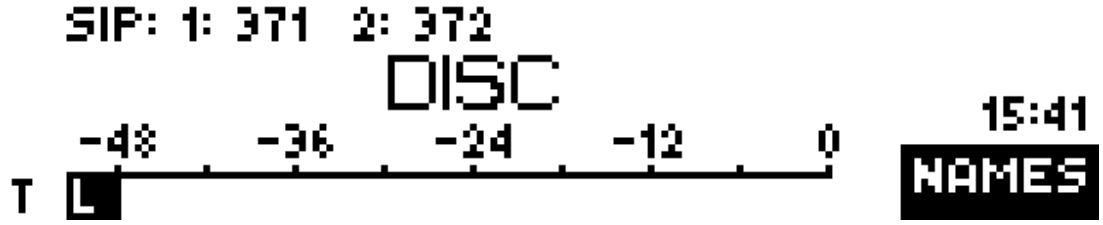


Figure 9.3: Level screen

At the top, the current line mode is displayed. If the line mode is VoIP / SIP, the registration state of channels 1 and 2 are displayed next to it. If the registration was successful, the SIP Username is displayed, otherwise “INVALID” is displayed.
In the middle, “DISC” indicates that the line is disconnected.
At the bottom, the level of the audio signal of the audio input of channel 1 is displayed.
Press **NAMES** to enter the phone book.

Press the **dial key** to display a list of the last 10 numbers for redialing.
Enter a digit on the a**lphanumerical keypad** to start dialing a phone number.
Press the **hang up button** to go back to the logo screen.
Press the **OK** button to enter the Connection Screen.

9.5 Connection screen

Control the audio connections via the **Connection Screen**.

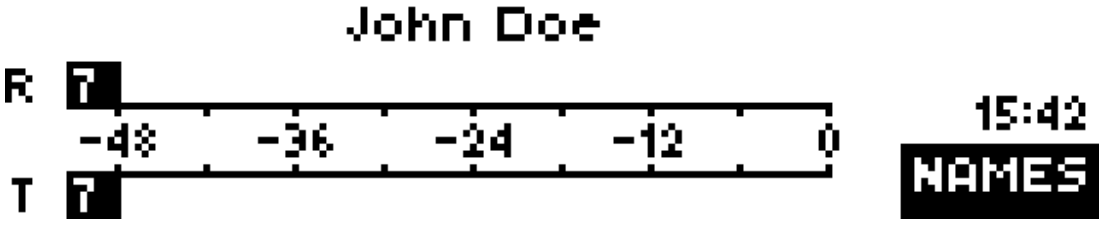


Figure 9.4: Connection screen - 1 channel

Figure 9.5: Connection screen - 2 channels

At the top, the caller’s name or phone number is displayed during a connection. Otherwise, the line number (LINE 1 or LINE 2) is displayed.

During a connection, the level meter shows the audio level in receive (R) and in send (T) direction in dBFS. The algorithm is indicated at the base of each level meter:
7: HD-Voice audio with 7 kHz audio bandwidth.
T: Standard audio with 3.1 kHz or 3.4 kHz audio bandwidth depending on the line mode.

If there is no connection, the line state is displayed:
– **DISC**: The line is disconnected.

- **CALL IN**: Someone is calling in. The phone number or the name of the caller is displayed.
- **CALL OUT**: The unit is calling out. The phone number or the name of the called party is displayed.
- **CALL SETUP**: The unit is preparing to call out.

If there is an incoming call, accept the call using the telephone receiver button. If you want to reject the call, press the **hang-up button**.

Press the **hang-up button** to disconnect.

Press the **#** key to switch between channel 1 and channel 2. If channel 2 is disconnected and channel 1 is active, only channel 1 is displayed. Otherwise, the 2-channel connection screen is displayed.

Press **NAMES** to enter the phone book.

9.6 Dial screen

Start entering a telephone number in the Level Screen or in the Connection Screen to enter the Dial Screen.

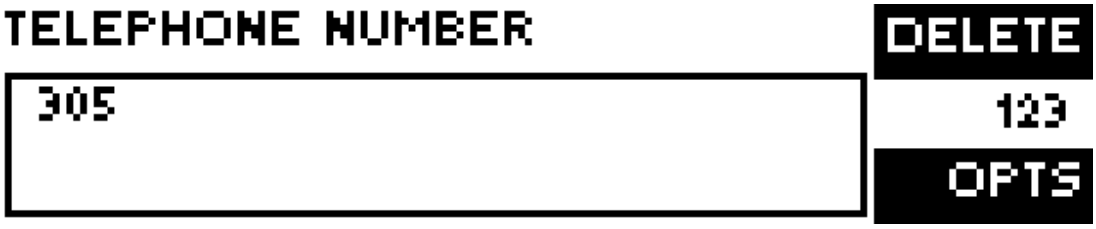


Figure 9.6: Dial screen

Type the **number** using the alphanumerical keypad.
Press **DELETE** to erase the last entered digit.
Press **OPTS** to:

- SAVE the number to the phone book.
- SAVE the number as front keypad SHORTCUT.

9.7 Phone book screen

Enter the **Phone Book Screen** via the Level Screen or the connection screen by pressing the **NAMES** softkey.

Figure 9.7: Phone book screen

Enter a **search term** to filter the phone book. The result is shown below the search bar. Use the arrow-keys to select an entry.

Press **OPTS** to:

- Create a **NEW** entry.

- **EDIT** the selected entry.
- **VIEW** the selected entry.
- **DELETE** the selected entry.
- **SAVE** the selected entry **AS** front keypad **SHORTCUT**.

9.8 Keypad lock

To avoid that keys are pressed accidentally you can enable a keypad lock.
For activation, press the **MENU** key followed by the ***** button. If the keypad lock is enabled the display backlight is turned off immediately and a key icon is displayed next to the clock.
The keypad lock is deactivated by entering the key sequence **MENU + *** again.
If you are logged out, the sequence is **LOGIN + *** .

9.9 Secure login

Access to the configuration of the RTS TIF-PRO2 via front display is restricted by passwords. By default, **Secure Login** is active. It mandates that an Administrator Password must be in place. You must set an Administrator Password at the front display when the RTS TIF-PRO2 is put into operation.
Password requirements
- Minimum eight characters.
- At least one letter, one digit, one special character.
- Acceptable special characters: +, *, ., -, !, #, and @.
- Passwords cannot be the same for Administrator and User.

The **Administrator Password** protects access to:
- Displaying and changing the configuration.
- Managing presets.
- Export and import of the telephone book.
- Export and import of the system configuration.

The **User Password** enables loading of presets.
The User Password adopts the role of the administrator password if just the User Password is set.
You may log out via **MENU | LOGIN | LOGOUT**. In addition, you are logged out automatically after 60 seconds.
If you are logged out, enter the **MENU** and select **LOGIN** to authorize access by entering the administrator password.

Figure 9.8: Menu screen when logged out

If you are logged in, select **LOGIN** to change the passwords.
It is possible to disable Secure Login:
- Make sure you are logged in.
- Enter **MENU**, select **LOGIN** and then **DEACTIVATE SECURE LOGIN**.
- Authorize the deactivation by entering the **Administrator Password**.
- When the authorization was successful, **Secure Login** deactivates.

– Now, it is possible to remove the Administrator Password:
  – Enter **MENU**, select **LOGIN** and then **ADMINISTRATOR PASSWORD**.
  – Delete the password via the upper softkey and confirm via the lower softkey.

Notice!
Secure login activates again by resetting the RTS TIF-PRO2 to factory settings.

9.10 Menu

Press the **MENU** softkey on the Logo Screen to enter the menu. If a password is set, log in to enable access to **SYSTEM SETTINGS** and **OPERATION SETTINGS**.

Figure 9.9: Menu screen when logged in

Use the **arrow-keys** to navigate the menu.

Notice!
It is possible to navigate the menus via Quick Menu key sequences. For this purpose, each menu item is marked with menu reference number in the upper left corner.
To reach a certain menu directly, type the respective digit via the alphanumerical keypad.
The menu reference number may change depending on the configuration.

Notice!
If the configuration has changed, you are asked if you want to SAVE SETTINGS when you leave the menu. Press YES to store the changes permanently in the unit. If you press NO the changes are lost when the unit is restarted.

9.11 Display structure

Notice!
Depending on the selected operating mode or line mode, some menu items are not displayed. These elements are shown in brackets.

9.11.1 Main

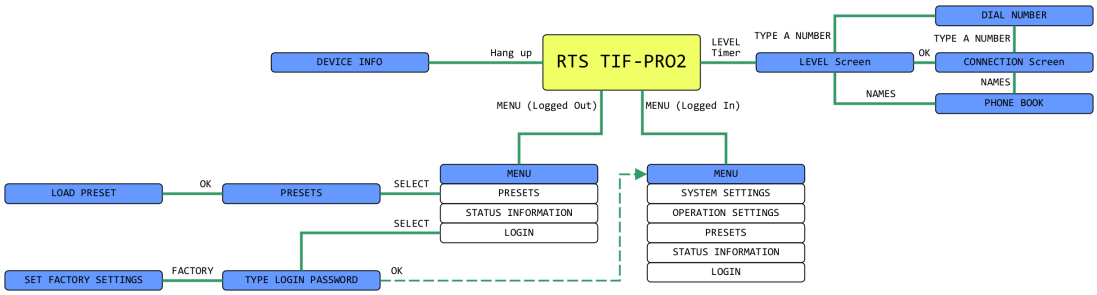


Figure 9.10: Front display - Main

9.11.2 Phone book

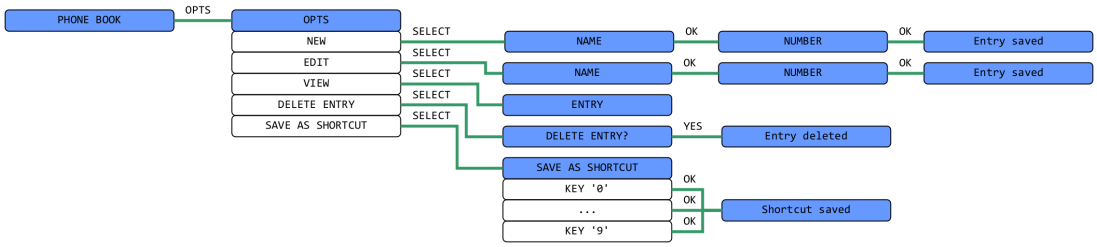


Figure 9.11: Front display - Phone book

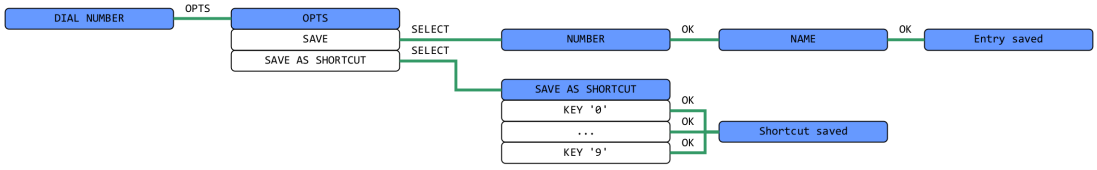


Figure 9.12: Front display - Dial number

9.11.3 System settings

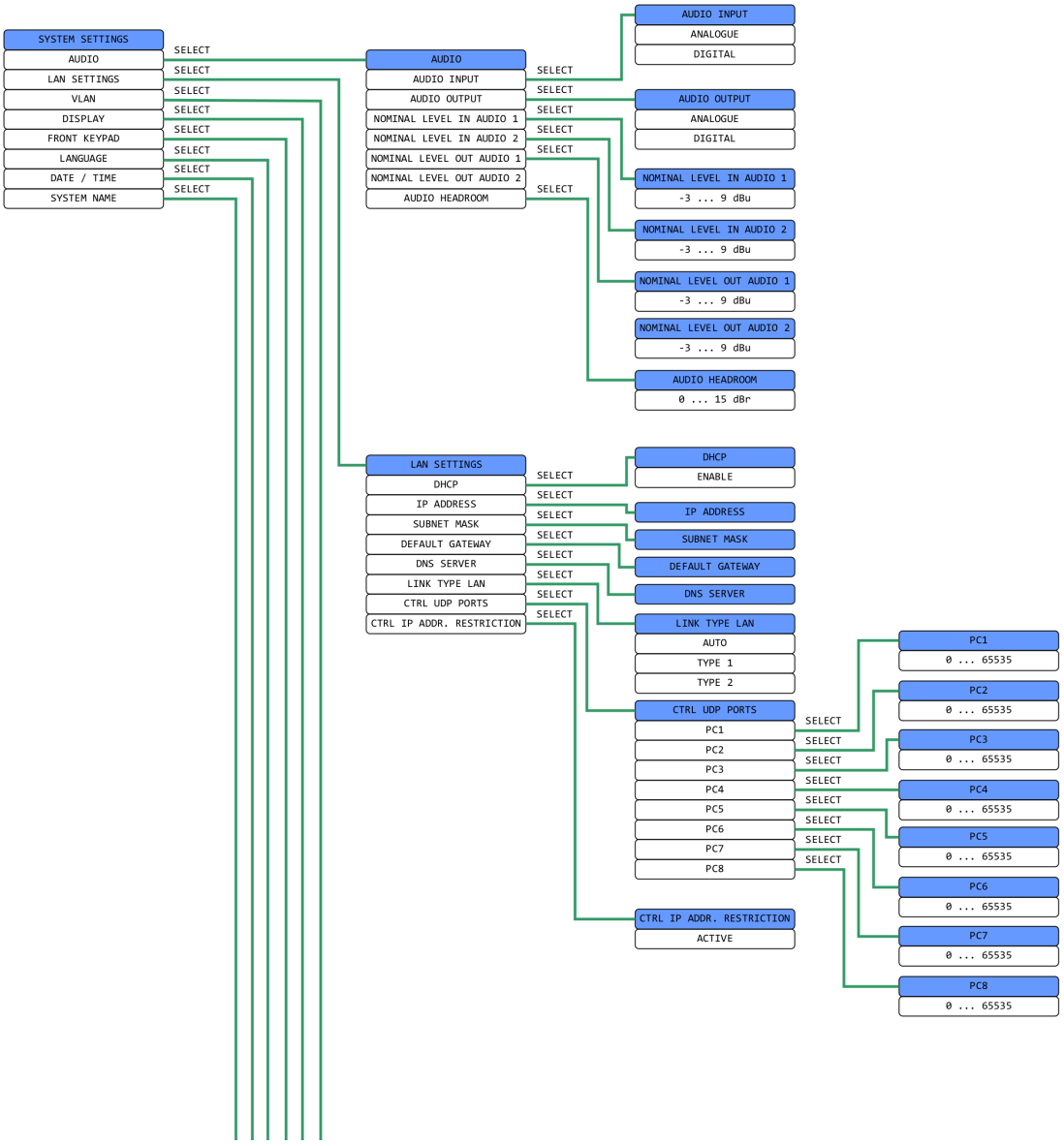


Figure 9.13: Front Display - System Settings (part 1)

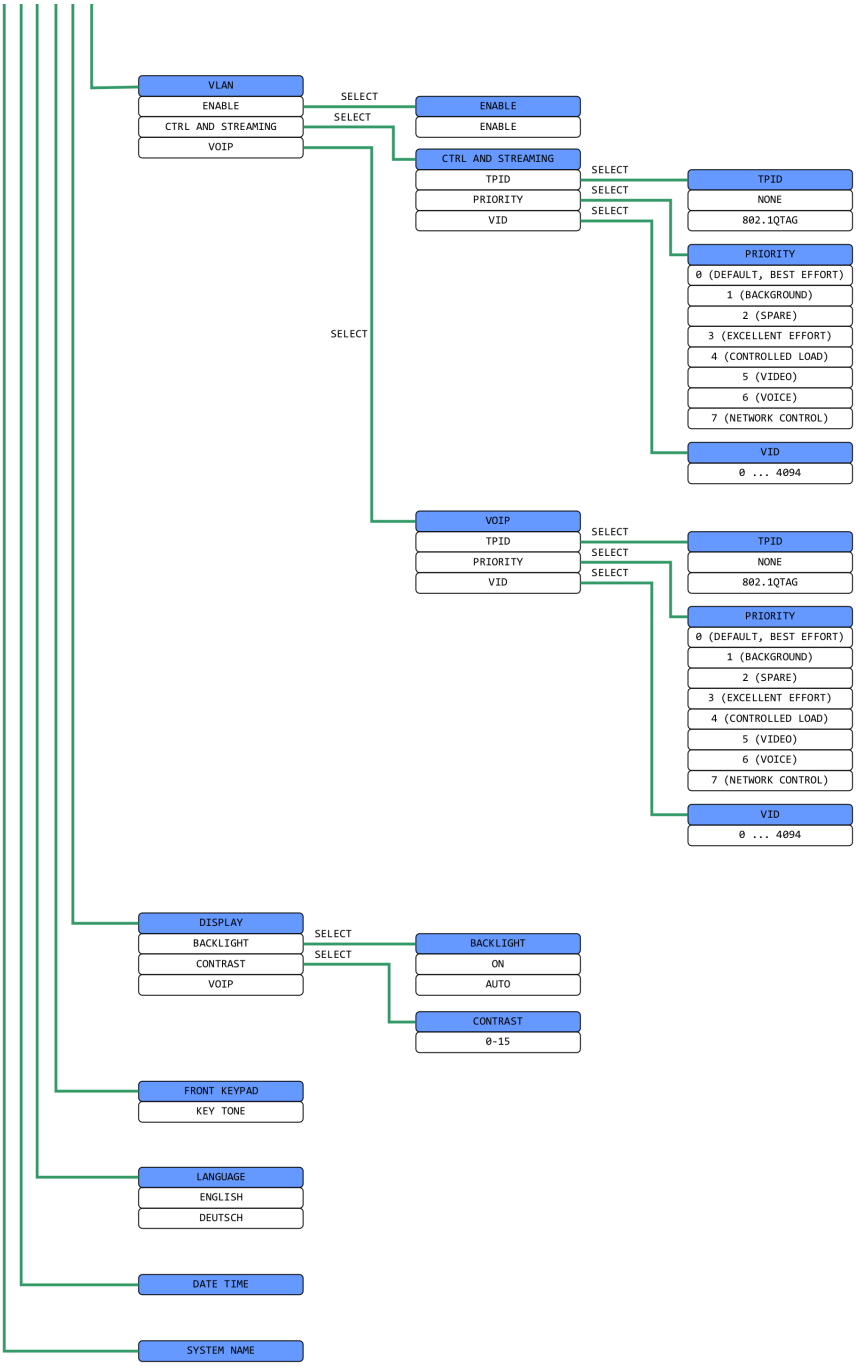


Figure 9.14: Front Display - System Settings (part 2)

9.11.4 Operation settings

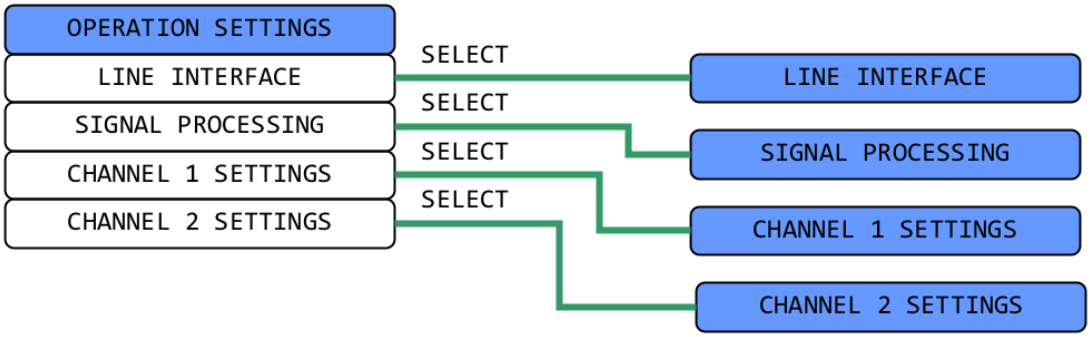


Figure 9.15: Front Display - Operation Settings Overview

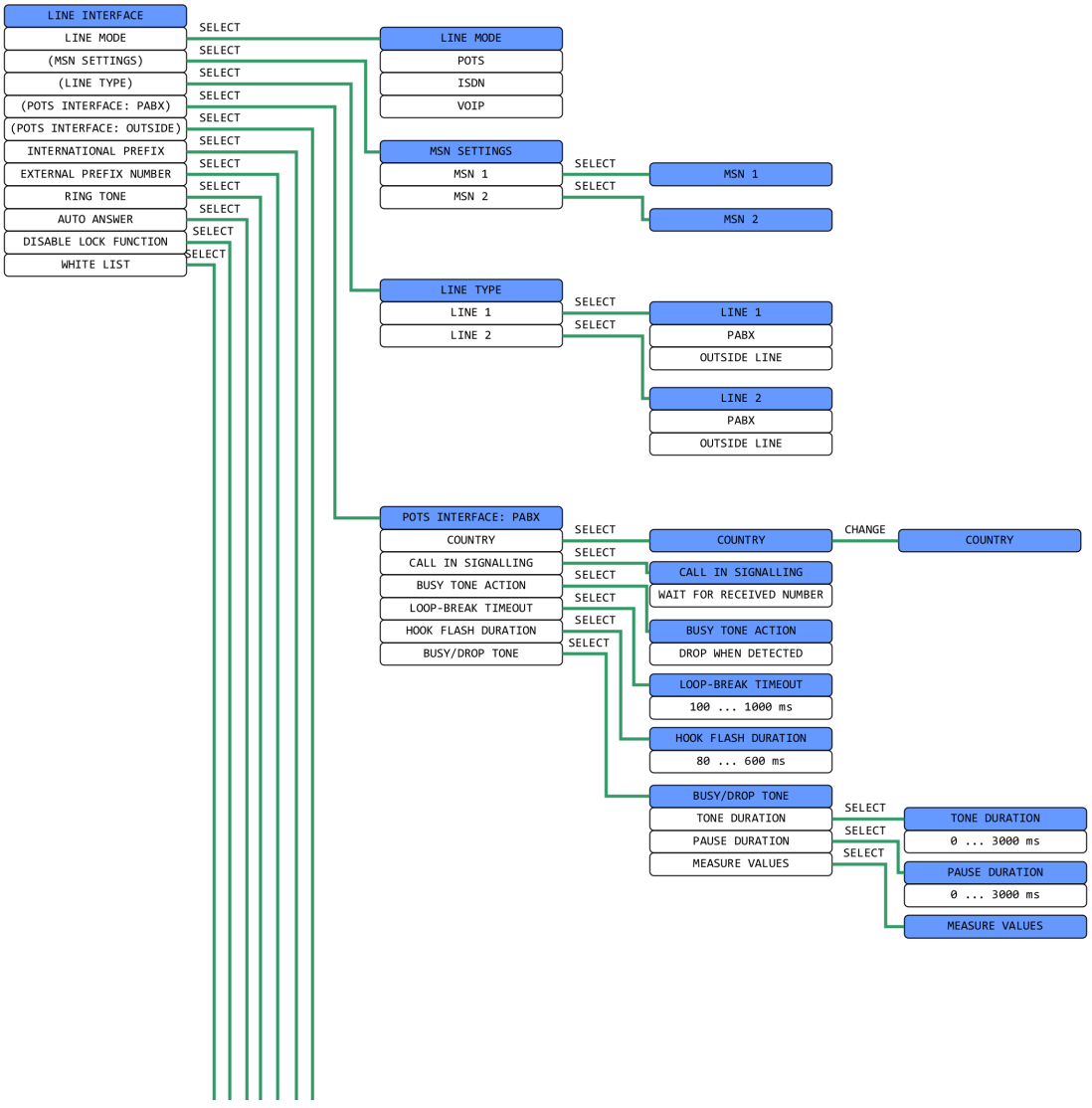


Figure 9.16: Front Display - Operation Settings - Line Interface (part 1)

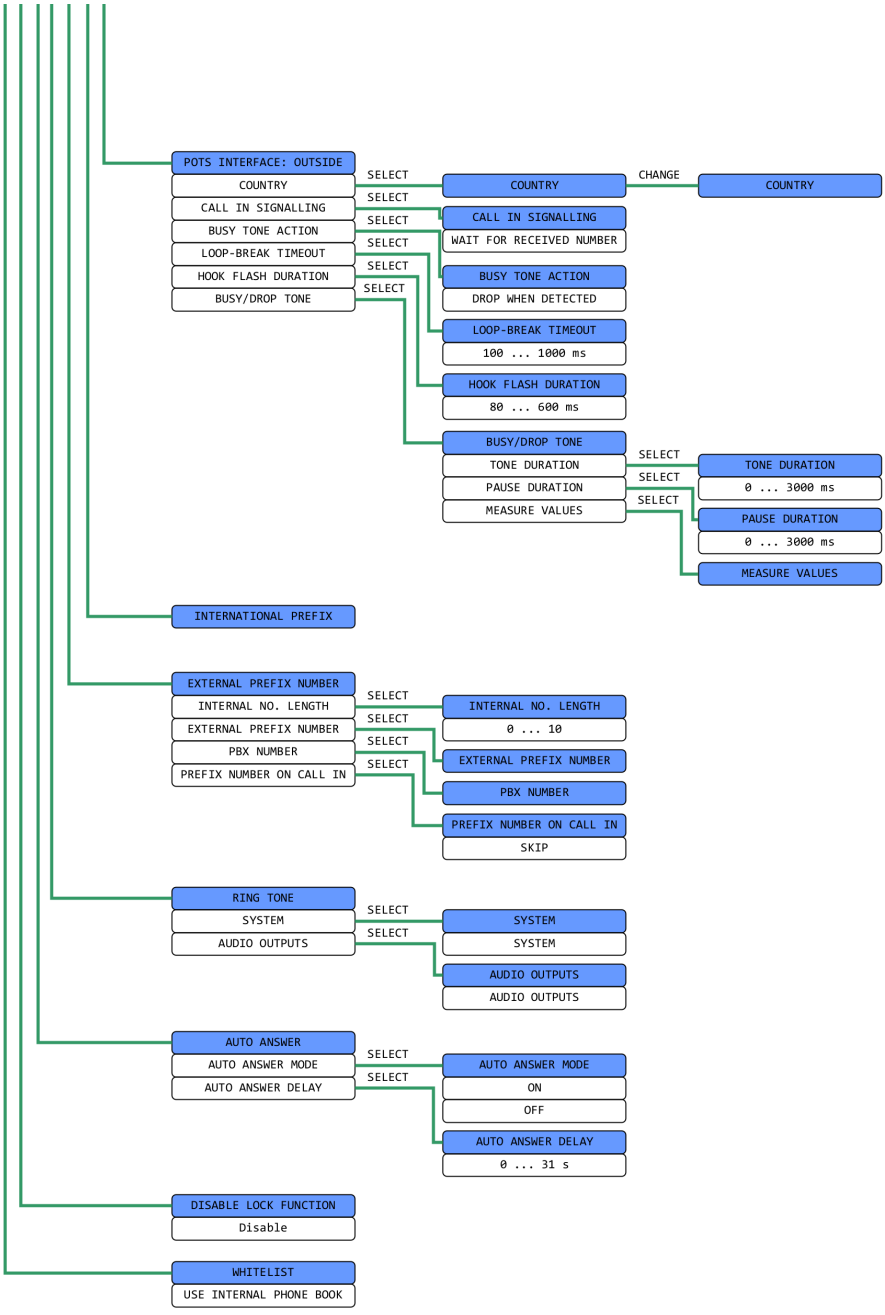


Figure 9.17: Front Display - Operation Settings - Line Interface (part 2)

