Assembly Instructions

English

Grundig SAT Systems

Head-End Digital Modulator

COFDM / QAM

HDMT 1000 ASI LAN

HDMT 1001 C

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Contents

1 Safety regulations and notes

Important information

- Assembly, installation and servicing should be carried out by authorised electricians.
- Switch off the operating voltage of the system before beginning with assembly or service work or pull out the mains plug.
- Install the system so it will not be able to vibrate…
  - in a dust-free, dry environment
  - in such a manner that it is protected from moisture, fumes, splashing water and dampness
  - somewhere protected from direct sunlight
  - not within the immediate vicinity of heat sources
  - in an ambient temperature of 0 °C to +50 °C. In case of the formation of condensation wait until the system is completely dried.
- Ensure that the head-end station is adequately ventilated. Do not cover the ventilation slots.
- Beware of short circuits
- No liability is accepted for any damage caused by faulty connections or inappropriate handling.
- Observe the relevant standards, regulations and guidelines on the installation and operation of antenna systems.
- The standards IEC/EN/DIN EN 50083 and IEC/EN/DIN EN 60728 must be observed.
- Do not perform installation and service work during thunderstorms.
- **Test the software versions of the head-end station and the cassette and update them if necessary. The current software versions can be found at *"www.gss.de"*.**
- **For further information please read the assembly instructions for the head-end station used.**

Take action to prevent static discharge when working on the device!

Electronic devices should never be disposed of in the household rubbish. In accordance with directive 2002/96/EC of the European Parliament and the European Council from January 27, 2003 which addresses old electronic and electrical devices, such devices must be disposed of at a designated collection facility. At the end of its service life, please take your device to one of these public collection facilities for proper disposal.

2 General information

2.1 Packing contents

1 cassette HDMT 1000 ASI LAN or HDMT 1001 C
2 HF cables
1 CD (assembly instructions)
1 Brief assembly instructions

2.2 Meaning of the symbols used

 Important note

—> General note

• Performing works

2.3 Technical data

The devices meet the following EU directives:
2006/95/EC, 2004/108/EC
The product fulfils the guidelines and standards for CE labelling.

Unless otherwise noted all values are specified as “typical”.

HF input

Frequency range: ..... 177.5 … 226.5, 474 … 858 MHz
Input level: ..... 60 dBµV … 80 dBµV
Loop through output gain ..... 0 dB … 3 dB
Symbol rate ..... acc. to EN 300744

HF output

Frequency range: ..... 42.0 MHz … 860.0 MHz
Channels: ..... S21 … C69
Types of modulation: ..... QAM 4, 16, 32, 64, 128, 256
Output level: ..... 96 dBµV
Output impedance: ..... 75 Ω

ASI interfaces

Standard: ..... DIN EN 50083-9
Format: ..... MPEG ISO IEC 13818-1
User data rate: ..... 2 … 90 Mbit/s
Level (input / output): ..... 800 mV_{PP} ± 10%
Return loss (input): ..... > 17 dB (5 … 270 MHz)

Connections

HF inputs: .....2 IEC sockets
HF loop-through outputs:.....2 IEC sockets
HF output: ..... 1 IEC socket
ASI input: .....1 BNC socket, 75 Ω
ASI output:.....1 BNC socket, 75 Ω
LAN:..... 1 RJ-45 socket
Connection strip (10-pin):.....for supply voltages and control circuits
RS-232 socket: ..... serial interface for software update
Common Interface: ..... several channels can be decoded.

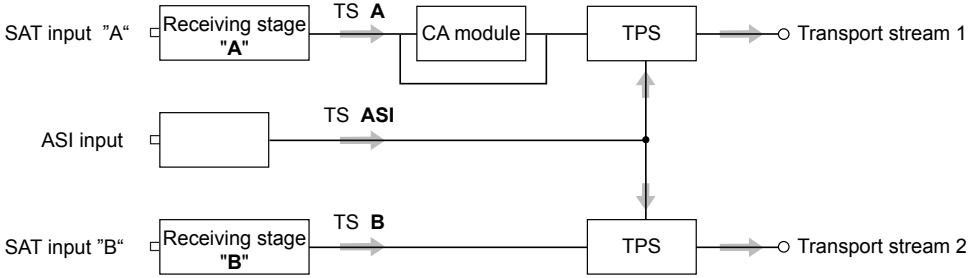
2.4 Description

The double transmodulator cassette is a converter, which converts COFDM modulated stations into two QAM modulated signals for feeding into a cable network. The cassette has two HF inputs, two loop-through outputs and one HF output. Additionally it is equipped with an ASI input and an ASI output (ASI – Asynchronous Serial Interface according to EN 50083-9).
The transport stream fed via the ASI socket can be inserted into the transport streams of the receiving stages via the TPS module. The signal path is set in the menu items input signal path "**INROUTE**" and output signal path "**OUTROUTE**".

2.4.1 Input signal path "INROUTE"

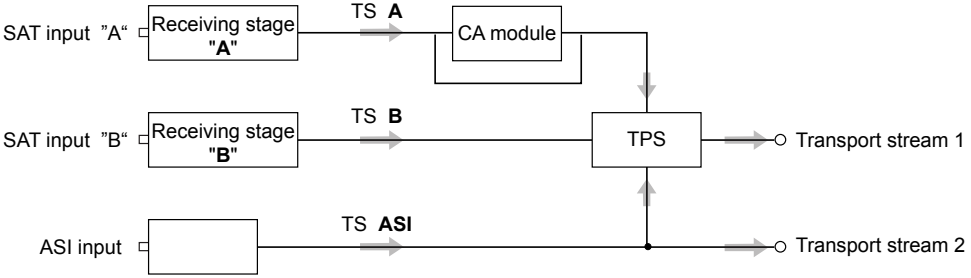
Menu setting "A+ASI = 1 B+ASI = 2"

The transport streams of the receiving stage "TS **A**" and of the ASI input "TS **ASI**" generate the transport stream 1. The transport streams of the receiving stage "TS **B**" and of the ASI input "TS **ASI**" generate the transport stream 2.



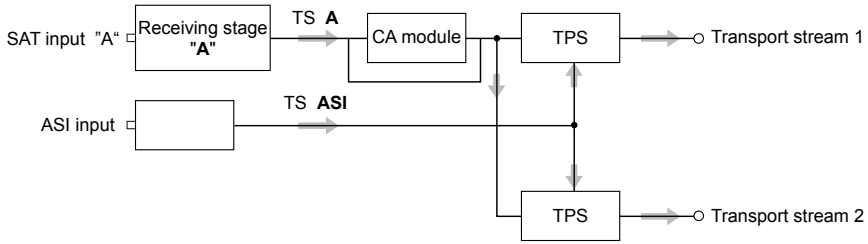
Menu setting "A+B+ASI = 1 ASI = 2"

The transport streams of the receiving stages "TS **A**" and "TS **B**" and of the ASI input "TS **ASI**" generate the transport stream 1. The "TS **ASI**" transport stream fed via the ASI input generates the transport stream 2.



Menu setting "A+ASI = 1 A+ASI = 2"

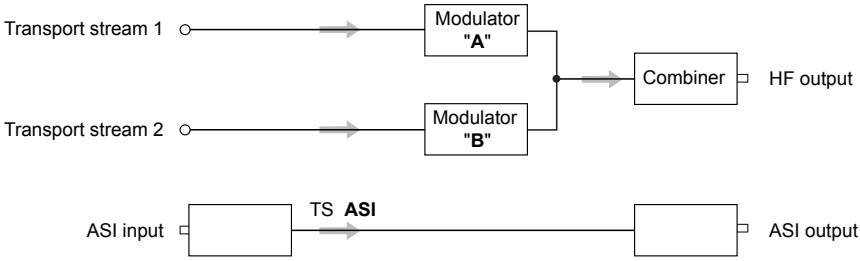
The transport streams of the receiving stage "**A**" "TS **A**" and of the ASI input "TS **ASI**" are split into transport stream 1 and 2. Receiving stage "**B**" is not used.



