# PROFESSIONAL SATELLITE UNIT

## PSU 12

PROFESSIONAL 12

Grundig SAT Systems

# CONTENTS

# GENERAL

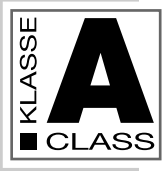
## Scope of delivery

1 professional satellite unit PSU 12, power supply and control unit included
1 user manual

## Available accessories

GRUNDIG GaAs hybrid amplifier PAMP 4, order no. GAH4600
GRUNDIG remote control unit PRCU 8, order no. GAH4400
– GRUNDIG PC programme PRCU included
GRUNDIG satellite control unit PSCU 6000, order no. GAH4500
GRUNDIG universal panel PUP 1, order no. GAH7600

## Technical data





**This product conforms with the requirements of the 73/23/EC and 89/336/EC guidelines of the European Council.**
**The standards EN 50083-2, EN 50083-2/A1, EN 50083-1 and EN 60065 required for the CE certification are kept to.**

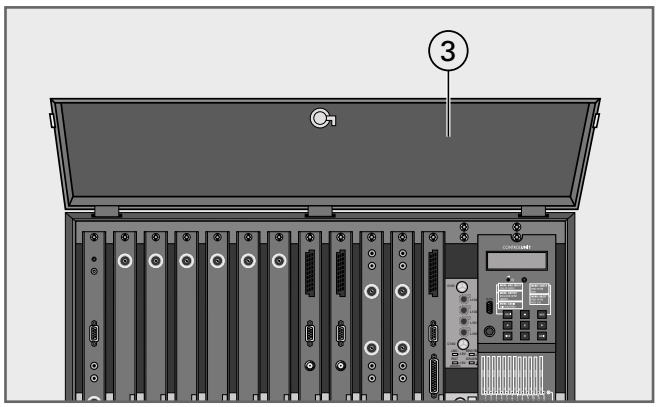
| | |
|---|---|
| Plug-in locations (not equipped): | for 12 satellite boxes |
| Input frequency range (SAT IF): | 950–2150 MHz |
| SAT input splitter : | 4 SAT If inputs A, B, C and D with 9 outputs each |
| Passage loss (9-fold): | typ. 16 dB |
| Input impedance: | 75 Ohm |
| Remote LNC power supply: | +18 V/total current max.1 A ⎓ for the 4 input splitters |
| Output frquency range of RF collector: | 48 MHz ... 865 MHz |
| Output level of RF collector (depending on box fitted): | about 80 dBµV |
| Output attenuation of RF collector: | typ. 18 dB |
| Output impedance: | 75 Ohm |
| Setting range of RF level controls: | –20 dB |
| Mains voltage: | 220–240 V~; 50/60 Hz |
| Power consumption: | typ. 180 W; fully equipped, LNB power supply included |
| Admissible ambient temperature: | –10 °C to + 50 °C; without humidification and dehumidification) |
| Dimensions W x H x D: | 700 mm x 410 mm x 310 mm |
| Weight: | |
| – empty | about 15 kg |
| – fully equipped | about 28 kg |



**Subject to technical modifications and errors!**

# AT A GLANCE


1
2
GRUNDIG
PROFESSIONAL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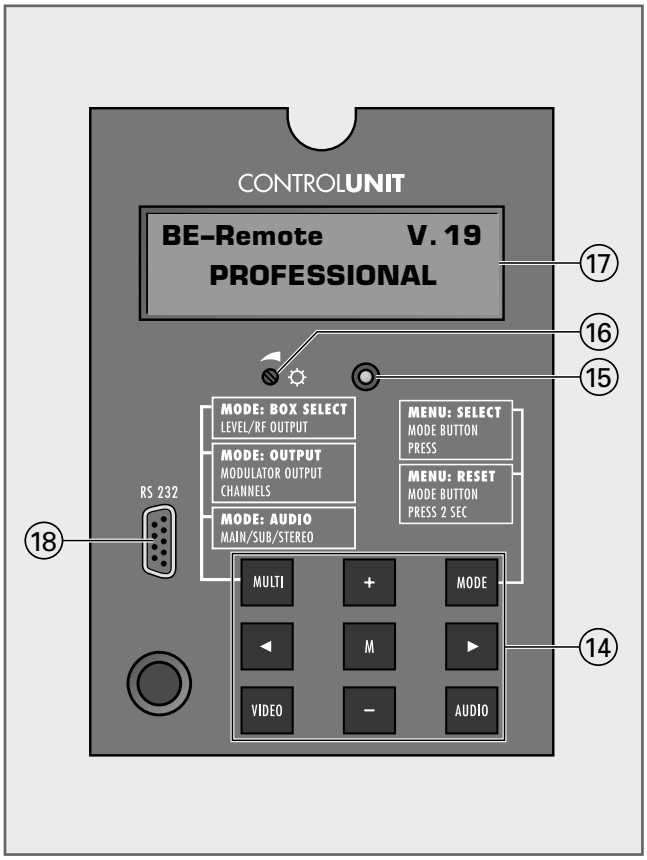
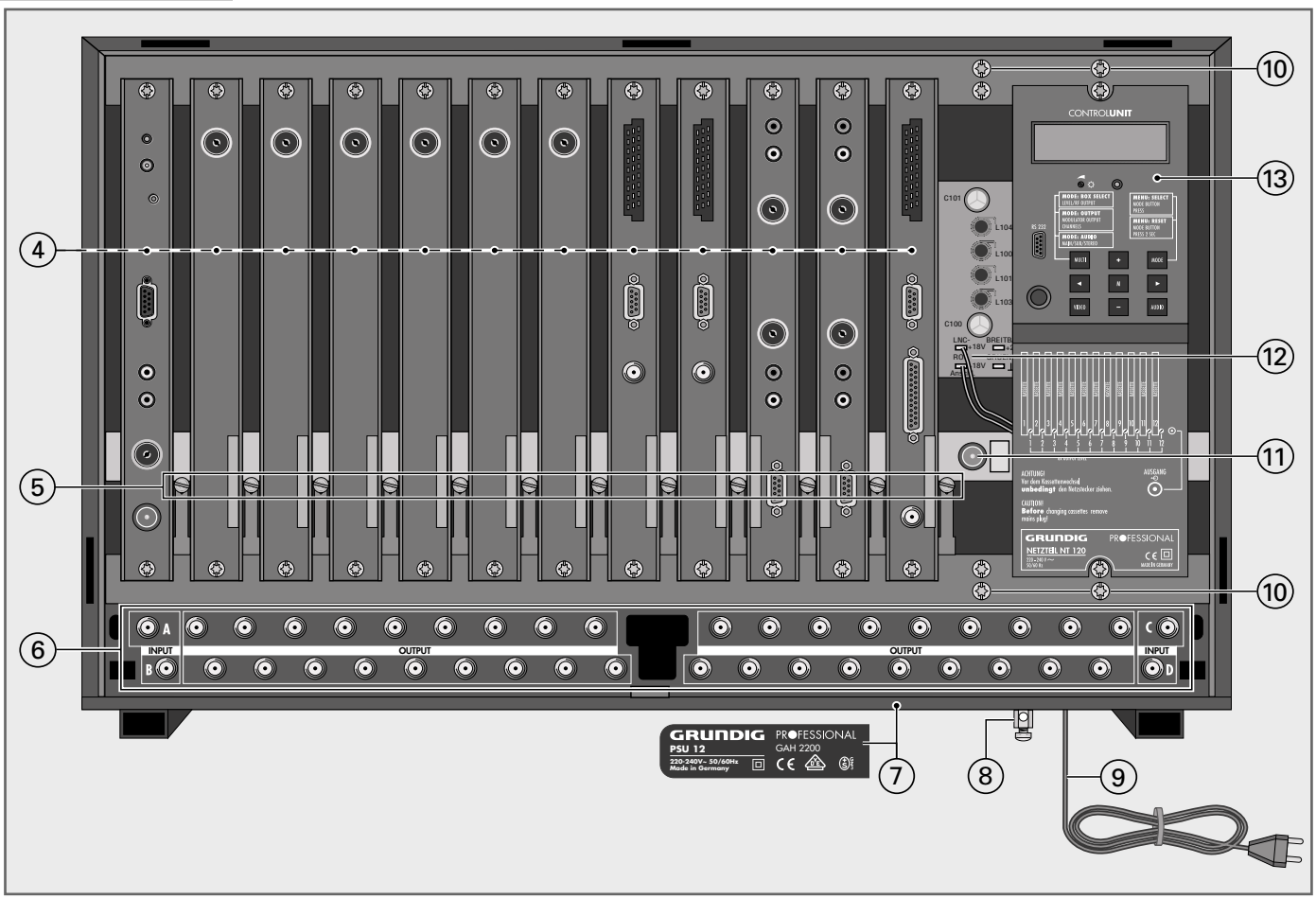