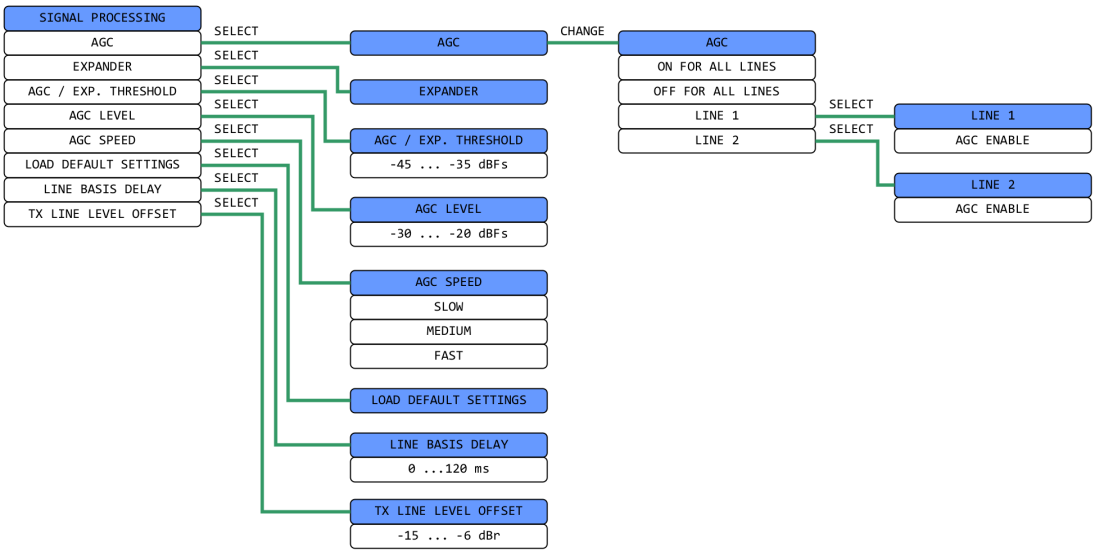


Figure 9.18: Front Display - Operation Settings - Signal Processing

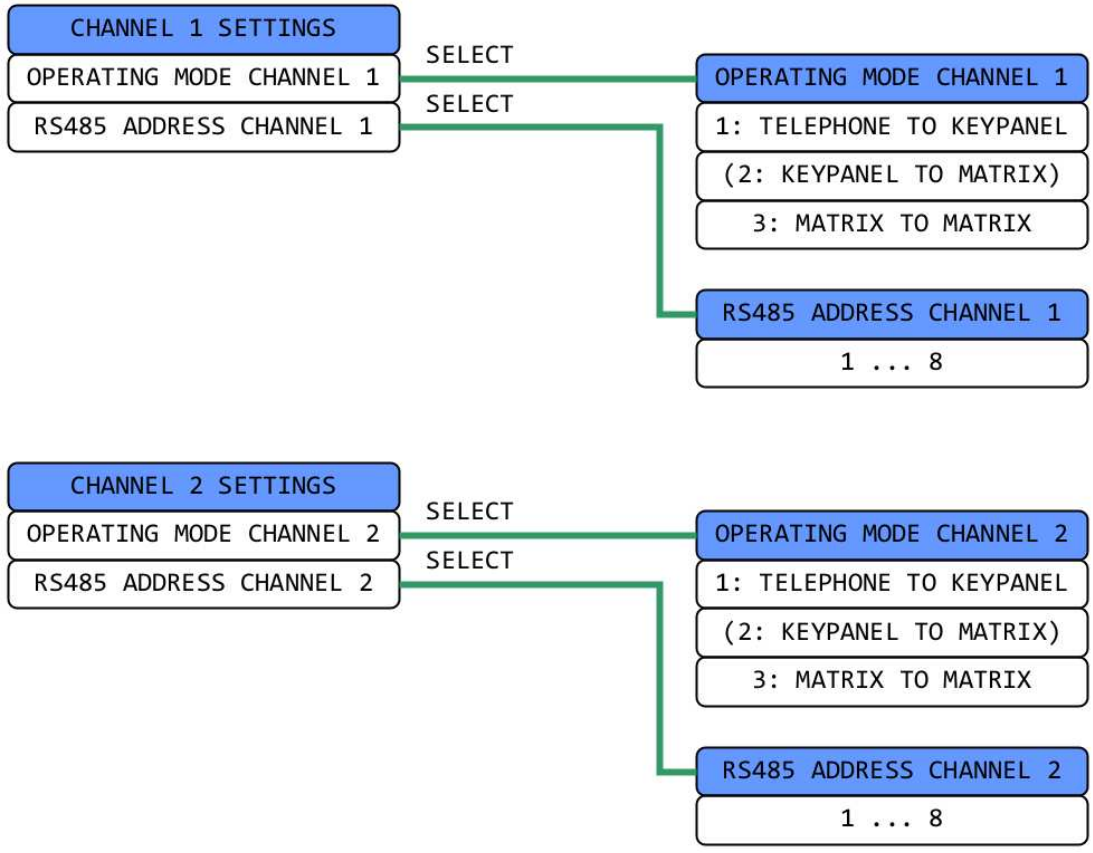


Figure 9.19: Front Display - Operation Settings - Channel Settings

9.11.5 Presets

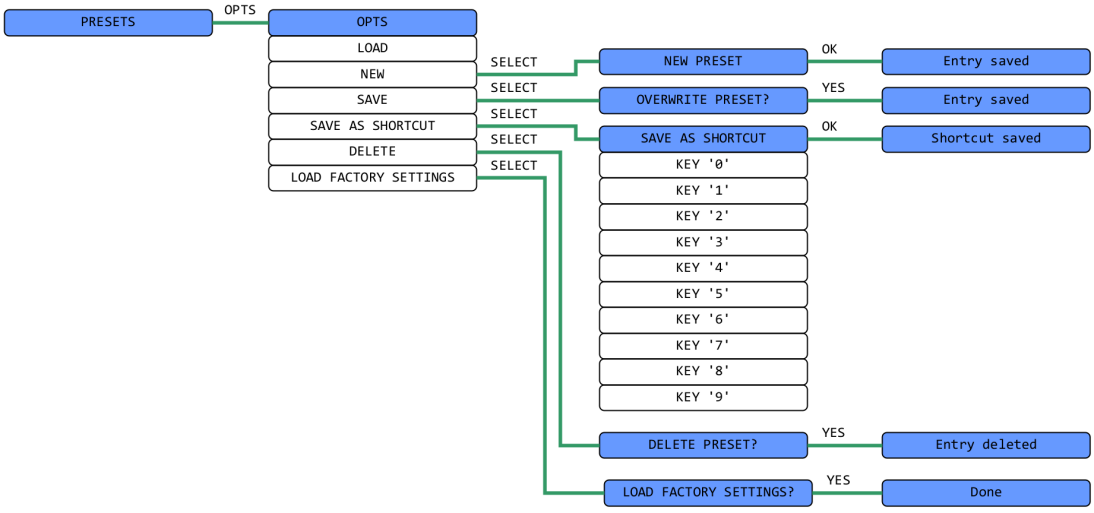


Figure 9.20: Front Display - Presets

9.11.6 Status information

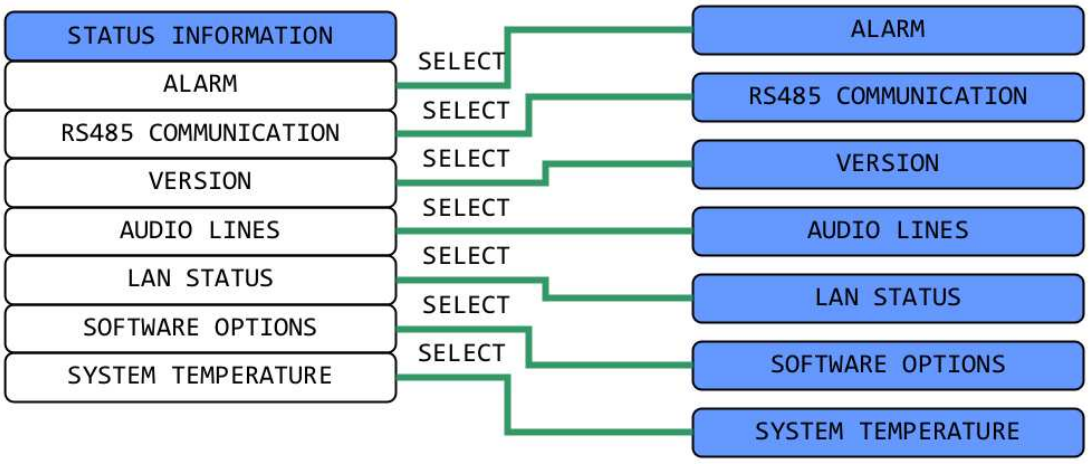


Figure 9.21: Front Display - Status Information

9.11.7 Login

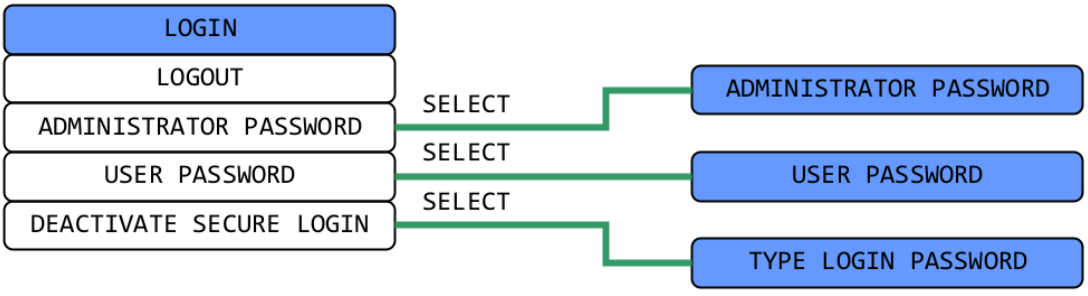


Figure 9.22: Front Display - LOGIN

10 Windows PC software

10.1 Hardware requirements

The PC must meet the following minimum requirements:
- x86 Processor (> 1 GHz) recommended.
- Windows 10
- 4 GB RAM
- 20 MB available hard disk space
- Screen resolution 1280 x 720 or higher.

10.2 Installation

1. Connect the USB drive included in delivery to a USB port of your PC.
2. Open the **USB drive in Windows Explorer** and run the **installation file setup.exe** from the folder **Software\RTS TIF-PRO2**.
3. Follow the **instructions** of the installation routine.

After the installation, the software can be started by clicking on the RTS TIF-PRO2 icon on the desktop.

1. **Connect** the RTS TIF-PRO2 to the same network as your PC.
2. Enter the **IP address** of the device under **Menu | Configuration | Control Interface**.

Notice!
You may need to run the PC software as Administrator to be able to change the Control Port settings. This depends on the Settings Location defined in the Local Settings.

The default IP address of the RTS TIF-PRO 2 is 192.168.96.102. You may adjust the IP settings of the unit via the front display to match your local network.

10.3 Main window

After starting the RTS TIF-PRO2 software, the main window is displayed. On first start-up, the PC Software has no connection to the unit.
The RTS TIF-PRO2 provides two channels that are displayed next to each other.

Figure 10.1: Main Window - No Connection

1	Alarm indicator
2	Connection status

Alarm Indicator

ALARMS

The “Alarms” button is shown when there is a problem with the connection to the RTS TIF-PRO2 or when there is a problem on the connected RTS TIF-PRO2.

1. Press the **alarm button** to display more information.

Figure 10.2: Alarm Information Window

2. Press **HIDE** to close the alarm information window.

Notice!
The RTS TIF-PRO2 is connected to the PC software, you can get more information on the system status via Menu | Extras | System # | System Monitor.

NO CONNECTION

Connection Status
The connection status shows if there is no connection to the RTS TIF-PRO2 or during the process of connecting to the RTS TIF-PRO2.

When the connection is fully established, the connection status does not show to minimize distractions on the main window.

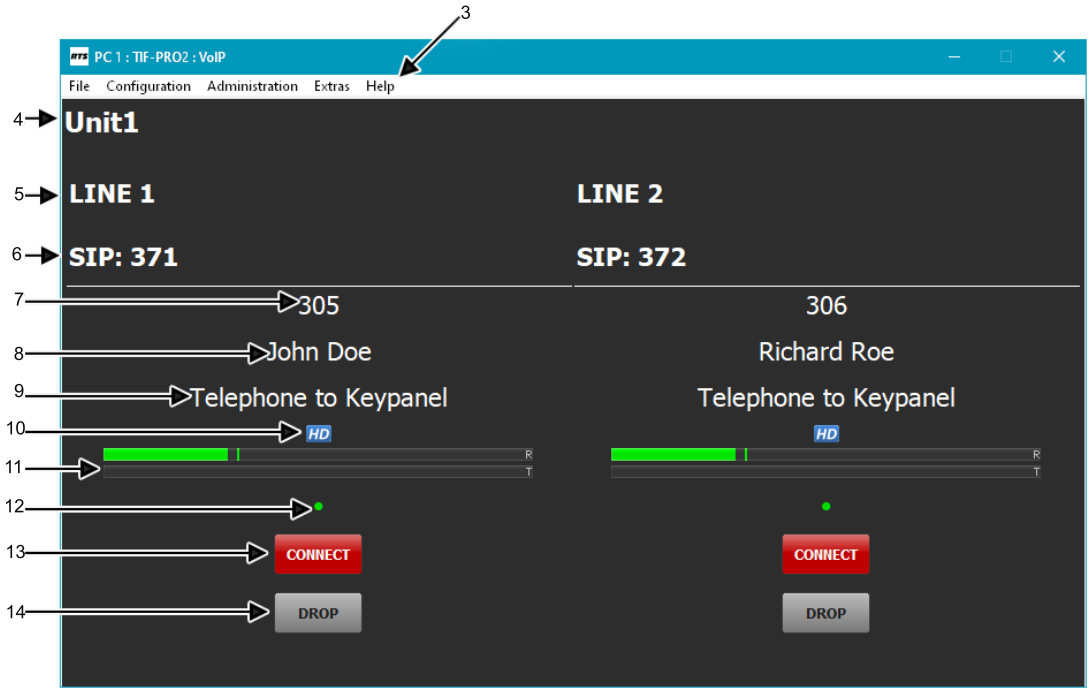


Figure 10.3: Main Window - Connected

3	Menu bar
4	System name
5	Line label
6	Line mode / own number
7	Caller information: Number
8	Caller information: Name
9	Operation mode
10	HD-Voice indicator
11	Level meter
12	Stream quality indicator
13	Call / Accept / Connect button

14	Drop button

Menu Bar
See *Menu bar, page 47*.

System Name
Displays the configurable system name. (See *General, page 80*.)

Line Label
Displays a configurable text. (See *Line labels, page 74*.)

Line Mode
Displays the line interface mode (VoIP, POTS, ISDN).

Caller Information: Number
Displays the number of the caller.

Caller Information: Name
Displays the name of the caller if the number is in the internal phone book. In VoIP mode, the name displays if the PABX or the provider provides it.

Operation Mode
Displays the operation mode used for the connection (Keypanel to Keypanel, Keypanel to Matrix, Matrix to Matrix).

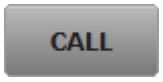
HD-Voice Indicator
The **HD-Voice logo** displays if the connection uses the G.722 algorithm, which provides an audio bandwidth of 7 kHz. If no logo displays, the standard algorithm with 3.1 kHz or 3.4 kHz audio bandwidth is used.

Level Meter
The upper level-meter shows the level of the audio signal received from the caller, with the letter "**R**" on the right.
The lower level-meter shows the level of the audio signal sent to the caller, with the letter "**T**" on the right.

Stream Quality Indicator
An LED shows the quality of the received audio stream. The RTS TIF-PRO2 constantly monitors transmission jitter and the rate of lost packets to classify stream quality into three categories:
Green LED - Excellent
Yellow LED - Acceptable
Red LED - Bad
The thresholds of the categories are configurable.

Call / Accept / Connect button
Depending on the line state, this button serves different purposes.

During an active connection, the button displays “CONNECT” on a red background. Press the button to send DTMF tones.



If there is no connection, the button displays “CALL” on a grey background. Press the button to open the dialing window. From the dialing window, dial the numbers or edit the phone book.

When there is an incoming call, the button displays “ACCEPT” and flashes yellow. Press the button to accept the call.

Drop Button

Depending on the line state, the Drop button serves different purposes.

When there is an incoming call, the button flashes yellow. Press the button to reject the call.

Otherwise, the button displays grey. Press the button during a connection to drop the call

Refer to

- *Menu bar, page 47*
- *General, page 80*
- *Line labels, page 74*

10.4 Multi-control main window

Up to 30 RTS TIF-PRO2 units can be controlled via one instance of the PC software. Depending on the window size, the units can be arranged on the main window in up to 30 columns and 26 rows. The window dimensions can be set to any size between 400 x 300 pixels and 8000 x 6000 pixels.
If the connected devices do not fit on one screen, they are distributed over up to 10 pages that are accessible via tabs below the menu bar.

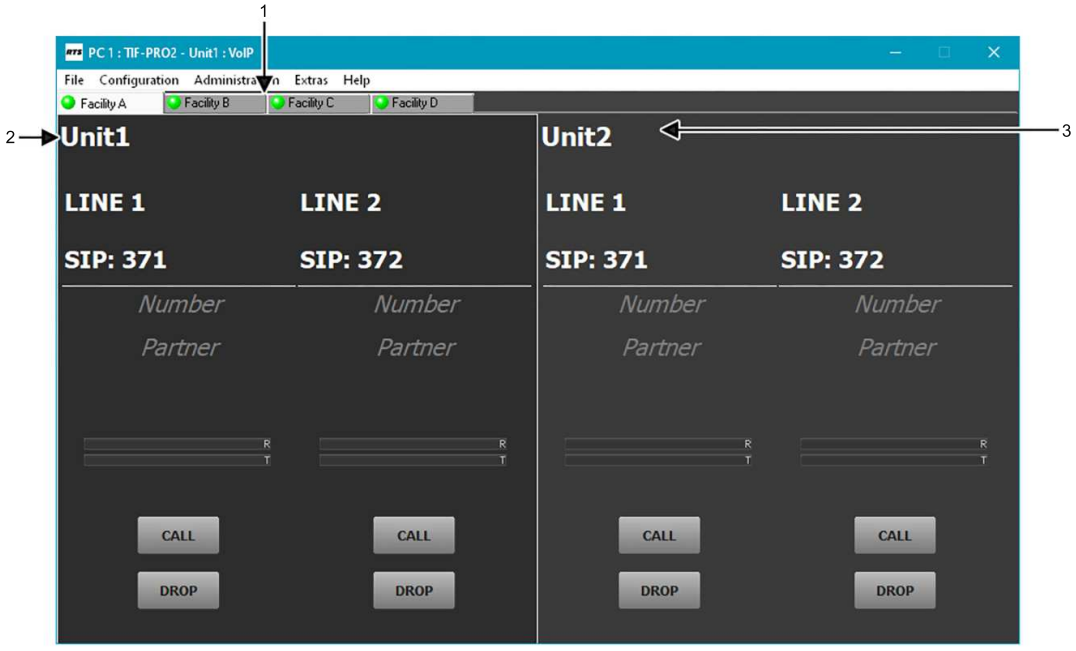


Figure 10.4: Main Window - 8 RTS TIF-PRO2 on 4 pages

1	Pages
2	Tile 1
3	Tile 2

10.4.1 Pages

The **Pages** tabs are automatically displayed if the connected units do not fit on the screen. The title of each tab can be configured in the Local Settings.

A sum alarm of the whole page is displayed on the tab. If everything is OK, it is green.

The LED turns red if one of the devices is not connected, or if there is an alarm on at least one of the devices on the tab.

10.4.2 Tiles

Arrange the units beside each other on the main window according to the layout, which is configured in the Local Settings.
Identify devices by their system name, which is configured in the device configuration.

10.5 Dialing window

Press the CALL button on the main window to open the dialing window.

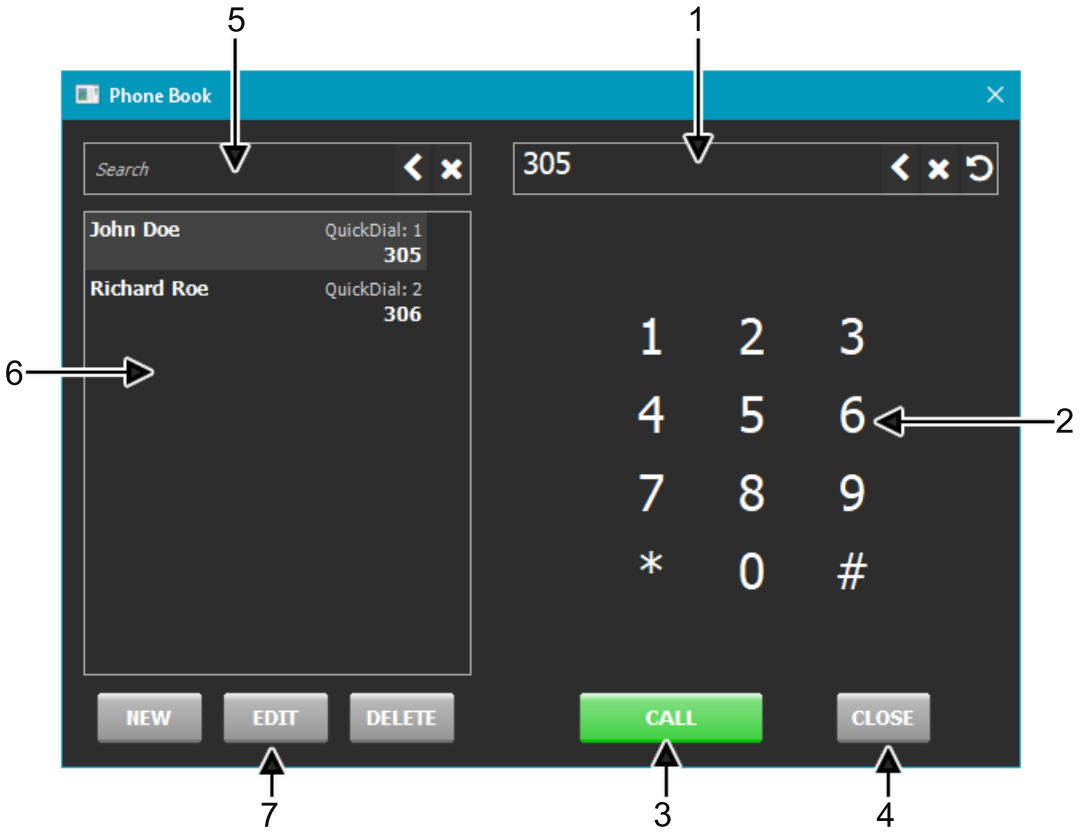


Figure 10.5: Dialing Window

1	Number input field
2	Number pad
3	Call button
4	Close button
5	Phone book search field

6	Phone book list
7	Phone book buttons

Number Input Field
Enter a number you want to call. You can enter the number on the keyboard of the PC or on the number pad displayed on the screen.

Press the back button to delete the last entered digit.

Press the erase button to delete all entered digits.

Press the redial button to open a list of ten last dialed numbers of this workplace.

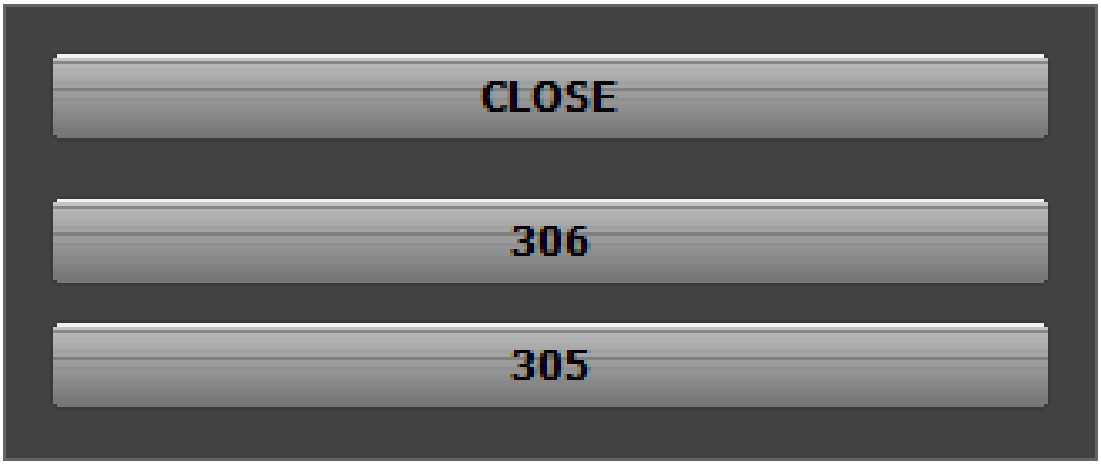


Figure 10.6: Redial List

Click an **entry** to transfer the number to the number input field.
Click “**CLOSE**” to close the list without selecting a number.

Number Pad
Press any of the buttons to dial a number. The number displays in the number input field.

Call Button

Press the call button to dial the number entered in the number input field.

If there is no number in the field, the call button is not active.

Close Button
Press the **close** button to close the dialing window.

Phone Book Search Field
Start typing to search the phone book. The results show in a list.

Press the back button to delete the last entered character.

Press the erase button to delete the complete search term.

Phone Book List
The Phone Book List shows all contacts of the phone book. Enter a search term in the phone book search field to display the results.

Select an entry to transfer its phone number to the number input field. Click the call button to dial the number.
Selecting an entry activates the **EDIT** and **DELETE** buttons.

Notice!
The phone book is stored in the RTS TIF-PRO2 system and not on the PC. By way of the menu File | Phone Book | Import/Export, a phone book can be imported from a data file or exported to a data file.

Phone Book Buttons

NEW

Press the **NEW** button to add a contact to the phone book.

EDIT

Press the **EDIT** button to edit the selected contact.

DELETE

Press the **DELETE** button to delete the selected contact. A confirmation message appears.

10.6 Phone book entry window

Press the **NEW** button or the **EDIT** button on the dialing window to open the phone book entry window.

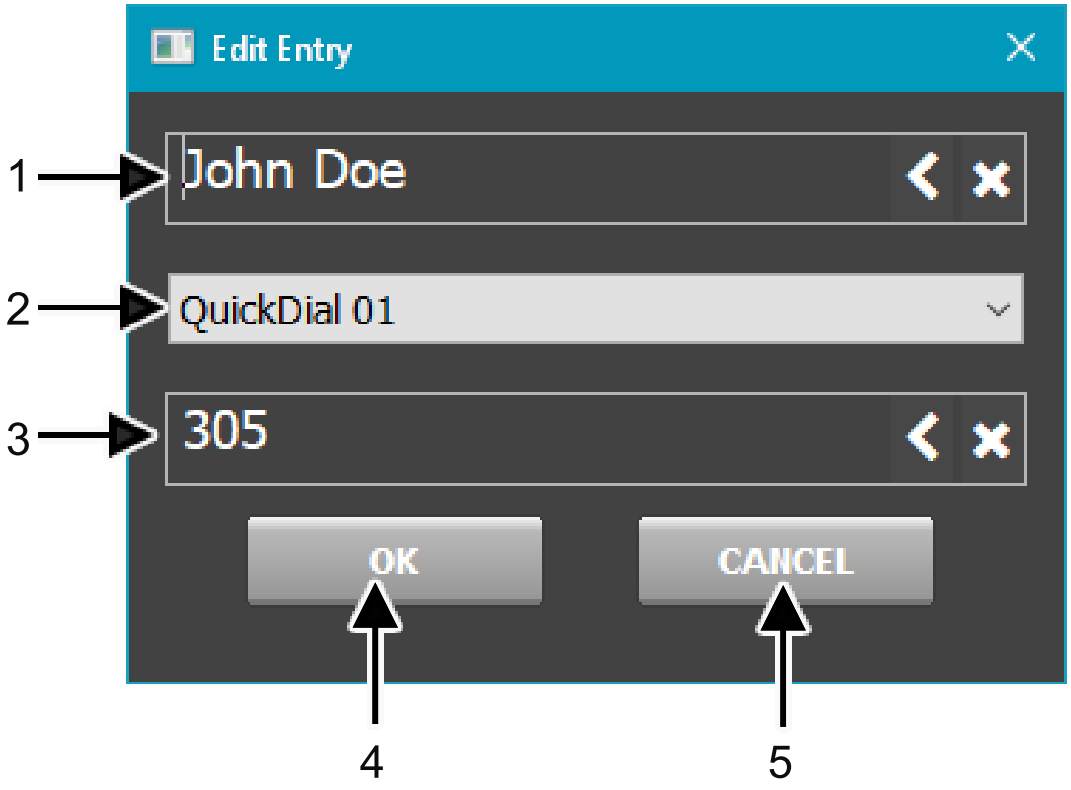


Figure 10.7: Phone Book Entry window

1	Name
2	Matrix Quick Call
3	Number

4	OK button
5	Cancel button

Name
Enter or change the name of a contact here.

Press the back button to delete the last entered character.

Press the erase button to delete the complete name.

Notice!
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 then the first name.

If the name already exists, an error message is displayed asking you if you want to overwrite the already existing entry. 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**.

Matrix quick dial
A contact can be assigned to one of 99 quick dials. These quick dials can be dialed via the matrix.

Number
Enter or change the number of the contact here.

Press the back button to delete the last entered character.

Press the erase button to delete the complete number.

OK button
Press **OK** to save the changes to the RTS TIF-PRO2.

Cancel button
Press **CANCEL** to discard the changes.

10.7 Menu bar

The **menu bar** provides access to configuration, status information, maintenance functions, and identification of all units.
To access a specific **unit**, click on the **menu** and select the **unit** in question.

