

Assembly Instructions

English



Grundig SAT Systems

STC 160 Head-End Station Quad FM Modulator

HFM 470



Notes on the Assembly Instructions

As well as this supplementary Assembly Instructions, the Assembly Instructions for the STC 160 apply.



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1 Safety regulations



Please read the safety regulations listed in the assembly instructions for the STC 160 head-end station which pertain to this module.



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

2 General information

2.1 Scope of delivery

- 1 Quad FM Modulator HFM 470
- 1 HF cable with F plugs
- 1 CD (assembly instructions)
- 1 Brief Assembly Instructions

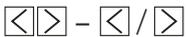
2.2 Meaning of the symbols used



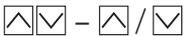
Important note



General note



Optional use of the buttons



Optional use of the buttons



Performing works

2.3 Technical data

The requirements of the following are met:

2006/95/EC, 2004/108/EC

The product fulfils the guidelines and standards for CE labelling.

HF outputs of the modulators A / B / C / D

Frequency range:	87.5 MHz - 108 MHz
Smallest setting raster:	typ. 50 kHz
Smallest neighbouring-channel raster:	typ. 300 kHz
Output impedance:	75 Ω
Output level:	typ. 88 dB μ V

Connections:

HF output:	1 F socket
Connection strip (20-pin):	Supply voltages and control circuits
Audio input:	26-pin pin socket

2.4 Description

The FM modulator module contains four modulators, which convert audio signals into FM broadcast signals in the 87.5 to 108 MHz frequency range fed via the audio interface.

The modulators are labelled (analogue to the channel strips) as “**A**”, “**B**”, “**C**” and “**D**”, and can be individually programmed. Four LEDs indicate if the respective modulator is switched on (LED illuminates) or off.

The audio signals being fed in through the 26-pin socket of the FM modulator module are modulated onto the FM carrier frequencies which have been selected. The output signals are sent through the HF output on the FM modulator module to the output collector. The levels of the output signals are adjustable by software.

When the head-end station is switched on, the two-line LC display shows the “**SETUP**” menu and the software version of the control unit. The head-end station total output level can be adjusted in this menu.

The operating software of the FM modulator module and the head-end station can be updated via the 9-pin D-SUB socket on the head-end station using a PC or notebook and the software “**BE-Flash**”. To operate the FM modulator module the software version of the head-end station must be “**V 7**” or higher.

You can find the current operating software for the FM modulator module and

the head-end station, the software "**BE-Flash**" and the current assembly instructions on the website "www.gss.tv".

The FM modulator module is designed exclusively for use in the STC 160 head-end station.

3 Installation



Caution

- 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 module, switch off the head-end station or unplug the power cable from the mains power socket.



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

3.1 Installing the FM modulator module



- Always position modules which belong together next to each other. The FM modulator module must be installed to the right of the digital module or an add-on module (e.g. HAV 160).
- When installing a module, make sure that it is inserted in a long numbered groove in front of the contact strip on the board at the rear wall of the housing.

The shorter, not numbered grooves without contact strip on the board at the rear wall of the housing are for add-on modules only.

- Open the housing of the head-end station in accordance with the assembly instructions for the STC 160.
- Open the locking device ① in the direction of the arrow (fig. 1).

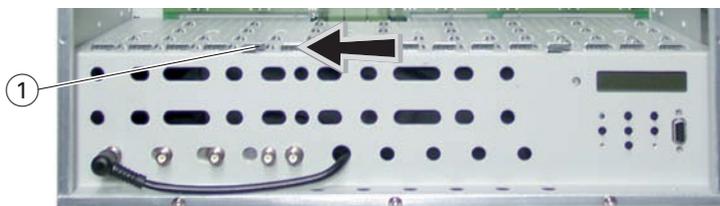


Fig. 1

—> Slots 1 (digital module) and 2 (FM modulator module) are shown in figure 2. The open slot in between (without a contact strip on the board at the rear wall of the housing) is intended for an add-on module (e.g. HAV 160).

- Insert the FM modulator module in grooves (A) and (B) (fig. 2) of an open slot on the right hand side of the associated digital module or an add-on module.
- Gently slide the FM modulator module into the head-end station and ensure that it makes contact with the contact strip on the board at the rear wall of the housing.