CONTROLUNIT
BE–Remote V. 19
PROFESSIONAL
17
16
15
MODE: BOX SELECT
LEVEL/RF OUTPUT
MODE: OUTPUT
MODULATOR OUTPUT
CHANNELS
MODE: AUDIO
MAIN/SUB/STEREO
MENU: SELECT
MODE BUTTON
PRESS
MENU: RESET
MODE BUTTON
PRESS 2 SEC
RS 232
18
MULTI
+
MODE
◄
M
►
VIDEO
–
AUDIO
14


10
13
4
12
11
5
10
6
A
B
C
D
INPUT
OUTPUT
OUTPUT
INPUT
CONTROLUNIT
GRUNDIG
PROFESSIONAL
NETZTEIL NT 120
GRUNDIG
PSU 12
PROFESSIONAL
GAH 2200
220-240V~ 50/60Hz
Made in Germany
7
8
9

## Components and connectors

① Ventilation slots.

② Door lock with key.

③ Cabinet cover; can be tilted up and removed.

④ Plug-in locations for 12 satellite boxes.

⑤ 12 output level controls for the satellite boxes,
setting range: 0 dB to –20 dB.

⑥ SAT input splitter (F-sockets): 4 inputs **A**, **B**, **C** and **D**,
9 outputs per input (F-sockets), passage loss: typ. 16 dB.

⑦ Type plate.

⑧ Ground terminal: make the ground connection according to the valid regulations DIN EN 50083/1, VDE 0855, Part 1.

⑨ Power supply connector; accessible from the bottom of the cabinet.

⑩ 4 spare screws for the fixation of the satellite boxes.

⑪ RF output (IEC plug) of the RF output collector;
output level: about 80 dBµV (depending on the boxes fitted), and
plug-in location for the GRUNDIG hybrid amplifier PAMP 4 (accessory).

⑫ LNB power supply connector (+18 V/ max.1 A ⎓).

⑬ Control panel.

### Control panel

⑭ **The buttons on the control panel**

»**MULTI**« (multi-function):
When in the »OUTPUT« menu: output channel display of the boxes.
When in the »AUDIO« menu: display of the main sound carrier and of the sound sub-carriers.
»**MODE**«:
Select: go to next menu item.
Reset: back to access menu.
»**VIDEO**«: direct access to the »VIDEO« (video amplitude) menu.
»**AUDIO**«: direct access to the »AUDIO« (select audio frequency ) menu.
»◄ ►« (cursor functions):
select settings, move cursor (_) to the left or right.
»**+ / –**«: change settings.
»**M**« (Memory): save settings.

⑮ LED (orange), lit during normal operation.

⑯ Display contrast control.

⑰ 2-line LC display, illuminated.

⑱ 9-pin Sub-D socket »**RS 232**«.

Serial interface: for remote configuration of the satellite boxes with the help of a PC or notebook and the GRUNDIG remote control unit PRCU 8 (accessory); input for software updates.

# FUNCTIONAL DESCRIPTION

## The PROFESSIONAL SATELLITE UNIT PSU 12

The professional satellite unit PSU12 is the basic unit of a modular system for the reception and coversion of analog satellite broadcasts (radio and TV), digital satellite broadcasts (radio and DVB TV = **D**igital **V**ideo **B**roadcasting), and terrestrial radio and TV broadcasts.

It is appropriate for the installation of medium-sized and large broad-band cable systems.

**Important:**
With this professional basic satellite unit, only the signals of GRUNDIG PROFESSIONAL satellite boxes can be processed.
An overview of the PROFI satelllite boxes which can be fitted into this professional basic satellite unit is to be found on the pages 14 and 15 of this user manual.

As this professional basic satellite unit is a modular system, it is possible to equip it with up to 12 satellite boxes which are fitted into its plug-in locations.
Depending on the boxes fitted, up to 24 analog/digital TV broadcasts, or 24 signals from external audio/video sources, or 48 FM broadcasts can be processed.

After connecting the professional basic satellite unit to the mains voltage, all boxes are supplied with the required operating voltages by a switched-mode power supply unit via the plug-in connectors on the contact rail.
The central control panel is connected via $I^2C$ bus lines (SDA, SCL) with the boxes.
The passive input splitter provides highest flexibility when selecting signals with horizontal or vertical polarization.

The professional boxes are connected to the four inputs **A**, **B**, **C** and **D** of the input splitters.
The four inputs can be operated from a remote voltage supply, that is, the LNBs can be supplied with an operating voltage of +18 V/ max.1 A ⎓. Each of the four inputs **A**, **B**, **C** and **D** has nine outputs.

All RF output signals of the boxes are unified in the RF output collector, and then passed on to the RF socket »**AUSGANG**« of the professional satellite unit. The RF output level of about 80 dBµV depends on the boxes fitted.

At the factory, the output level controls for the boxes are set to maximum output level.
Please adjust the output level of the individual boxes with the associated level controls on the front panel of the professional satellite unit to the following values:
For analog TV broadcasts to about 80 dBµV.
For digital TV broadcasts (64 QAM) to about 6 to 10 dB lower.
For FM radio broadcasts to about 10 dB lower.

If several professional satellite units are linked with each other, we recommend to install the GRUNDIG GaAs hybrid amplifier PAMP 4 (accessory).
The hybrid amplifier delivers an output level of max. 115 dBµV.
The required operating voltage of +24 V ⎓ is provided by the switched-mode power supply unit.
The hybrid amplifier should be installed into that professional satellite unit from which the cable system is supplied.


All input and outputs parameters of the individual boxes can be selected with the keys on the control panel.
The user is guided by a two-line display on the control panel.

When switching the professional satellite unit on, the software version of the control panel is briefly indicated in the 2-line LC display.
About 5 minutes after the last key is pressed, the display is automatically switched off, and the software version of the control panel is displayed.

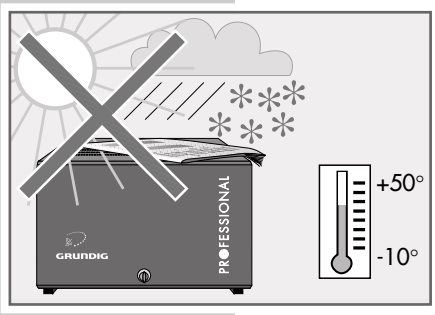
**Note:**
If desired, the software version of the control panel can also manually be displayed in the following way:
Press any two keys on the control panel at the same time and hold them down until the following occurs:
– The display turns dark, and then, after several seconds, the software version, e.g. **V.19**, is displayed

The 9-pin Sub-D socket »**RS 232**« is a serial interface for the remote configuration with the help of a PC or notebook and the GRUNDIG remote control unit PRCU 8 (accessory), and for updating the software for the control panel of the professional satellite unit.

With the help of the GRUNDIG professional satellite control unit PSCU 6000 (accessory), it is possible to monitor the output signal of the broad-band cable system in the frequency range of 47 – 862 MHz.

# INSTALLATION, FIXATIOIN

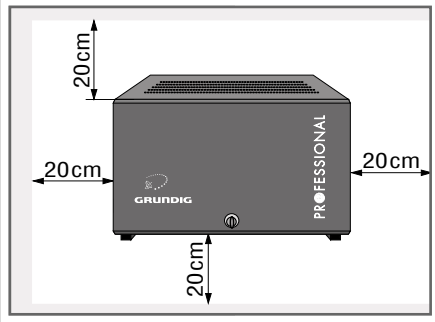
## Installation




Heat build-up will shorten the life of all electrical appliances and is a source of danger.
For this reason it is absolutely necessary to observe all aeration criteria when installing the professional satellite unit.

**Attention!**
**It is absolutely necessary to make sure that the ambient and operating temperatures do neither fall below nor exceed the admissible range (-10° C to +50° C) specified by the manufacturers.**

Heat develops inside the housing of the professional satellite unit which must be able to escape.