2.4.2 Output signal path "OUTROUTE"

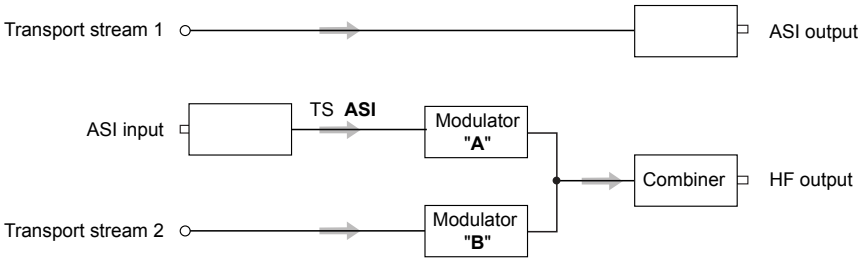
Menu setting "ASI => ASI"

Transport stream 1 is made available via modulator "**A**", transport stream 2 via modulator "**B**" and the transport stream from the ASI input "TS **ASI**" via the ASI output.



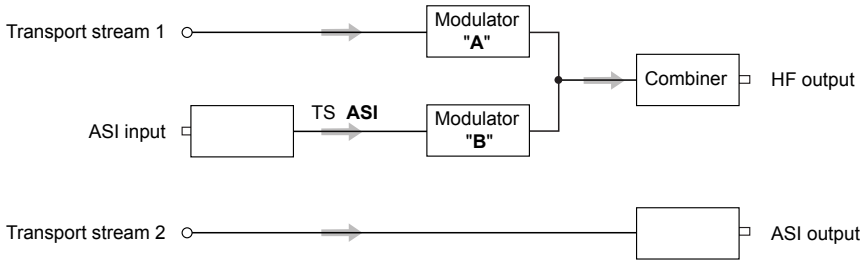
Menu setting "1 => ASI ASI => MA"

Transport stream 1 is made available via the ASI output, transport stream 2 via modulator "**B**" and the transport stream from the ASI input "TS **ASI**" via modulator "**A**" (MA).



Menu setting "2 => ASI ASI => MB"

Transport stream 1 is made available via modulator "**A**", transport stream 2 via the ASI output and the transport stream from the ASI input "TS **ASI**" via modulator "**B**" (MB).



2.4.3 General

The cassette is equipped with two channel strips ("**A**" and "**B**"). The channel strips consist of the digital terrestrial tuners, the digital signal preparation units and the output converter. The channel strips are indicated in the head-end station display with "**Bx ...A**" and "**Bx ...B**". Using an adequate CA module encoded channels can be decoded via channel strip "**A**". In addition cassette HDMT 1001 C is able to scramble unscrambled channels via an adequate CA module. The control of the cassette takes place via the control unit of the head-end station.

Two LEDs provide an indication of the input signal quality based on their colour and indicate if the respective channel strip is switched on (LED illuminates) or off. The integrated TPS module (Transport Stream Processing) processes the data of the transport streams.

The QAM modulated HF output signals are sent through the HF output of the cassette to the HF output collector. The common output level of the channel strips can be set at the output collector. Additionally a transport stream is made available via the ASI output dependent on the signal path set.
When the head-end station is switched on, the two-line LC display shows the software version of the control unit. To operate this cassette the software version of the control unit must be "**V 41**" or higher. You can find the current operating software for the control unit and the cassette, the software "**BE-Flash**" and the current assembly instructions on the website "***www.gss.de***".
The cassette is designed for use in the following head-end stations:
STC 1200, STC 316, STR 19-8 und PST 19-1.

2.5 Software query

Control unit

If necessary, you can activate the indication of the software version of the control unit manually:

- Press any two keys on the control unit of the head-end station simultaneously until the display goes dark and the software version, e.g. "**V 41**" appears.

2.6 How the TPS module works

After decoding COFDM-modulated signals, the demodulated data streams and the data stream fed via the ASI socket can be accessed via the integrated TPS module. These data streams, also called transport streams, contain several stations in all their components (video, audio, data and service information), which can be changed using the TPS module.

The individual functions

Station filter

Individual stations can be deleted. This reduces the data rate and, consequently, the output symbol rate. Additionally stations of the different transport streams can be assembled to a new transport stream.

Stuffing

The transport stream is padded using what is known as zero data. This ensures a steady and constant output data rate.

Changing the Transport stream and ORGNET-ID
The transport stream ID can be changed. If the stations of a transponder are split into the transport streams of the channel strips "A" and "B", one of the both transport streams a new identification must be allocated to realise the channel search of the settop boxes connected without mistakes.
If the ORGNET-ID is changed a new NIT must be generated.

Changing the NIT
The transport stream contains data in the form of tables which the receivers evaluate and require for convenient use. The TPS module can adjust the "Network Information Table" (NIT) to accommodate the new station data. The "NIT" contains data which is required by the set-top boxes connected to the cable network for the automatic search feature.

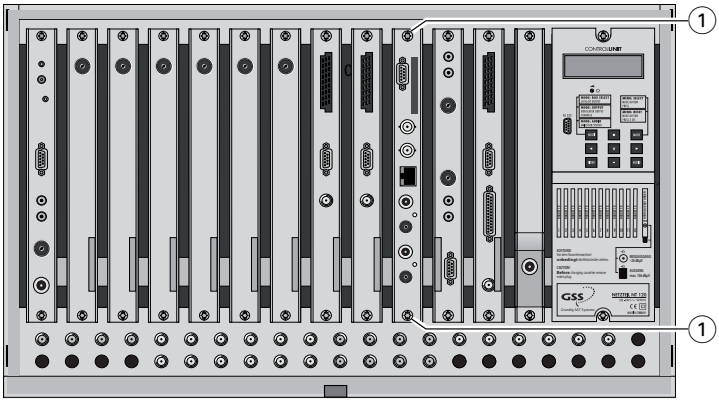
Changing the operator ID (CAT)
Some network operators transmit an operator ID in the data stream (e.g. visAvision). By changing the CAT the operator ID can be adjusted to the current demands.

3 Assembly

3.1 Installing the cassette

– Ensure the head-end station is mounted so it will not be able to vibrate. Avoid, for example, mounting the head-end station onto a lift shaft or any other wall or floor construction that vibrates in a similar way.
– Before installing or changing a cassette unplug the power cable from the mains power socket.

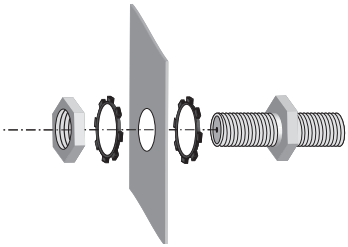
- Remove the fastening screws (1) of an unoccupied slot from the bracket of the head-end station.
- Insert the cassette in this slot and push it into the housing.
- Align the cassette and apply slight pressure to connect it to the connections of the board and the HF bus bar.
- Fasten the cassette with the screws (1).



3.2 EMC regulations

To comply with the current EMC regulations, it is necessary to connect the lines leading in and out of the head-end station using cable terminals.
When mounting the cassette in a STR 19-8 or PST 19-1 head-end station which is installed in a 19" cabinet, make sure the connections leading in and out for the 19" cabinet are made using cable terminals.

The attenuation of shielding of the connection lines for ASI and antenna must meet the requirements for "Class A".

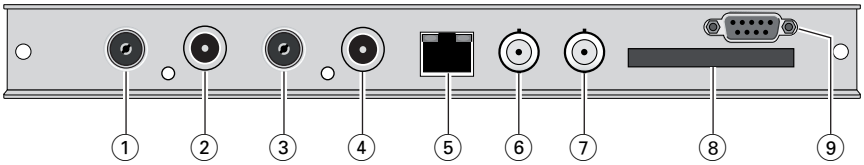


- Insert the required number of cable terminals in the openings provided in the head-end station or in the 19″ cabinet.

—> cable terminals are not included in the scope of delivery.

Tighten the nuts of the cable terminals until the teeth on the lock washers put under have penetrated the exterior coating and a good connection is made between the housing / 19″ cabinet and cable terminals.

3.3 Overview of the cassette



(1) HF input (channel strip "**B**")
(2) Loop-through output of input (1)
(3) HF input (channel strip "**A**")
(4) Loop-through output of input (3)
(5) LAN socket (intended for additional functions)
(6) ASI input
(7) ASI output
(8) Slot for a CA module
(9) D-SUB socket "RS-232"

The operating software of the cassette can be updated via the 9-pin D-SUB socket "RS-232" using a PC or notebook and the software "**BE-Flash**".
You can find the current operating software on the website "***www.gss.de***".

3.4 Connecting the cassette

- Connect the HF connections to the inputs ③ (channel strip "**A**") and ① (channel strip "**B**") .
- Connect the ASI input ⑥ and the ASI output ⑦ to the peripheral ASI devices.

3.5 Retrofitting a CA module

The cassette is equipped with a common interface. It allows you to connect a CA module for various scrambling systems and service providers. Scrambled channels can only be descrambled with a CA module suitable for the scrambling system and the corresponding smart card. The smart card contains all the information for authorisation, descrambling and subscription.
The cassette HDMT 1001 C is able to scramble unscrambled channels via an adequate CA module.