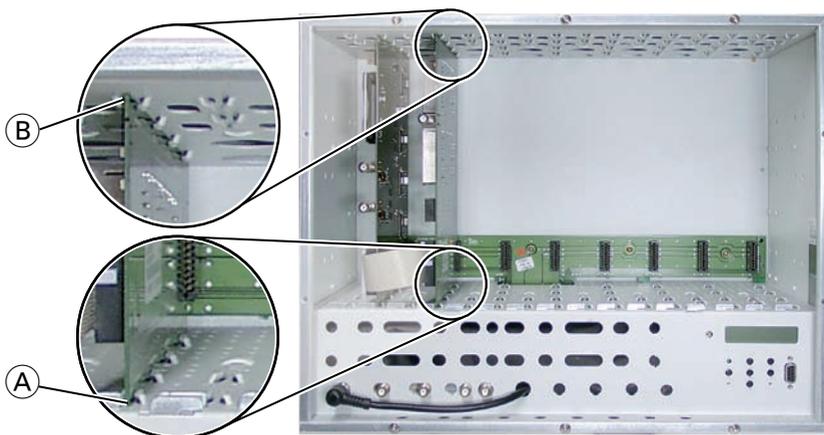


Fig. 2

3.2 Connecting the FM modulator module

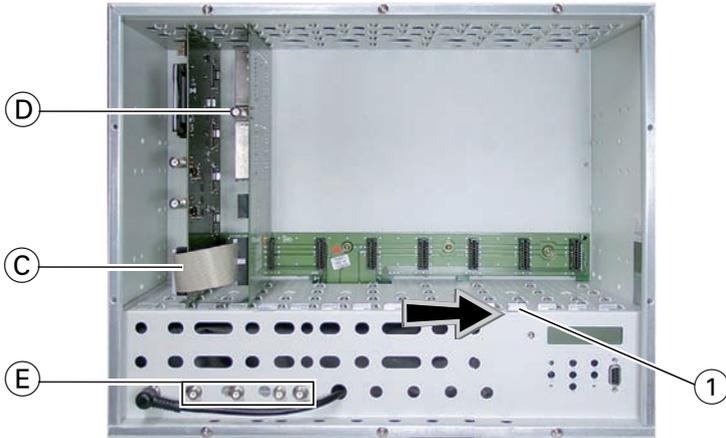


Fig. 3

- Using the connecting cable (C), connect the FM modulator module to the digital module or to an add-on module if applicable.
- After programming, connect the output (D) of the FM modulator module to one of the input sockets (E) of the output collector.
- Close the locking device (1) in the direction of the arrow.

4 The control panel at a glance

4.1 Menu items

Program the module using the buttons on the head-end station control unit. The menus appear on the two-line display of the control unit.

You can use the **M** button to select the following menu items:

- Modulator output frequency, switching the modulator on / off
- RDS name
- Output level
- Storing

4.2 Functions of the control panel buttons

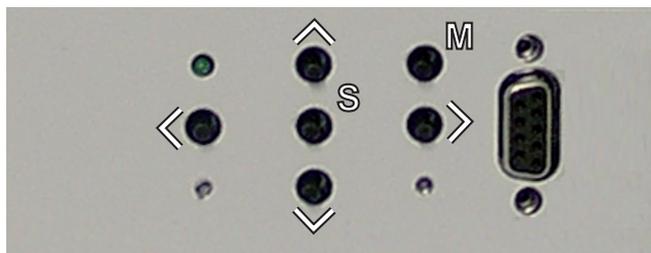


Fig. 4

-   – To move the cursor
-   – To adjust values and functions
-  – To store the programmed data
-  – To switch to the next menu

5 Programming

5.1 Preparation

- Connect the test receiver to the HF output on the FM modulator module.
- Adjust the test receiver to the output frequency of the channel strip to be set.
- Switch on the modulator if necessary. For each modulator, there is a green LED which indicates if the modulator is switched on.