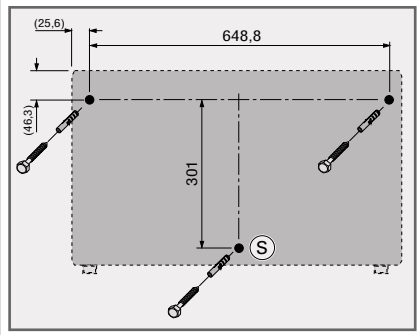



Therefore never cover the bottom and top ventilation slots in the housing.
If several units are installed on top of each other or side by side, minimum distances of 20 cm must be kept in all directions.

Never expose the professional satellite unit to any moisture. It has been designed for being operated in a dry room.
Always make sure that the professional satellite unit is not exposed to dripping or splashing water.
– Recommended place of installation: cool place indoors!

## Fixation to a wall

The professional satellite unit has been designed for wall fixation.
Fixation material:
3 plastic pegs 50 mm x 10 mmØ
3 hexagon-headed screws x 8 mmØ




The figure shows the rear side of the professional satellite unit with the 2 hook-in straps and one security strap, along with the measures necessary for a professional fixation to the wall.

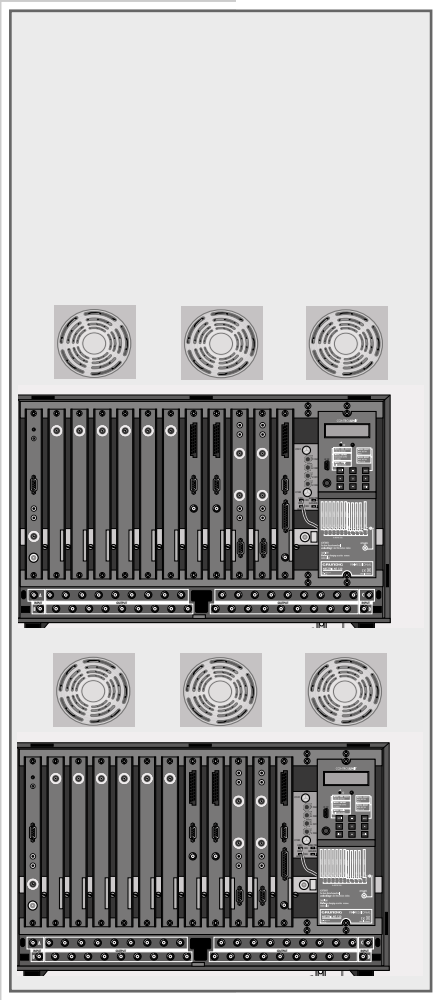
1 Fix the screws according to the Figure, and then hook in the professional satellite unit (ensure a flat surface!).

2 To prevent the professional satellite unit from being lifted up, a security screw must be fitted from the front side through the centre hole Ⓢ.

**Important!**
It is absolutely necessary to make sure that the fixation is able to carry the weight (about 30 kg) of the professional satellite unit.
Before putting the unit into operation, ground it according to the regulations DIN EN 50083/1, VDE 0855, Part 1.

# OPERATION IN RACK SYSTEMS

## Aeration, safety



**Attention!**
**When installing the professional satellite unit into a rack system, it is absolutely necessary to make sure that the ambient and operating temperatures do neither fall below nor exceed the admissible range (-10°C to +50°C) specified by the manufacturer.**

The professional satellite unit must be installed as close as possible to the bottom of the rack.

A circular aeration, for example by means of a ventilator, is to be ensured.

In addition it is necessary to permanently control by means of thermo elements the ambient and operating temperature of max. 50°C specified by the manufacturer.

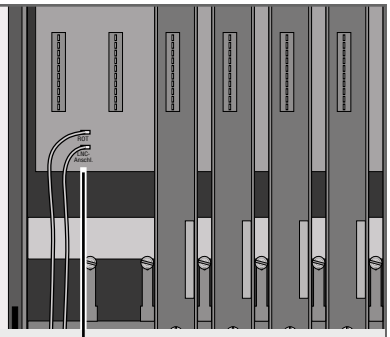
If the ambient and operating temperature inside the rack system exceeds 50° C max., the thermoswitch of the rack system must automatically disconnect the rack system from the power supply.

**Note:**
As circuit-breaker at temperatures above 50° C in rack systems, we recommend, for example, the safety temperature limiter with reclose inhibition ATHf-70 of Jumo.
This can be obtained from the RS-Components company under:
– Tel. ++49(0)6105/401 234
– Order number 357-7935

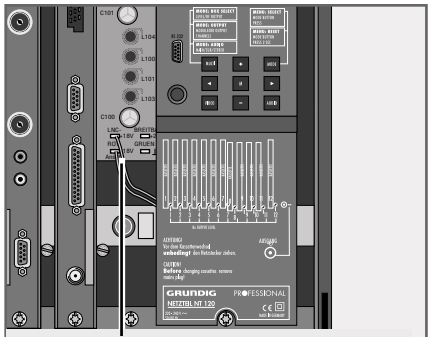
Always make sure that the professional satellite unit is not exposed to dripping or splashing water.

## Operation with twin LNBs

In order to adjust the vertical polarization when twin LNB's are connected, it is necessary to disconnect the voltage supply plug (LNB voltage: +18 V/total current max.1 A ⎓ ) of the RF input concerned (**A**, **B**, **C** or **D**) on the chassis board of the professional satellite unit (see Figs. below).



2 x LNB supply voltage
(via SAT inputs A and B)



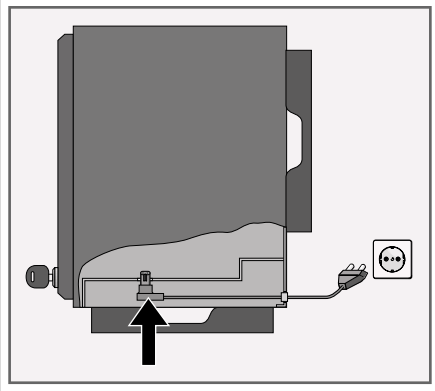
2 x LNB supply voltage
(via SAT inputs C and D)

## Installing and connecting professional satellite units

**Attention!**
**Before installing or replacing a professional boxes, the power supply unit/control panel, or the hybrid amplifier, it is absolutely necessary to disconnect the power supply plug from the wall outlet.**

**1** Install and connect the professional boxes according to the instructions given in their user manuals.

**2** Install and connect the GaAs hybrid amplifier PAMP 4 (accessory) according to the instructions given in its user manual into the professional satellite unit.



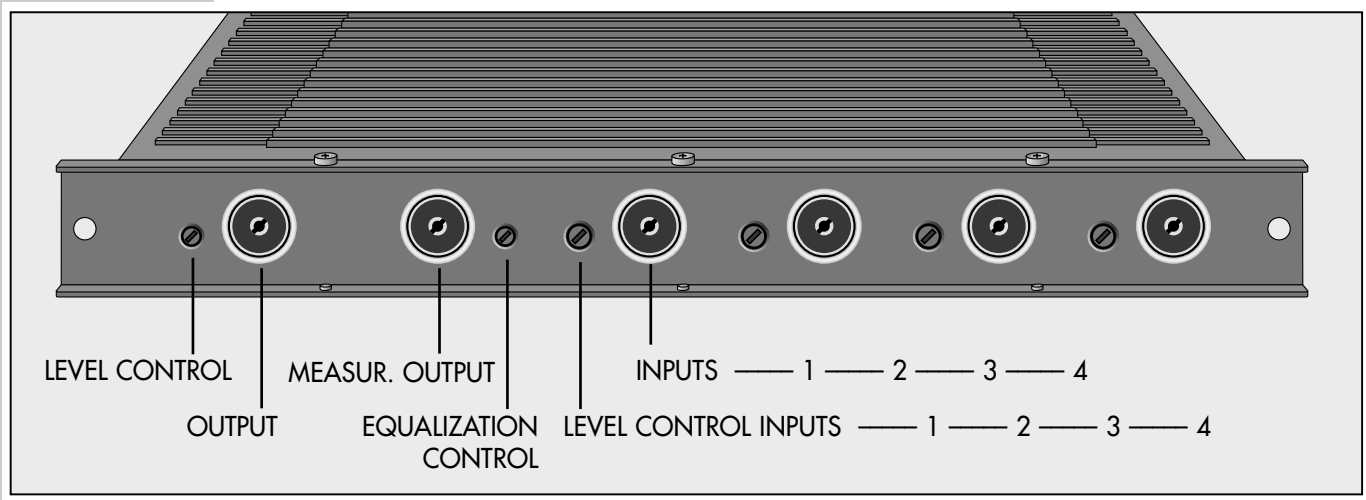
**3** Connect the powers supply plug of the professional satellite unit with a wall outlet (220-240 V~, 50/60 Hz).