⚠
– Check with the distributor or manufacturer of the CA module to be used to ensure that it is suitable for descrambling several channels.
– **The hardware and software of this cassette have been thoroughly prepared and tested.**
Any changes made by programme provider to the structures in the programme data might impair or even prevent this function.
– When working with the CA module, please read the corresponding operating manual from the respective provider.

- Insert the smart card ① into the CA module ② so that the chip ③ on the smart card faces the thicker side (top) of the CA module.
- Insert the CA module into the guide rails of the CA slot ④ with the top side of the CA module facing the top side of the cassette.
- Push the CA module without canting into the guide rails of the CA slot ④ and contact it to the common interface.

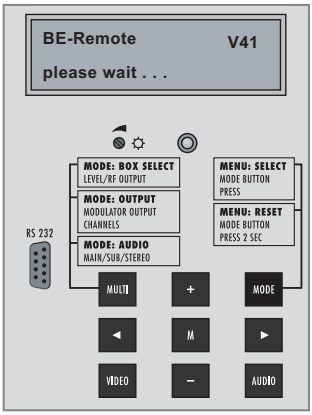
4 The control panel at a glance

4.1 Menu items

Programme the cassette using the buttons on the control unit of the head-end station. The two-line display of the control unit then shows the menus.
The parameters and functions to be set are underlined.

Use the **MODE** key to select the following main menu items:

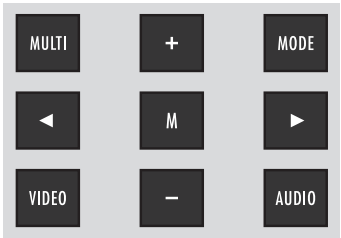
- Input signal path
- Output signal path
- Channel strip
- Channel / frequency selection
- Output channel / output frequency
- Output level
- Input channel
- Hierarchical modulation
- Station filter
- CA module (if available)
- QAM modulation
- Stuffing
- Substitute signal
- Transport stream and ORGNET-ID
- Network Information Table (NIT)
- Network/operator identification
- Deleting a PID
- Renaming a PID
- Factory reset



4.2 Control panel

The key pad on the head-end station is used to scroll through the menus step-by-step:

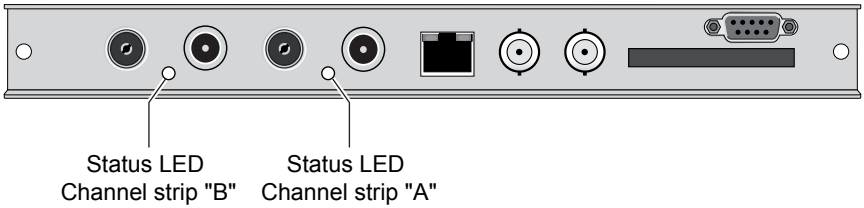
MODE scrolls forward through the menus.
◄ / **►** select parameters in the menus.
+ / **-** set values, initiate actions.
MULTI selects sub-menus.
AUDIO scrolls backward through the menus.
M saves all entries.



5 Programming

5.1 Preparation

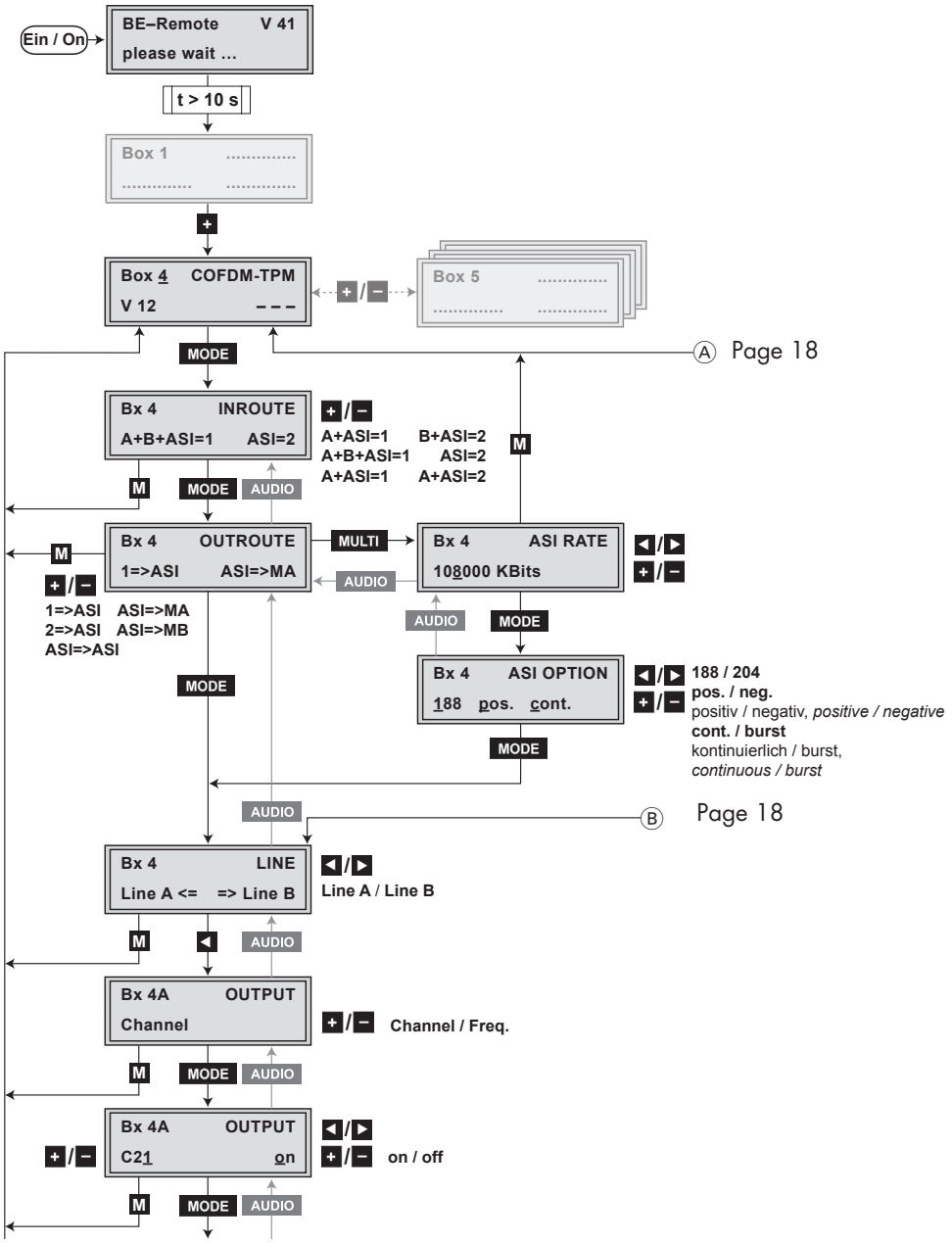
- Test the software versions of the head-end station and the cassette and update them if necessary. The current software versions can be found on the website "***www.gss.de***".
- Connect the test receiver to the HF output or the test output of the head-end station.
- Set the output channel / output frequency of the cassette (page 23) and adjust the TV test receiver to this channel / frequency.
- Switch on the channel strip (modulator) if necessary (page 24). For each channel strip, there is a status LED which indicates if the channel strip is switched on.