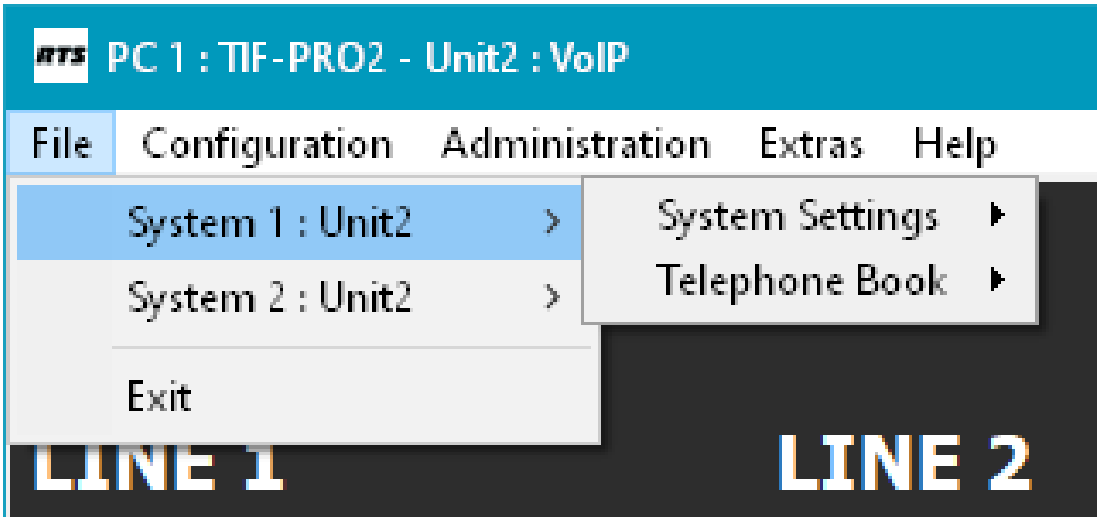


Figure 10.8: Available Units are listed in each menu

Notice!
You may also right click on a tile in the main window to access the menu of an individual device.

10.7.1 Login

For some menu items, you must authorize yourself with the administrator password.

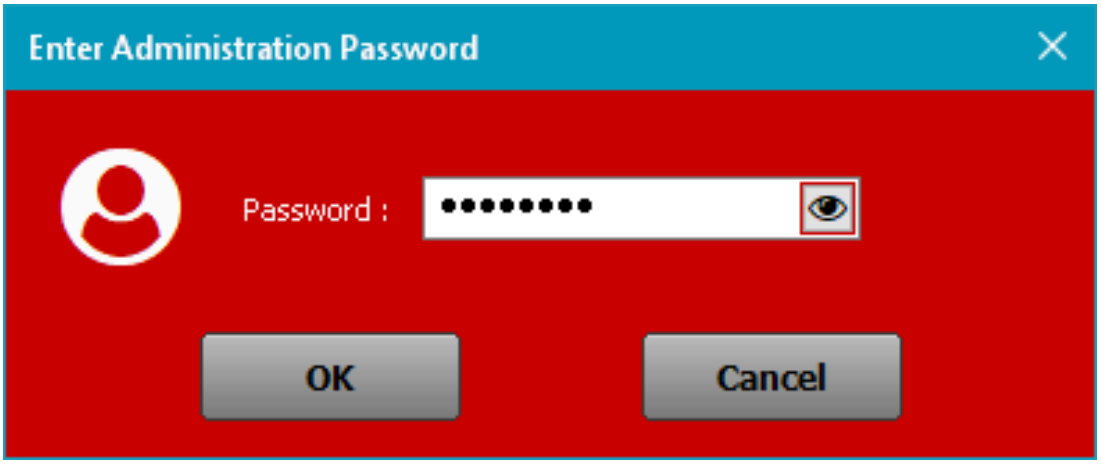


Figure 10.9: Login

When the main panel displays, log out automatically occurs after 60 seconds.
After three unsuccessful attempts at logging into the system, a 30-second wait time activates for the fourth attempt. The wait time increases by 30 seconds for each unsuccessful attempt. The maximum wait time is 10 minutes.

10.7.2 Menu file

Open the file menu to import and export the system settings or the internal telephone book of an RTS TIF-PRO2.

- Press **Exit** to close the application.

System Settings Import / Export

- Open the File menu, select the unit in question and then System Settings.
  - **Import**: Restore the settings of the device from a file stored on your PC.
  - **Export**: Backup the settings of the device to a file on your PC.

The backup contains:

– The configuration of the RTS TIF-PRO2.
– The Presets stored on the device.

Telephone Book Import / Export

▸ Open the File menu, select the unit and then Telephone Book.
– **Import**: Load contacts from a file in *.csv format stored on your PC. Existing contacts are deleted.
– **Export**: Save the contacts of the internal phone book to a file in *.csv format on your PC.

The phone book file is a text file with the *.csv file extension. It contains a file header, column headers and the contacts as semicolon separated list.

TelBook.cvs	
RTS;1; QD;Name;Number 1;John Doe;305 2;Richard Roe;306	Header (Type, Version) Columns (Quick Dial, Name, Number) Entries (one contact per line)

10.7.3 Menu configuration

Control Interface

Open the **File** menu and select Control Interface to enter all RTS TIF-PRO2 devices you would like to control with the PC software. Each slot can hold the parameters for a device. There are 30 slots available.

▸ Double click on a **line** or select **Add/Edit** to edit the parameters of a slot.

Notice!
You may need to run the PC software as Administrator to be able to change the Control Port settings. This depends on the Settings Location defined in the Local Settings.

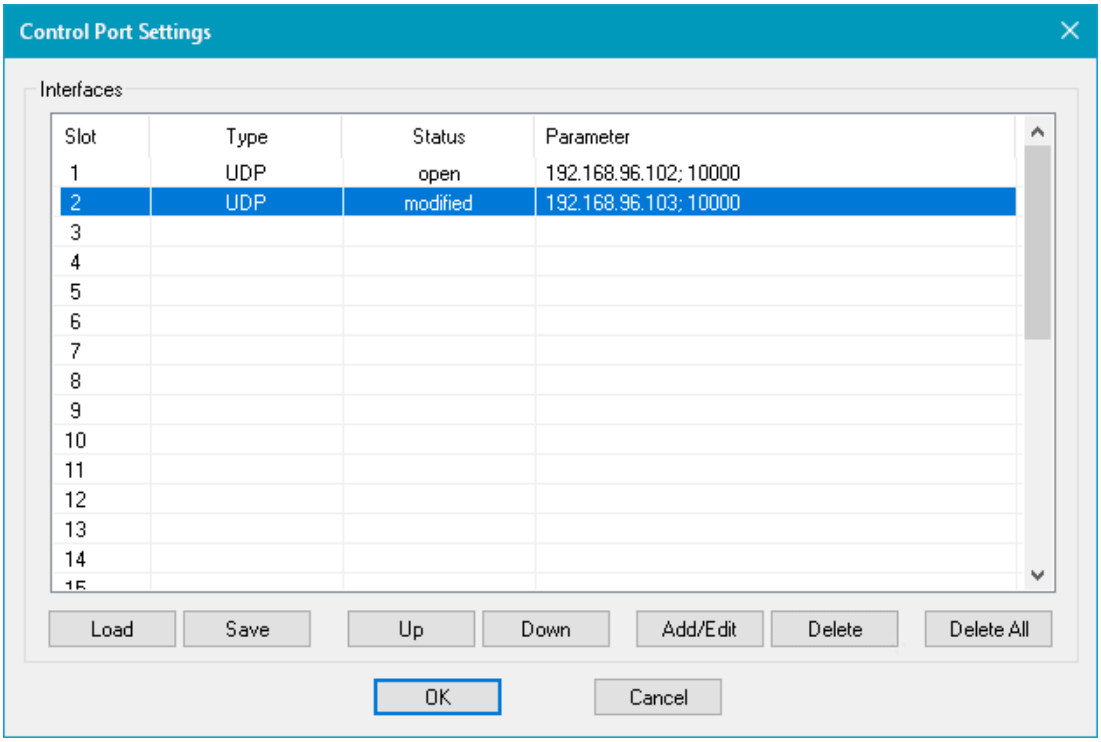


Figure 10.10: Control Interface List

The interfaces list displays an overview of configured connections.

- **Slot**: There are 30 slots available.
- **Type**: Only UDP via LAN is available.
- **Status**: Shows the status of the slot:
  - **modified**: The parameters have been changed since the window was opened.
  - **open**: The parameters have not changed since the window was opened.
- **Parameter**: Displays the IP address, the Control Port and the selected network interface of the PC.

Use the buttons below the list to edit the interfaces list:

- **Load**: Load an interface list from a file stored on your PC.
- **Save**: Save the interfaces list to a file on your PC.
- **Up**: Move the selected entry up in the list.
- **Down**: Move the selected entry down in the list.
- **Add/Edit**: Edits the selected entry or adds an entry to the first free slot if no entry is selected.
- **Delete**: Deletes the selected entry.
- **Delete All**: Deletes all entries.

▸ Double click on a **slot** or press **Add/Edit** to open the Communication Interface Parameter window:

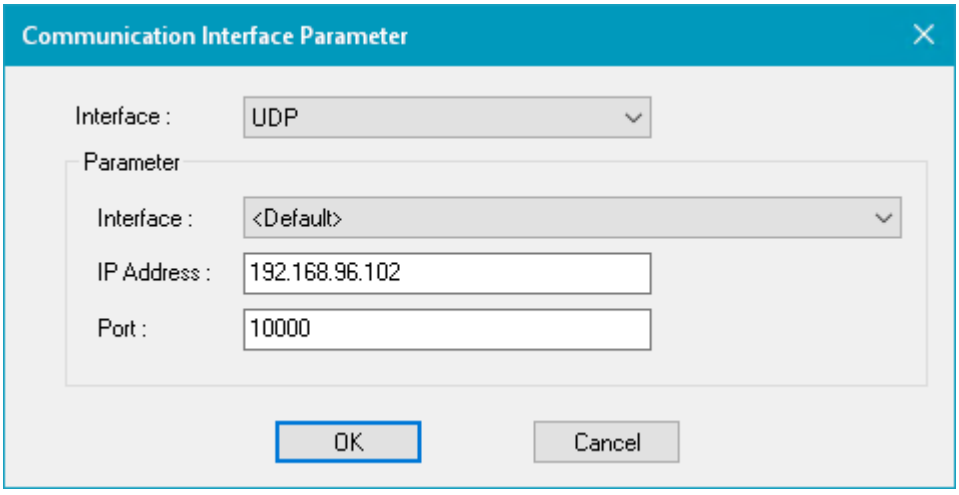


Figure 10.11: Communication Interface Parameter window

- Interface: Select UDP.
- Parameter: Enter the connection parameters:
  - Interface: Select the network interface of the PC which has access to the device.
  - IP Address: Enter the IP address of the device.
  - Port: Enter the control port of the device (default: 10 000).

Local Settings

▸ Open the **File** menu and select **Local Settings** to open the local settings window.

The Window Parameters control the appearance of the RTS TIF-PRO2 PC software.

Notice!
You may need to run the PC software as Administrator to be able to change the Local settings. This depends on the Settings Location defined in the Local Settings.

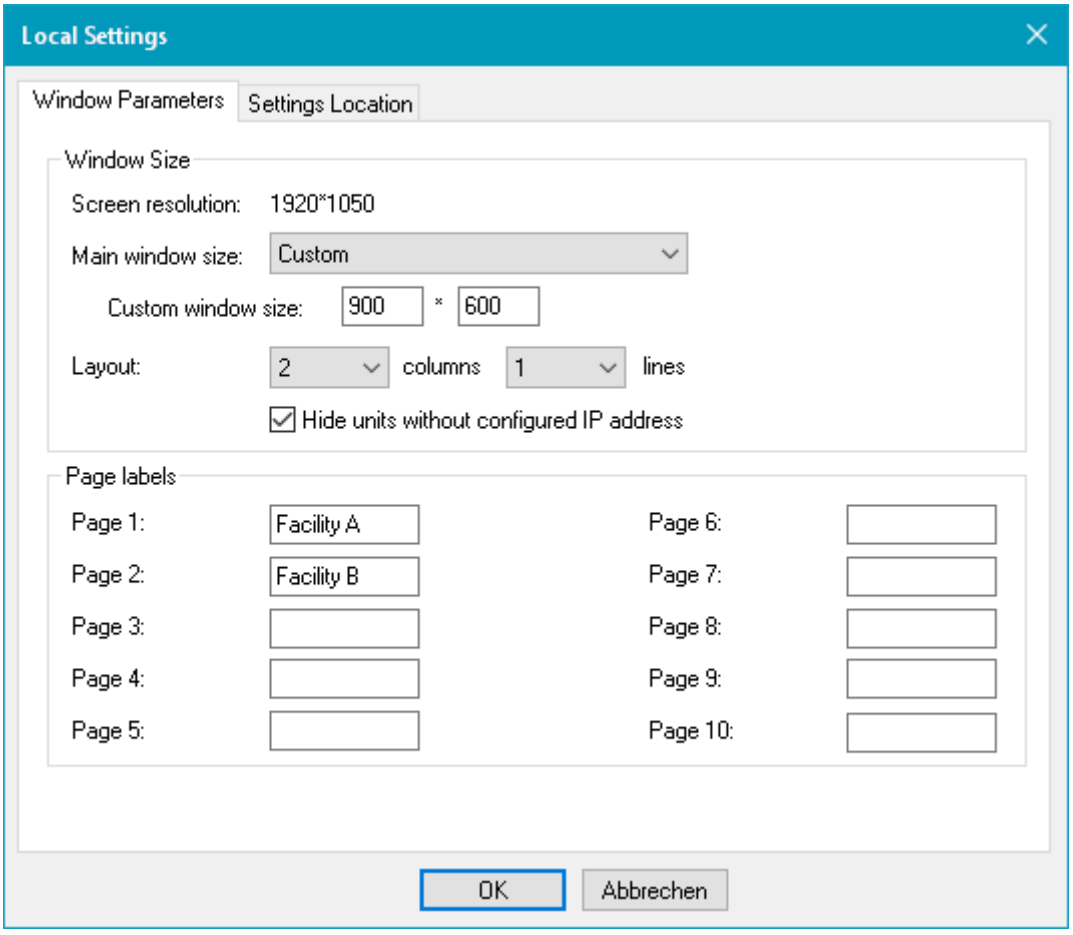


Figure 10.12: Local Settings - Window Parameters

- **Main Window Size**: Set the size of the main window. There are two options:
  - Select one of the predefined window resolutions.
  - **Custom**: Enter the windows size under Custom Window Size.
    The current Screen Resolution of your monitor is shown above. The minimum window size is 400x300. The maximum window size is 8000x6000.
- **Layout**: Set the number of columns and lines in which the tiles of the individual devices are arranged in the main window.
- **Hide units without configured IP address**: Enable this option to omit empty slots in the Interfaces List when populating the main window.
- **Page Labels**: Configure the labels shown on the tabs if the devices need to be distributed over several pages in the main window.

The **Settings Location** defines where and how the local settings are stored.

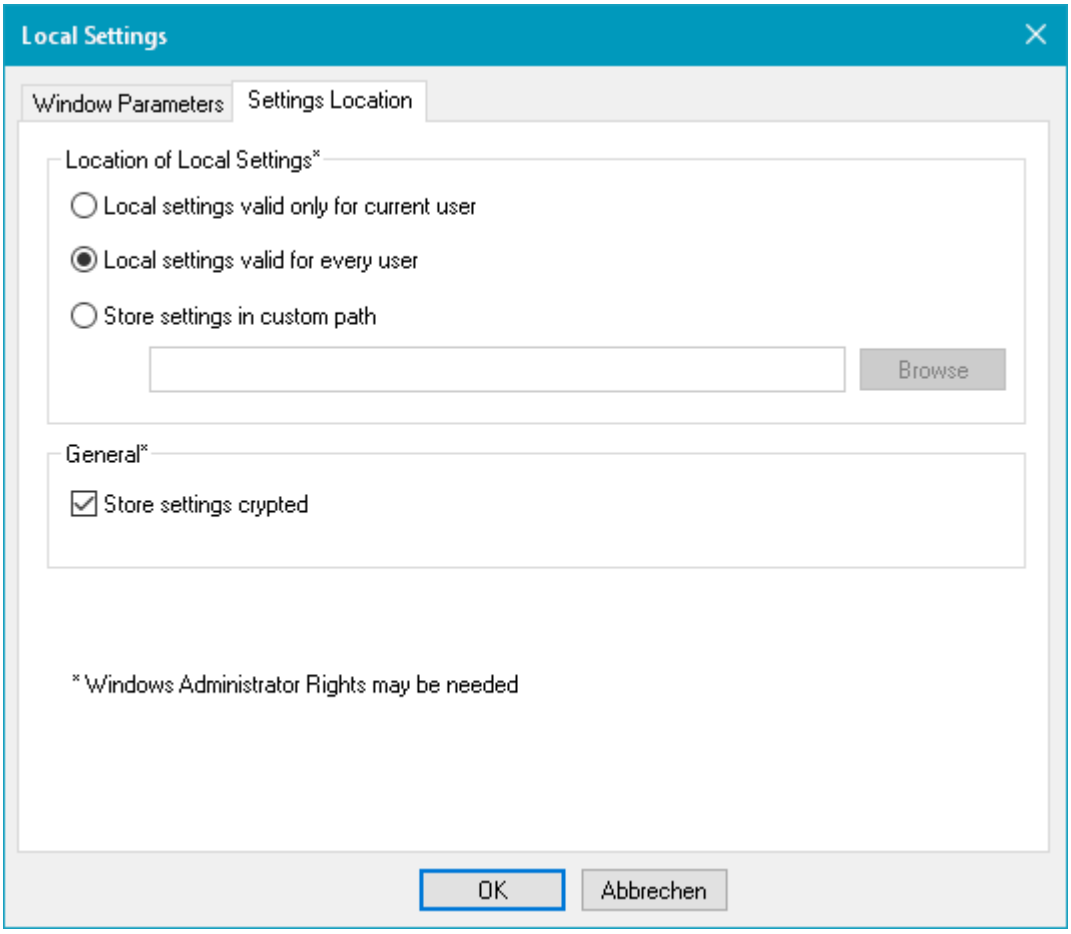


Figure 10.13: Local Settings - Settings Location

- **Location of Local Settings**: Configure the storage location on the PC. Depending on the location you need different user rights to change the local settings. This also affects the Control Interface settings.
  - **Local settings valid only for current user**: The settings are stored in the user's directory on the PC. Each user must configure their own local settings. User rights are sufficient to change the local settings.
  - **Local settings valid for every user**: The settings are stored in the "ProgramData" directory. They apply to each user who logs in on that PC. Administrator rights are required to change the local settings.
  - **Store settings in custom path**: Use the Browse button to select a storage location of the local settings. The access rights are determined by the selected directory.
- **Store settings crypted**: Enable this option to encrypt the contents of the local settings configuration file.

Notice!
The Local Settings, including the Control Interface settings, are stored on the PC. They are not included in the backup up **File | System # | System Settings | Export**.

The location on the PC can be displayed in the System Panel by sending the command: **showprofilepath**

Configuration

1. Open the **Configuration** menu.
2. Select a **device** and click on **Configuration** to open the configuration window. (The configuration is described in *Configuration, page 64*)

Presets

Presets are stored in the internal flash memory of the RTS TIF-PRO2. The number of presets is limited by the storage space. Only parameters that are displayed in the Operation Settings branch of the configuration are saved in a preset.

- Click on **Presets** to open the Presets sub menu.
  - **Save Preset As ...**: The current configuration is saved as a preset. Enter a preset name with up to 16 characters. The preset name cannot be changed later.
  - **Manage Presets**: Opens the preset manager window. See below for details.
  - **List of Presets**: Click on a preset name to load the preset. You must confirm before the configuration of the unit is changed.
- Click on **Manage Presets** to open the Presets window.

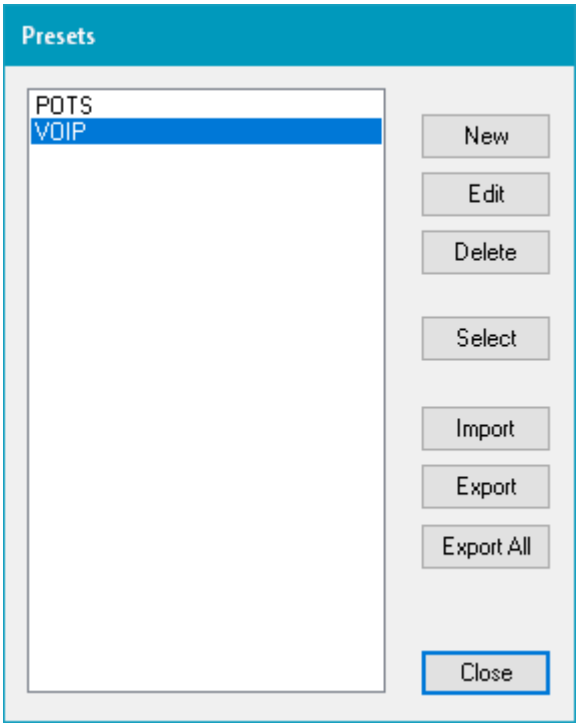


Figure 10.14: Presets window

The Preset Manager window displays the presets stored on the device.

- **New**: Create a new preset based on the current configuration. First, enter a preset name with up to 16 characters. (The preset name cannot be changed later.) Then, adjust the configuration stored in the preset.
- **Edit**: Change the configuration stored in the selected preset.
- **Delete**: Delete the selected preset.
- **Select**: Overwrite the current configuration of the RTS TIF-PRO2 with the content of the preset. You must confirm before the configuration of the unit is changed.
- **Import**: Import a preset which is stored in a file on your PC.
- **Export**: Export the selected preset to your PC.

– **ExportAll**: Export all presets to your PC.

Login Passwords

Access to the configuration of the RTS TIF-PRO2 is restricted by passwords. (See *Secure login, page 30* for more information about secure login.)

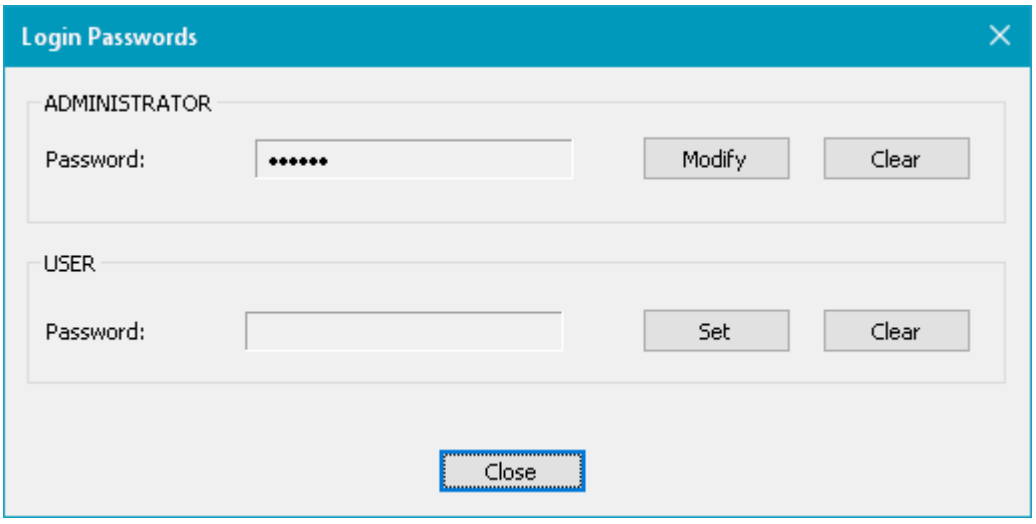


Figure 10.15: Login Passwords window

The Administrator Password protects access to:
– displaying and changing the configuration.
– importing backups.
– managing presets.
– opening the system panel.
– accessing the file system.
– updating the firmware.
– resetting to factory settings via PC software.

When an administrator password is set, the User Password enables the loading of presets and protects the alarm counter reset in the System Monitor.

The user password adopts the role of the administrator password if just the User Password is set.

– **Set**: Set the password. You need to confirm the password at the front display of the RTS TIF-PRO2 within 5 minutes.
– **Modify**: Change the password. You need to confirm the password at the front display of the RTS TIF-PRO2 within 5 minutes.
– **Clear**: Remove the password. You need to confirm the removal at the front display within 5 minutes. By default, it is not possible to remove an administrator password. (See *Secure login, page 30* if you like to disable secure login.)

Notice!
If you forgot your administrator password, you need to reset the RTS TIF-PRO2 to factory settings via the front display: **MENU | LOGIN | FACTORY**.

10.7.4 Menu administration

Firmware Download

The firmware of the RTS TIF-PRO2 is updated via the PC software. The firmware file is included in the setup of the PC software and stored in the installation directory.

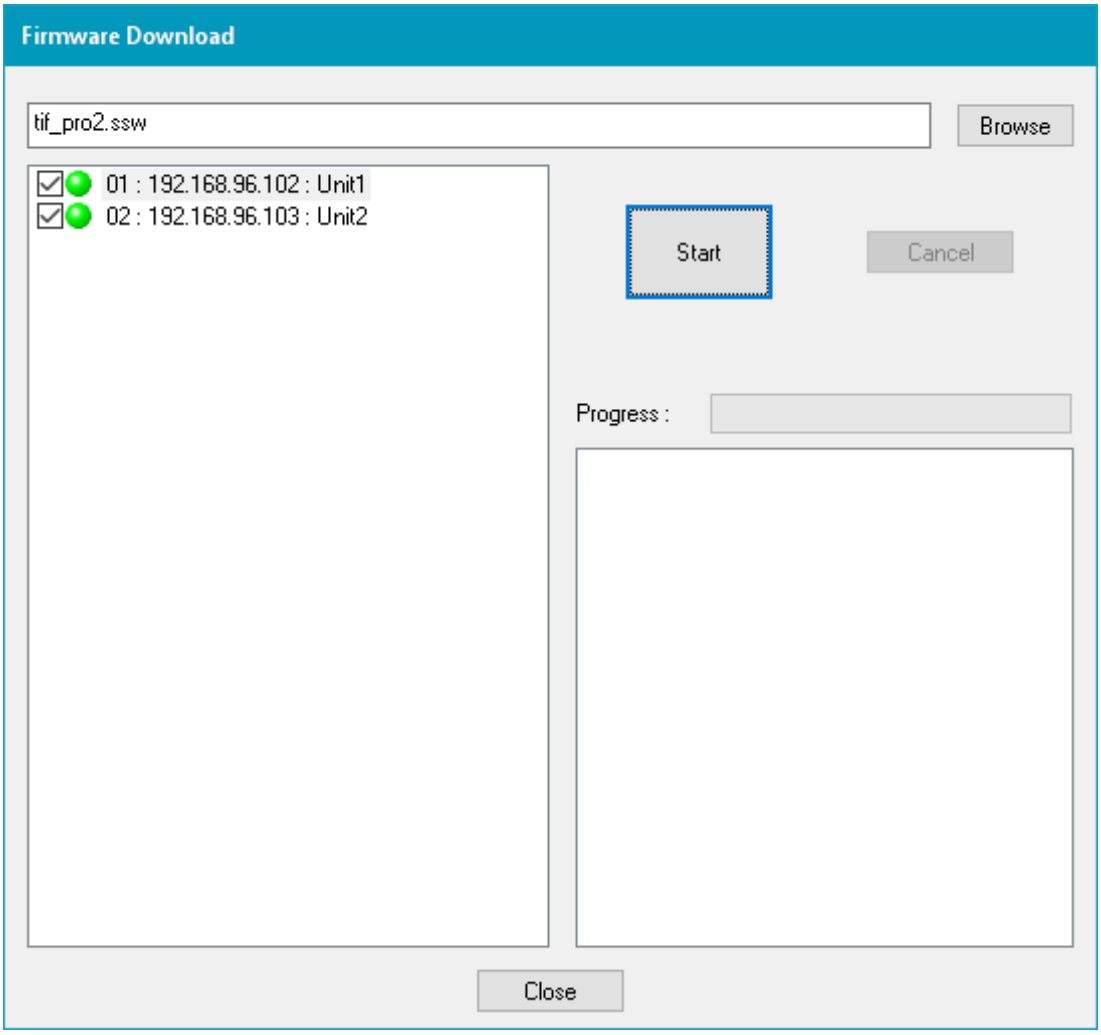


Figure 10.16: Firmware Download window

To update the device, open the **Administration** menu and select **Firmware Download**.

- The firmware file that matches the PC software is already selected. Click on the Browse button if you like to use a different firmware file.
- Mark the units to be updated on the left side.
- The LEDs show the status of each unit:
  - Green LED: The unit is online.
  - Yellow LED: The unit is updating.
  - Grey LED: The unit is offline.
- Click Start to update the devices. The PC software updates one RTS TIF-PRO2 at a time. After the download is finished the device will restart automatically to activate the new firmware.
- **Progress**: The status of the current device is displayed via the progress bar and the message area below it.

Registration

- Open the **Administration** menu, select a **device** and click on **Registration** to get information on the RTS-TIF-PRO2 hardware and software options.