**Important!**
**The professional satellite unit is only completely separated from the mains voltage by pulling the power supply plug.**

**4** Set up the professional boxes according to the instructions given in their user manuals.

**Note:**
The professional satellite unit can be protected against unauthorized use.
To do this, close the cabinet cover and lock it with the key supplied.

# ACCESSORIES

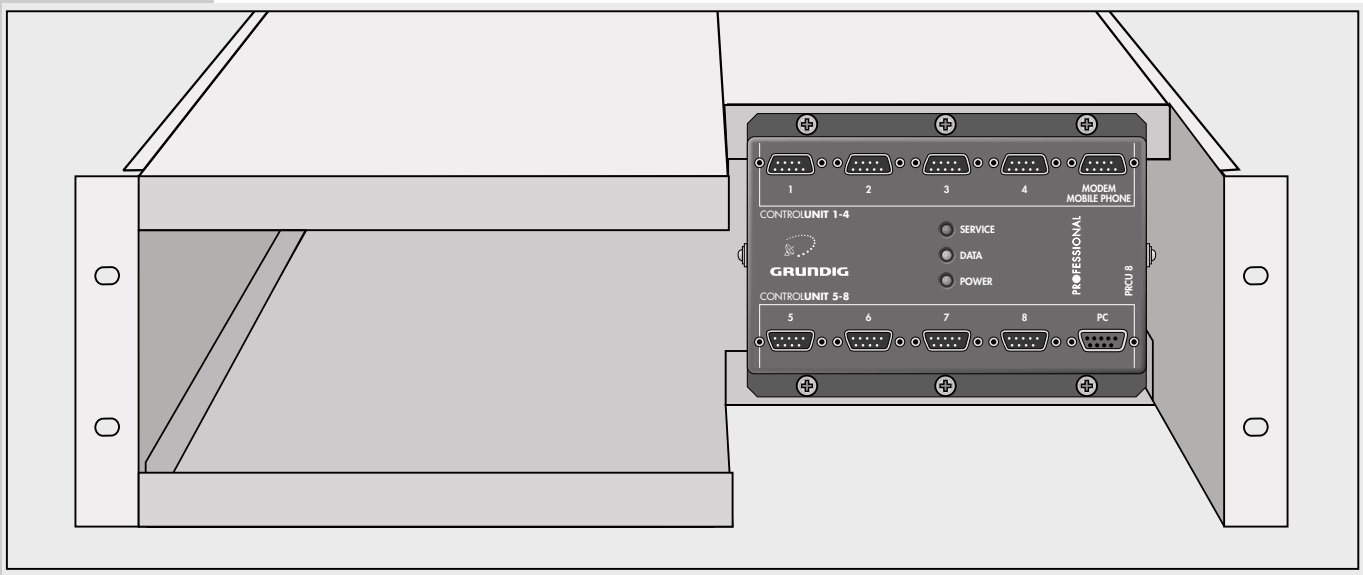



## The GRUNDIG GaAs hybrid amplifier PAMP 4

This hybrid amplifier has been designed according to the latest GaAs technology.
It comprises 4 Interstage RF inputs, 1 measuring RF output (–30 dB), and 1 RF output.

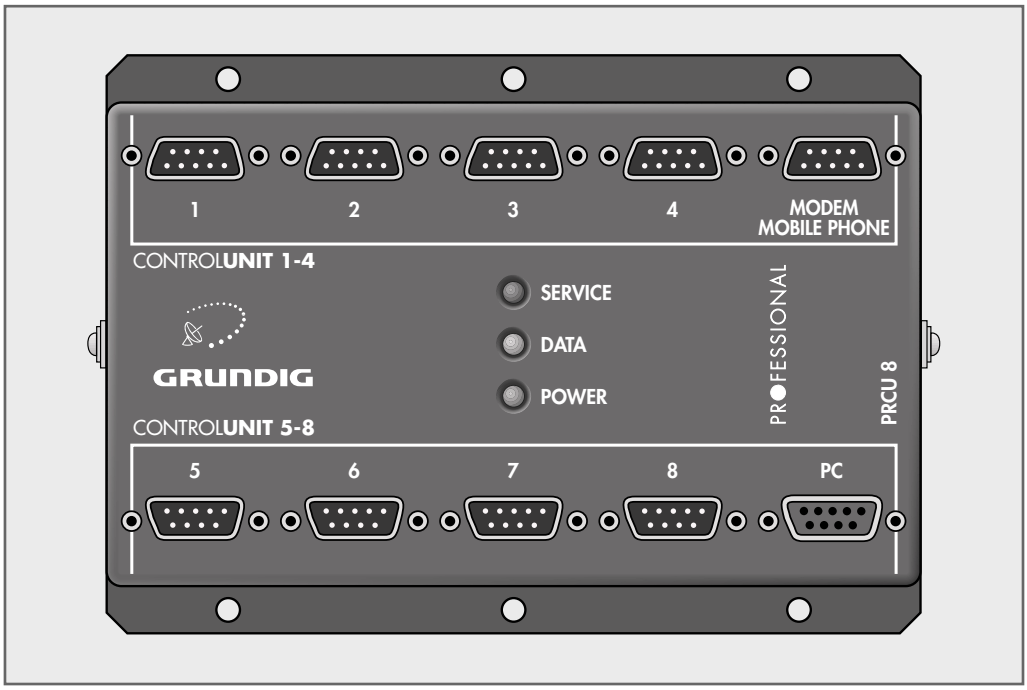
The level of each of the 4 inputs can be adjusted with the associated level control. Due to the different cable loss over the frequency range of the cable system, the equalization can be adjusted with the associated control.

The output level at the RF output of the hybrid amplifer can be reduced by about –20 dB with the associated control.




## The GRUNDIG professional universal panel PUP1

If you install the GRUNDIG professional universal panel PUP 1 into the rack system, the external accessory, for example the professional remote control unit PRCU 8, can be installed in an easy-to-access place, and all control leads, the modem, the connecting leads, etc. can be kept in a well-ordered way.




## The GRUNDIG remote control unit PRCU 8

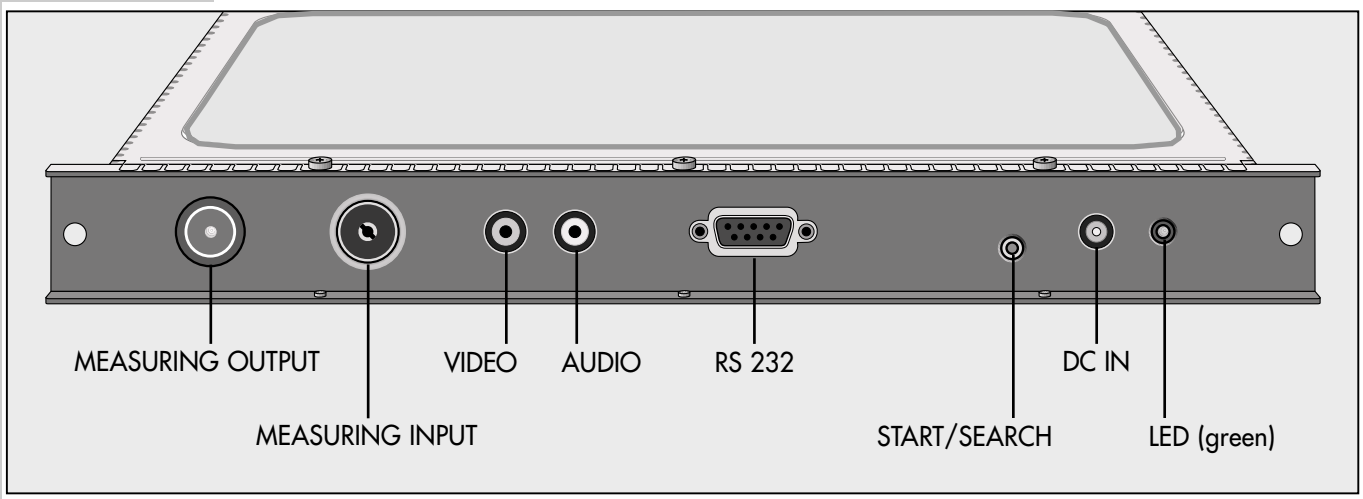
It is possible to connect to the GRUNDIG remote control unit PRCU 8 the following equipment:
1 PC or notebook, 1 analogue industry modem or 1 GSM modem, 8 basic satellite units, or 7 basic satellite units plus 1 satellite control unit PSCU 6000.
With the help of the PC or notebook along with the remote control unit PRCU 8, the professional satellite control unit PSCU 6000, and the GRUNDIG PC programme PRCU, it is possible to remotely configure and monitor the cable system in a very convenient way.
The PC programme PRCU requires the following system conditions:
– Operating system Windows 95/98/ME/2000/XP.
– Serial interface (Sub-D socket RS 232).