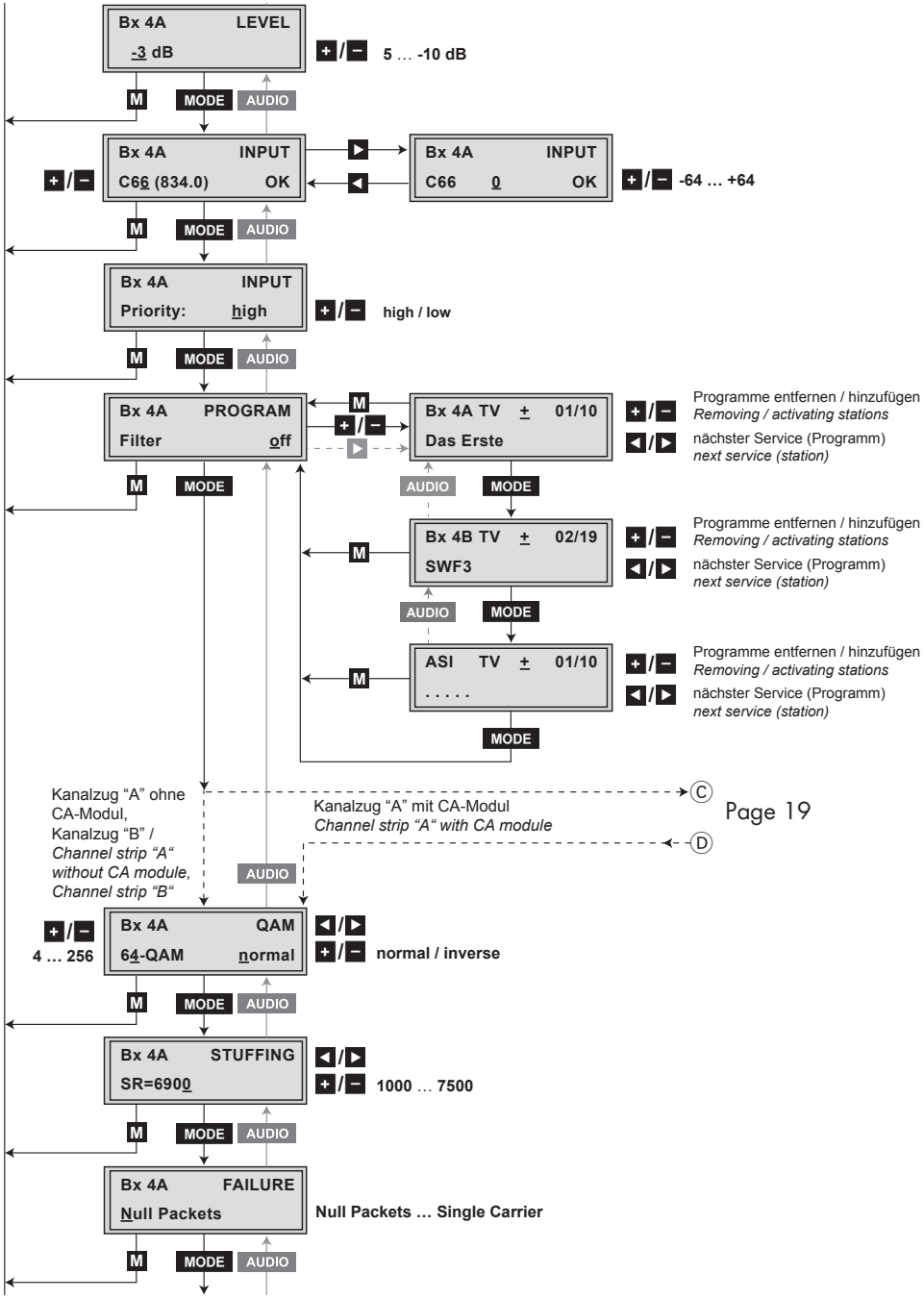


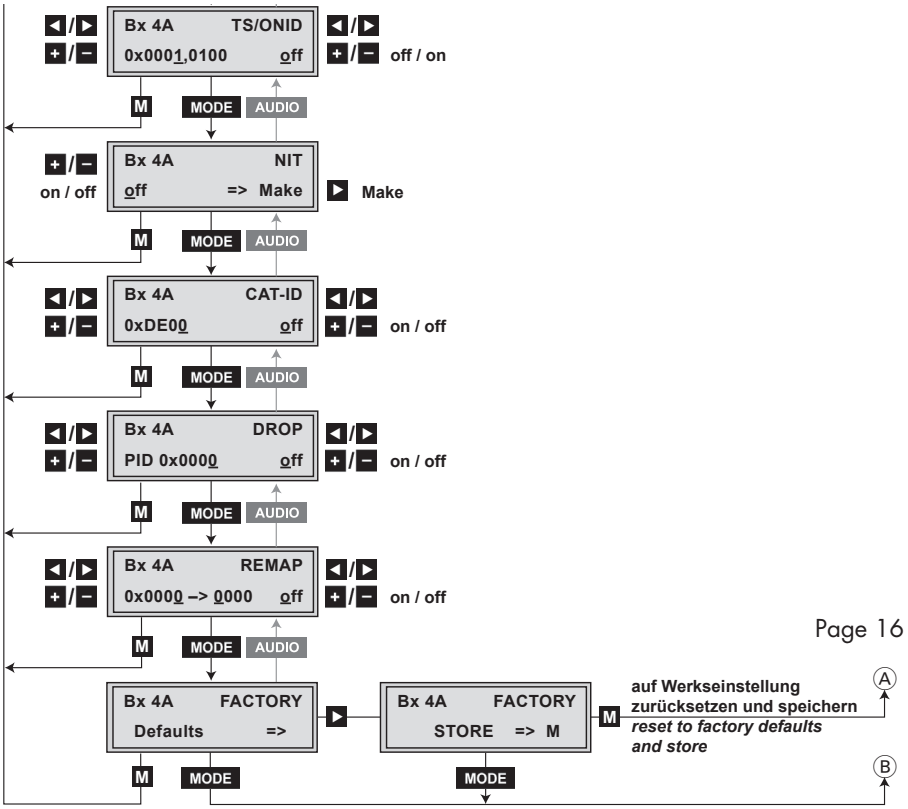
- Balance the output levels of the channel strips "**A**" and "**B**" if the difference in level is ≥ 1 dB (page 25).

5.2 Programming procedure

Channel strips "A" (without CA module) and "B"



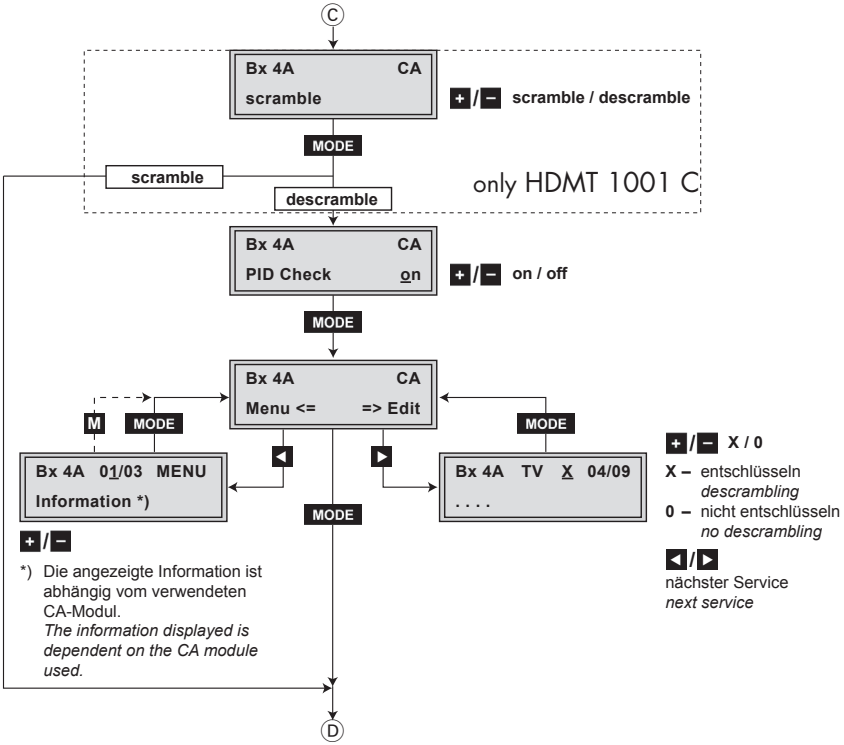

Bx 4A LEVEL
-3 dB
+/− 5 … -10 dB
M MODE AUDIO
Bx 4A INPUT
C66 (834.0) OK
Bx 4A INPUT
C66 0 OK
+/− -64 … +64
Bx 4A INPUT
Priority: high
+/− high / low
Bx 4A PROGRAM
Filter off
Bx 4A TV ± 01/10
Das Erste
Programme entfernen / hinzufügen
Removing / activating stations
nächster Service (Programm)
next service (station)
Bx 4B TV ± 02/19
SWF3
ASI TV ± 01/10
. . . . .
Kanalzug “A” ohne CA-Modul, Kanalzug “B” / Channel strip “A“ without CA module, Channel strip “B“
Kanalzug “A” mit CA-Modul
Channel strip “A“ with CA module
Page 19
Bx 4A QAM
64-QAM normal
4 … 256
normal / inverse
Bx 4A STUFFING
SR=6900
1000 … 7500
Bx 4A FAILURE
Null Packets
Null Packets … Single Carrier


Bx 4A TS/ONID
0x0001,0100 off
off / on
MODE
AUDIO
Bx 4A NIT
off => Make
on / off
Make
Bx 4A CAT-ID
0xDE00 off
on / off
Bx 4A DROP
PID 0x0000 off
on / off
Bx 4A REMAP
0x0000 –> 0000 off
on / off
Bx 4A FACTORY
Defaults =>
Bx 4A FACTORY
STORE => M
auf Werkseinstellung
zurücksetzen und speichern
reset to factory defaults
and store
A
B

Page 16

Channel strip “A” with CA module

Page 17



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5.3 Programming the cassette

—> Pressing the **MODE** button for longer than 2 seconds cancels the programming procedure. This takes you back to the programme item "Selecting the cassette" from any menu. Any entries that have not been saved are reset to the previous settings.