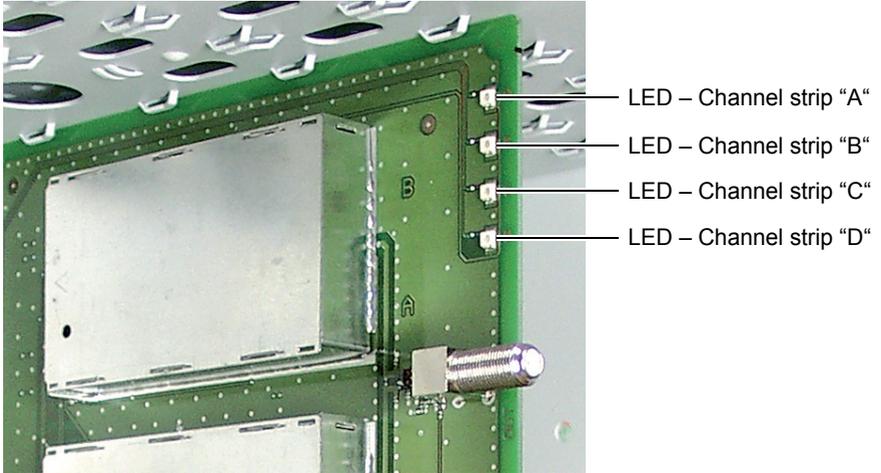
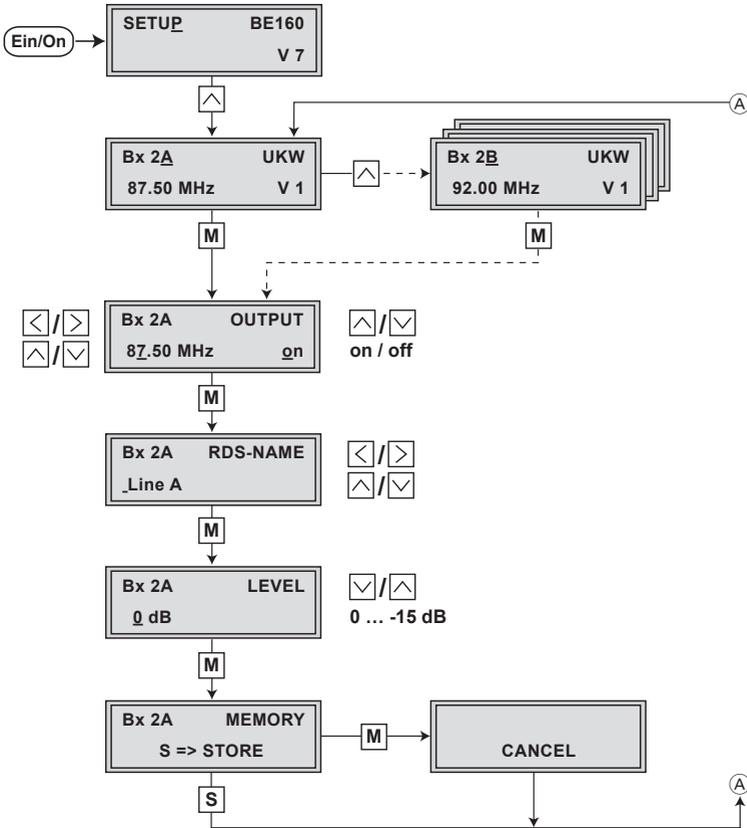


Fig. 5

5.2 Programming procedure

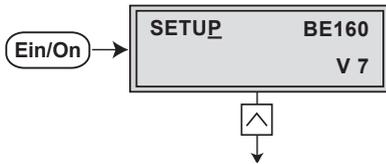
The parameters and functions to be set are underlined>.



5.3 Programming the FM modulator module

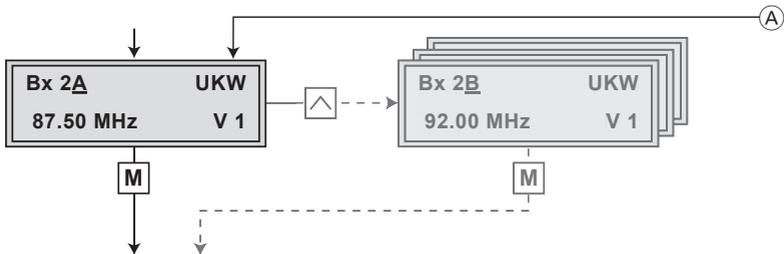
Notes:

- Entries are saved by pressing the **[S]** button.
 - You will be returned to the item **"Selecting the module/channel strip"**.
- The programming process can be cancelled by pressing and holding the **[M]** button.
 - You will be returned to the item **"Selecting the module/channel strip"**.
- Switch on the head-end station.
 - The display shows **"SETUP BE160"** and the software version of the head-end station (e.g. V 7).
 - In the **"SETUP"** menu, the output level of the output collector can be adjusted (see STC 160 assembly instructions).



Selecting the module / channel strip

- Press **[^]**/**[v]** repeatedly if necessary to select the particular module (**Bx ...**) or channel strip **"A"**, **"B"**, **"C"** or **"D"** to be programmed.