### Remote configuration of the cable system

Editing the channel list of the satellite control unit:
– Add new channels .
– Delete existing channels.
– Enter the modulation mode and symbol rate for the manual search.
– Change the station name.
– Automatic combination of the channel lists of the satellite control unit and of the connected headend stations.
– Display of the current RF level of a selected channel.
– Entry of an input attenuation to display the actual RF level of the cable system if the RF input level of the satellite control unit had to be attenuated before.

### Remote monitoring of the cable system

– Entry of a minimum or maximum tolerance in dB. If the level exceeds or falls below this tolerance range, an alarm message is transmitted as SMS or Telefax to a layed down telephone number.
– Entry of a waiting time until the alarm message is to be transmitted.
– Monitoring activation/deactivation of individual channels.
– Documentation of the entire system with channel lists and setup data of all boxes.




## The professional satellite control unit GRUNDIG PSCU 6000

The professional satellite control unit PSCU 6000 is used for controlling (monitoring) the output signal of a wideband cable system in the frequency range of 47 – 862 MHz.
The following parameters are controlled:
– Analog TV channels: RF level and synchronization pulse.
– Digital TV channels: RF level, BER (Bit Error Rate).
– Radio programmes: RF level.

### The channel search

After starting the channel search, an info channel about the channel assignment of the cable system, including the station names which are determined with the help of the RDS or VPS data, is processed and injected into the cable sytem.

The search starts with the analog TV channels in ascending channel order: channels C2 ... C4, special channels S2 ... S10, channels C5 ... C12, special channels S11 ... S41, and finally the channels C21 ... C69.

When the search for analog channels is completed, digital TV channels in the frequency range of 306.00 MHz to 858.00 MHz are searched in steps of 8 MHz.

The search finally explores the frequency range of 87.5 MHz to 108 MHz in steps of 50 kHz for FM radio programmes.

With the help of a PC or a notebook, the GRUNDIG remote control unit PRCU 8, and the GRUNDIG PC programme PRCU, it is very convenient to set up the configuration of the professional boxes.

# OVERVIEW OF PROFI BOXES

## Overview of the professional boxes for the professional basic satellite unit PSU 12

Programming of the professional boxes is to be found in the user manual of the professional box concerned. The following tables list the currently available professional boxes with the most important data.
Detailed channel/frequency assignments are to be found at the end of this user manaul.

| Box type | Input range of the profi boxes | Output range of the profi boxes | Channel norm |
|---|---|---|---|
| **For twin satellite TV reception** | | | |
| PSAP 1000 | 950-2150 MHz | Modulator A: C2-C4, Modulator B: S3-S24, C5-C12, 48.25 MHz-327.25 MHz | CCIR |
| PSAP 3000 | 950-2150 MHz | C5-C12, S3-S24 119.25 MHz-327.25 MHz | CCIR |
| PSAP 4000 | 950-2150 MHz | S21-S41 303.25 MHz-463.25 MHz | CCIR |
| PSAP 5000 | 950-2150 MHz | C21-C69 471.25 MHz-855.25 MHz | CCIR |
| **For terrestrial twin TV reception** | | | |
| PTAP 1000 | C2-C12, S2-S41, C21-C69 | Modulator A: C2-C4, Modulator B: S3-S24, C5-C12, 48.25 MHz-327.25 MHz | CCIR |
| PTAP 3000 | C2-C12, S2-S41, C21-C69 48.25-855.25 MHz | C5-C12, S3-S24 119.25 MHz-327.25 MHz | CCIR |
| PTAP 4000 | C2-C12, S2-S41, C21-C69 48.25-855.25 MHz | S21-S41 303.25 MHz-463.25 MHz | CCIR |
| PTAP 5000 | C2-C12, S2-S41, C21-C69 48.25-855.25 MHz | C21-C69 471.25 MHz-855.25 MHz | CCIR |
| **For digital satellite reception (QPSK – QAM)** | | | |
| PSDN 4000 | 950-2150 MHz | S21-S41 306.00 MHz-466.00 MHz | QAM-NIT |
| PSDQ 4000 | 950-2150 MHz | S21-S41 306.00 MHz-466.00 MHz | QAM |
| PSDQ 5000 | 950-2150 MHz | C21-C69 474.00 MHz-858.00 MHz | QAM |
| PSDQ 4001 (transport current module) | 950-2150 MHz | S21-S41 306.00 MHz-466.00 MHz | QAM/TSM |
| PSDQ 5001 (transport current module) | 950-2150 MHz | C21-C69 471.25 MHz-855.25 MHz | QAM/TSM |
| **For digital satellite reception (QPSK – PAL)** | | | |
| PSDP 3000 (Common Interface) | 950-2150 MHz | C5-C12, S3-S24 119.25 MHz-327.25 MHz | CCIR |
| PSDP 5000 (Common Interface) | 950-2150 MHz | C21-C69 471.25 MHz-855.25 MHz | CCIR |
| **For FM radio reception** | | | |
| PSRF 2000 | 950-2150 MHz | 87,5-108 MHz | FM |
| PTTF 2000 (4-fold FM converter) | UKW 87.5-108 MHz | FM 87.5-108 MHz | FM) |
| PTAF 2000 (FM broadband amplifier | 87.5-108 MHz | 87.5-108 MHz | FM |

## CCIR-Kanalraster/CCIR Channel Steps/Pas de canaux CCIR

Bild-/Ton-Abstand: 5,5 MHz / Video-audio distance: 5.5 MHz / Ecart vidéo/audio: 5,5 MHz

| Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz | Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz | Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz | Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz |
|---|---|---|---|---|---|---|---|
| C 2 | 48,25 | S 16 | 266,25 | S 41 | 463,25 | C 45 | 663,25 |
| C 3 | 55,25 | S 17 | 273,25 | C 21 | 471,25 | C 46 | 671,25 |
| C 4 | 62,25 | S 18 | 280,25 | C 22 | 479,25 | C 47 | 679,25 |
| S 2 | 112,25 | S 19 | 287,25 | C 23 | 487,25 | C 48 | 687,25 |
| S 3 | 119,25 | S 20 | 294,25 | C 24 | 495,25 | C 49 | 695,25 |
| S 4 | 126,25 | S 21 | 303,25 | C 25 | 503,25 | C 50 | 703,25 |
| S 5 | 133,25 | S 22 | 311,25 | C 26 | 511,25 | C 51 | 711,25 |
| S 6 | 140,25 | S 23 | 319,25 | C 27 | 519,25 | C 52 | 719,25 |
| S 7 | 147,25 | S 24 | 327,25 | C 28 | 527,25 | C 53 | 727,25 |
| S 8 | 154,25 | S 25 | 335,25 | C 29 | 535,25 | C 54 | 735,25 |
| S 9 | 161,25 | S 26 | 343,25 | C 30 | 543,25 | C 55 | 743,25 |
| S 10 | 168,25 | S 27 | 351,25 | C 31 | 551,25 | C 56 | 751,25 |
| C 5 | 175,25 | S 28 | 359,25 | C 32 | 559,25 | C 57 | 759,25 |
| C 6 | 182,25 | S 29 | 367,25 | C 33 | 567,25 | C 58 | 767,25 |
| C 7 | 189,25 | S 30 | 375,25 | C 34 | 575,25 | C 59 | 775,25 |
| C 8 | 196,25 | S 31 | 383,25 | C 35 | 583,25 | C 60 | 783,25 |
| C 9 | 203,25 | S 32 | 391,25 | C 36 | 591,25 | C 61 | 791,25 |
| C 10 | 210,25 | S 33 | 399,25 | C 37 | 599,25 | C 62 | 799,25 |
| C 11 | 217,25 | S 34 | 407,25 | C 38 | 607,25 | C 63 | 807,25 |
| C 12 | 224,25 | S 35 | 415,25 | C 39 | 615,25 | C 64 | 815,25 |
| S 11 | 231,25 | S 36 | 423,25 | C 40 | 623,25 | C 65 | 823,25 |
| S 12 | 238,25 | S 37 | 431,25 | C 41 | 631,25 | C 66 | 831,25 |
| S 13 | 245,25 | S 38 | 439,25 | C 42 | 639,25 | C 67 | 839,25 |
| S 14 | 252,25 | S 39 | 447,25 | C 43 | 647,25 | C 68 | 847,25 |
| S 15 | 259,25 | S 40 | 455,25 | C 44 | 655,25 | C 69 | 855,25 |

