Assembly Instructions

GSS
Grundig SAT Systems

STC 160 Head-End Station
Quad modulators

HMS 480
HMM 480 / HMM 480 OIRT
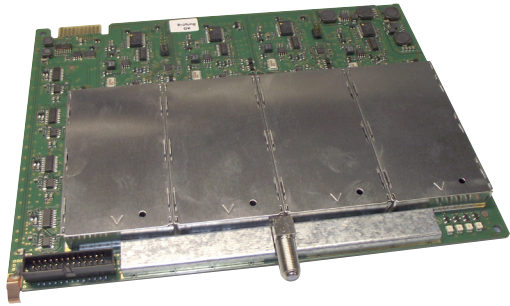
Notes on the Assembly Instructions.
As well as this supplementary Assembly Instructions, the Assembly Instructions for the STC 160 apply.

CE

CONTENTS

1   SAFETY REGULATIONS

⚠ • The standards IEC/EN/DIN EN 50083 resp. IEC/EN/DIN EN 60728 must be observed.
   • Do not perform installation and service work during thunderstorms.
   • 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.
   • Avoid short circuits!
   • Observe the relevant standards, regulations and guidelines on the installation and operation of antenna systems.
   • To ensure electromagnetic compatibility, make sure all connections are tight and the covers are screwed on securely.
   • No liability is accepted for damage caused by faulty connections or inappropriate handling of the device.

⚠ Check the head-end station STC 160 according to the safety instructions listed in their assembly instruction.

Take precautions 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   SCOPE OF DELIVERY

1 HMM 480, HMM 480 OIRT or HMS 480 module
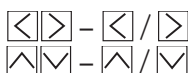1 HF cable with F plugs
1 Brief Assembly Instructions

2.2 MEANING OF THE SYMBOLS USED

⚠ (triangle with !)   Important note

—>   General note

◁▷ – ◁ / ▷
∧∨ – ∧ / ∨   Optional use of the buttons

•   Performing works

2.3 TECHNICAL DATA

The requirements of the following EU directives are met:
2006/95/EC, 2004/108/EC
The product fulfils the guidelines and standards for CE labelling (pages 19…).

Unless otherwise noted all values are specified as "typical".

HF outputs Modulators A / B / C / D:
Channels:
HMM 480 / HMS 480 .... PAL B/G; C 02…C 69, S 03…S 41
HMM 480 OIRT .... PAL D/K; R 01…R 12; s 01…s 38, C 21…C 69

Frequency range:
HMM 480 / HMS 480 .... 48.25 MHz…855.25 MHz
HMM 480 OIRT ....49.75 MHz…855.25 MHz

Output level: .... 85 dBµV
Output impedance: ....75 Ω, nominal

Video:
Signal-to-noise ratio:..55 dB
Frequency response: .... 20 Hz…5 MHz

Audio:
Frequency response: ....40 Hz…15 kHz

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

The modulator modules contain four modulators, which convert existing CVBS and audio signals into CCIR PAL B/G signals in the C 02 … C 69 channel range (HMM 480 / HMS 480) or OIRT PAL-D/K signals in the channel range R 01 … C 69 (HMM 480 OIRT) via the AV 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 and video signals being fed in through the 26-pin socket of the modulator module are modulated onto the carrier frequencies (channels) which have been selected. The HF output signals are sent through the HF output on the modulator module to the output collector. The levels of the HF 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.

If the modulator modules are not detected by the head-end station you can update the head-end station's operating software via the head-end station's 9-pin D-Sub socket, using a PC or notebook and the "**BE-Flash**" software. To operate the digital module the software version of the control unit (head-end station) must be "**V 9**" or higher. You can find the current operating software for the head-end station, the software "**BE-Flash**" and the current assembly instructions on the website "**www.gss.de**".

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

3   INSTALLATION

⚠ – 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 measures to protect against ESD!

• Open the housing of the head-end station in accordance with the assembly instructions for the STC 160.