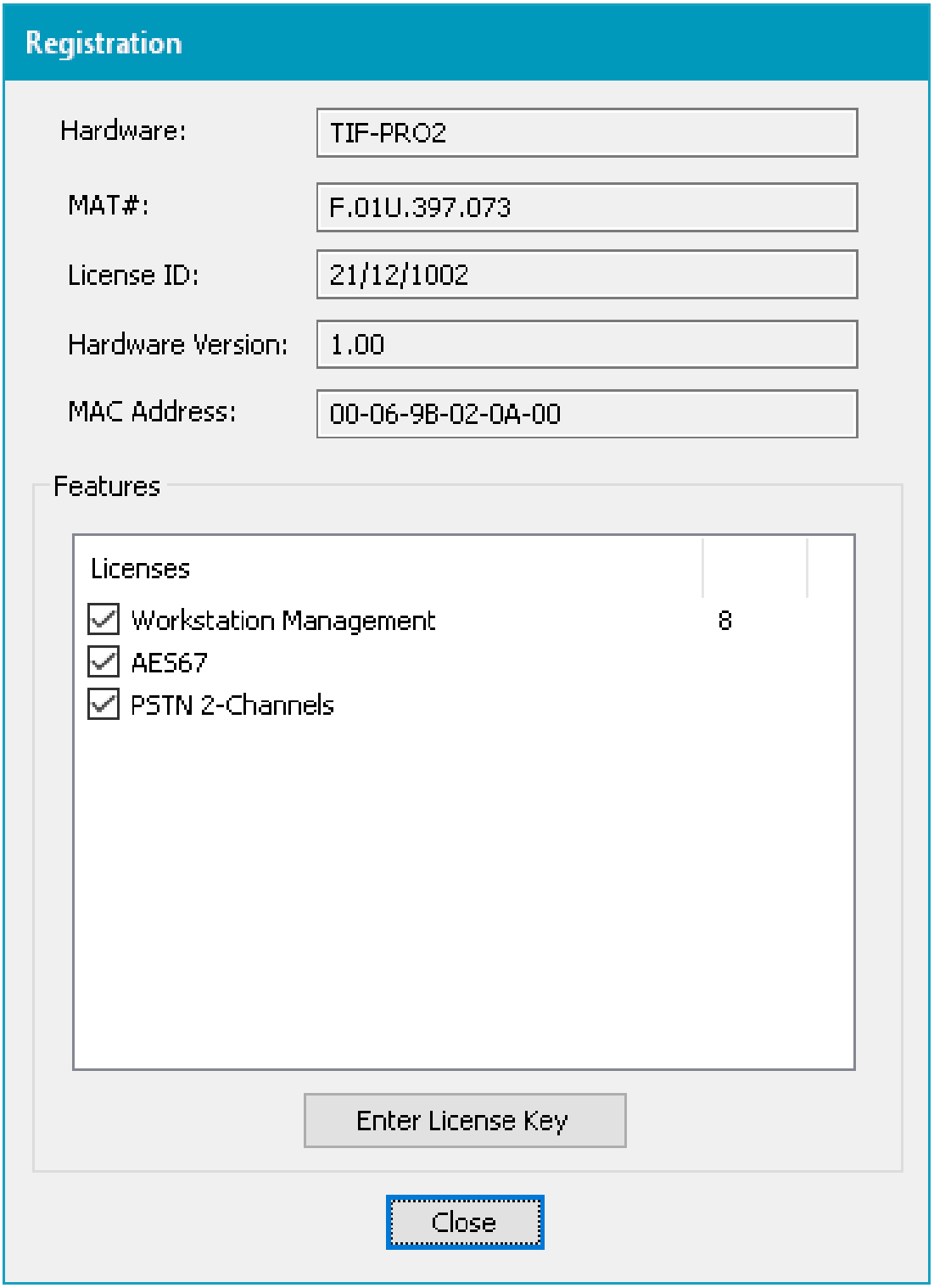


Figure 10.17: Registration Window

- **Hardware**: Displays the hardware type.
- **MAT#**: Displays the model ID.
- **License ID**: The licenses for additional Features are bound to the license ID of the device.

- **Hardware Version**
- **MAC Address**: Displays the MAC address of the unit's LAN interface.
- **Software Options**: Displays the available software options.
  - **Workstation Management**: Determines the number of PC software clients that can connect to the device at the same time. The maximum is 8.
  - **AES67**: Enables the AES67 audio interface.
  - **PSTN 2-Channels**: Enables the POTS and ISDN telephone interfaces. (VoIP is included in the basic functionality.)
- **Enter license key**: Enter a software license key to enable additional Features. Contact your distributor for more information.

File System

▸ Open the **Administration** menu, select a **device** and click **File System** to access the internal storage of the RTS TIF-PRO2.

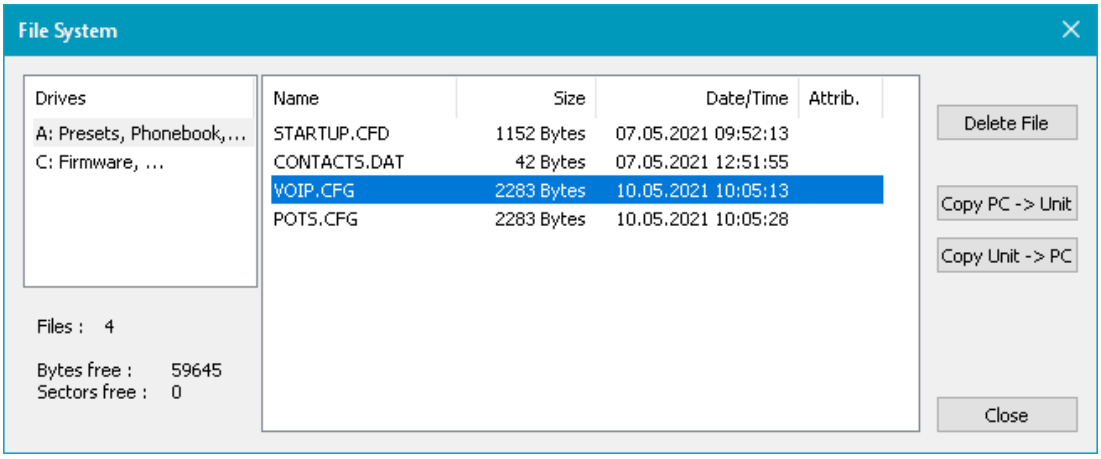


Figure 10.18: File System Window

The internal memory is organized in two drives.
Drive A holds:
- The current configuration (STARTUP.CFD)
- The internal phone book (CONTACTS.DAT)
- The presets (*.CFG)

Drive C holds:
- The firmware file (TIF_PRO2.SSW)
- The SIP logfile (SIPD.LOG)

▸ Select a **file** and use the **buttons** on the right side to organize the files:
- **Delete File**: Delete the selected file.
- **Copy PC → Unit**: Copy a file from the PC to the device. In the file transfer window, use the Browse button to select the file on your PC. Enter the file path on the unit including the drive letter. (like this: A:CONTACTS.DAT)
- **Copy Unit → PC**: Select a file and copy it to the PC. In the file transfer window, use the Browse button to save the file to your PC.

Notice!
Changing or deleting files may render the device unusable. Be sure to follow only the instructions of our support team.

System Panel

- Open the **Administration** menu, select a **device** and click on **System Panel** to open a command line window for troubleshooting.

There are commands that are executed on the device and commands which are executed on the PC.

Type “**help**” for a list of available commands that are executed on the RTS TIF-PRO2:

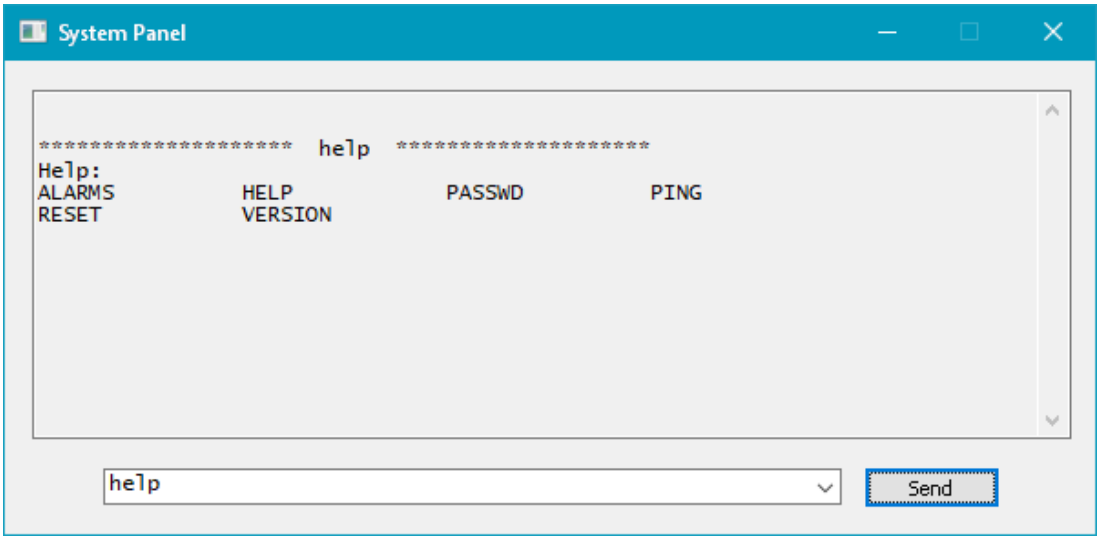


Figure 10.19: System Panel window

- **Alarms**: Displays alarm codes and alarm counters which are also displayed on the System Monitor window.
- **Help**: Displays the list of available commands.
- **Passwd**: Pass a software license password as parameter to enable a software option. This can also be done via the Registration window.
- **Ping**: Send an ICMP echo request (ping) from the RTS TIF-PRO2 to an IP address in the network. Type “**ping**” for help on the parameters.
- **Reset**: Restarts the RTS TIF-PRO2.
- **Version**: Displays the firmware version information.

Type “**?**” for a list of available commands which are executed by the PC software:

- **showinterfacestatistic**: Shows information about the control interface connection.
- **showprofilepath**: Shows the current path of the local settings file on this PC.
- **dumphostaccess**: Shows access times to external hosts.
- **dumpfileaccess**: Shows access times to files and folders.
- **showipstatistic**: Shows information about the VoIP connection after Disconnect in the System Panel
- **hideipstatistic**: Don't show information about VoIP connection in System Panel.

Set Factory Settings

- Open the **Administration** menu, select a **device** and click on **Set Factory Settings** to reset the configuration of the RTS TIF-PRO2.

Figure 10.20: Factory Settings Confirmation window

Notice!
The telephone book and the presets are not deleted.

Notice!
The administrator password is also reset. You need to set a new password at the front display before you can access the device via the PC software.

10.7.5 Menu extras

System Monitor

- Open the **Administration** menu, select a **device** and click on **System Monitor** to get detailed information about the system status.

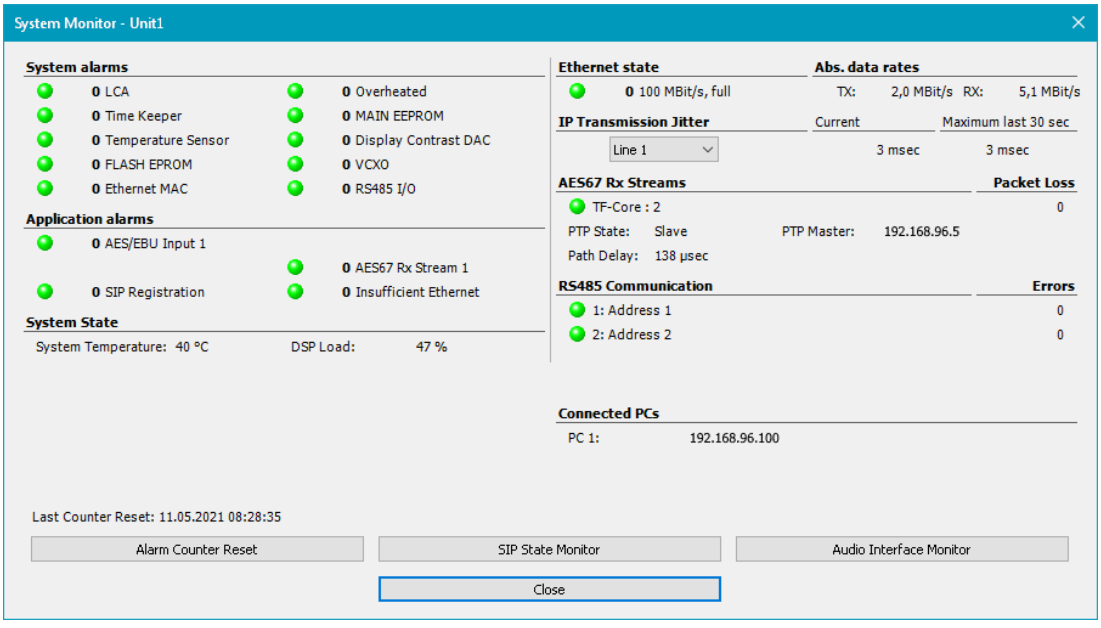


Figure 10.21: System Monitor window

The alarm status is displayed as an LED:
Red LED: Alarm is active. There is an error.
Yellow LED: Alarm is active but not relevant for the current configuration.

Green LED: Status is OK.
Blue LED: There was an alarm. The status is OK now. Check the alarm counter next to the LED.
The alarm counters next to the LEDs indicate how often the alarm occurred since the alarm counters were reset.

Press the **Alarm Counter Reset** button to reset the counters. A timestamp of the last reset is displayed above the button.

Press the **SIP State Monitor** button to get more information about the status of the VoIP lines.

Press the Audio Interface Monitor button to get more information on the status of the audio interfaces.

The status information is organized in sections:
- **System Alarms**: These alarms show the status of the main components of the RTS TIF-PRO2 hardware.
- **Application Alarms**: These alarms show the status of some basic features:
  - AES/EBU Input: The system can detect if there is a valid digital audio signal at the AES input. Additional information is displayed next to the alarm if there is a problem.
  - AES67 RX Stream: Shows if the AES67 software module receives configured stream.
  - SIP Registration: Shows if all VoIP lines could register with the SIP server.
  - Insufficient Ethernet: Shows whether the Ethernet connection is established at 100 Mbps, full duplex. Lower bitrates or half duplex mode will cause audio problems.
- **System State**: Displays the general system health:
  - System Temperature: Displays the temperature on the main board in °C. It is recommended to keep the temperature below 50°C through suitable cooling. The RTS TIF-PRO2 will raise the TEMPERATURE ALARM at 57 °C. A higher temperature can lead to undefined behavior of the device.
  - DSP Load: Displays the utilization of the main processor.
- **Ethernet State**: Displays information about the LAN interface of the device:
  - LED: Displays whether the physical connection to the network could be established.
  - Speed: Displays speed and duplex mode of the network connection. (100Mbps, full is required)
  - TX/RX: Gross data rates of the interface in send and receive direction. The RTS TIF-PRO2 can handle up to 25 Mbps in RX direction. If the data rate is higher, check for broadcast or multicast traffic that is reaching the device unintentionally.
- **IP Transmission Jitter**: Displays the jitter statistics of a selected VoIP audio stream. The internal audio buffers are automatically adjusted to the current jitter. If the jitter is high, expect larger delays of the received audio signal.
  - Line: Select a telephone line to monitor it.
  - Current: Displays the current jitter value.
  - Maximum Last 30 sec: Shows the highest jitter value that has occurred during the last 30 seconds.
- **AES67 RX Streams**: Displays the status of the built-in AES67 software module.
  - Stream Name: Name of the stream as provided by the sender.
  - Packet Loss: Number of audio packets lost in the received streams since last alarm counter reset.

  - PTP State: Device role according to PTP (Precision Time Protocol). The RTS TIF-PRO2 can only work as SLAVE.
  - PTP Master: IP address of the PTP master in the audio network.
  - Path Delay: Current delay to the PTP master.
- **Connected PCs**: Displays the PC clients connected to the RTS TIF-PRO2.
  - PCx: Internal port used for connecting the PC client.
  - IP Address: IP address of the client PC.

Sip State Monitor

- Open the **Administration** menu, select a **device** and click on **System Monitor**. Then press **SIP State Monitor** to display detailed information about the status of the VoIP lines.

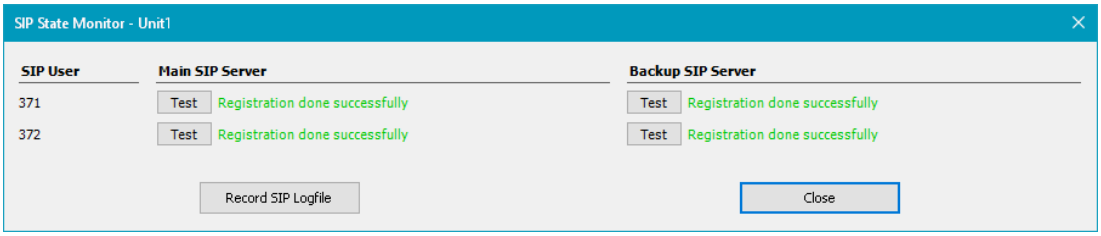


Figure 10.22: SIP State Monitor window

The status of a telephone line is displayed in one line, respectively.

- **SIP User**: Displays the SIP Username as configured.
- **Main SIP Server**: State of registration at the main SIP server.
  - **Test**: Click **Test** to start registration. The result is displayed next to the button. The test may take up to 2 minutes.
  - **State**: State of the registration process in plain text.
- **Backup SIP Server**: State of registration at the backup SIP server.
  - **Test**: Click **Test** to start registration. The result is displayed next to the button. The test may take up to 2 minutes.
  - **State**: State of the registration process in plain text.

Press the Record SIP Logfile button to log the SIP communication on the RTS TIF-PRO2.

Record SIP Logfile

- Open the **Administration** menu, select a **device** and click on **System Monitor**. Press **SIP State Monitor** and then **Record SIP Logfile**.

The unit can record up to 7 MB of SIP communication to its internal memory. Depending on the call frequency at the unit and the PABX, this is sufficient for about one hour of recording.

Notice!
Record SIP logfiles only over a short period e.g., for debugging if the device runs out of internal memory, the normal operation may be disrupted.

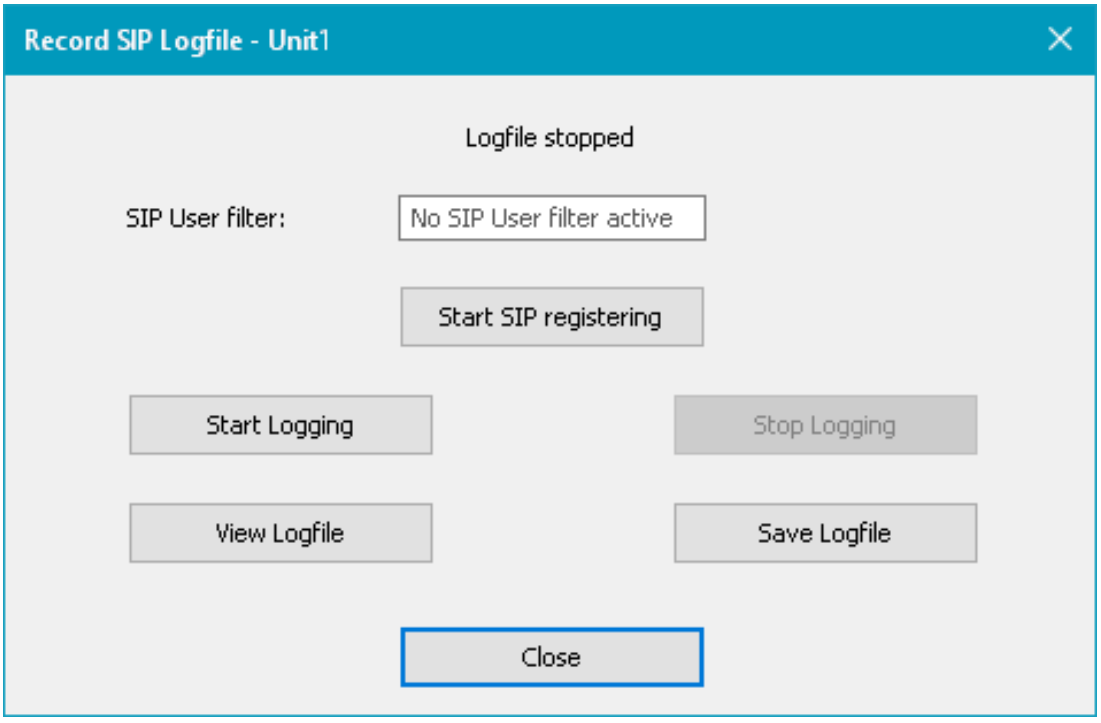


Figure 10.23: Record SIP Logfile window

- **Sip User Filter**: Enter the SIP username of any line of the RTS TIF-PRO2 to filter the messages written to the logfile.
- **Start Logging**: Starts recording the SIP messages.
- **Start Sip Registering**: Click while the logging is active if you like to record the SIP registration process.
- **Stop Logging**: Stops recording the SIP messages.
- **View Logfile**: Open the logfile in a text editor on the PC. Available once the logging is stopped.
- **Save Logfile**: Click to save the logfile on the PC. Available once the logging is stopped.

Audio Interface Monitor

- Open the **Administration** menu, select a **device** and click on **Audio Interface Monitor** to display the audio levels of all audio interfaces of the device.

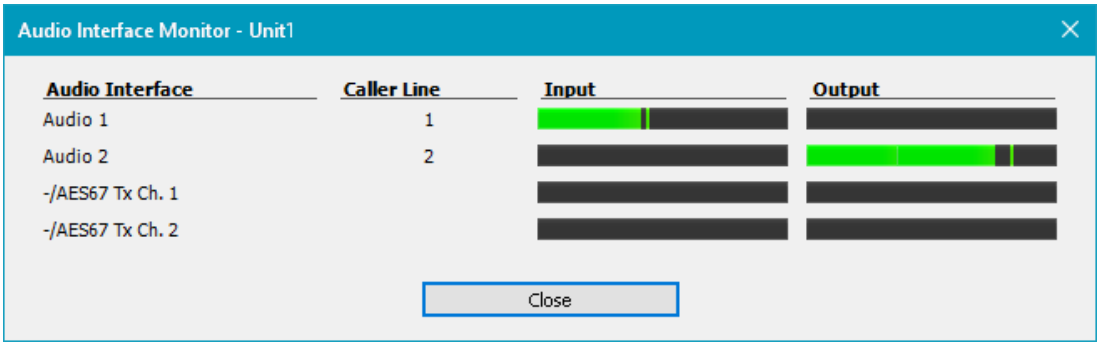


Figure 10.24: Audio Interface Monitor window

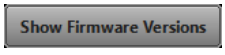
For each Audio Interface, the assigned Caller Line and the levels of the Input and Output signals are displayed.

10.7.6 Menu help

About

- Open the **Administration** menu and select **About** to display contact information and version information.

Figure 10.25: About Contact window



Press **Show Firmware Versions** to display the firmware version of each individual RTS TIF-PRO2.

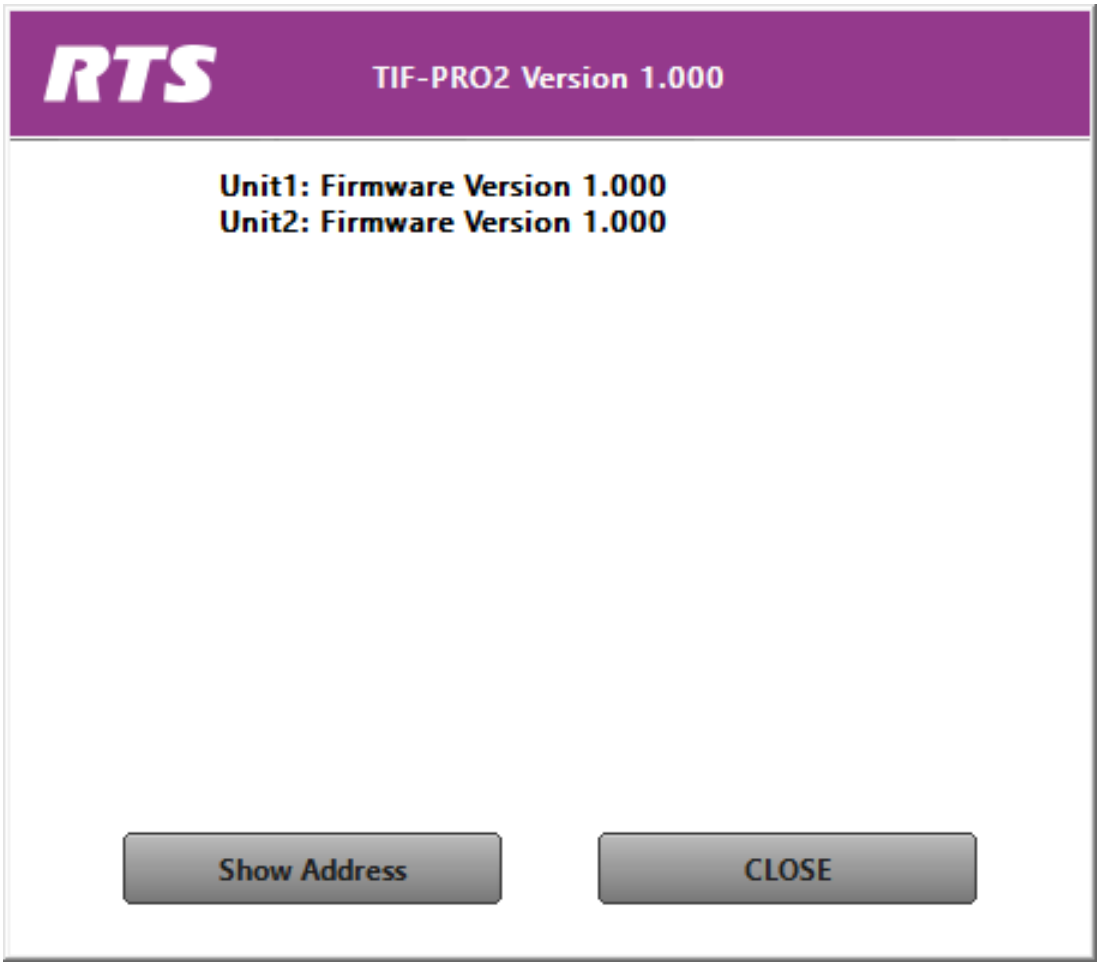


Figure 10.26: About Firmware Versions window

10.8 Configuration

Open the **Configuration** menu, select a device and click on Configuration to open the configuration window.
The configuration is stored on the RTS TIF-PRO2.

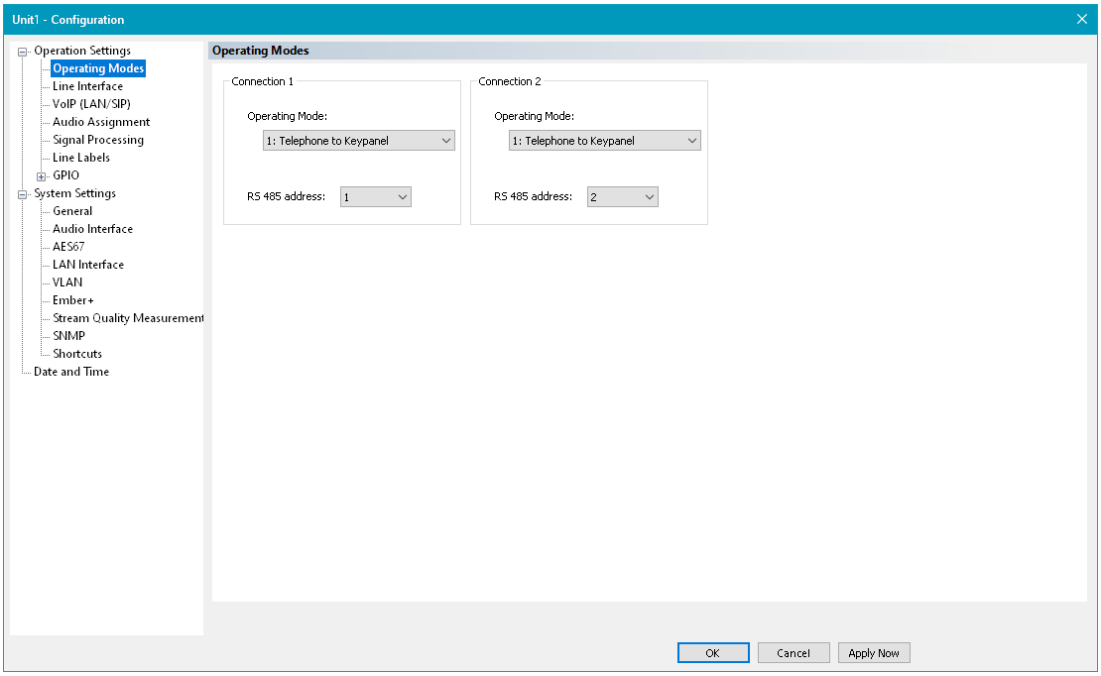


Figure 10.27: Configuration window

– Press OK to save the configuration and close the window.
– Press Apply Now to save the configuration.
– Press Cancel to discard all changes and close the window.