## France-Kanalraster/France Chann. Steps/Pas de canaux en France

Bild-/Ton-Abstand: 6,5 MHz / Video-audio distance: 6.5 MHz / Ecart vidéo/audio: 6,5 MHz

| Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz | Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz | Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz | Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz |
|---|---|---|---|---|---|---|---|
| C 21 | 471,25 | C 34 | 575,25 | C 47 | 679,25 | C 60 | 783,25 |
| C 22 | 479,25 | C 35 | 583,25 | C 48 | 687,25 | C 61 | 791,25 |
| C 23 | 487,25 | C 36 | 591,25 | C 49 | 695,25 | C 62 | 799,25 |
| C 24 | 495,25 | C 37 | 599,25 | C 50 | 703,25 | C 63 | 807,25 |
| C 25 | 503,25 | C 38 | 607,25 | C 51 | 711,25 | C 64 | 815,25 |
| C 26 | 511,25 | C 39 | 615,25 | C 52 | 719,25 | C 65 | 823,25 |
| C 27 | 519,25 | C 40 | 623,25 | C 53 | 727,25 | C 66 | 831,25 |
| C 28 | 527,25 | C 41 | 631,25 | C 54 | 735,25 | C 67 | 839,25 |
| C 29 | 535,25 | C 42 | 639,25 | C 55 | 743,25 | C 68 | 847,25 |
| C 30 | 543,25 | C 43 | 647,25 | C 56 | 751,25 | C 69 | 855,25 |
| C 31 | 551,25 | C 44 | 655,25 | C 57 | 759,25 | | |
| C 32 | 559,25 | C 45 | 663,25 | C 58 | 767,25 | | |
| C 33 | 567,25 | C 46 | 671,25 | C 59 | 775,25 | | |

## OIRT-Kanalraster/OIRT Channel Steps/Pas de canaux OIRT

Bild-/Ton-Abstand: 6,5 MHz / Video-audio distance: 6.5 MHz / Ecart vidéo/audio: 6,5 MHz

| Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz | Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz | Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz | Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz |
|---|---|---|---|---|---|---|---|
| R 1 | 49,75 | s 14 | 271,25 | C 21 | 471,25 | C 46 | 671,25 |
| R 2 | 59,25 | s 15 | 279,25 | C 22 | 479,25 | C 47 | 679,25 |
| R 3 | 77,25 | s 16 | 287,25 | C 23 | 487,25 | C 48 | 687,25 |
| R 4 | 85,25 | s 17 | 295,25 | C 24 | 495,25 | C 49 | 695,25 |
| R 5 | 93,25 | s 18 | 303,25 | C 25 | 503,25 | C 50 | 703,25 |
| s 1 | 111,25 | s 19 | 311,25 | C 26 | 511,25 | C 51 | 711,25 |
| s 2 | 119,25 | s 20 | 319,25 | C 27 | 519,25 | C 52 | 719,25 |
| s 3 | 127,25 | s 21 | 327,25 | C 28 | 527,25 | C 53 | 727,25 |
| s 4 | 135,25 | s 22 | 335,25 | C 29 | 535,25 | C 54 | 735,25 |
| s 5 | 143,25 | s 23 | 343,25 | C 30 | 543,25 | C 55 | 743,25 |
| s 6 | 151,25 | s 24 | 351,25 | C 31 | 551,25 | C 56 | 751,25 |
| s 7 | 159,25 | s 25 | 359,25 | C 32 | 559,25 | C 57 | 759,25 |
| s 8 | 167,25 | s 26 | 367,25 | C 33 | 567,25 | C 58 | 767,25 |
| R 6 | 175,25 | s 27 | 375,25 | C 34 | 575,25 | C 59 | 775,25 |
| R 7 | 183,25 | s 28 | 383,25 | C 35 | 583,25 | C 60 | 783,25 |
| R 8 | 191,25 | s 29 | 391,25 | C 36 | 591,25 | C 61 | 791,25 |
| R 9 | 199,25 | s 30 | 399,25 | C 37 | 599,25 | C 62 | 799,25 |
| R 10 | 207,25 | s 31 | 407,25 | C 38 | 607,25 | C 63 | 807,25 |
| R 11 | 215,25 | s 32 | 415,25 | C 39 | 615,25 | C 64 | 815,25 |
| R 12 | 223,25 | s 33 | 423,25 | C 40 | 623,25 | C 65 | 823,25 |
| s 9 | 231,25 | s 34 | 431,25 | C 41 | 631,25 | C 66 | 831,25 |
| s 10 | 239,25 | s 35 | 439,25 | C 42 | 639,25 | C 67 | 839,25 |
| s 11 | 247,25 | s 36 | 447,25 | C 43 | 647,25 | C 68 | 847,25 |
| s 12 | 255,25 | s 37 | 455,25 | C 44 | 655,25 | C 69 | 855,25 |
| s 13 | 263,25 | s 38 | 463,25 | C 45 | 663,25 | | |

## GB-Kanalraster/GB Channel Steps/Pas de canaux en GB

Bild-/Ton-Abstand: 6,0 MHz / Video-audio distance: 6.0 MHz / Ecart vidéo/audio: 6,0 MHz

| Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz | Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz | Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz | Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz |
|---|---|---|---|---|---|---|---|
| A | 45,75 | C 26 | 511,25 | C 41 | 631,25 | C 56 | 751,25 |
| B | 53,75 | C 27 | 519,25 | C 42 | 639,25 | C 57 | 759,25 |
| C | 61,75 | C 28 | 527,25 | C 43 | 647,25 | C 58 | 767,25 |
| D | 175,25 | C 29 | 535,25 | C 44 | 655,25 | C 59 | 775,25 |
| E | 183,25 | C 30 | 543,25 | C 45 | 663,25 | C 60 | 783,25 |
| F | 191,25 | C 31 | 551,25 | C 46 | 671,25 | C 61 | 791,25 |
| G | 199,25 | C 32 | 559,25 | C 47 | 679,25 | C 62 | 799,25 |
| H | 207,25 | C 33 | 567,25 | C 48 | 687,25 | C 63 | 807,25 |
| I | 215,25 | C 34 | 575,25 | C 49 | 695,25 | C 64 | 815,25 |
| J | 223,25 | C 35 | 583,25 | C 50 | 703,25 | C 65 | 823,25 |
| C 21 | 471,25 | C 36 | 591,25 | C 51 | 711,25 | C 66 | 831,25 |
| C 22 | 479,25 | C 37 | 599,25 | C 52 | 719,25 | C 67 | 839,25 |
| C 23 | 487,25 | C 38 | 607,25 | C 53 | 727,25 | C 68 | 847,25 |
| C 24 | 495,25 | C 39 | 615,25 | C 54 | 735,25 | C 69 | 855,25 |
| C 25 | 503,25 | C 40 | 623,25 | C 55 | 743,25 | | |

## China-Kanalraster/China Channel Steps/Pas de canaux en China

Bild-/Ton-Abstand: 6,5 MHz / Video-audio distance: 6.5 MHz / Ecart vidéo/audio: 6,5 MHz