3.1   INSTALLING THE MODULATOR MODULE

⚠ – Always position modules which belong together next to each other. The modulator module must be installed to the right of the digital module or an add-on module.
– When installing a module, make sure that it is inserted in the long numbered grooves 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.
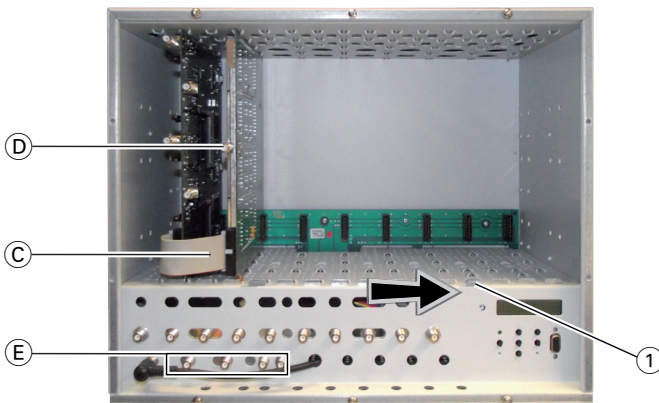• Open the locking device ① in the direction of the arrow.
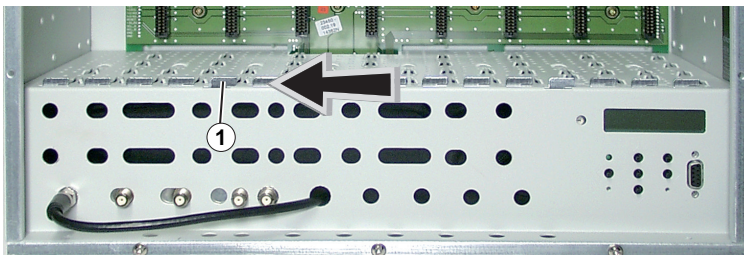
—> Slots 1 (digital module) and 2 (modulator module) are shown in the following figure. The open slot in between (without a contact strip on the board at the rear wall of the housing) is intended for an add-on module.

- Insert the modulator module in grooves (A) and (B) of an open slot on the right hand side of the associated digital module or an add-on module.
- Gently slide the 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.
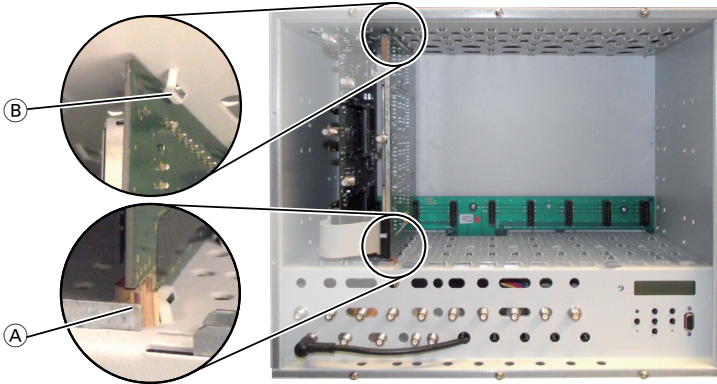
3.2   CONNECTING THE MODULATOR MODULE

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

—> Ensure that the ground spring (A) gets contact to the locking device.
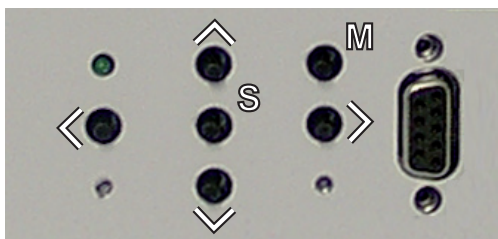
4   THE CONTROL PANEL AT A GLANCE

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 settings
– Modulator output channel
– Output level
– Audio setting
– Storing