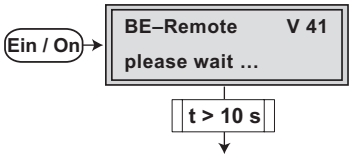
—> Entries in the menus can be saved by pressing the **M** key. You are taken back to the "Selecting the cassette" menu item.

—> Using the **AUDIO** button previous menus can be activated.

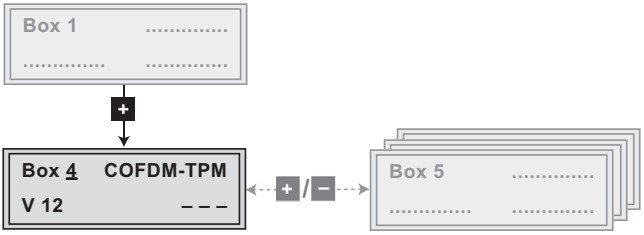
- Switch on the head-end station.

—> The display shows the software version of the head-end station (e.g. "**V 41**").

—> The processor reads the cassettes' data (approx. 10 seconds).



Selecting the cassette



- Select the cassette you want to programme (e.g. **Box 4**) by repeatedly pressing the button **+** if necessary.

—> The display shows e.g. the menu:

Box 4 COFDM-TPM
V 12

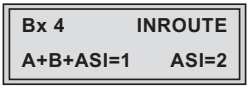
"**Box 4**"	stands for slot 4
"**COFDM-TPM**"	Type of cassette
"**V 12**"	Software version of the cassette

- Press the **MODE** button.

—> The "Selecting the input signal path" – "**INROUTE**" menu is activated.

Selecting the input signal path

In this menu you define the signal path of the input transport streams.
Menu setting "**A+ASI = 1 B+ASI = 2**" (page 6).
Menu setting "**A+B+ASI = 1 ASI = 2**" (page 7).
Menu setting "**A+ASI = 1 A+ASI = 2**" (page 7).



- Use the **+** / **-** buttons to select the signal path wished.

- Press the **MODE** button.

—> The "Selecting the output signal path" – "**OUTROUTE**" menu is activated.

Selecting the output signal path

In this menu you define the signal path of the output transport streams.
Menu setting "**ASI => ASI**" (page 7).
Menu setting "**1 => ASI ASI => MA**" (page 8).
Menu setting "**2 => ASI ASI => MB**" (page 8).

- Use the **+** / **-** buttons to select the signal path wished.

- If you do not want to do ASI settings, press the **MODE** button.

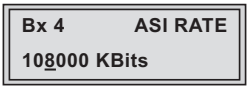
—> The "Selecting the channel strip" – "**LINE**" menu is activated (page 23).

- To set the ASI parameters press the **MULTI** button.

—> The "Setting the ASI transfer rate" – "**ASI RATE**" menu is activated.

Setting the ASI transfer rate

In this menu you set the output transfer rate for the ASI component connected. For this setting please take the required information from the documentation (technical data) of the ASI component to be connected.



- Use the ◄/► buttons to place the cursor under the digits to be set for the transfer rate then use the +/- buttons to set the transfer rate wished.

- Press the **MODE** button.

—> The "Setting the ASI options" – "**ASI OPTION**" menu is activated.

Setting the ASI options

In this menu you define the size of the data packets, their polarity and the type of transmission.
For this setting please take the required information from the documentation (technical data) of the ASI component to be connected.

- Press the +/- buttons to set the size of the data packets ("**188"** or "**204**" bits).

- If the polarity of the data to be transmitted has to be changed, press the ◄/► buttons to place the cursor under "**pos.**" (positive – standard) and using the +/- buttons set to "**neg.**" (negative).

- To change the type of transmission press the ◄/► buttons to position the cursor under "**cont.**" (continuous – standard) and using the +/- set to "**burst**".

—> Setting "**cont.**"
The data packets of the user data are collected to a great data packet in the transport stream.

—> Seting "**burst**"
The data packets of the user data are spaced out evenly in the transport stream.

- Press the **MODE** button.

—> The "Selecting the channel strip" – "**LINE**" menu is activated.

Selecting the channel strip

- By pressing ◄ select channel strip "**A**" ("**Line A**") or select channel strip "**B**" ("**Line B**") by pressing the ► button.

—> The "Selecting channel / frequency setting" – "**OUTPUT**" menu is activated.

Selecting channel / frequency setting

In this menu, you can select the channel or frequency setting for the adjustment of the HF output. The channel setting covers the range of channels S21 … C69, the frequency setting covers the range from 42.0 MHz to 860.0 MHz.

The QAM signal is normally transmitted with a bandwidth of 8 MHz. This means that you can only use the channel centre frequency of the existing channel grid in the range of channels S21 … C69 (frequency grid 8 MHz). Please note thereby that many receivers cannot receive the channel ranges S21 … S41 (306 … 466 MHz).
The CCIR channel grid is 7 MHz in the range of the lower frequency bands (channels C2 … S20). Therefore the frequency setting is used here. If one uses the existing channel grid of 7 MHz in these channel ranges, this will result in interference (overlapping) with the 8 MHz QAM signal packages, thus causing transmission problems.
For programming in these channel ranges and in the frequency ranges below them, we recommend starting with channel S21 / 306 MHz going back in steps of 8 MHz (see frequency table on page 42), or reducing the bandwidth of the QAM output signal by removing stations.

- Use **+** / **-** to select channel setting "**Channel**" or frequency setting "**Freq.**".

- Press the **MODE** button.

—> The "Setting the output channel" or "Setting the output frequency" – "**OUTPUT**" menu is activated.

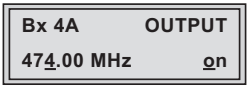
Setting the output channel

In this menu you set the output channel of the channel strip (S21 … C69). Additionally the modulator of the channel strip can be switched off or on (page 24).

- Use the **+**/**-** buttons to set the output channel.

Setting the output frequency

In this menu you set the output frequency of the channel strip (42.0 … 860.0 MHz). Additionally the modulator of the channel strip can be switched off or on (page 24).



- Use the **◄**/**►** buttons to place the cursor under the digit to be set for the frequency display then use **+**/**-** to set the output frequency wished.

Switching the modulator off or on

- To switch off the modulator place the cursor under "**on**" using the **►** button and switch "**off**" the modulator of the channel strip using the **+**/**-** buttons.

—> The status LED is switched off (see also page 15).

—> The switched off modulator is indicated by " **- - -** " in the display instead of the channel or frequency display.

- In the case the modulator is switched "**off**" use the **+**/**-** to switch it "**on**".

- Press the **MODE** button.

—> The "Adjusting the output levels of the channel strips" – "**LEVEL**" menu is activated.

Adjusting the output levels of the channel strips

This menu item is used to set the output levels of the modulators of the channel strips "**A**" and "**B**" to the same value.

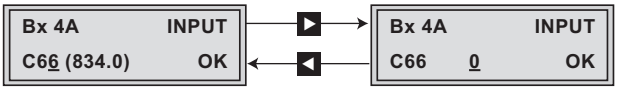
- Measure and note down the output level of the channel strip. To adjust the output level to the output levels of the other cassettes please pay attention to chapter 6 "Final procedures".
- By repeatedly pressing the **AUDIO** button scroll back to the "Selecting the channel strip" menu.
- Select the other channel strip (page 23) and set the following menu items:
- "Selecting channel / frequency setting" (page 23).
- "Setting the output channel" or "Setting the output frequency" (page 24).
- Switch on the modulator if necessary (page 24).
- Measure and note down the output level.
- Activate the "**LEVEL**" menu of the channel strip with the higher output level.
- By pressing **+**/**-** adjust the higher output level of the one channel strip to the lower output level of the other channel strip incrementally ("**0**" … "**–10 dB**").
- If necessary activate the channel strip to be programmed.