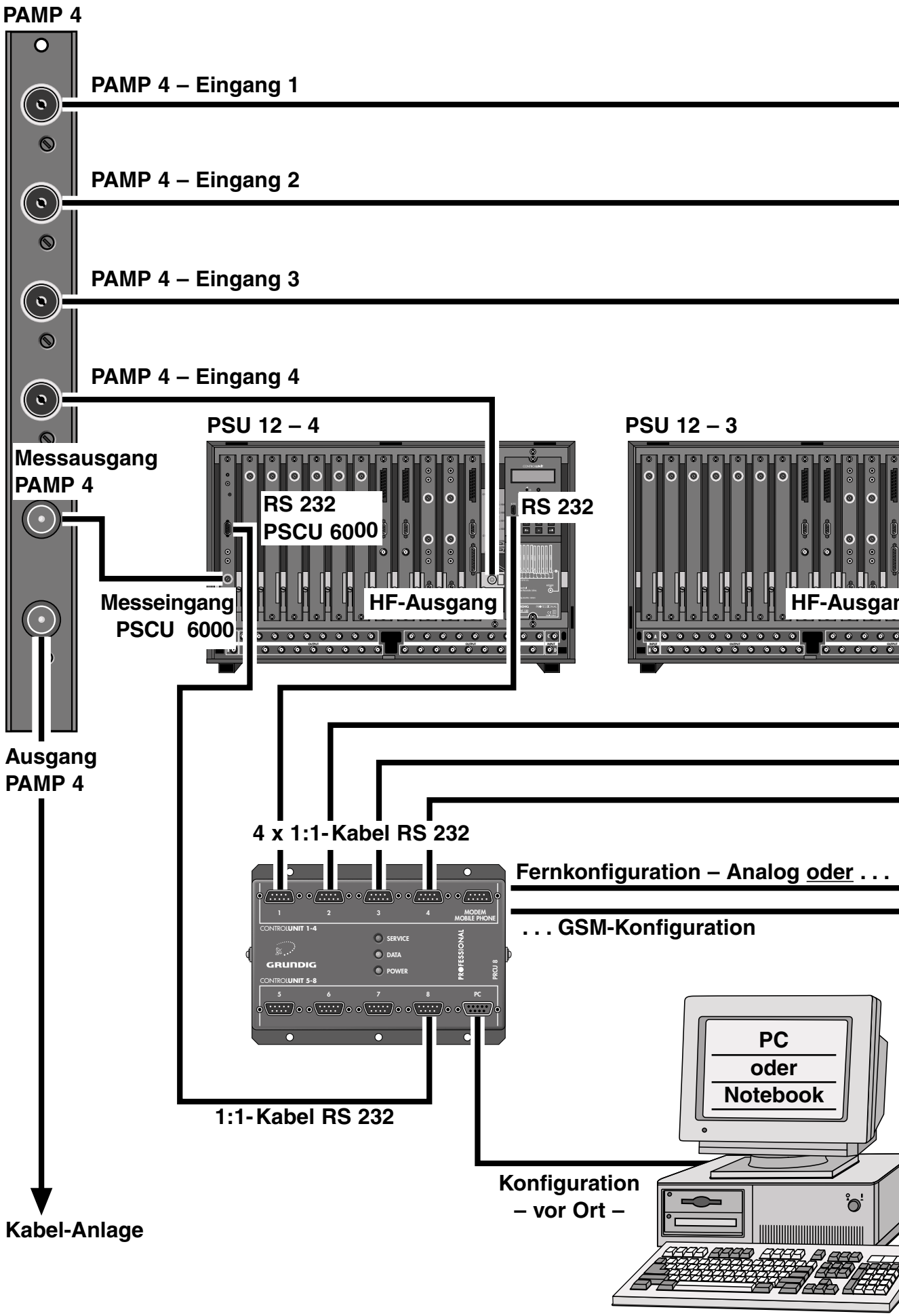
| Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz | Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz | Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz | Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz |
|---|---|---|---|---|---|---|---|
| D 1 | 49,75 | Z 14 | 272,25 | D 13 | 471,25 | D 38 | 711,25 |
| D 2 | 57,75 | Z 15 | 280,25 | D 14 | 479,25 | D 39 | 719,25 |
| D 3 | 65,75 | Z 16 | 288,25 | D 15 | 487,25 | D 40 | 727,25 |
| D 4 | 77,25 | Z 17 | 296,25 | D 16 | 495,25 | D 41 | 735,25 |
| D 5 | 85,25 | Z 18 | 304,25 | D 17 | 503,25 | D 42 | 743,25 |
| Z 1 | 112,25 | Z 19 | 312,25 | D 18 | 511,25 | D 43 | 751,25 |
| Z 2 | 120,25 | Z 20 | 320,25 | D 19 | 519,25 | D 44 | 759,25 |
| Z 3 | 128,25 | Z 21 | 328,25 | D 20 | 527,25 | D 45 | 767,25 |
| Z 4 | 136,25 | Z 22 | 336,25 | D 21 | 535,25 | D 46 | 775,25 |
| Z 5 | 144,25 | Z 23 | 344,25 | D 22 | 543,25 | D 47 | 783,25 |
| Z 6 | 152,25 | Z 24 | 352,25 | D 23 | 551,25 | D 48 | 791,25 |
| Z 7 | 160,25 | Z 25 | 360,25 | D 24 | 559,25 | D 49 | 799,25 |
| D 6 | 168,25 | Z 26 | 368,25 | D 25 | 607,25 | D 50 | 807,25 |
| D 7 | 176,25 | Z 27 | 376,25 | D 26 | 615,25 | D 51 | 815,25 |
| D 8 | 184,25 | Z 28 | 384,25 | D 27 | 623,25 | D 52 | 823,25 |
| D 9 | 192,25 | Z 29 | 392,25 | D 28 | 631,25 | D 53 | 831,25 |
| D 10 | 200,25 | Z 30 | 400,25 | D 29 | 639,25 | D 54 | 839,25 |
| D 11 | 208,25 | Z 31 | 408,25 | D 30 | 647,25 | D 55 | 847,25 |
| D 12 | 216,25 | Z 32 | 416,25 | D 31 | 655,25 | D 56 | 855,25 |
| Z 8 | 224,25 | Z 33 | 424,25 | D 32 | 663,25 | D 57 | 863,25 |
| Z 9 | 232,25 | Z 34 | 432,25 | D 33 | 671,25 | | |
| Z 10 | 240,25 | Z 35 | 440,25 | D 34 | 679,25 | | |
| Z 11 | 248,25 | Z 36 | 448,25 | D 35 | 687,25 | | |
| Z 12 | 256,25 | Z 37 | 456,25 | D 36 | 695,25 | | |
| Z 13 | 264,25 | Z 38 | 464,25 | D 37 | 703,25 | | |

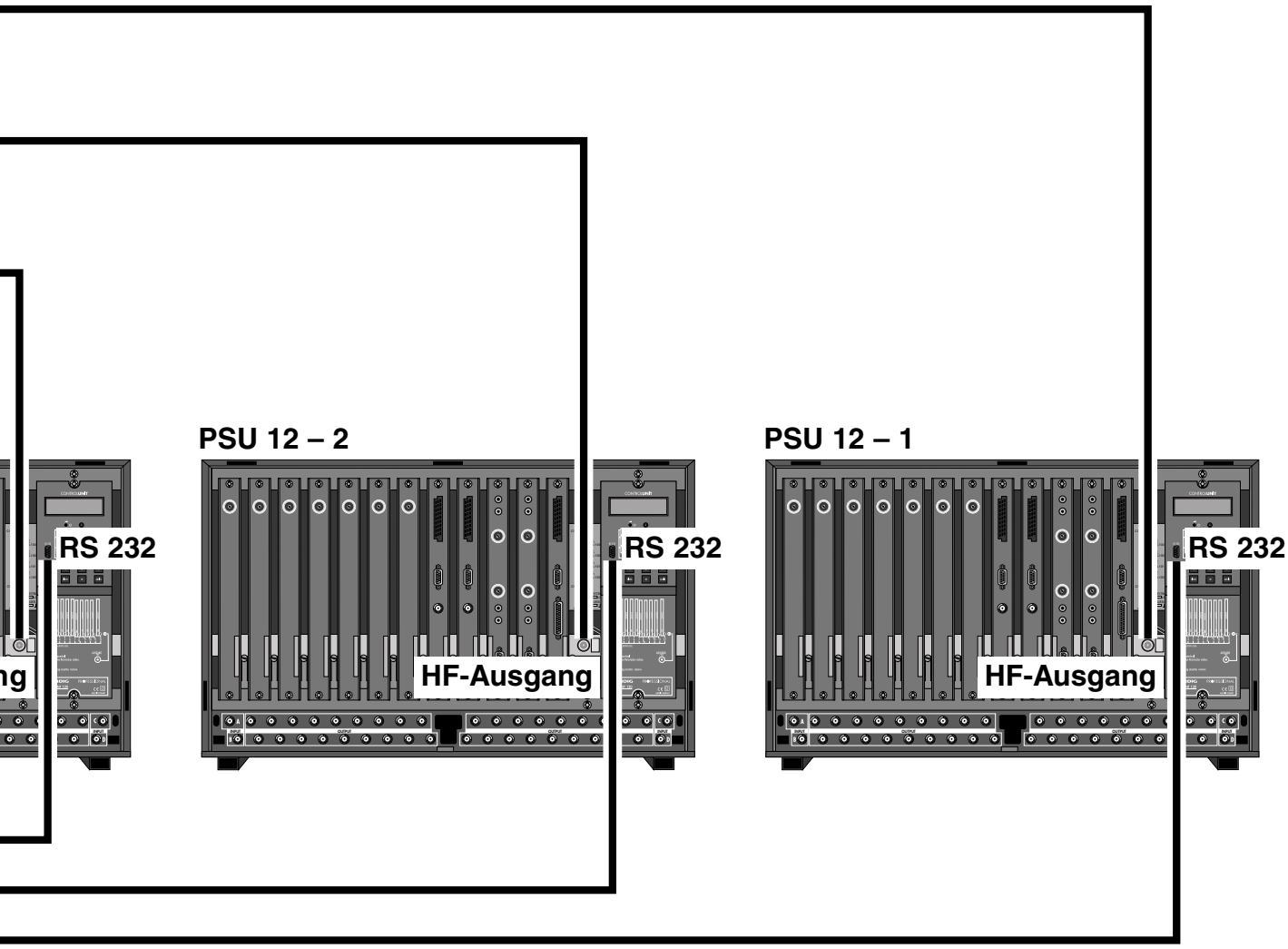
## USA-Kanalraster/USA Channel Steps/Pas de canaux en E.U.A.