4.2   FUNCTIONS OF THE CONTROL PANEL BUTTONS

◁ ▷	To move the cursor
△ ▽	To adjust values and functions
S	To save the programmed data
M	To switch to the next menu

5.1   PREPARATION

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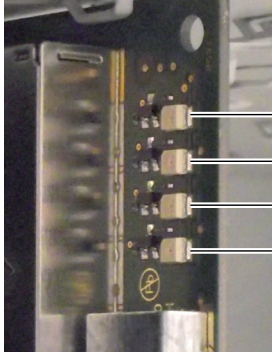- Adjust the test receiver to the output channel of the channel strip to be set.
- Switch on the modulator if necessary. For each modulator, there is a green LED which indicates if the modulator is switched on.

LED – Channel strip "A"

LED – Channel strip "B"

LED – Channel strip "C"

LED – Channel strip "D"

⚠ **To use the HMM 480 OIRT module the head-end station STC 160 must be set to OIRT operation mode.**

Therefore in the setup menu of the control unit
- press the M button twice.

—> The "Setting the Standard" - "**NORM**" menu is activated.

- Switch to standard "PAL DK" using the ∧ button.
- Press the M button.

—> The "Saving Data" - "**MEMORY**" menu is activated.

- Store the setting using the S button.

—> Always all modulator modules are set.
   Mixed operation is not possible!

To operate the HMM 480 OIRTmodule the software version of the control unit (head-end station) must be "V 9" or higher.

5.2 PROGRAMMING PROCEDURE

The parameters and functions to be set are <u>underlined</u>.
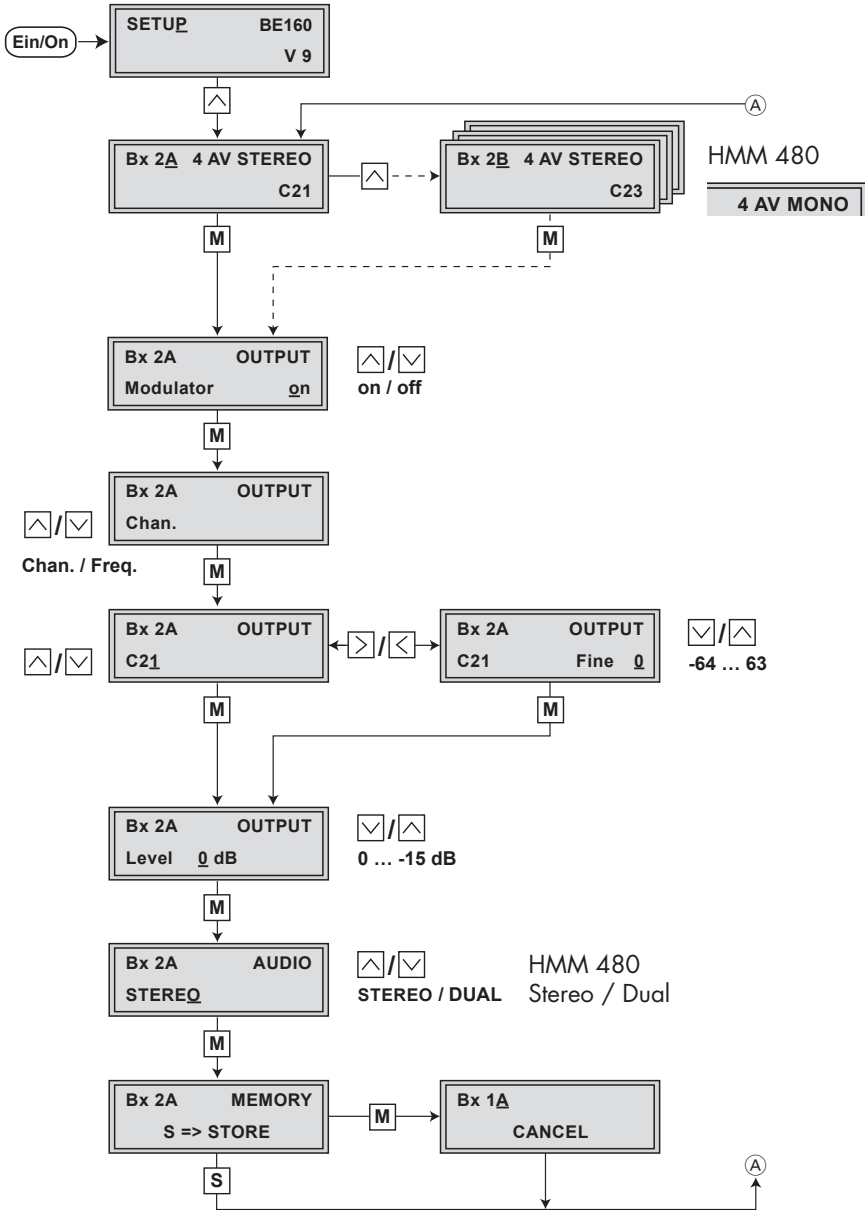
Notes:
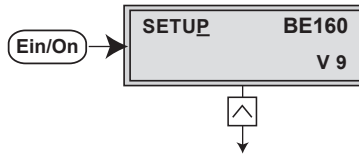– Entries are saved by pressing the $\boxed{\text{S}}$ button.