The configuration is divided into two sections:

– **Operation Settings**: These settings can be stored in Presets.
– **System Settings**: These settings cannot be stored in Presets.

10.8.1 Operating modes

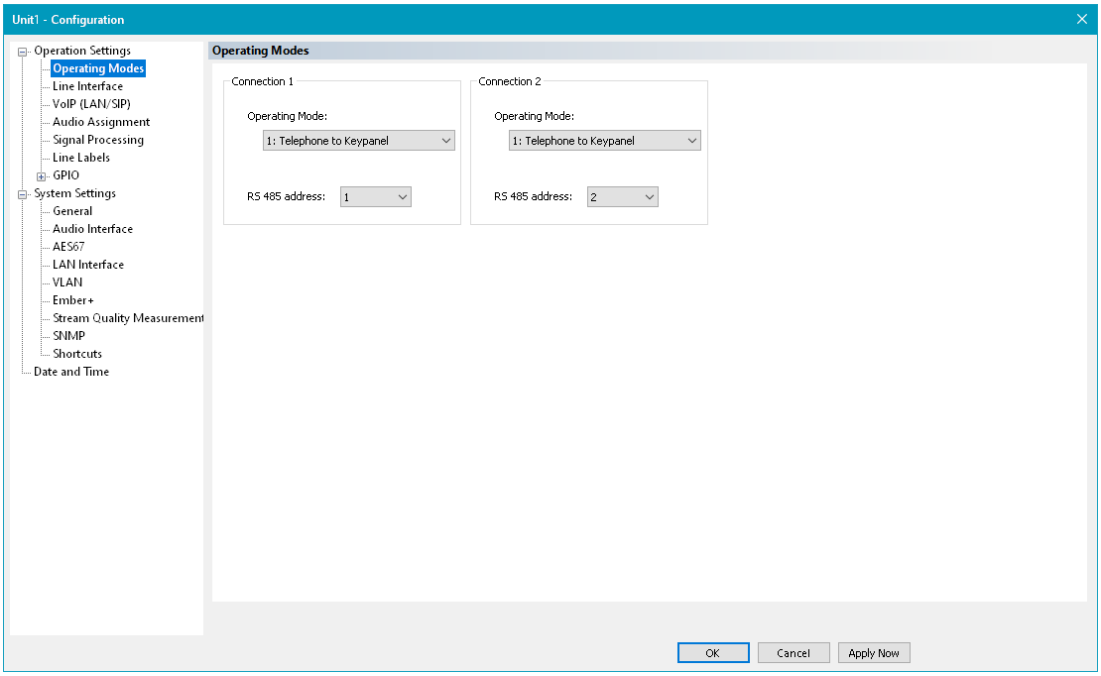


Figure 10.28: Configuration - Operating Modes

Define the Operating Mode for each connection (see *Operation modes, page 24*):

- **Operating Mode**:
  - **Telephone to Keypanel**
  - **Keypanel to Matrix**: Only possible with VoIP.
  - **Matrix to Matrix**
- **RS485 Address**: Required for the data channel to the matrix if operating mode 1 or 3 is configured.

10.8.2 Line interface

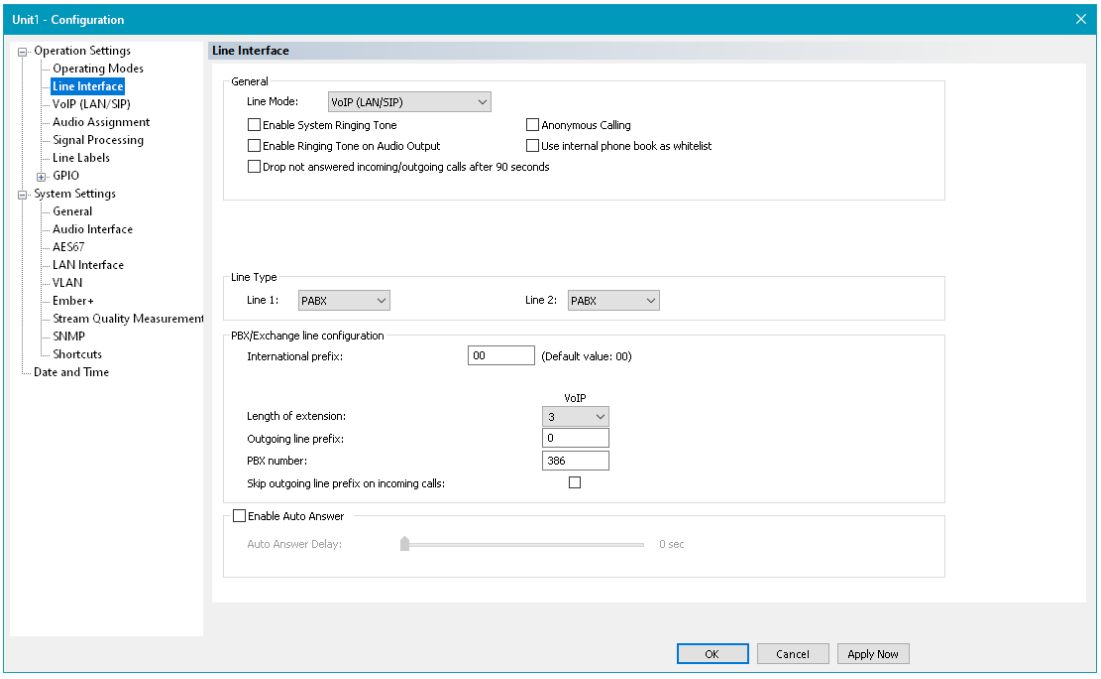


Figure 10.29: Configuration - Line Interface

Configure the basic line mode in the General section.

Line Mode: The available line modes depend on the installed software licenses.

- **VoIP (LAN/SIP)**: Voice over IP provides digital audio transmission over IP networks. The audio quality is automatically negotiated at call setup. The RTS TIF-PRO2 supports two audio algorithms:
  - **G.711** (3.4 kHz audio bandwidth)
  - **G.722** (HD-Voice, 7 kHz audio bandwidth)
  - For incoming calls, the RTS-TIF-PRO2 always uses the best algorithm which is supported by the calling station.
- **POTS** (optional): Plain Old Telephone Service provides analogue audio transmission with 3.1 kHz audio bandwidth. Only mode 1 (Telephone to Keypanel) is supported in POTS mode.
- **ISDN** (optional): Integrated Services Digital Network provides digital audio transmission with 3.4 kHz audio bandwidth in mode 1 (Telephone to Keypanel) and HD-Voice with 7 kHz audio bandwidth in mode 3 (Matrix to Matrix). Mode 2 (Keypanel to Matrix) as well as AES67 are not supported in ISDN mode.

Enable System Ringing Tone: Enable to use the built-in beeper to signal incoming calls.

Enable Ringing Tone on Audio Output: Enable to signal incoming calls on the audio interface assigned to the respective connection.

Drop not answered incoming / outgoing calls after 90 seconds: Enable to drop calls automatically when they are not answered within 90 seconds.
Anonymous Calling: Enable to hide the own telephone number. (Not available in POTS mode). VoIP providers or VoIP PABX's might refuse to call out or refuse registration requests when this option is enabled.
Use internal phone book as whitelist: Activate this option if you want the RTS TIF-PRO2 to reject all incoming calls from phone numbers that are not in the internal phone book.
ISDN Protocol: Select an ISDN protocol depending on your location or the setting in your ISDN PABX. (Only available in ISDN mode.)
- **Euro ISDN**
- **USA ISDN (NI-1)**
- **Japanese ISDN**

Permanent activation of ISDN Layer 2: Activate this option if the first in a series of calls cannot be established or incoming calls are not detected. (Only available in ISDN mode.)

Configure whether a channel is connected to a PABX or to the provider in the Line Type section. This enables the RTS TIF-PRO2 to distinguish between internal and external calls.
- **PABX**: Select if the channel is connected to a PABX. Also configure the PBX / Exchange line configuration.
- **Outside Line**: Select if the channel is connected to the provider.

The PBX / Exchange line configuration enables the device to distinguish between international, external and internal calls.
- **International Prefix**: Prefix digits for dialing an international telephone number. (default: "00", don't set to "+")
- **National Prefix**: Prefix digits for dialing long distance telephone numbers. (default: "0")
- **Length of Extension**: Number of digits of internal phone numbers. If you dial a number which is longer the system automatically pre-dials the outgoing line prefix.
- **Outgoing Line Prefix**: Prefix digit inserted before the number to dial external phone numbers.
- **PBX Number**: The office / trunk number. Required if there are PABX lines and outside lines.
- **Skip Outgoing Line Prefix on Incoming Calls**: Some PBXs signal the calling party's number including the prefix digits, some do not. Set this option so, that the number of an incoming call is displayed without the prefix digits in the PC software.

The RTS TIF-PRO2 can automatically accept incoming calls. Configure the respective parameters in the Auto Answer section.
- **Enable Auto Answer**: Answer incoming calls on all channels automatically.
- **Auto Answer Delay**: Set how long an incoming call rings before it is automatically answered by the unit

10.8.3 VoIP (LAN/SIP)

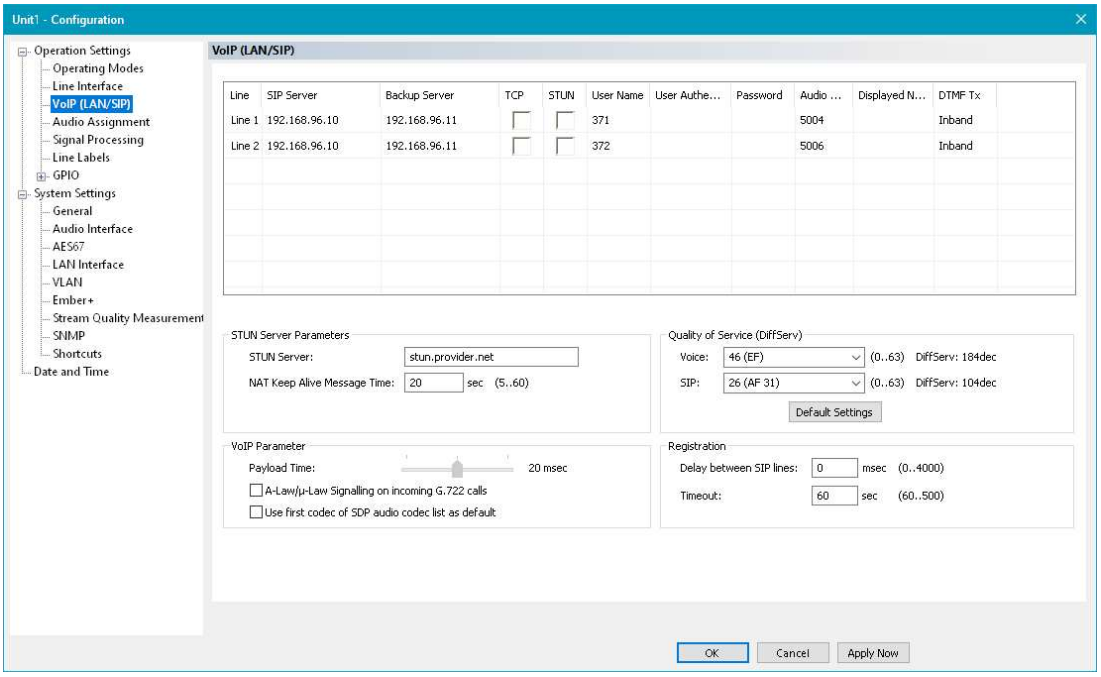


Figure 10.30: Configuration - VoIP (LAN/SIP)

Enter the SIP credentials for each telephone line in the VoIP (LAN/SIP) table.
The RTS TIF-PRO2 provides two VoIP channels which are completely independent from each other. The parameters must be defined for each VoIP line.

- **Sip Server**: Main SIP server. May consist of three parts: proxy@SIP-Server:port
  - **Proxy**: IP address or host name of the proxy server.
  - **Sip-Server**: Also referred to as REALM or REGISTRAR. IP address or host name. (Mandatory)
  - **Port**: Server port for SIP. May be omitted if the default port 5060 is used.
- **Backup Server**: The RTS TIF-PRO2 monitors constantly if the main SIP server is available. If not, it switches to the backup SIP server. When the primary SIP server becomes available again, the unit switches back to the primary SIP server. Refer to Sip Server for further information.
- **TCP**: Enable to use TCP to connect to the SIP server. Otherwise UDP is used.
- **STUN**: Enable if STUN is required by the SIP server. Specify the STUN server below on the same page.
- **User Name**: Identifies the SIP account. (The user name may be the phone number of the extension or the public phone number, or an ID.)
- **User Authentication**: Identifies the user account if a password is needed to access a SIP server. When the user authentication field is left blank, the device uses the user name for authentication.
- **Password**: The password for the SIP account.
- **Audio Port (UDP)**: Local UDP port for the audio transmission of this VoIP channel. It is recommended to use only straight numbers. (default: 5004,5006)
- **Displayed Name**: Text entered here will be displayed on the telephones of the callers. Note that PBXs or providers may override the displayed name.

The RTS TIF-PRO2 uses STUN (Session Traversal Utilities for NAT) to determine its public IP address. It depends on the SIP server or the provider whether STUN is necessary. Configure STUN in the STUN Server Parameters section:

- **Stun Server**: Enter the IP address or the host name of the STUN server specified by the VoIP provider.
- **Nat Keep Alive Interval**: Specify how often the device sends periodic Keep-Alive packets to the SIP Server. Thus, routers and firewalls keep the SIP communication ports open. This allows the SIP server to notify the device about incoming calls. Keep-Alive packets are only sent if STUN is enabled for the respective SIP account. (default: 20 seconds)

Configure common VoIP Parameters:

- **Payload Time**: The device always uses a payload time of 20 ms. Bigger or smaller packets tend to cause audio problems when calls are routed via public telephone networks.
- **A-Law/µ-Law Signaling on Incoming G.722 Calls**: Enable this option if audio is missing or broken when receiving forwarded calls. This problem might occur when one of the participants is not capable of HD-Voice (G.722) and the PBX is not aware of that.
- **Use First Codec of the SDP Audio Codec List as Default**: Enable this option if phones call in which announce a list of supported audio codecs but only work when the RTS TIF-PRO2 selects the first mentioned algorithm.

Specify the timing of the SIP registration process in the Registration section:

- **Delay Between SIP Lines**: During start-up, the device simultaneously sends a SIP registration telegram for each VoIP channel to the SIP server. If this is overwhelming the SIP server this option introduces a delay between the VoIP channels.
- **Timeout**: The RTS TIF-PRO2 renews the SIP registration every 60 seconds by default to check if the SIP server is still available. Increase the interval if the SIP server rejects the registration telegrams as too soon.

10.8.4 POTS phone numbers

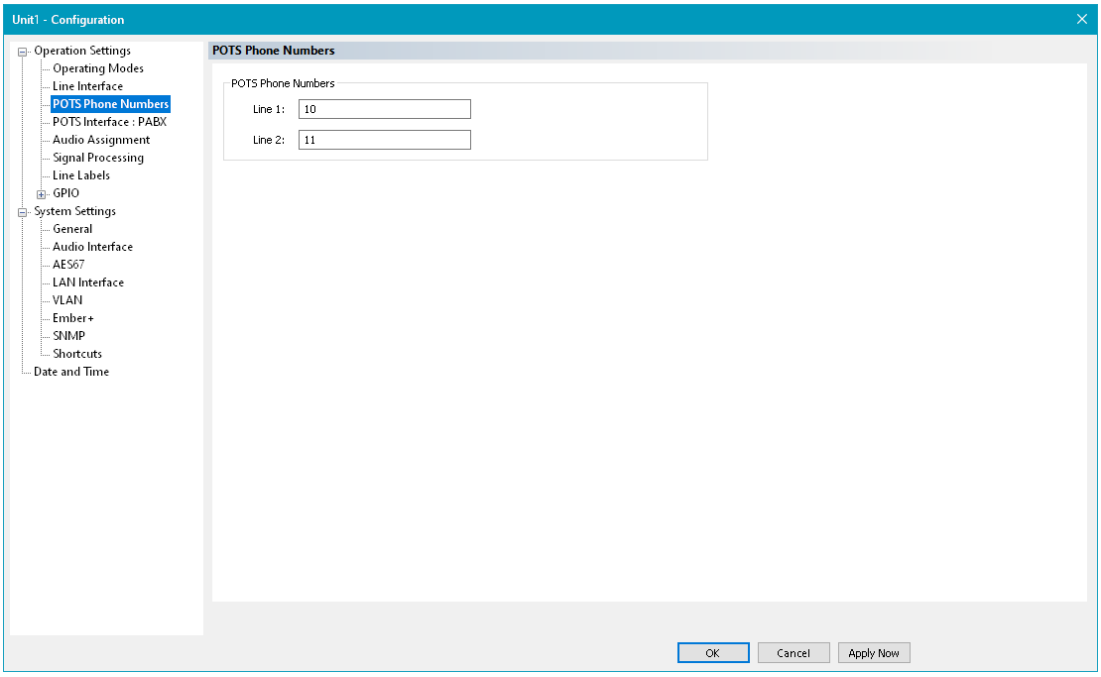


Figure 10.31: Configuration - POTS Phone Numbers

The **POTS Phone Numbers** page is displayed only in POTS mode.

There is no technical necessity to specify the POTS phone numbers of the RTS TIF-PRO2. Enter the POTS phone numbers if you like to display them in the line labels using the {lineid} wildcard on the Line Labels configuration page.

10.8.5 POTS interface PABX / outside line

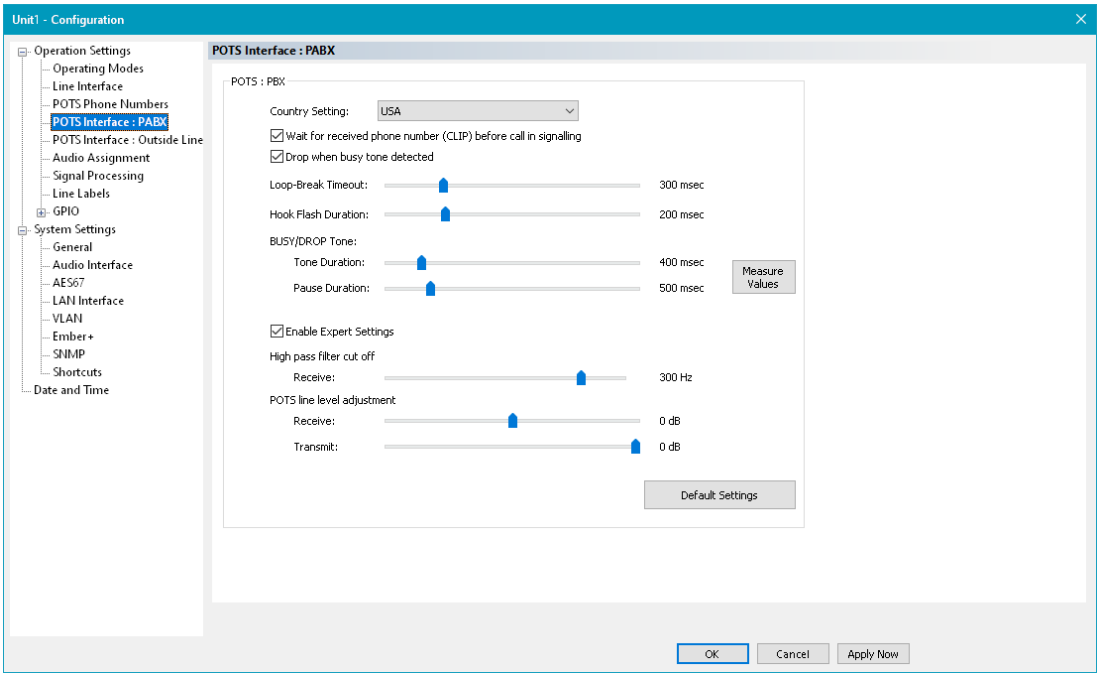


Figure 10.32: Configuration - POTS Interface

The **POTS Interface pages** are only displayed in POTS mode.
The POTS interface parameters for channels connected to a PBX are configured on the POTS Interface: PABX page.
The POTS interface parameters for channels connected directly to the public telephone network are configured on the POTS Interface: Outside Lines page.
The options are the same for both variants.

- **Country Setting**: Defines the POTS interface's impedance. Finding the correct setting is crucial to minimize echo. Set the country of your location or use the country of manufacture of the PBX as a guideline.
- **Wait for Received Phone Number (CLIP) Before Call in Signaling:** The calling party's phone number is signaled between the first and the second ringing. If this option is enabled, the incoming call is ignored until the second ringing. The call will be visible from the second ringing even if no phone number is detected.
- **Drop When Busy Tone Detected**: Enable if the system should drop the call automatically when the disconnected tone (busy tone) is heard on the telephone line. You may need to specify or measure the tone in the BUSY/DROP TONE section.
- **Loop-Break Timeout**: Defines the minimum time the loop current of the telephone line must be interrupted for the RTS TIF-PRO2 to drop the call. Short interruptions are used to signal events in the network (e.g., initiate call forwarding). Longer interruptions indicate a problem in the network. When the timeout is set too low, accidental disconnects may happen. (default: 300ms)
- **Hook Flash Duration**: A hook flash signals the network that a device wants to forward a call. Adjust the hook flash duration if there are problems forwarding calls.

- **BUSY / DROP Tone**: The RTS TIF-PRO2 can detect if the remote station has hung up. It is monitoring the audio signal for a sequence of tones and pauses with defined duration. The sequence might be different for each PBX or provider.
  - **Tone Duration**: Specify a custom tone duration.
  - **Pause Duration**: Specify a custom pause duration.
  - **Measure Values**: Click the button to measure the actual sequence and set it as custom tone and pause duration. To measure the values correctly make sure the drop tone can be heard on the first telephone line connected to the PBX or the public network, respectively.
- **Enable Expert Settings**: The expert settings help to improve the audio signal on telephone lines with difficult line characteristics.
- **High Pass Filter Cut-Off Frequency** - **Receive**: Sounds below this frequency are filtered out (e.g., low frequency hum).
- **POTS Line Level Adjustment**
  - **Receive**: Increase the value to amplify the audio signal coming in from the telephone line. Decrease the value if the audio is distorted.
  - **Transmit**: Increase the value to send a louder signal. Decrease the value if the audio signal sounds distorted at the remote station or if there is a loud echo signal coming back.
- **Default Settings**: Resets all values on the page to factory settings.

10.8.6 MSN

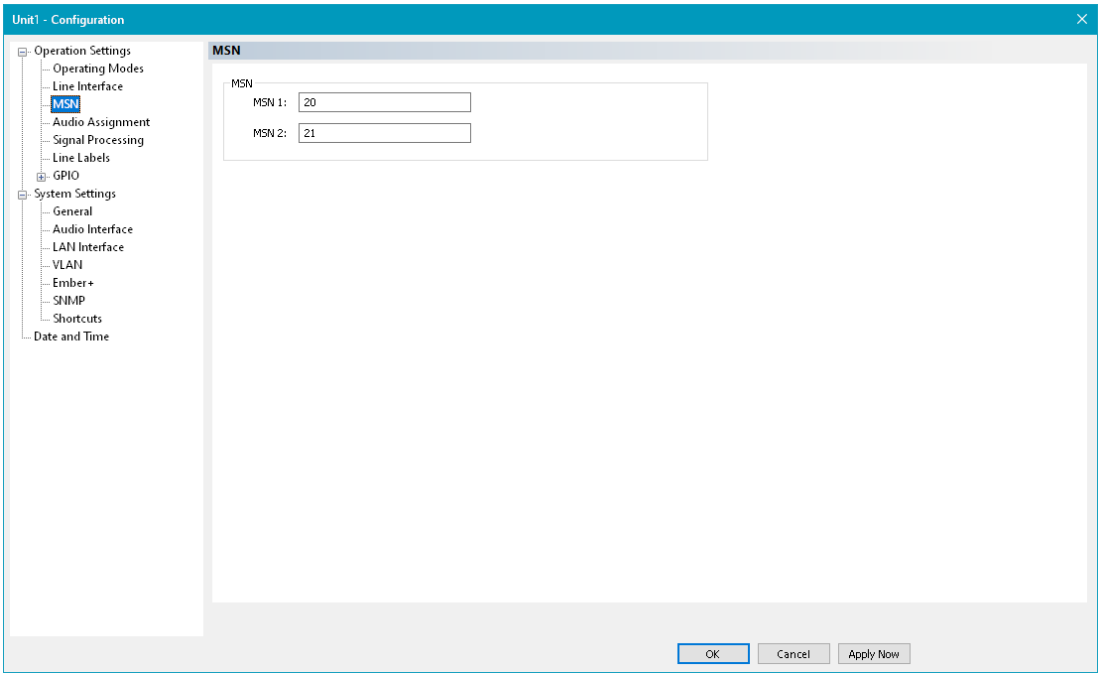


Figure 10.33: Configuration - MSN

The **MSN** page is displayed only in ISDN mode.
Depending on the PBX you may need to enter an MSN (Multiple Subscriber Number) for each ISDN channel connected to the RTS TIF-PRO2. The MSN may be the internal telephone number (extension). For more information, refer to the PBX manual or the provider's documentation.

10.8.7 Audio assignment

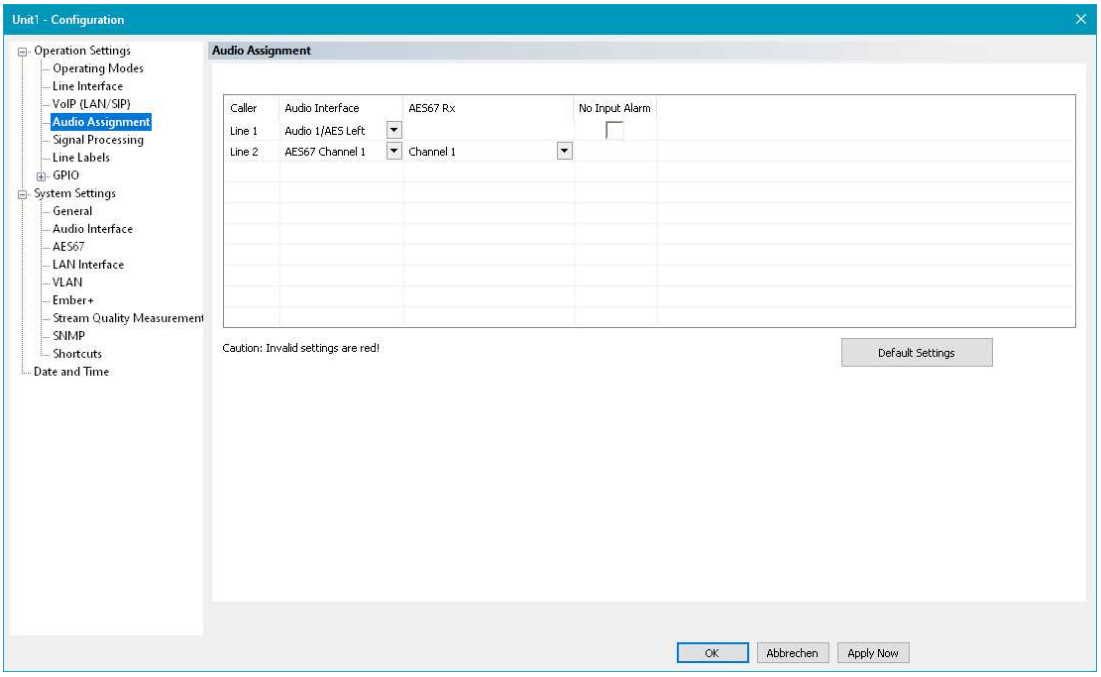


Figure 10.34: Configuration - Audio Assignment

Specify the audio interfaces used for each channel on the Audio Assignment page.

- **Caller**: Shows the telephone line.
- **Audio Interface**: Click on the cell to assign an audio interface to the telephone line.
- **AES67 Rx**: Only required if an AES67 channel is assigned in the Audio Interface column. Assign an audio channel of a received AES67 stream. Specify the AES67 stream on the AES67 configuration page under Reception.
- **No Input Alarm**: Disable the AES input alarm for this telephone line. Only available if an AES input is assigned to the telephone line.