- Press the **[M]** button to activate the channel strip.
 - The display shows this menu (for example) **"Bx 2A UKW 87.50 MHz"**:
 - "Bx"** indicates the slot
 - "2"** indicates slot no. 2
 - "A"** indicates channel strip **"A"**
 - "87.50 MHz"** indicates the HF frequency set
 - "V 1"** Software version of the module

→ If the modulator of the channel strip is switched off, "off" is indicated instead of the output frequency.

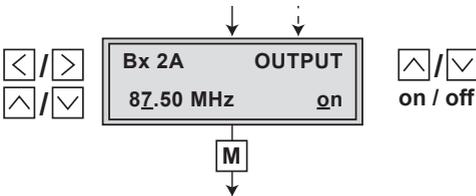
- Press the **M** button.

→ The "Setting the output frequency" – "OUTPUT" menu is activated.

Setting the output frequency

In this menu you set the output frequency of the channel strip. Additionally the modulator can be switched on and off.

If the modulator is switched off at activating the menu, the cursor is positioned below "off". In this case start programming with "Switching on the modulator" setting.



- Using the **◀▶** buttons move the cursor under the digit of the frequency to be set.
- Use the **▲▼** buttons to set the output frequency.



The space between the output frequencies of the channel strips must be 300 kHz minimum.

Example:

- Channel strip "A": $f = 90.50$ MHz
- Channel strip "B": $f = 90.80$ MHz
- Channel strip "C": $f = 91.10$ MHz
- Channel strip "D": $f = 91.40$ MHz

Switching on the modulator

- Using the **▶** button to position the cursor under "on" or "off".
- Use the **▲▼** buttons to switch "on" the modulator (LED illuminates – page 9), or to switch "off" the modulator if necessary (LED is switched off).

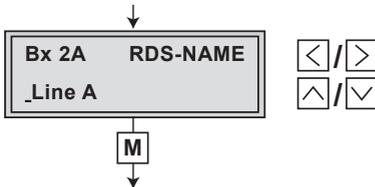
→ By pressing the  button you can return to "Setting the output frequency" menu item.

• Press the  button.

→ The "Setting the RDS name" – "RDS NAME" menu is activated.

Setting the RDS name

In this menu you can refer a RDS name to the generated broadcast channel. Therefore characters are assigned to the   buttons. The length of the name is limited to 9 characters.



• Use the   buttons to move the cursor under the position of the characters to be set.

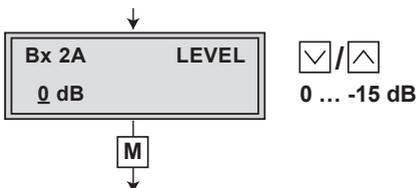
• Use the   buttons to select the characters.

• Press the  button.

→ The "Setting the output level" – "LEVEL" menu is activated.

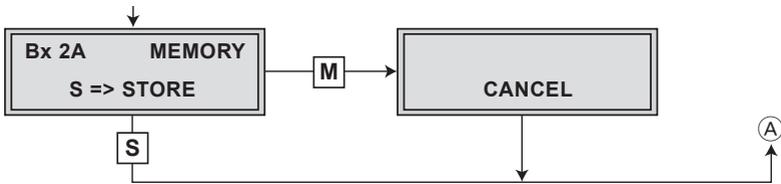
Setting the output level

This menu item is used to set the output levels of the modulators of the module's channel strips to the same values and to level them to the output levels of the modulators of other modules used.



- Use the test receiver to measure the output level of the channel strip and make note of the value.
- When adjusting the other channel strips, compare their values with the value noted for the first channel strip.
- Measure the output levels of the modulators of other modules used and make notes of their values.
- Use the $\square \uparrow \square$ $\square \downarrow \square$ buttons to balance the higher output level of the one channel strip to the lower output levels of the other modulators used ("0 dB" ... "-15 dB").
- Press the $\square M$ button.
 → The "Storing data" – "MEMORY" menu is activated.

Storing data



- All programmed data is saved by pressing the $\square S$ button. You will be returned to the menu item "Selecting the module / channel strip" via \textcircled{A} (page 11).
 → By pressing the $\square M$ button, you will be returned to the menu item "Selecting the module / channel strip" via \textcircled{A} **without** saving the programmed data.
- Select additional channel strips for programming if necessary.

6 Final procedures



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

- Securely tighten the cable connections (F connectors) using an open-ended spanner (spanner gap 11 mm).
- After programming, connect the modulator output (D) to one of the input sockets (E) of the output collector (page 7, fig. 3).
- Test the output level of the output collector according to the STC 160 assembly instructions and set the output level required for the cable system.
- Mount the base plate and the front cover (see STC 160 assembly instructions).

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