> —> You will be returned to the item "**Selecting the module/channel strip**".

– The programming process can be cancelled by pressing and holding the $\boxed{\text{M}}$ 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 9).

⚠ **To use ths HMM 480 OIRT module the head-end station STC 160 must be set to OIRT operation mode.**
Therefore in the setup menu of the control unit
• press the $\boxed{\text{M}}$ button twice.

> —> The "Setting the Standard" - "**NORM**" menu is activated.

• Switch to standard "PAL DK" using the $\boxed{\wedge}$ button.
• Press the $\boxed{\text{M}}$ button.

> —> The "Saving Data" - "**MEMORY**" menu is activated.

• Store the setting using the $\boxed{\text{S}}$ button.

> —> Always all modulator modules are set.
> Mixed operation is not possible!

To operate the HMM 480 OIRTmodule the software version of the control unit (head-end station) must be "V 9" or higher.

SELECTING THE MODULE / CHANNEL STRIP

• Press ⋀⋁ repeatedly if necessary to select the particular module (**Bx** …) or channel strip "**A**", "**B**", "**C**" or "**D**" to be programmed.

```
Bx 2A  4 AV STEREO        Bx 2B  4 AV STEREO
                 C21  ⋀            C23
```
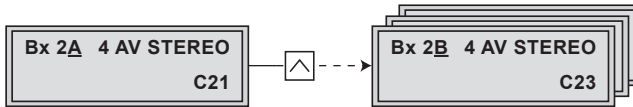
—> " **MONO**" is shown instead of "**STEREO**" using HMM 480.

• Press the **M** button to activate the channel strip.

—> The display for example shows: "**Bx 2A   4 AV STEREO   C21** ":
   "**Bx**"   indicates the slot
   "**2**"   indicates slot no. 2
   "**A**"   indicates channel strip "**A**"
   "**C21**"   indicates the HF channel set

• Press the **M** button:

—> The "Switching on the modulator" – "**OUTPUT – Modulator**" menu is activated.

SWITCHING ON THE MODULATOR

```
Bx 2A          OUTPUT
Modulator         on
```
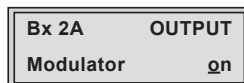
• Use the ⋀⋁ buttons to switch "**on**" the modulator (LED illuminates – page 9), or to switch "**off**" the modulator if necessary (LED is switched off).

• Press the $\boxed{\text{M}}$ button.

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

SELECTING CHANNEL / FREQUENCY SETTING
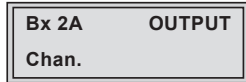
```
Bx 2A        OUTPUT
Chan.
```

• Use the $\boxed{\wedge}\boxed{\vee}$ buttons to select channel setting "**Chan.**" or frequency setting "**Freq.**".