10.8.8 Signal processing

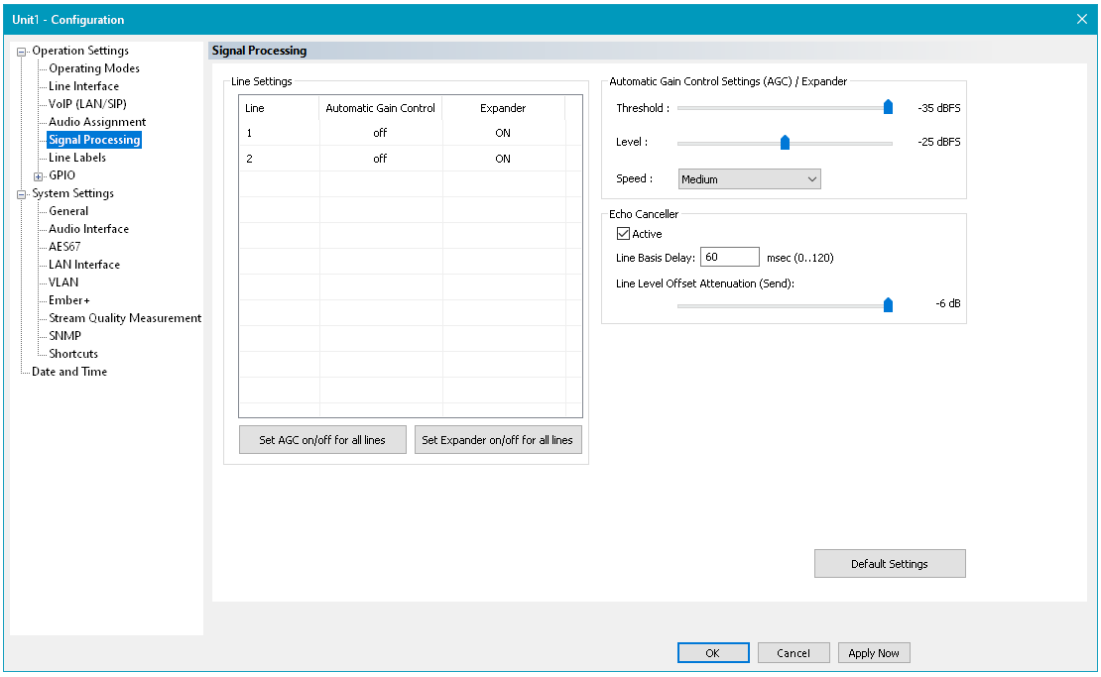


Figure 10.35: Configuration - Signal Processing

Define the signal processing parameters on the Signal Processing page:

- **Line Settings**: Enable or disable AGC or Expander for each line individually.
  - **Automatic Gain Control (AGC)**: The AGC controls the amplifier which processes the audio signal of the caller. Enable the AGC to maintain a certain audio level. The AGC parameters can be modified under Automatic Gain Control Settings (AGC) / Expander.
  - **Expander**: The expanders lower the level of quiet audio signals even more to reduce noise. The threshold for the receiver is defined under Automatic Gain Control Settings (AGC) / Expander.
    The expander for the transmitter is always on with a threshold of -52 dBFS.
- **Automatic Gain Control Settings (AGC) / Expander**: Define the parameters for AGC and expander.
  - **Threshold**: The AGC is only applied to audio signals above this level. The expander in the receiver is only applied to audio signals below this level.
  - **Level**: Define the target level for the AGC. The AGC tries to maintain this level for the audio signal of the caller. The amplifier has a range of 32 dB. Which means it can lower the signal by 16 dB and amplify the signal by 16 dB.
  - **Speed**: Define how fast the AGC adjusts to changes in the audio signal coming from the caller.

Echo Canceller: The echo canceller eliminates echo coming back from the caller in POTS, ISDN and VoIP mode. It is not used for HD-Voice calls. There is a dedicated echo canceller for each telephone line.
It is recommended to adjust the audio levels so that the TX level displayed on the main panel of the PC software is between -18 dBFS and -12 dBFS.

- **Active**: Enables the echo cancellers.
- **Line Basis Delay**: The echo canceller can detect and eliminate echoes with a delay of up to 120 ms. Depending on the telephone network there is a minimum round-trip time of an echo signal. This timespan can be ignored by the echo canceller. The defined line basis

delay moves the 120 ms range of the echo canceller.
A value of e.g., 60 ms enables the RTS TIF-PRO2 to eliminate echoes which occur within 60 ms and 180 ms.
Recommended values:
- POTS, ISDN: 0 ms
- ISDN with PBX: 40 ms
- VoIP: 60 ms

- **Line Level Offset Attenuation (Send)**: Define how much the level of the audio signal being sent over the telephone line to the caller is attenuated. Decrease the value if the returned echo signal is too strong to be eliminated by the echo canceller.

10.8.9 Line labels

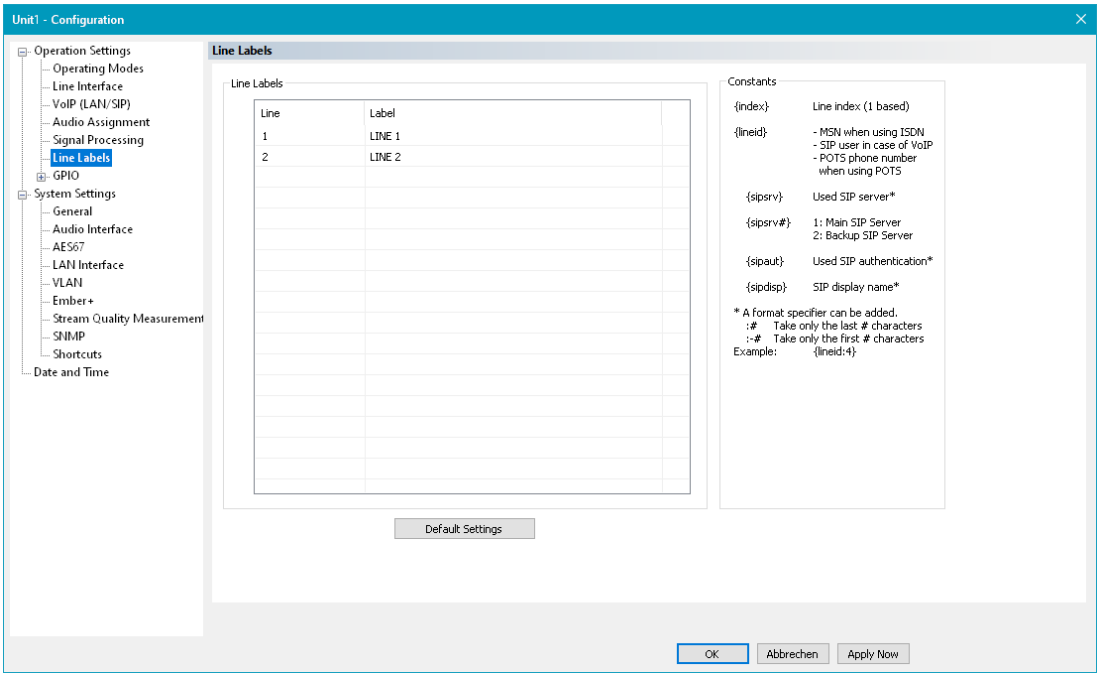


Figure 10.36: Configuration - Line Labels

Define the labels on all telephone lines displayed on the main panel of the PC software on the Line Labels page.
Line: Shows the line numbers of the available telephone lines.
Label: Enter any text. You may also mix text with the supported variables:
- {**index**}: Line index
- {**lineid**}: Telephone number derived from the line interface settings.
  - **VoIP**: SIP User as defined on the VoIP (LAN / SIP) configuration page.
  - **ISDN**: MSN as defined on the MSN configuration page.
  - **POTS**: Phone number as defined on the POTS Phone Numbers configuration page.
- {**sipsrv**}: Only in VoIP mode. SIP server name / address currently used. (*)
- {**sipsrv#**}: Only in VoIP mode. 1 if the main SIP server is currently used. 2 if the backup SIP server is currently used.
- {**sipaut**}: Only in VoIP mode. SIP authentication as defined on the VoIP (LAN / SIP) configuration page. (*)
- {**sipdisp**}: Only in VoIP mode. SIP display name as defined on the VoIP (LAN / SIP) configuration page. (*)

- **(*)**: The result of these variables can be modified:
  - **{...:#}**: Use only the last # characters. (e.g. {lineid:4})
  - **{...:-#}**: Use only the first # characters.

10.8.10 GPIO

TTL/Relay

The RTS TIF-PRO2 provides two hardware TTL contacts:

- Each TTL GPIO can be configured individually as input or output.
- It is possible to assign functions to the positive edge (signal goes from “low” to “high”) and the negative edge (signal goes from “high” to “low”).
- Each pin has an internal pull up resistor. An open pin has therefore the logic state “high”.
- Use for example an external relay to short-circuit the pin to device ground which is also available through the GPIO connector.

Notice!
In the high position, a TTL output supplies a voltage of 3.3 V and a maximum current of 10 mA.

The RTS TIF-PRO2 provides two hardware relays:

- The relays are normally open.

Notice!
A relay can be loaded with a maximum 200 mA and 48 V.

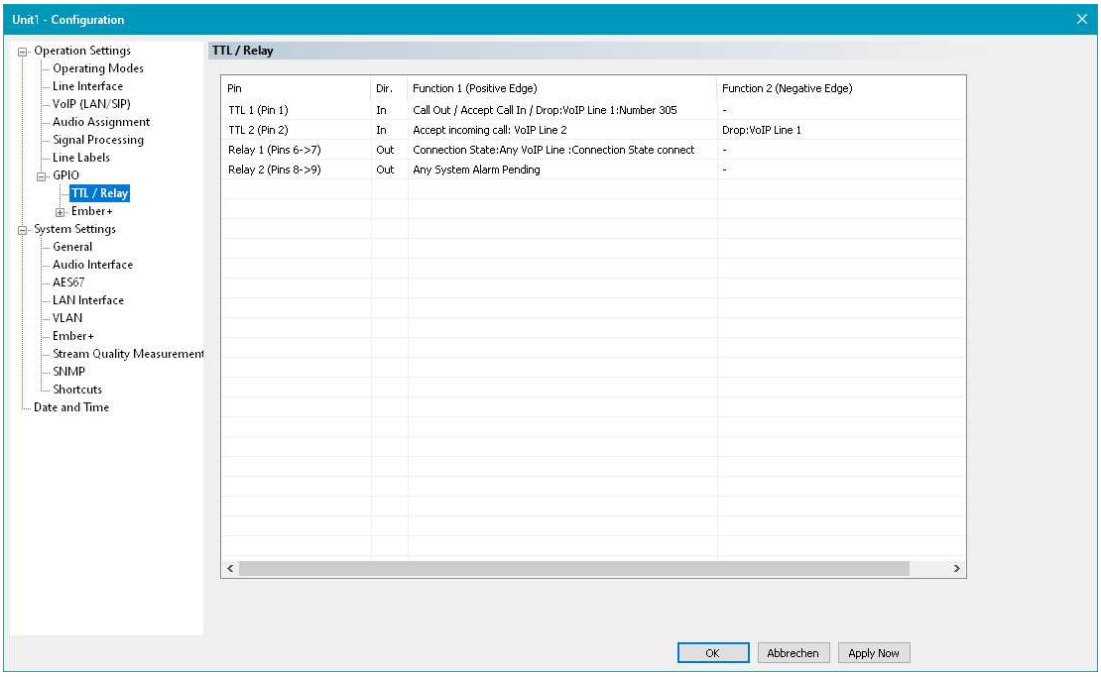


Figure 10.37: Configuration - GPIO - TTL/Relay

The TTL/Relay configuration page displays the available TTL and Relay GPIOs and provides an overview of the assigned functions.

- **Pin**: Shows the available contacts along with the pin assignment of the TTL/Relay connector of the RTS TIF-PRO2.
- **Dir.**: Displays if the contact is used as input or output.
- **Function 1 (Positive Edge)**: Displays the first function assigned to the GPIO. If it is an edge triggered input function, it is executed on the positive edge of the input signal.
- **Function 2 (Negative Edge)**: Displays the second function assigned to the GPIO. Only edge triggered input functions can be assigned to function 2.

Double-click a list entry to configure the function.

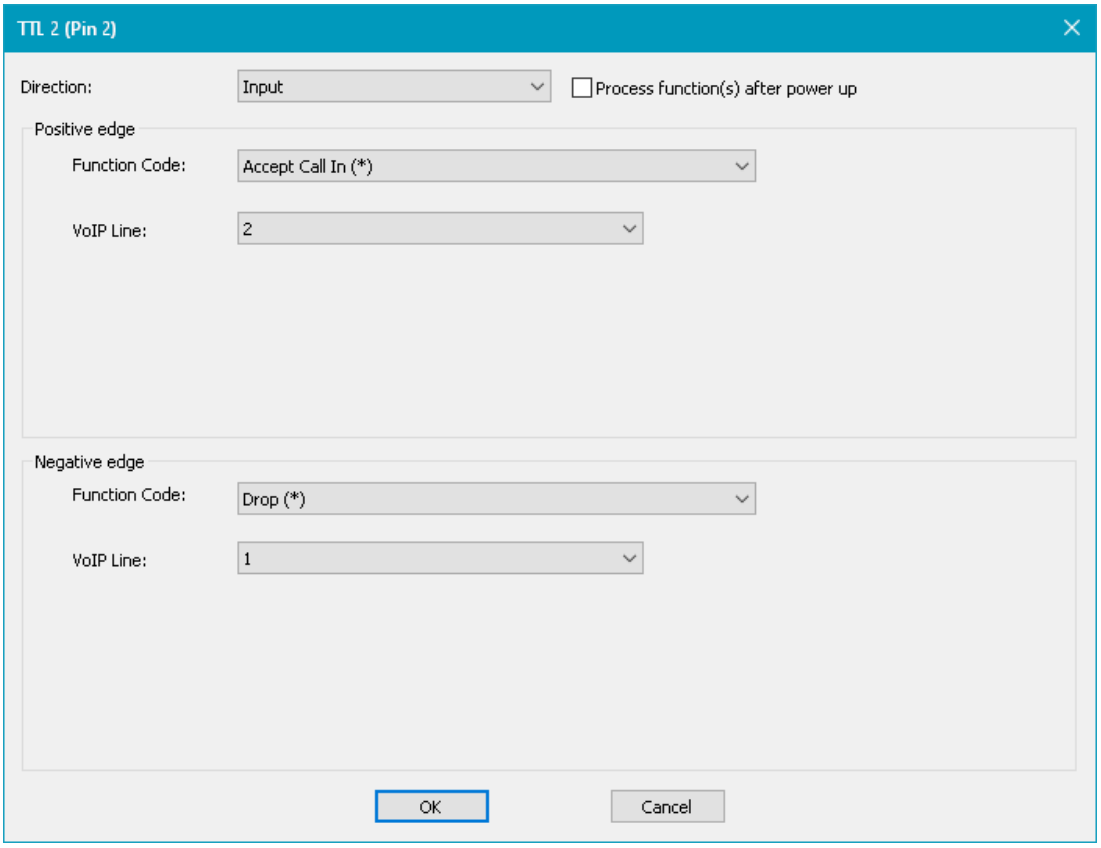


Figure 10.38: Configuration - GPIO - TTL/Relay Contact

- **Direction**: Define if the TTL contact works as an input or as an output. (Only available for TTL contacts.)
- **Positive Edge**: First function of the GPIO. If an edge triggered input function is selected, it is executed on the positive edge (the input signal goes from “low” to “high”).
- **Process function(s) after power up**: If enabled, the RTS TIF-PRO2 executes the configured functions after booting depending on the state of the TTL input. (Only available for TTL inputs which are marked with an asterisk (*).)
- **Function Code**: Select from a list of pre-defined functions.
- **Inverted**: Output functions can be inverted so that the signal is low if the output is active and high if the output is inactive.
- **Parameters**: The parameters depend on the selected function.
- **Negative Edge**: Only edge triggered input functions can be assigned to the negative edge.

Ember+

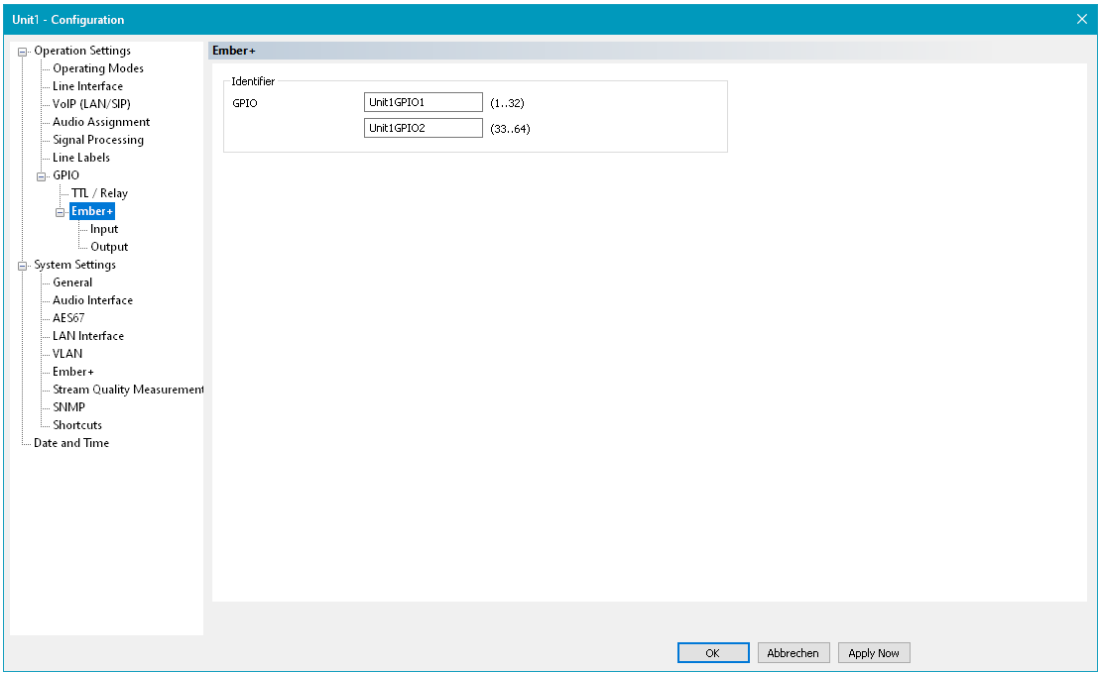


Figure 10.39: Configuration - GPIO - Ember+

Additional 64 inputs and 64 outputs are supported via the Ember+ protocol that must be activated on the Ember+ configuration page.

- **Identifier**: The GPIOs are only available in the Ember+ tree if there is an identifier defined for them.
- **GPIO**: An identifier provides access to 32 inputs and 32 outputs. Define the first identifier for GPIOs 1-32 and the second identifier for GPIOs 33-64.

Select the Ember+ Input or Ember+ Output page on the left to assign the functions.

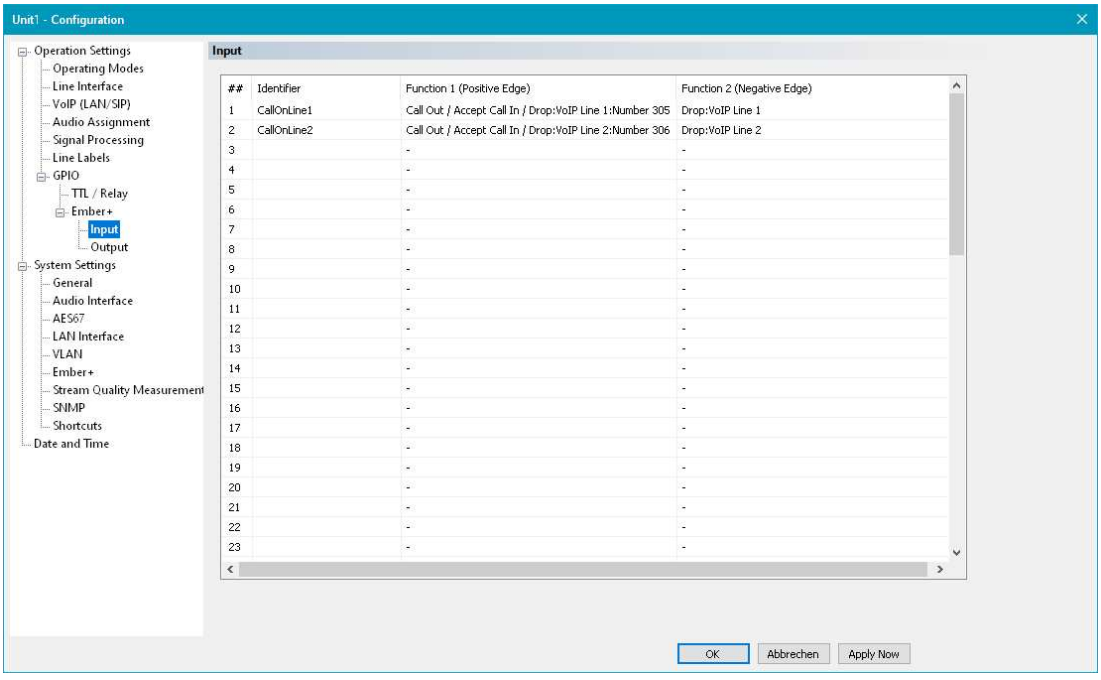


Figure 10.40: Configuration - GPIO - Ember+ - Input

- **####**: Shows the number of the Ember+ input or output.
- **Identifier**: Displays the identifier assigned to the input or output.
- **Function 1 (Positive Edge)**: Displays the first function assigned to the input or output. Input functions are executed on the positive edge of the input signal.
- **Function 2 (Negative Edge)**: Displays the second function assigned to the input. Input functions are executed on the negative edge of the input signal. Only available for inputs.

Double-click a list entry to configure the function.

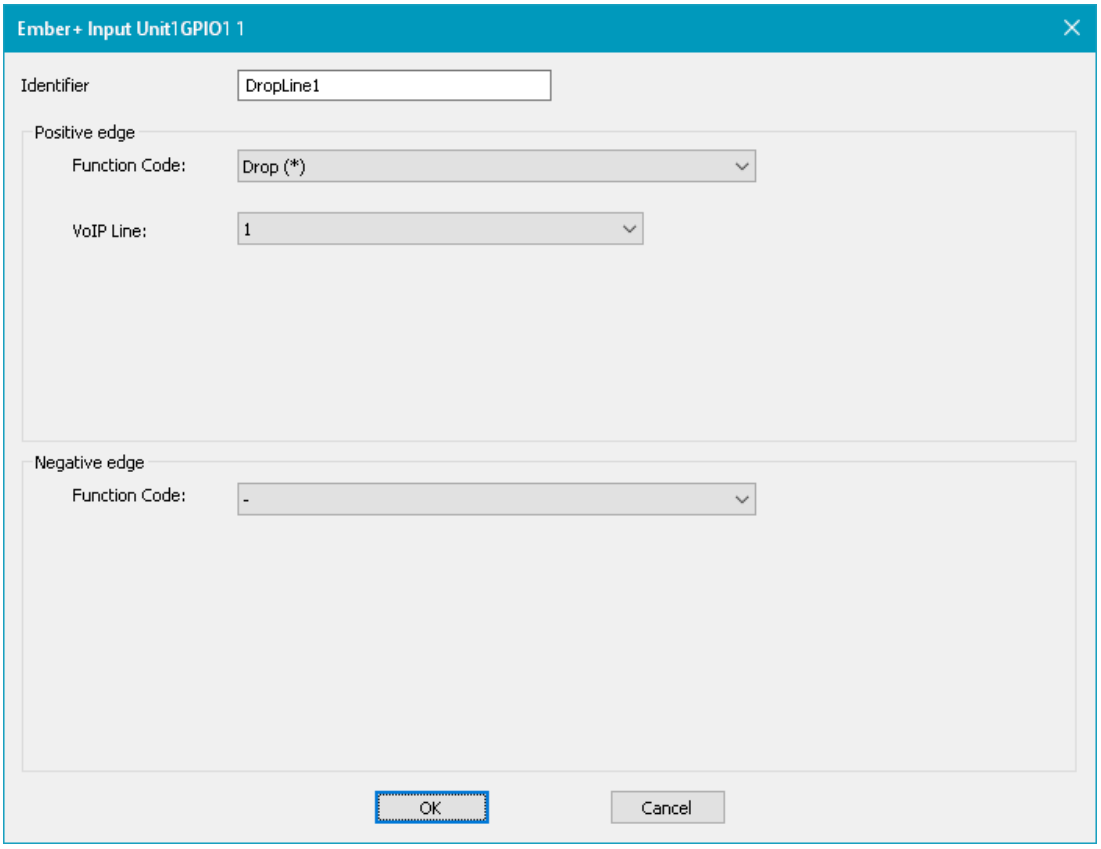


Figure 10.41: Configuration - GPIO - Ember+ - Input

- **Identifier**: Can be chosen freely.
- **Positive Edge**: First function of the GPIO. If an edge triggered input function is selected, it is executed on the positive edge (the input signal goes from “low” to “high”).
- **Function Code**: Select from a list of pre-defined functions.
- **Parameters**: The parameters depend on the selected function.
- **Negative Edge**: Only input functions can be assigned to the negative edge.

GPI Functions

Function	Parameter			Description
Call Out / Accept Call In / Drop (*)	Line Number	LI #	1...2 <phone number>	Dials phone # on caller line LI. Accepts an incoming call on caller line LI. Drops the connection on caller line LI.

Function	Parameter			Description
Call Out (Level triggered	Line Number	LI #	1...2 <phone number>	Dials phone # on caller line LI repeatedly when the input is high.
Accept Call In (*)	Line Number	LI #	1...2 <phone number>	Accept an incoming call on caller line LI.
Drop (*)	Line Number	LI #	1...2 <phone number>	Drop the call on line LI.
String Command (*)	Cmd	C	-	Special developer function.
Load Preset	Preset	P	<preset name>	Loads the preset P.
Suppress ring tone (Level triggered)	-	-	-	Suppress the system ringing tone when the input is high.
Disable Auto Answer (Level triggered)	-	-	-	Auto answer disables when input is high.
Always open	-	-	-	The relay is always open.
Always closed	-	-	-	The relay is always closed.
Fixed high	-	-	-	The output is always high.
Fixed low	-	-	-	The output is always low.
Information Base Entry	Entry ID Value	ID V		Special developer function.
Any System Alarm Pending	-	-	-	Activated if at least one system alarm is active. See Alarms
Application Alarm Pending	Alarm	AA	Configured application alarms	Activated if at least one of the selected application alarms is activated.
Ringing / Connected State	Line Calling	LI C	1...2, Any Include / Exclude	Activated if the connection status on caller line LI (Any: on at least one caller line) is RINGING or CONNECTED. Set C to "include" to also activate the output if the connection state is CALLING.

Tab. 10.17: GPI Functions

(*): Process functions after power up is supported for a TTL input
(Level triggered functions are not available with Ember+)

GPO Functions

Function	Parameter			Description
Always open	-	-	-	The relay is always open
Always closed	-	-	-	The relay is always closed
Fixed high	-	-	-	The output is always high
Fixed low	-	-	-	The output is always low
Information Base Entry	Entry ID Value	ID V		Special developer function
Any System Alarm Pending	-	-	-	Activate if at least one system alarm is active
Application Alarm Pending	Alarm	AA	Configured application alarms	Activated if at least one of the selected application alarms is active.
Ringing / Connected State	Line Calling	LI C	1 to 2, Any Include, Exclude	Activate if the connection status on caller line LI (Any: on at least one caller line) is RINGING or CONNECTED. Set C to "include" to also activate the output if the connection state is CALLING.

Tab. 10.18: GPO Functions

10.8.11 General

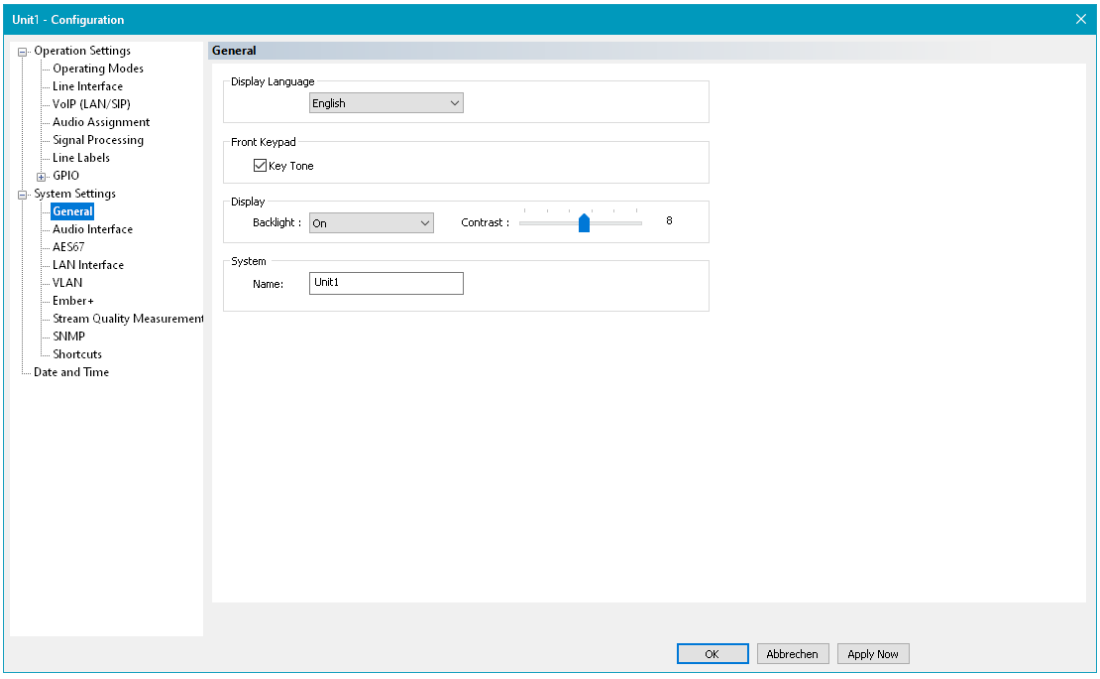


Figure 10.42: Configuration - General

Find miscellaneous settings on the **General** configuration page.