- Press the **MODE** button.

—> The menu "Setting the input channel" – **INPUT**" is activated.

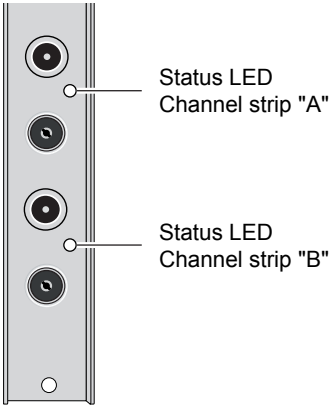
Setting the input channel

If three dots " **...** " appear in the second line of the display, the cassette is in the "**station search**" mode. Please wait until the process has finished.
Once the HF receiver has synchronised to the input signal, "**OK**" is displayed.
If "**– –**" appears in the second line of the display, there is no input signal present. Check the configuration of the antenna system and the head-end station as well as the preceding settings of the cassette.



- Use **+**/**-** to set the desired input channel.
- If necessary use the **►** button to activate the menu "Fine tuning" ("**0**" is displayed additionally).
- Use **+**/**-** for fine tuning the input channel.

In addition to the indicator in the display, there is also a status LED which indicates the quality of the received transport stream:



LED indicator	Indication
Green	Signal quality is good
Red	No signal
Off	The channel strip (modulator) is switched off

- To return to the main menu press the **◄** button.

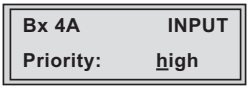
- Press the **MODE** button.

—> The menu "Setting the hierarchical modulation" – "**INPUT Priority:**" is activated.

Setting the hierarchical modulation

In order to attain with less field strength a greater range for broadcasters, with DVB-T so-called "hierarchical modulation" is used. In this process, several data streams are modulated onto a DVB-T data stream using "Quadrature Amplitude Modulation" (QAM). The robust "High Priority" data stream (HP) with a lower data rate is modulated onto the more sensitive "Low Priority" data stream, which possesses a higher data rate. In good reception conditions, the

receivers can receive both data streams; in poorer reception conditions, only the "HP" portion.



- By pressing **+**/**-** set to "**high**" or "**low**" (not relevant in the case of standard modulation).

- Press the **MODE** button.

—> The menu "Setting the station filter " – "**PROGRAM**" is activated.

Setting the station filter

If no station is found the error message "**FILTER no Service**" is displayed. Check the configuration of the antenna system and head-end station as well as the previous settings of the cassette in question.

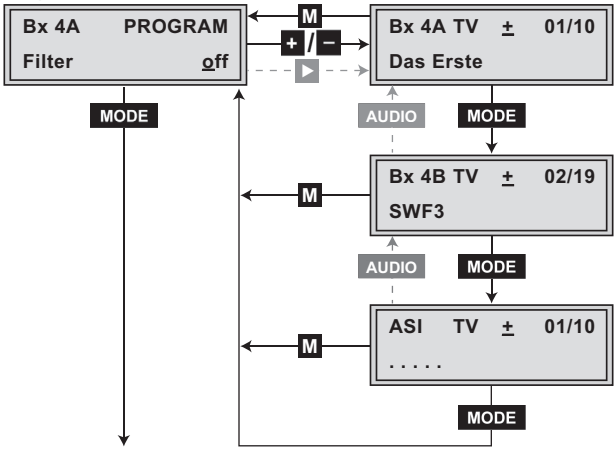
If the input signal path "**A+B+ASI=1 ASI=2**" is selected the station filter of channel strip "**B**" is used in the channel strip "**A**". Therefore perform the setting for channel strip "**B**" (input channel) according to page 23, before activating the "Setting the station filter" – "**PROGRAM**" menu.
If the input signal path "**A+ASI=1 B+ASI=2**" or "**A+ASI=1 A+ASI=2**" is selected the channel strips can be programmed one after the other.

The default setting for the station filter is "**off**". In this menu you define the stations received to be transmitted. If stations are activated the output data rate increases.
If the station filter is switched off (factory default) all stations of the transport stream passes the station filter. As soon as the station filter is activated all stations are inactive.

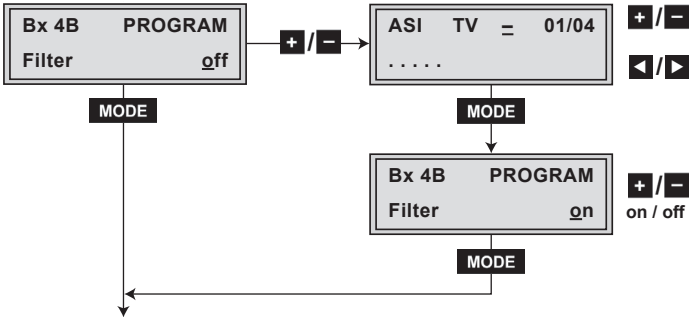
The figure of the menu below is dependent on the setting of the "Selecting the input signal path" menu (page 21).
The menu shows the setting "**A+B+ASI = 1 ASI = 2**".
With this setting the transport stream of channel strip "**B**" is routed to the transport stream of channel strip "**A**" and therefore cannot be set in channel strip "**B**". Programming channel strip "**B**" the transport stream coming from the ASI input can be processed only.

Menu setting "A+B+ASI = 1 ASI = 2".

Channel strip "**A**"



—> The following figure shows the "Setting the station filter" menu of channel strip "**B**".



- Press the **+** / **-** button.

—> All stations from the channel strip will be read, and then displayed with name and station type.

—> Pressing the **MULTI** button all stations can be activated or deactivated.

—> If no station is found, the following error message will appear in the display: "**FILTER no Service**".
In this case, check the configuration of the antenna system and head-end station, as well as the previously adjusted settings for the cassette and the components connected to the ASI input.

—> The display shows e.g.:

Bx 4A TV + 01/10
Das Erste

Meaning of the indicators in the example:

"**Bx 4A**" Slot 4, channel strip "**A**"
"**TV**" TV channel type
" **+** " The currently selected station is activated.
"**01/10**" The 1st of 10 stations is being displayed.
"**Das Erste**" Station name

Further possible terms displayed:

"**RA**" Radio channel type
For radio stations, the background of the screen of the connected TV or test receiver is darkened.
" **–** " The currently selected station is deactivated.
" ***** " The star means that the TV or radio statio selected is encoded. To enable the stations, the CA module and the appropriate smart card of the station provider are required.

—> If a service number (e.g. "**131**") appears instead of "**TV**" or "**RA**", this indicates that an unnamed station or an undefined data stream is being received.

- Use the ◄/► buttons to call up the stations in sequential order, then use +/- to activate (indicated by " **+** ") or to deactivate them (indicated by " **–** ").

- Press the **MODE** button.
- Set the station filters of channel strip "**B**" and "**ASI**" in the same way as channel strip "**A**".

—> To return to the previous station filter press the **AUDIO** button.

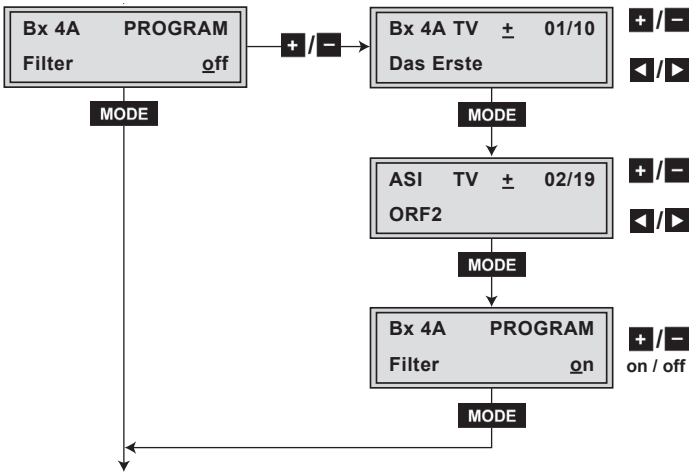
- To save changes and to activate the station filters press the **MODE** button.

—> The display shows "**PROGRAM Filter on**".
—> If stations are activated the corresponding PIDs (audio, video, text) are inserted into the data stream and the PAT and SDT tables are updated.

- In the "**PROGRAM Filter on**" menu the station filters switched on can be switched "**off**" using the buttons +/- if necessary.

Menu setting **"A+ASI = 1 B+ASI = 2".**
"A+ASI = 1 A+ASI = 2"

Channel strip "**A**"



- Set the channel strip "**A**" or "**B**".