Bild-/Ton-Abstand: 4,5 MHz / Video-audio distance: 4.5 MHz / Ecart vidéo/audio: 4,5 MHz

| Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz | Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz | Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz | Kanal<br>Chann.<br>Canal | Freq. BT in MHz<br>Frequ. in MHz<br>Fréqu. en MHz |
|---|---|---|---|---|---|---|---|
| c 2 | 55,25 | P | 253,25 | c 33 | 585,25 | c 60 | 747,25 |
| c 3 | 61,25 | Q | 259,25 | c 34 | 591,25 | c 61 | 753,25 |
| c 4 | 67,25 | R | 265,25 | c 35 | 597,25 | c 62 | 759,25 |
| c 5 | 77,25 | S | 271,25 | c 36 | 603,25 | c 63 | 765,25 |
| c 6 | 83,25 | T | 277,25 | c 37 | 609,25 | c 64 | 771,25 |
| A | 121,25 | U | 283,25 | c 38 | 615,25 | c 65 | 777,25 |
| B | 127,25 | V | 289,25 | c 39 | 621,25 | c 66 | 783,25 |
| C | 133,25 | W | 295,25 | c 40 | 627,25 | c 67 | 789,25 |
| D | 139,25 | c 14 | 471,25 | c 41 | 633,25 | c 68 | 795,25 |
| E | 145,25 | c 15 | 477,25 | c 42 | 639,25 | c 69 | 801,25 |
| F | 151,25 | c 16 | 483,25 | c 43 | 645,25 | c 70 | 807,25 |
| G | 157,25 | c 17 | 489,25 | c 44 | 651,25 | c 71 | 813,25 |
| H | 163,25 | c 18 | 495,25 | c 45 | 657,25 | c 72 | 819,25 |
| I | 169,25 | c 19 | 501,25 | c 46 | 663,25 | c 73 | 825,25 |
| c 7 | 175,25 | c 20 | 507,25 | c 47 | 669,25 | c 74 | 831,25 |
| c 8 | 181,25 | c 21 | 513,25 | c 48 | 675,25 | c 75 | 837,25 |
| c 9 | 187,25 | c 22 | 519,25 | c 49 | 681,25 | c 76 | 843,25 |
| c 10 | 193,25 | c 23 | 525,25 | c 50 | 687,25 | c 77 | 849,25 |
| c 11 | 199,25 | c 24 | 531,25 | c 51 | 693,25 | c 78 | 855,25 |
| c 12 | 205,25 | c 25 | 537,25 | c 52 | 699,25 | c 79 | 861,25 |
| c 13 | 211,25 | c 26 | 543,25 | c 53 | 705,25 | c 80 | 867,25 |
| J | 217,25 | c 27 | 549,25 | c 54 | 711,25 | c 81 | 873,25 |
| K | 223,25 | c 28 | 555,25 | c 55 | 717,25 | c 82 | 879,25 |
| L | 229,25 | c 29 | 561,25 | c 56 | 723,25 | c 83 | 885,25 |
| M | 235,25 | c 30 | 567,25 | c 57 | 729,25 | | |
| N | 241,25 | c 31 | 573,25 | c 58 | 735,25 | | |
| O | 247,25 | c 32 | 579,25 | c 59 | 741,25 | | |

# ANSCHLUSSBEISPIEL – CONNECTION EXA




PSU 12 – 2
PSU 12 – 1
RS 232
RS 232
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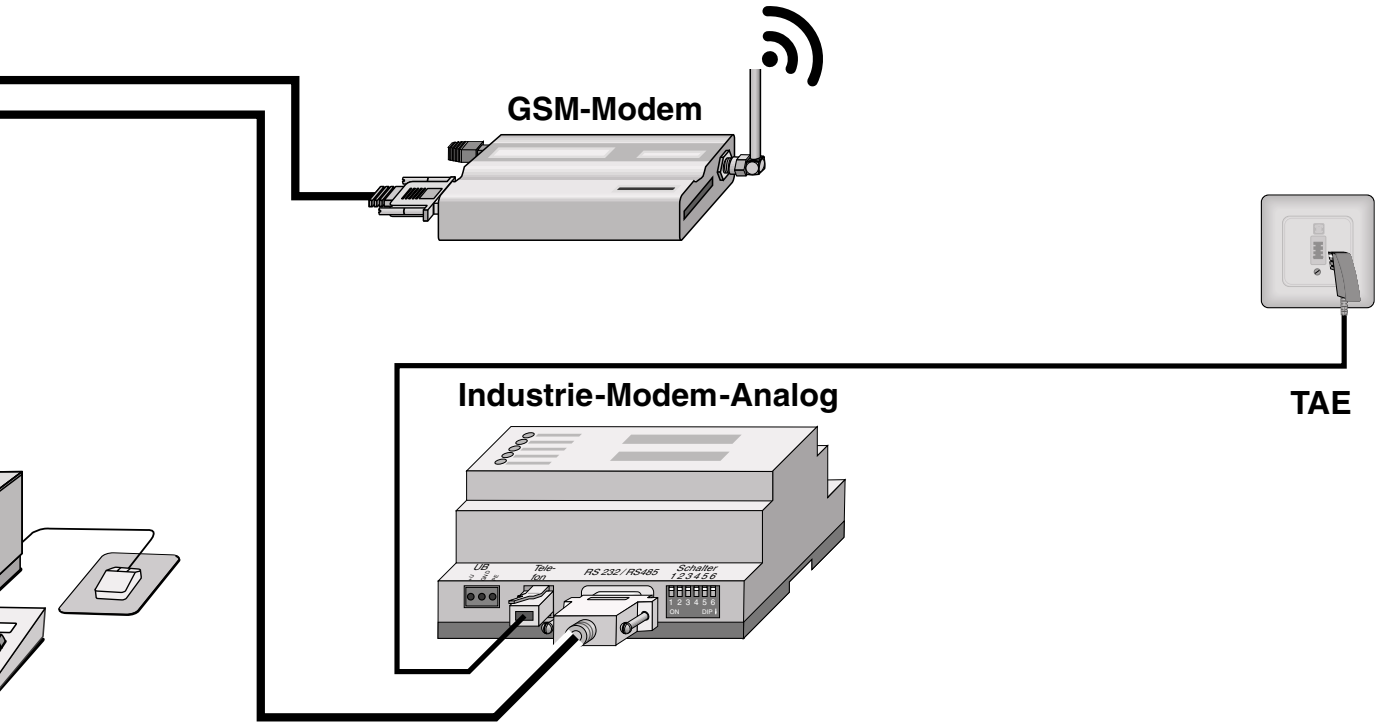
HF-Ausgang
HF-Ausgang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