- **Display Language**: The front display of the RTS TIF-PRO2 supports two languages:
  - **English**
  - **German**
- **Front Keypad Key Tone**: Enable the key click of the front keypad.
- **Display Backlight**: Set the backlight mode of the front display:
  - **Auto**: Turns on when a key is pressed and turns off after a few seconds.
  - **On**: Permanently on.
- **Display Contrast**: Adjust the contrast to improve the clarity of the front display.
- **System Name**: Enter a system name. It is used:
  - to identify the device on the main window.
  - as the NetBIOS name of the device, to address it in the Control Interface configuration.
  - along with requesting an IP address via DHCP.
  - to identify the system via the front display

10.8.12 Audio interface

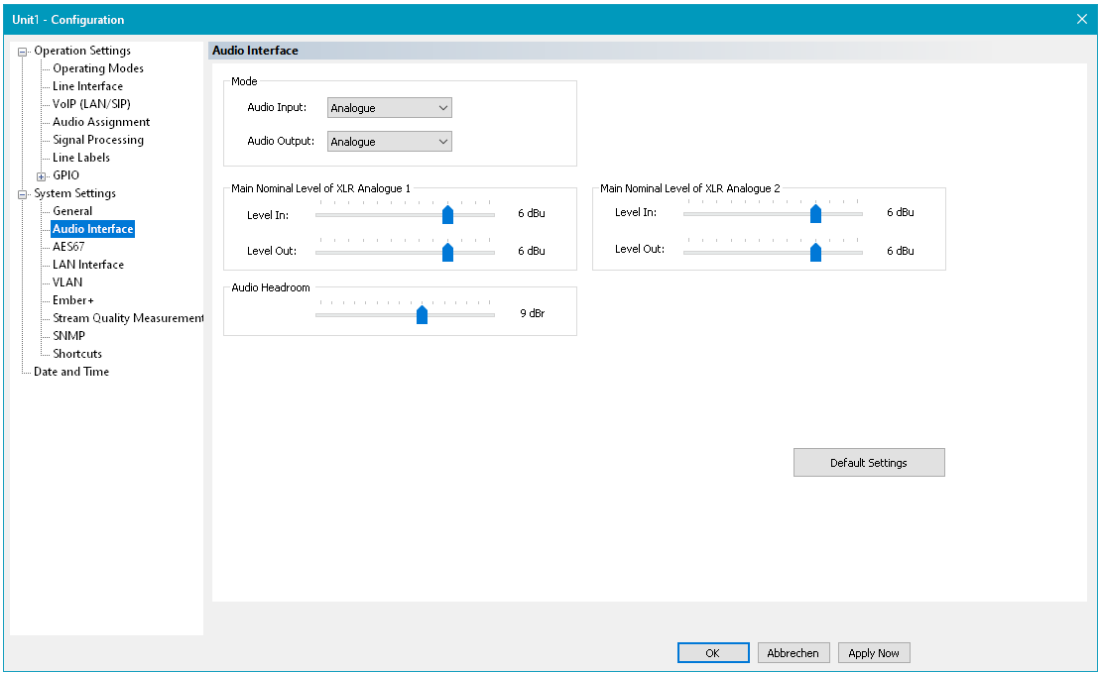


Figure 10.43: Configuration - Audio Interface

Configure the parameters of the audio interfaces on the Audio Interface configuration page.

- **Mode Audio Input**: Set the Audio input to analogue or digital (AES/EBU). The audio connectors are located on the rear panel of the RTS TIF-PRO2.
  - **Analogue**: Use AUDIO 1 IN and AUDIO 2 IN for one mono signal each.
  - **Digital**: Use AES IN for a stereo AES/EBU signal.
- **Mode Audio Output**: Set the Audio output to analogue or digital (AES/EBU). The audio connectors are located on the rear panel of the RTS TIF-PRO2.
  - **Analogue**: Use AUDIO 1 OUT and AUDIO 2 OUT for one mono signal each.
  - **Digital**: Use AES OUT for a stereo AES/EBU signal.
- **AES/EBU Interface - Clock Source of Digital Output**: Select the clock source to which the digital output is synchronized. (Only available if the audio output is set to digital.)

  - **Internal**: The output uses the internal clock of the RTS TIF-PRO2.
  - **Recovered**: The output clock is derived from the AES input. (Only available in POTS mode. The audio input must be set to digital. AES67 must be disabled.)
- **Main Nominal Level of XLR 1/2**: Adjust the audio levels of the analogue audio inputs and outputs.
  - **Input Left / Right**: Set the sensitivity of the audio inputs (default: 6dBu).
  - **Output Left / Right**: Set the gain of the audio outputs (default: 6dBu).
- **Audio Headroom**: The audio level of the analog audio inputs is reduced by the headroom. The audio level of the analog audio outputs is increased by the headroom. (default: 9 dBr).

10.8.13 AES67

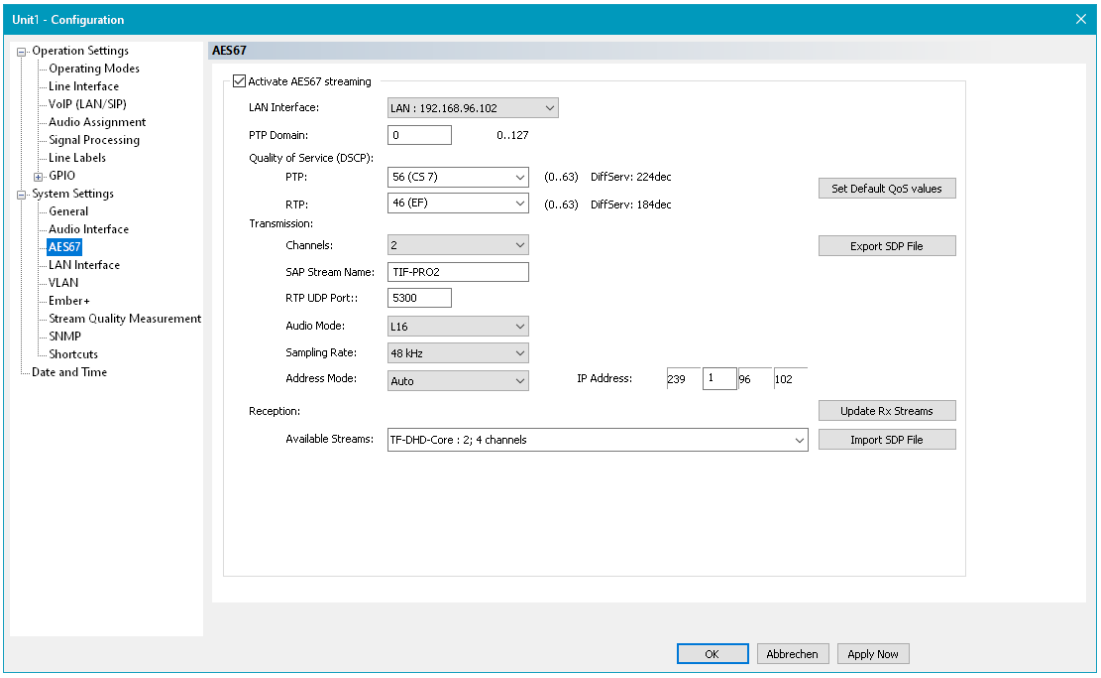


Figure 10.44: Configuration - AES67

The AES67 functionality is activated and configured on the AES67 configuration page.
LAN Interface: Select the network interface of the device used for AES67.
PTP Domain: Set the PTP domain number for PTP clock synchronization.
Quality of Service (DSCP): Set the classification of data to enable switches and routers to prioritize network traffic.
- **PTP**: DSCP classification of the clock synchronization protocol.
- **RTP**: DSCP classification of transmitted AES67 audio streams.
- **Set Default QOS Values**: Set default values for PTP and RTP.

Transmission: Define the AES67 audio stream in send direction. The stream can contain up to 2 channels and is made accessible in the network via SAP (Session Announcement Protocol).
- **Channels**: 1 or 2 mono audio channels.
- **SAP Stream Name**: Identifier of the AES67 stream in the network.
- **RTP UDP Port**: Port of the audio stream.
- **Audio Mode**: Algorithm for audio coding:
  - **L16**: Linear PCM 16 bits
  - **L24**: Linear PCM 24 bits

- **Sampling Rate**: Sampling rate of the audio signal:
  - 32 kHz
  - 48 kHz
- **Address Mode**:
  - **Manual**: Free entry of the multicast address of the audio stream.
  - **Auto**: The multicast address is derived from the IP address of the device. Only a multicast subnet can be entered.
- **IP Address**: Multicast IP address of the audio stream.
  - **Export SDP File**: Not all manufacturers support SAP to automatically discover AES67 streams in the network. In this case, the definition can be exported to a file in SDP format. Recipients must be able to import SDP files.

RECEPTION: If AES67 is activated, the device searches the network for AES67 streams. It may take up to 5 minutes for all available streams to be listed. The RTS TIF-PRO2 can subscribe to one AES67 stream.

- **Update RX Streams**: Reloads the list of detected AES67 streams.
- **Available Streams**: All AES67 streams published in the network via SAP are offered for selection.
  - **Import SDP File**: If the definition of an AES67 stream is available as a file in SDP format, the stream information can be imported here.

10.8.14 LAN interface

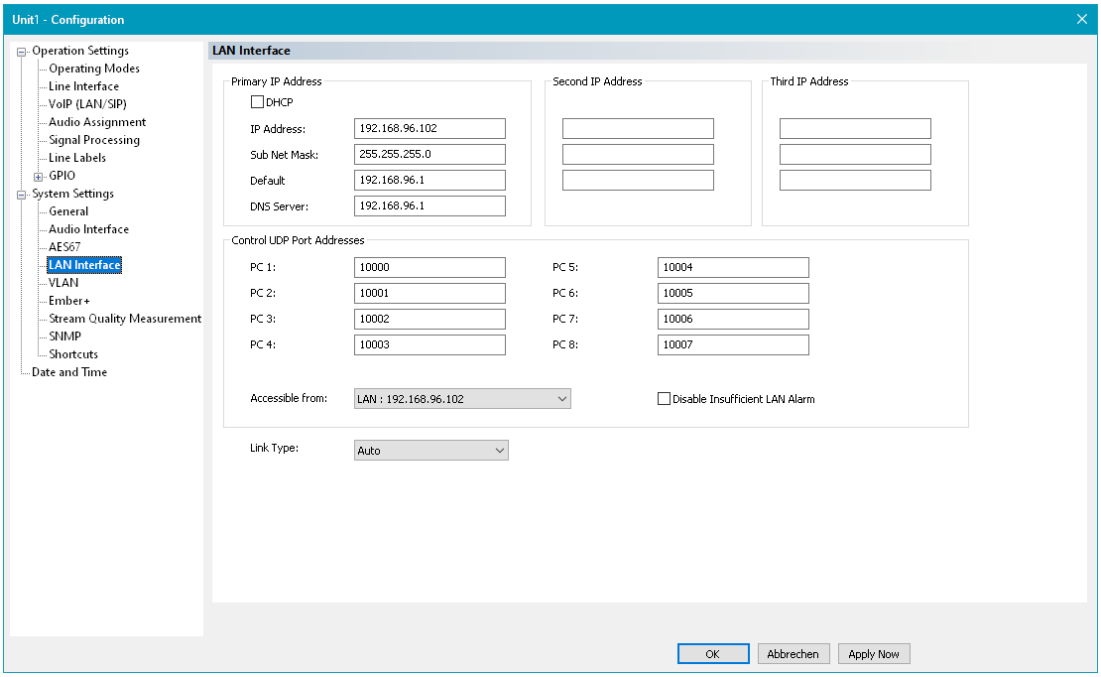


Figure 10.45: Configuration - LAN Interface

Configure the basic parameters for connections to IP networks on the Lan Interface configuration page.
There are three IP addresses available. You must use the Primary IP Address to connect to a SIP server when using the VoIP (LAN/SIP) line mode.
The second and third IP addresses may be used if VLANs (virtual networks) are enabled.
Assign a service (Ember+, SNMP, PC control, ...) to a VLAN on the VLAN configuration page.
Assign a service to an IP address on the corresponding configuration page of the service.

PCs may by default connect to any IP address of the RTS TIF-PRO2.

- **DHCP**: Retrieve an IP address automatically from a DHCP server.
- **IP Address**: Enter a unique IP address. Default IP address: 192.168.96.102.
- **Subnet Mask**: Enter the bitmask describing the subnet. Default subnet mask: 255.255.255.0.
- **Default Gateway**: Enter the IP address of the router in the local network. Default: 192.168.96.1.
- **DNS Server**: Enter the IP address of a DNS server. Required to resolve host names of SIP servers and STUN servers.
- **Control UDP Port Addresses**: Each PC software connecting to an RTS TIF-PRO2 needs to use a unique port. Up to eight clients (depending on the licensed number of workplaces) can connect simultaneously. The default ports are 10000 - 10007.
- **Accessible From**: Select the IP address of the device, to which the PC access is to be limited. It is recommended to select a specific network to prevent unauthorized access.
- **Link Type**: Select the mode for crossover cable detection (default: auto).

10.8.15 VLAN

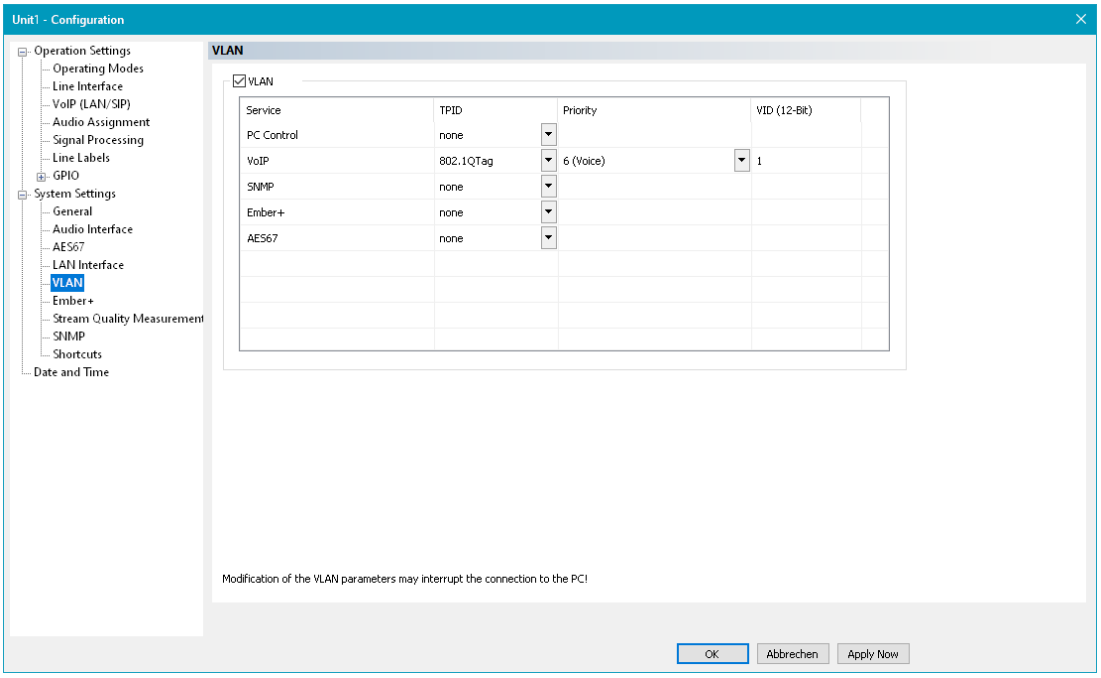


Figure 10.46: Configuration - VLAN

Configure the basic parameters for virtual local area networks on the VLAN configuration page.

- **VLAN**: Enable or disable virtual networks globally.
- **Service**: All services provided by the RTS TIF-PRO2 which support virtual LANs are listed here.
- **TPID**: Enable or disable VLAN for the specific service:
- **NONE**: The service will not carry a VLAN ID and therefor is not part of a VLAN.
- **802.1QTag**: The service will carry a VLAN ID specified in VID and therefore becomes part of that VLAN.

- **Priority**: Sets a quality-of-service classification for the service ranging from 0 = lowest priority to 7 = highest priority. It is recommended to set the priority to 6 for services transmitting audio (VoIP and AES67).
- **VID (12-Bit)**: Sets the VLAN identifier specifying to which VLAN the service belongs. The range is 1-4094.

Notice!
Changing the VLAN configuration requires you to reconfigure the network switches and routers accordingly. If not done correctly, the software loses connection to the unit.

Notice!
VLAN can be enabled or disabled globally on the front display of the RTS TIF-PRO2.

10.8.16 Ember+

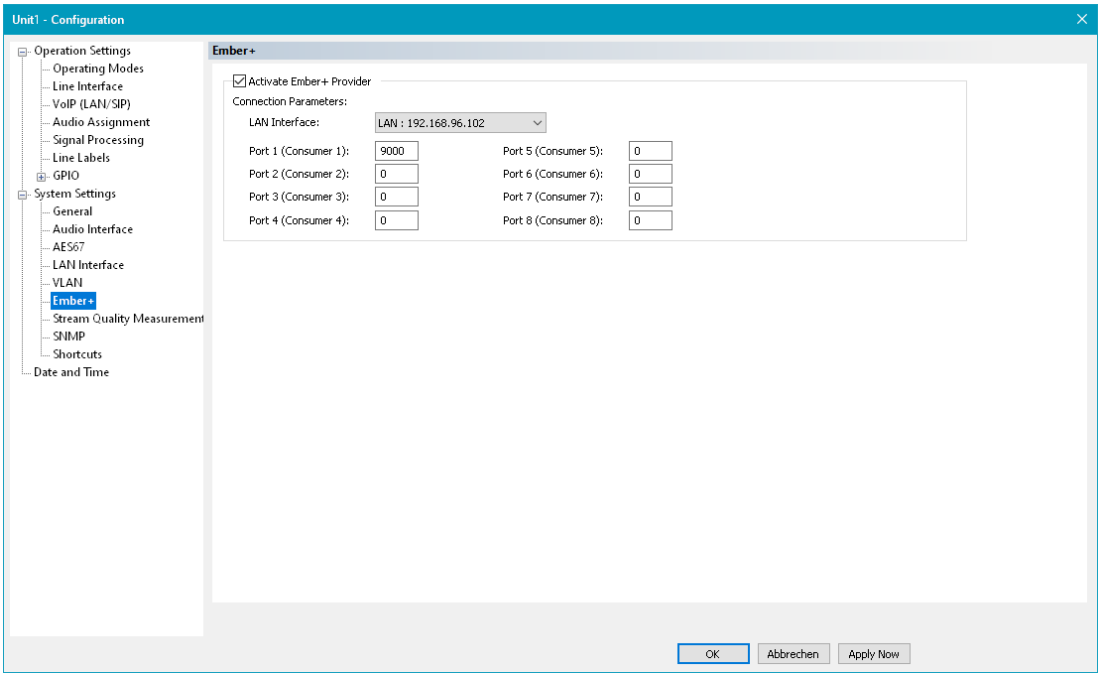


Figure 10.47: Configuration - Ember +

Configure the Ember+ Provider of the RTS TIF-PRO2 on the Ember+ configuration page.

- **Activate Ember+ Provider**: Enables the built-in Ember+ provider.
- **Lan Interface**: LAN interface via which Ember+ consumers can establish a connection to the device.
- **Port**: TCP ports for up to eight Ember+ consumers. (Standard ports: 9000 - 9007) Unused ports should be deactivated by entering “0”.

The functions and signals are configured on the configuration page **GPIO → Ember+ → Input / Output**.
The Ember+ parameter tree also provides status information and functions that can be called directly by consumers. (See *Ember+ tree, page 90*.)

10.8.17 Stream quality measurement

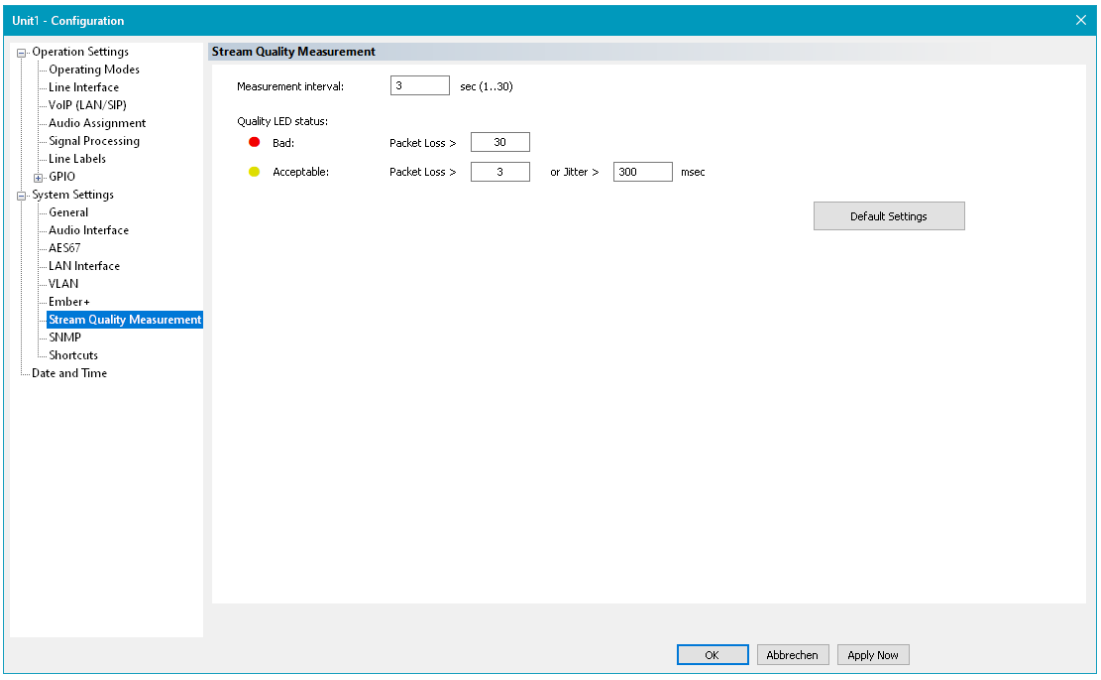


Figure 10.48: Configuration - Stream Quality Measurement

Define the parameters for these categories on the Stream Quality Measurement configuration page.
An LED beneath the level meter indicates the audio stream quality on the main panel.
The RTS TIF-PRO2 constantly monitors transmission jitter and the rate of lost packets to classify stream quality into three categories:
Excellent (green)
Acceptable (yellow)
Bad (red)

- **Measurement Interval**: Specify the period of time in which the number of lost packets is accumulated, and the maximum jitter is determined. This value also dictates the update frequency of the stream quality indicator.
- **Quality LED Status Bad**: Define the packet loss threshold. If the number of lost audio packets exceeds this value, the stream quality indicator turns red.
- **Quality LED Status Acceptable**: Set the thresholds for packet loss and jitter. If the configured number of lost audio packets or the maximum jitter is exceeded, the stream quality indicator goes yellow.
- **Default Settings**: Set the measurement interval and the thresholds to default settings.

10.8.18 SNMP

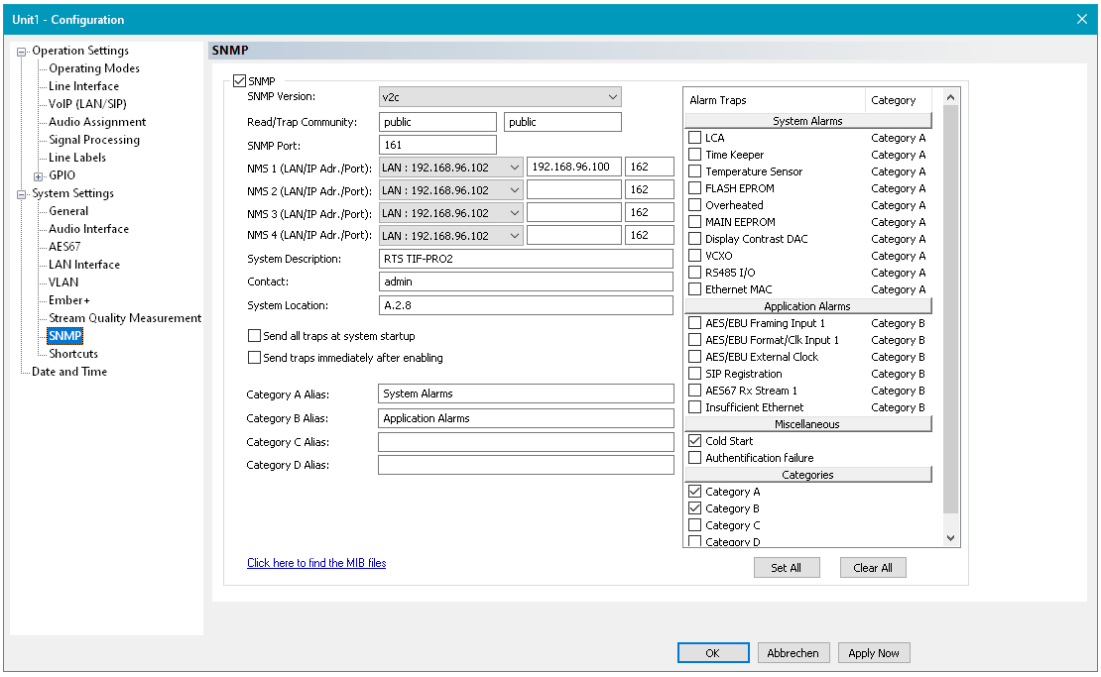


Figure 10.49: Configuration - SNMP

Configure the parameters for connecting the RTS TIF-PRO2 to a network management system on the SNMP configuration page.
The parameters exposed through SNMP are read-only. The unit responds to Get-requests and sends traps.

- **SNMP Version**: Select the SNMP version. The RTS TIF-PRO2 supports SNMPv1 and SNMPv2c.
- **Read / Trap Community**: Enter a string for the READ community and a string for the TRAP community. Communities are used to authenticate the device with the network management system.
- **SNMP Port**: Specify the local UDP port for receiving SNMP requests and sending SNMP responses. The remote port is derived from received SNMP requests. (default: 161)
- **NMS 1-4**: Specify up to four network management stations to send Traps to.
- **LAN**: Select the LAN interface of the RTS TIF-PRO2 which is used to send SNMP traps.
- **IP Address**: Specify the IP address of the network management system.
- **Port**: Specify the UDP port of the Trap receiver of the network management system. (default: 162)
- **System Description**: Enter a string describing this unit. This string is part of the standard MIB.
- **Contact**: Enter a string with information about who is responsible for the unit. This string is part of the standard MIB.
- **System Location**: Enter a string describing where the device is located. This string is part of the standard MIB.
- **Send All Traps at System Start up**: Enable this option to send all traps when the RTS TIF-PRO2 finished booting.
- **Send Traps Immediately After Enabling**: Enable to send a trap immediately after it was enabled in the configuration.
- **Category A-D Alias**: Each Trap may be assigned to a category. Enter strings to describe the categories. The strings can be read by the network management system.

- **Alarm Traps**: Find all available traps in this table.
  - Select all traps which should be sent to the network management system.
  - Click into the Category column to assign a trap to a category.
  - There are four categories. To decrease the number of traps to send, assign a couple of alarms to a category and select only the Category X Trap at the end of the list.
  - Find more information, see *Menu extras, page 59*.
- Additional Traps:
  - **Authentication Failure**: A request used an unknown community string.
  - **Cold Start**: Sent at device startup.

Notice!
Find the MIBs in the MIB folder of the installation directory of the RTS TIF-PRO2 PC software.