—> The setting of the channel strips "**A**" and "**B**" is identical and follows the description above.

- Press the **MODE** button.

—> The "Setting the QAM modulation / Inverting the user signal" – "**QAM**" menu is activated when the channel strips "**A**" without a CA module installed and "**B**" are programmed.

—> Programming the channel strip "**A**" with a CA module installed the settings for the CA module are activated (page 37).

Setting the QAM modulation

In this menu, you can set the QAM modulation and invert the user signal.

- Use **+** / **-** to set the QAM modulation ("**4**" … "**256**").

—> For higher QAM modulation, the output symbol rate is decreased. An output QAM modulation of >64 QAM places a large burden on the cable network. Due to noise, delay and frequency response problems, reception of the converted output signal can be affected.

Inverting the user signal

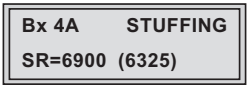
For exceptional cases and "older" digital cable receivers, the spectral position of the user signal can be inverted "**inverse**". The factory default is "**normal**".

- Use ◄/► to place the cursor under "**normal**".
- Use +/- to set the spectral position to "**inverse**".

- Press the **MODE** button.

—> The "Setting stuffing" – "**STUFFING**" menu is activated.

Setting stuffing



SR=6900 (= "Number 1"): Active output symbol rate
(**6325**) (= "Number 2"): The current measured output symbol rate.
If the station filter is activated, this value is lower than the value of the "Number 1". The value fluctuates, since the data rates of individual stations are dynamically modified by the broadcasters.

—> "Number 2" is not displayed in the channel strips "**A**" or "**B**" at the settings "**OUTROUTE 1=>ASI ASI=>MA**" or "**2=>ASI ASI=>MB**", for the symbol rate of the ASI input signal cannot be measured. The ASI input signal therefore must be built in such a way so that the output symbol rate ("Number 1") is not exceeded.
The symbol rates of the transport streams built by the cassette can be measured at the setting "**OUTROUTE ASI=>ASI**" and be displayed in the respective channel strip.

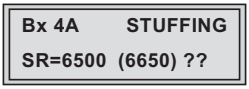
- Use the ◄/► buttons to place the cursor under the number to be changed ("Number 1") and set the symbol rate with the buttons +/- . The value set corresponds to the new output symbol rate.

Increasing the value of "Number 1".

—> The "Number 1" can be increased to any value up to 7500.

Reducing the value of "Number 1".

—> With the station filter switched "**on**", the "Number 1" can be decreased. To do this, observe the "Number 2" for approx. 30 seconds and note the highest value. Add roughly 10 % to this value. Do not decrease the "Number 1" lower than the value of "Number 2".
Is the "Number 1" lower than "Number 2" question marks "**??**" appear in the display.

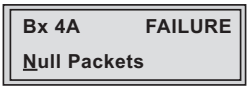


- Press the **MODE** button.

—> The "Setting a substitute signal in the case of an incorrect input signal" – "**FAILURE**" menu is activated.

Setting a substitute signal in the case of an incorrect input signal

You use this menu to set whether a QAM signal filled with "**Null Packets**", a QAM signal filled with null packets and self-made tables "**Tables**" or a "**Single Carrier**" signal should be provided as an output signal whenever an incorrect input signal occurs. Self-made tables are transmitted furthermore.



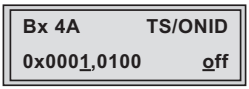
- Use the **+**/**-** buttons to set the output signal required.

- Press the **MODE** button.

—> The "Setting the transport stream ID and the ORGNET-ID" – "**TS/ONID**" menu is activated.

Setting the transport stream ID and the ORGNET-ID

If the stations of a transponder are split into the transport streams of the channel strips "**A**" and "**B**", one of the both transport streams a new identification must be allocated to realise the channel search of the settop boxes connected without mistakes.
If the ORGNET-ID is changed a new NIT must be generated (page 33).



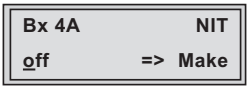
- Use the ◄/► buttons to position the cursor under the digit of the hexadecimal number to be set.
- Press + / - to set the respective digit of the hexadecimal number.
- Repeat the procedure by the quantity of the digits to be set.
- Using the ► button place the cursor under "**off**" and switch "**on**" the transmitter identification using the + / - buttons.

—> By pressing the ◄ button you return to the hexadecimal number setting.

- Press the MODE button.

—> The "Network Information Table" – "**NIT**" menu is activated.

Network Information Table (NIT)



- To switch NIT on/off ("**on**"/"**off**") press the + / - buttons.

- Press the ► button to activate NIT ("**Make**").

All active …-QAM cassettes must be set and ready for reception.
The NIT of all …-QAM cassettes are switched on.
The cassette fetches all the information (output frequencies, output symbol rates, etc.) it needs from all the …-QAM cassettes in order to generate the cable NIT. This process may take a few seconds.
Then the NIT is generated, added and sent to all …-QAM cassettes. The other …-QAM cassettes also add this new cable NIT. The status of all …-QAM cassettes in the NIT menu changes to "**on**".
The display shows: "**read … / copy …**".

- To switch off the new NIT ("**off**") press the **-** button.

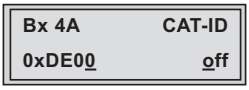
The cable NITs of the other …-QAM cassettes will stay switched on. When the cable NIT of the cassette is switched on again ("**on**") by pressing the **-** button, the previously generated NIT is added again. If you have changed parameters in the meantime, you must first select "**Make**" to generate a new, up-to-date NIT.

- Press the **MODE** button.

—> The "Setting the network/operator identification" – "**CAT-ID**" menu is activated.

Setting the network/operator identification

In this menu, you can change the network/operator identification (CAT-ID – **C**onditional **A**ccess **T**able - **Id**entification), for example of the visAvision transponder (Eutelsat 8° West).



CAT is not to be changed:

- Press the **MODE** button.

—> The "Deleting a PID" – "**DROP**" menu is activated (page 35).

Changing the CAT:

The network operator e.g. requires that you set the operator ID of the visAvision transponder to "2".

- Use the **◄**/**►** buttons to position the cursor under the digit to be set.
- Use **+**/**-** to change the operator ID from "**0xDE00**" to "**0xDE02**".
- Use the **►** button to position the cursor under "**off**," then use **+**/**-** to activate the new CAT ("**on**").

—> The menu display switches to "**modified**".

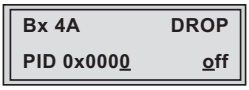
—> If you try to change the network/operator identification (operator ID) of a transponder which cannot be modified, "**not modified**" appears in the display.

- Press the **MODE** button.

—> The "Deleting a PID" – "**DROP**" menu is activated.

Deleting a PID

In this menu a PID of the transport stream can be deleted.



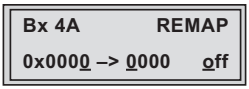
- Use the ◄/► buttons to place the cursor under the respective digit of the hexadecimal number of the PID to be deleted ("**0x0000**") and set the hexadecimal number using +/-.
- Use the ► button to set the cursor under "**off**" and delete the PID using the +/- buttons ("**on**").

- Press the **MODE** button.

—> The "Renaming a PID" – "**REMAP**" menu is activated.

Renaming a PID

In this menu you can allocate a new address to a PID retaining the complete data content.



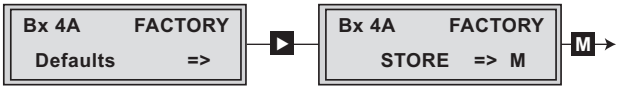
- Use the ◄/► buttons to place the cursor under the respective digit of the hexadecimal number of the PID to be changed ("**0x0000**") and set the hexadecimal number using +/-.
- Use the ◄/► buttons to place the cursor under the respective digit of the hexadecimal number of the new PID ("**–> 0000**").
- Set the hexadecimal number using +/-.
- Use the ► button to set the cursor to "**off**" and rename the PID using the +/- buttons ("**on**").

- Press the **MODE** button.

—> The "Factory reset" – "**FACTORY Default**" menu is activated.

Factory reset

In this menu you can reset all settings to the factory defaults.



- Press the ▶ button.

—> The factory defaults are invoked.

—> By pressing the **MODE** button, you will be returned to the menu item "Selecting the channel strip" via Ⓑ **without** invoking the factory defaults (page 24).

- Press the **M** button.

—> The factory defaults are saved. The display shows "STORE"

—> Back to "Selecting the cassette" Ⓐ (page 20).

—> By pressing the **MODE** button, you will be returned to the menu item "Selecting the channel strip" via Ⓑ **without** saving the factory defaults (page 23).

—> If necessary set channel strip "**B**".

Saving settings

- Press the **M** button.

—> Returning to "Selecting the cassette" menu via connection Ⓐ (page 20).

—> The settings are saved.

—> If functions of the TPS module are activated, their status is shown in the second line of the menu:

"**M**" – Station filter is switched on.
"**N**" – NIT is activated.
"**C**" – Network/operator identification CAT is activated.

—> By pressing the **MODE** button, you will be returned to the menu item "Selecting the channel strip" via Ⓑ **without** saving the programmed data (page 23).

—> If necessary set channel strip "**B**".

5.3.1 Operation with a CA module

In order for this function of the CA module to be possible, stations capable of being scrambled (only HDMT 1001 C) or descrambled by the CA module you are using and your smart card must be selected in the "Setting the station filter" – "**PROGRAM**" menu (page 27).
Short-term picture loss may occur when switching between scrambled and unscrambled broadcasts within one service (e.g. scrambled stations and unscrambled regional broadcasters).

—> Cassette HDMT 1001 C:
The "Setting the encoding" – "**CA**" menu is activated.
—> Cassette HDMT 1000 ASI LAN:
The "Setting the PID monitoring" – "**CA**" menu is activated (page 38).

Setting the scrambling

With cassette HDMT 1001 C it is possible to scramble unscrambled channels. You can set whether you want to descramble scrambled channels, or to scramble unscrambled channels.

- Use the **+** / **-** buttons to set "**scramble**" or "**descramble**".

- Press the **MODE** button.

—> In case of setting "**scramble**":
The "Setting the QAM modulaton" – "**QAM**" menu is activated (page 30).
—> In case of setting "**descramble**":
The "Setting the PID monitoring" – "**CA**" menu is activated.

Setting the PID monitoring

The factory default of the PID monitoring is switched on.
If particular PIDs are not decrypted the CI module is reset. Additionally drop-outs may occur if several stations are decrypted. To prevent this the PID monitoring can be switched off.

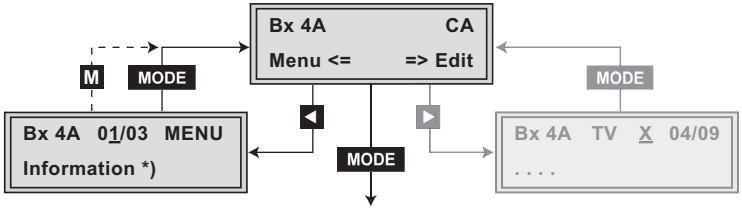
- Use the **+** / **-** buttons to switch "**off**" or "**on**" the PID monitoring.

- Press the **MODE** button.

—> The "Configuring the CA module" – "**CA**" menu is activated.

Configuring the CA module

The menu varies according to which CA module you are using. For this reason, please refer to the operating manual of your particular CA module. The relevant information is shown in the display of the head-end station. This may appear as a fixed display or as scrolling text according to display capabilities.



—> By pressing the **MODE** button you can skip the "Configuring the CA module" – "**CA**" menu and activate the "Setting the QAM modulation" – "**QAM**" menu (page 30).

- Press the **◄** button to activate the menu of the CA module.

—> The display shows e.g.:

Bx 4A 01/03 MENU
Information

Meaning of the indicators:

"**Bx 4A**" – Slot 4, channel strip "**A**"
"**01/03**" – The first of three menu items is activated.
"**MENU**" – The menu of the CA module is activated.

For the explanation of further details please use the operating instructions of the CA module used.

- Use the + / - buttons to activate the menu desired.
- Press the ▶ button to activate the menu.
- Use the + / - buttons to select the function desired.
- To set the CA module use the ◀ / ▶ and + / - buttons.
- All settings are saved by pressing the M button.

—> You will be returned to the "Configuring the CA module" – "**CA**" menu item.

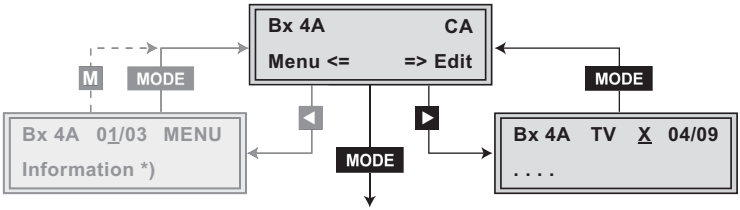
—> By pressing the MODE button you can cancel the settings in the menu of the CA module and are returned to the "Configuring the CA module" – "**CA**" menu.

- Press the ▶ button.

—> The "Setting the station filter" – "**Edit**" menu is activated.

Setting the station filter

In this menu you select the stations wished from the scrambled data stream, which are to be descrambled.



—> The display shows e.g.:

Bx 4A TV X 04/09
. . . .

Meaning of the indicators in the example:

"**Bx 4A**" – Slot 4, channel strip "**A**"
"**TV**" – TV channel type
"**X**" – Descrambling is set for the currently selected station.
"**04/09**" – The 4th of 9 stations read is being displayed.
"**. . . .**" – Station name

Further possible terms displayed:

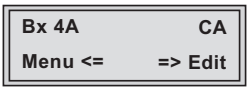
"**RA**" – Radio channel type
"**0**" – The currently selected station remains unchanged.

- Use the ◄/► buttons to call up the stations in sequential order which are to be descrambled, then use + / - to descramble ("**X**") or not to descramble them ("**0**").

Save changes and activate the station filter:

- Press the **MODE** button.

—> The filter is activated. The display shows the "Configuring the CA module" – "**CA**" menu.



- Press the **MODE** button.

—> The "Setting the QAM modulation" – "**QAM**" menu is activated (page 30).

6 Final procedures

After installing the head-end station, upgrading accessories or installing cassettes it is necessary to tighten all cable connections, cable terminals and cover screws in order to maintain compliance with current EMC regulations securely.

- Securely tighten the cable connections using an appropriate open-ended spanner.
- Measure the output levels of the other cassettes and tune them to a uniform output level using the appropriate level controls or software dependent on the head-end station used. Please regard the assembly instructions of the respective head-end station.

—> In order to prevent interference within the head-end station and the cable system, the output levels of the digital cassettes must be set lower by 8 dB compared to analogue cassettes.

- Mount the front cover (see assembly instructions of the head-end station).

7 Channel and frequency tables

Advice for a frequency grid (8 MHz) in the band III

Frequenz Frequency [MHz]	Frequenz Frequency [MHz]	Frequenz Frequency [MHz]	Frequenz Frequency [MHz]	Frequenz Frequency [MHz]
114.00	154.00	194.00	234.00	274.00
122.00	162.00	202.00	242.00	282.00
130.00	170.00	210.00	250.00	290.00
138.00	178.00	218.00	258.00	298.00
146.00	186.00	226.00	266.00	

CCIR – Hyperband (frequency grid 8 MHz)

Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]	Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]	Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]	Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]	Kanal Channel	Kanalmittenfrequenz Channel centre frequency [MHz]
S 21	306.00	S 26	346.00	S 30	378.00	S 34	410.00	S 38	442.00
S 22	314.00	S 27	354.00	S 31	386.00	S 35	418.00	S 39	450.00
S 23	322.00	S 28	362.00	S 32	394.00	S 36	426.00	S 40	458.00
S 24	330.00	S 29	370.00	S 33	402.00	S 37	434.00	S 41	466.00
S 25	338.00								

CCIR – Band IV/V (frequency grid 8 MHz)

C 21	474.00	C 31	554.00	C 41	634.00	C 51	714.00	C 61	794.00
C 22	482.00	C 32	562.00	C 42	642.00	C 52	722.00	C 62	802.00
C 23	490.00	C 33	570.00	C 43	650.00	C 53	730.00	C 63	810.00
C 24	498.00	C 34	578.00	C 44	658.00	C 54	738.00	C 64	818.00
C 25	506.00	C 35	586.00	C 45	666.00	C 55	746.00	C 65	826.00
C 26	514.00	C 36	594.00	C 46	674.00	C 56	754.00	C 66	834.00
C 27	522.00	C 37	602.00	C 47	682.00	C 57	762.00	C 67	842.00
C 28	530.00	C 38	610.00	C 48	690.00	C 58	770.00	C 68	850.00
C 29	538.00	C 39	618.00	C 49	698.00	C 59	778.00	C 69	858.00
C 30	546.00	C 40	626.00	C 50	706.00	C 60	786.00		

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