10.8.19 Shortcuts

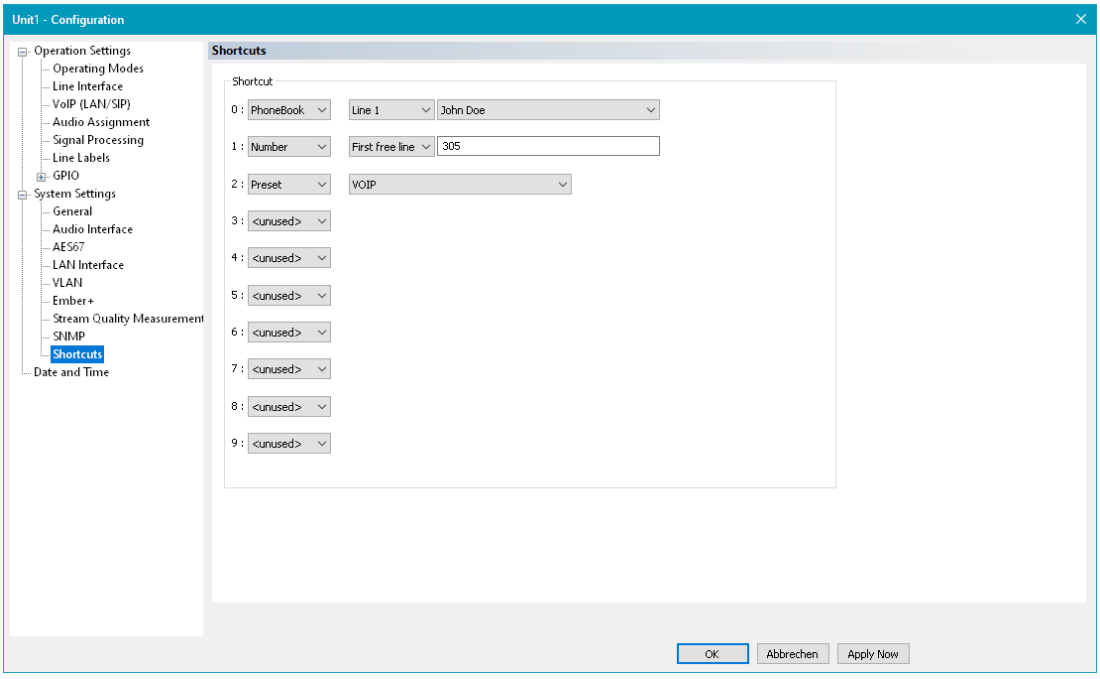


Figure 10.50: Configuration - Shortcuts

You may assign shortcuts to the keys ‘0’ - ‘9’ of the number pad on the front of the RTS TIF-PRO2 on the Shortcut configuration page.
Long press the key on the front keypad to execute the programmed action.
Available actions:

- **Phonebook**: Assign an entry of the internal phone book of the RTS TIF-PRO2 to the key. Long press the key on the front keypad to call the contact.
- **Number**: Assign a phone number to the key and select the line that should be used. Long press the key on the front keypad to dial the number.
- **Preset**: Assign a preset to the key. Long press the key on the front keypad to load that preset.
- **<unused>**: Deactivates the shortcut for that key.

10.8.20 Date and time

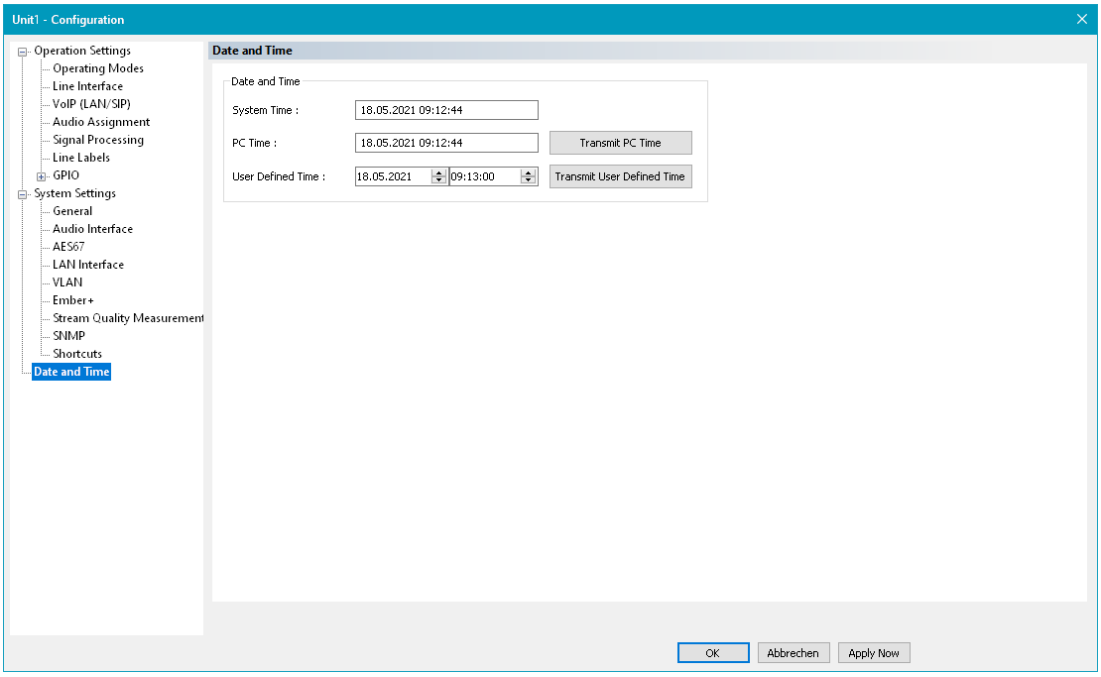


Figure 10.51: Configuration - Date and Time

Set the internal clock of the RTS TIF-PRO2 on the Date and Time configuration page
System Time: The current time of the RTS TIF-PRO2.
PC Time: The current time of the PC on which the PC software is running.
Transmit PC Time: Press the button to set the system time to the PC time.
User Defined Time: Enter a date and a time that can be transmitted to the RTS TIF-PRO2.
Transmit User Defined Time: Press the button to set the system time to the user defined time.

11 Ember+ tree

When an Ember+ consumer connects to the RTS TIF-PRO2, it has access to the GPIOs and functions which are organized in the Ember+ tree.

Element	Description
Node	Background colour indicates the position of the node in the tree hierarchy.
Parameter	The value of the node can only be read.
Parameter	The value of the node can be changed.
Function	Function call executed by the telephone hybrid
Info	Description of a node.
	Connects nodes.
	Links to a description of a node.

Figure 11.1: Ember+ Tree - Key

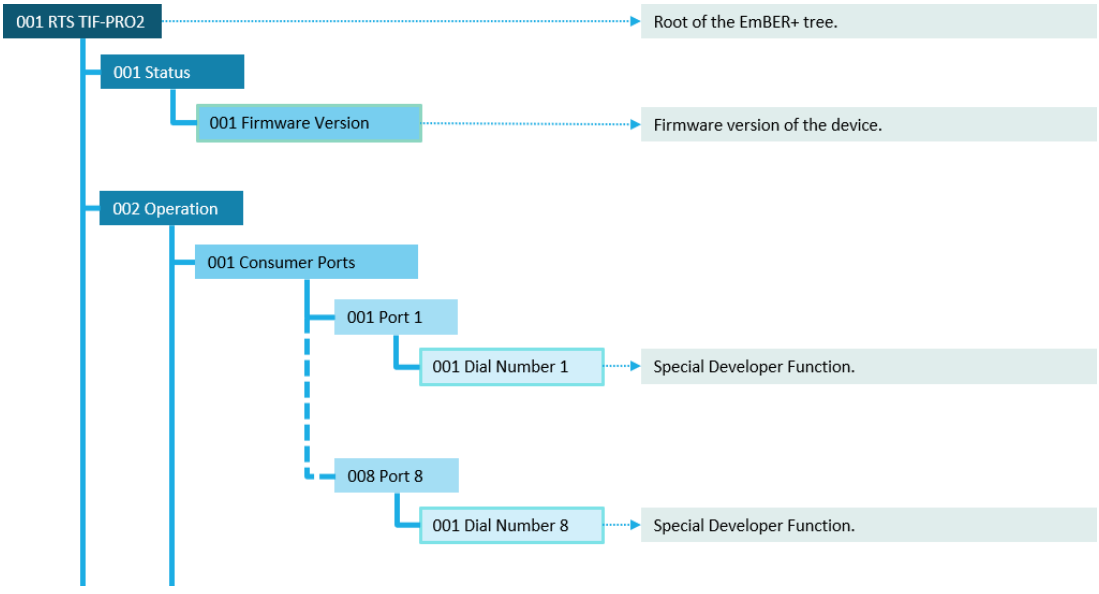


Figure 11.2: Ember= Tree - Status and Operation

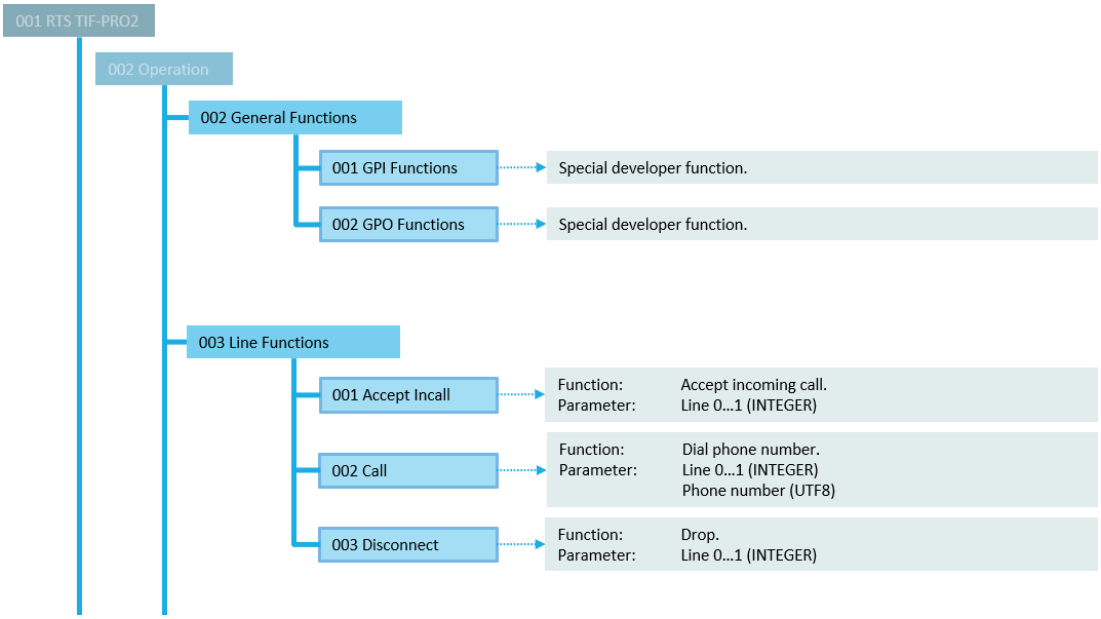


Figure 11.3: Ember+ Tree - Functions

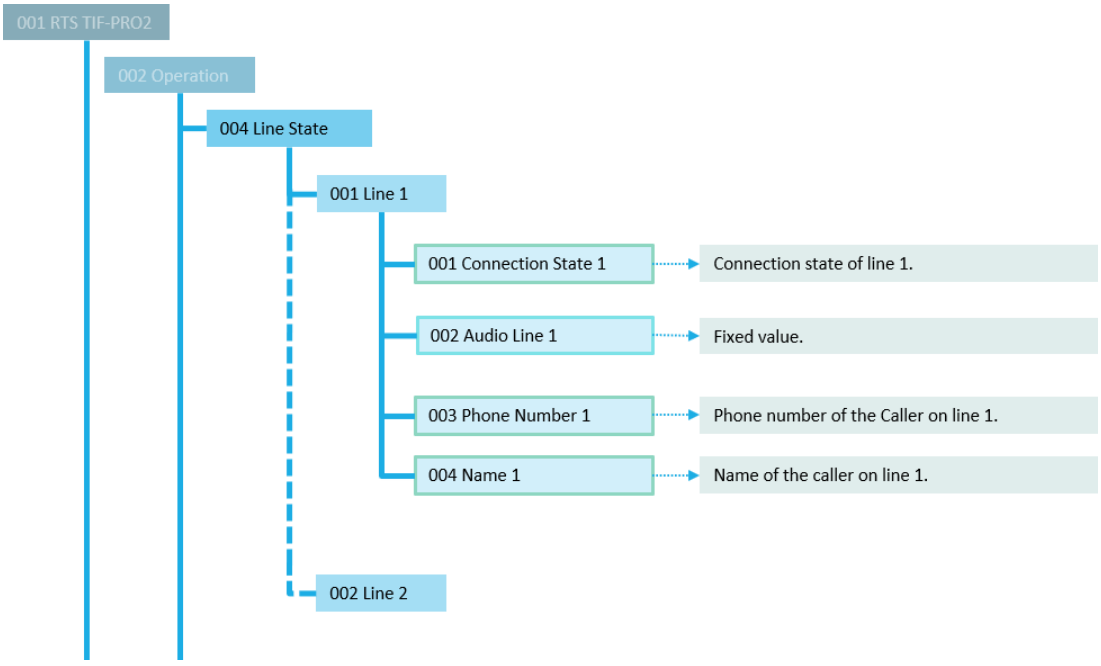


Figure 11.4: Ember+ Tree - Line State

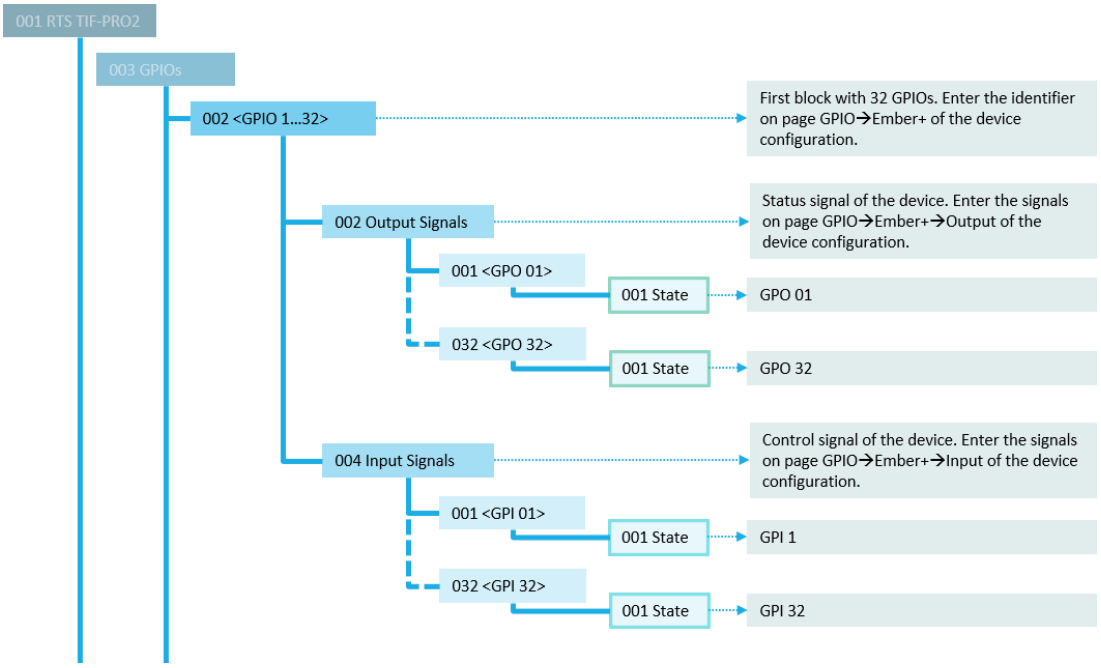


Figure 11.5: Ember+ Tree - GPIO 1 - 32

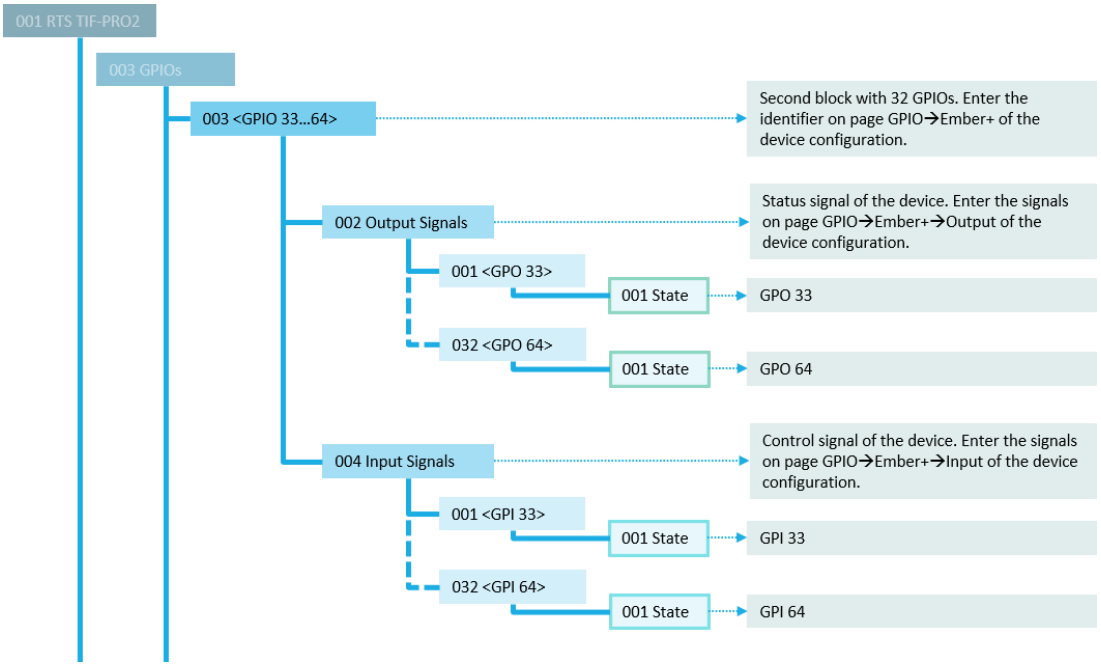


Figure 11.6: Ember+ Tree - GPIO 33 - 64

12 RS485 / audio adapter cable

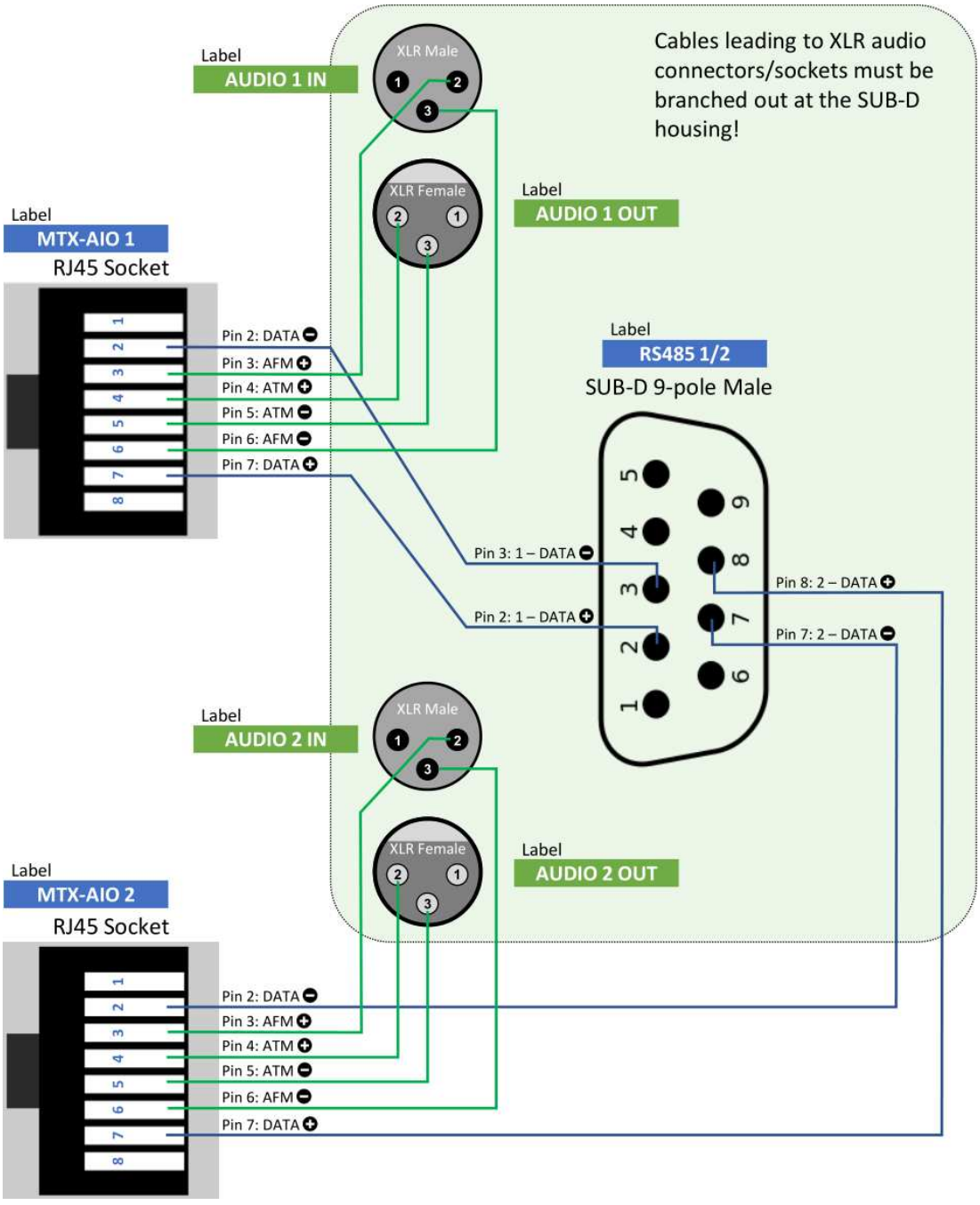


Figure 12.1: RS485 Audio Adapter Cable - Wiring

Figure 12.2: RS485 / Audio Adapter Cable

All cable lengths: 30 cm

DATA ⊕ and DATA ⊖ / AFM ⊕ and AFM ⊖ / ATM ⊕ and ATM ⊖
are twisted pair cables without shield

PIN	RS485 1 / 2
1	
2	1 – DATA ⊕
3	1 – DATA ⊖
4	
5	
6	
7	2 – DATA ⊖
8	2 – DATA ⊕
9	

PIN	AUDIO 1/2 IN	AUDIO 1/2 OUT
1		
2	AFM ⊕	ATM ⊕
3	AFM ⊖	ATM ⊖

AFM: Audio From Matrix
ATM: Audio To Matrix

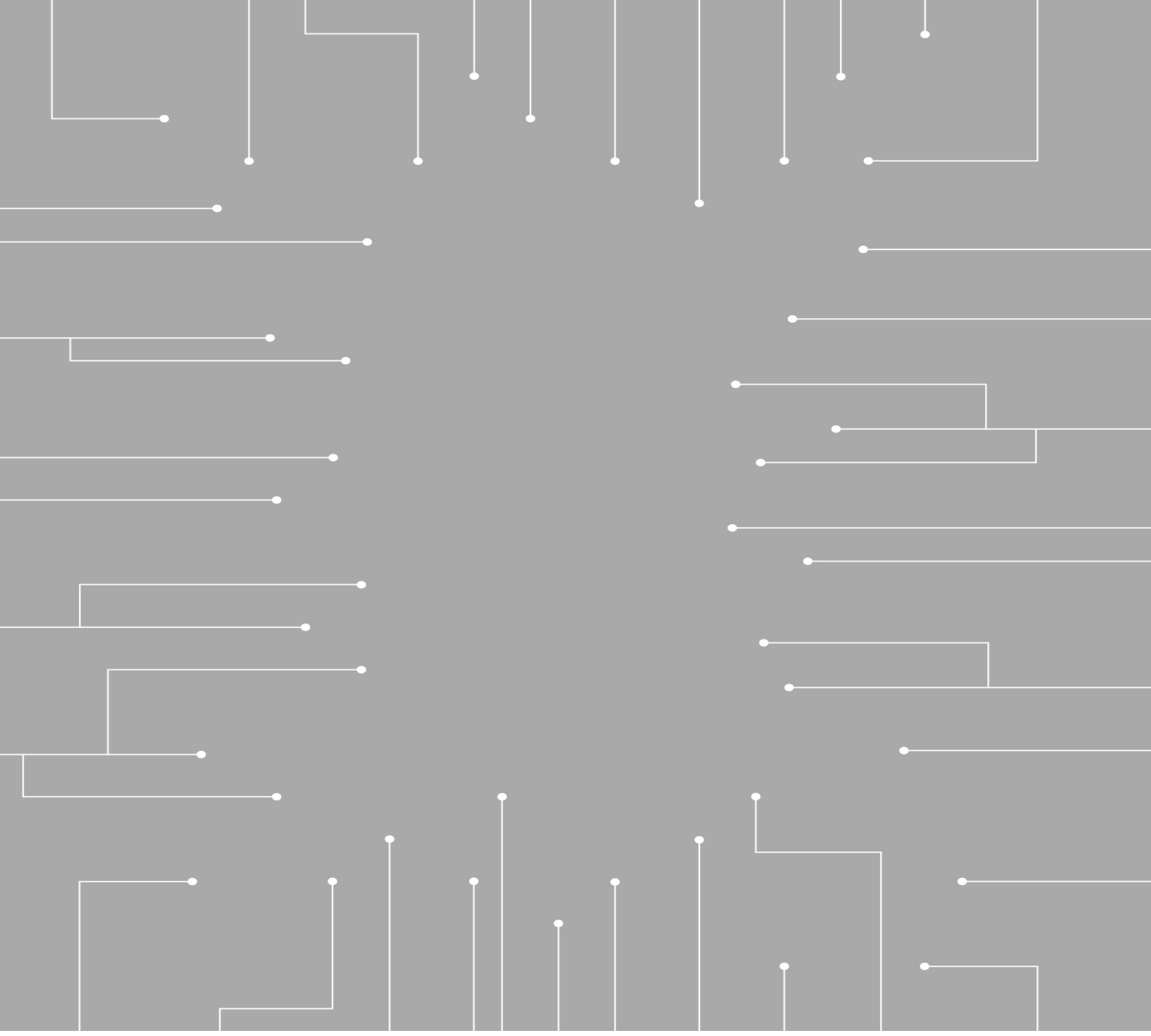
PIN	MTX-AIO 1	MTX-AIO 2
1		
2	1 – DATA ⊖	2 – DATA ⊖
3	1 – AFM ⊕	2 – AFM ⊕
4	1 – ATM ⊕	2 – ATM ⊕
5	1 – ATM ⊖	2 – ATM ⊖
6	1 – AFM ⊖	2 – AFM ⊖
7	1 – DATA ⊕	2 – DATA ⊕
8		

Figure 12.3: RS485 / Audio Adapter Cable - Pin Assignments

13 Technical data

CODING ALGORITHMS	
G.711	A-Law / µ-Law, 3.1 kHz (Telephone algorithms)
G.722	HD-Voice, 7 kHz
LINE INTERFACES	
ISDN	
1xS_0	I.430, RJ45
Protocol	DSS-1, NI-1, Japanese ISDN
POTS	
2xPOTS	RJ12
LAN	
1xLAN	RJ45
CONTROL INTERFACES	
LAN	RJ45
TTL / RELAY	9-pin D-SUB socket
2x TTL Input /Output	3.3 V / 10 mA Function can be programmed
2x Relay	48 V / 200 mA Function can be programmed
DATA INTERFACES	
RS485	
2x RS485	V.11, 9-pin D-SUB socket
AUDIO INTERFACES	
Analogue **Audio 1 / 2**	
Electronically balanced input	XLR female
Electronically balanced output	XLR male
Nominal level	-3 to +9 dBu Can be programmed
Head room	0 to +15 dBu Can be programmed
Impedance Input	>25 KΩ
Impedance Output	50 Ω
Frequency Response	50 Hz to 7 kHz
Signal to noise ratio	>80 dB

Noise	-92 dB
Digital Audio **AES / EBU**	
Format	IEC-958 AES / EBU Professional
Balanced Input	XLR female
Balanced Output	XLR male
Sample Rate converter at the inputs	
SIGNAL PROCESSING	
	AGC per channel, configurable
	Echo canceller per channel (100 msec echo cancelling time)
	Expander per channel, configurable
DISPLAY	
Graphical resolution	160 x 32 Pixel
Illuminated, can be switched off	
POWER SUPPLY VIA EXTERNAL ADAPTER	
Direct Voltage (DC)	+12 V
Power consumption	Max. 15 W
ENVIRONMENTAL	
H x W x D	1.7 in. x 8.7 in. x 7.9 in. (44 mm x 220 mm x 200 mm)
Weight	Ca. 3.75 lb (Ca. 1.7 kg)
Temperature	41 °F to 113 °F (5 °C to 45 °C)
Relative humidity	5% to 85%



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