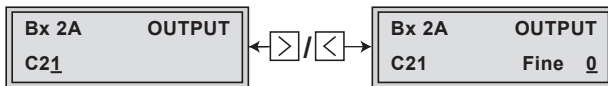—> **For OIRT modules select frequency setting and adjust the output frequency according to the OIRT table on page 18.**

• Press the $\boxed{\text{M}}$ button.

—> Depending on the setting the "Setting the output channel/fine tuning" or the "Setting the output frequency" – "**OUTPUT**" menu is activated.

SETTING THE OUTPUT CHANNEL

SETTING THE FINE TUNING

In this menu you set the output channel of the channel strip. Additionally the output frequency of the output channel can be fine tuned.

```
Bx 2A        OUTPUT          Bx 2A        OUTPUT
C21                          C21            Fine  0
```
$\leftarrow\boxed{>}/\boxed{<}\rightarrow$

Setting the output channel
• Use the $\boxed{\wedge}\boxed{\vee}$ buttons to set the output channel.

Setting the fine tuning

⚠ Only change the fine tuning (frequency offset) in circumstances where it is absolutely necessary to do so. Once you have changed it, all televisions connected to the cable system will need to be calibrated by means of fine tuning to match it.

- Press the $\boxed{>}$ button.

- Use the $\boxed{\wedge}\boxed{\vee}$ buttons to adjust the fine tuning (**Fine**).
- Press the $\boxed{M}$ button.

—> The "Setting the output level" – "**OUTPUT   Level**" menu is activated.

SETTING THE OUTPUT FREQUENCY

In this menu you set the output frequency of the channel strip.

```
Bx 2A          OUTPUT
870.00
```

- Use the $\boxed{<}\boxed{>}$ buttons to select the digit to be set.
- Use the $\boxed{\wedge}\boxed{\vee}$ buttons to set the output frequency (table page 17/18).

- Press the $\boxed{M}$ button.

—> The "Setting the output level" – "**OUTPUT   Level**" menu is activated.

SETTING THE OUTPUT LEVEL

This menu item is used to set the output levels of the modulators of the modul´s channel strips to the same value and to level them to the output levels of the modulators of other modules used.

```
Bx 2A          OUTPUT
Level   0 dB
```

- Use the test receiver to measure the output level of the channel strip and make note of the value.
- When adjusting the other channel strip, compare its value with the value noted for the first channel strip.
- Measure the output levels of the other modulators used and make notes of their values.

- Use the △▽ 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 M button.

—> The "Selecting the audio signal" – "**AUDIO**" menu is activated.

SELECTING THE AUDIO SIGNAL

In this menu, you can select when using
– HMS 480 between the audio settings "**STEREO**" or "**DUAL**" or when using
– HMM 480 / OIRT between mono audio (**Mono L**) and the composite signal of the audio signals (**Mono L + R**).

```
Bx 2A          AUDIO
Stereo
```

- The △▽ buttons are used to select the audio signal (HMS 480 "**STEREO**" or "**DUAL**", HMM 480 / OIRT "**Mono L**" or "**Mono L + R**").

- Press the M button.

—> The "Storing data" – "**MEMORY**" menu is activated.

STORING DATA

```
Bx 2A        MEMORY
    S => STORE
```

- All programmed data is saved by pressing the S button. You will be returned to the menu item "**Selecting the module / channel strip**" (page 12).

—> By pressing the M button, you will be returned to the menu item "**Selecting the module / channel strip**" **without** saving the programmed data.

- Select additional channel strips for programming if necessary.

⚠️ **After installing the** head-end station**, upgrading accessories or installing modules it is necessary to tighten all cable connections, cable 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 ⓓ to one of the input sockets ⓔ of the output collector.
- 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).
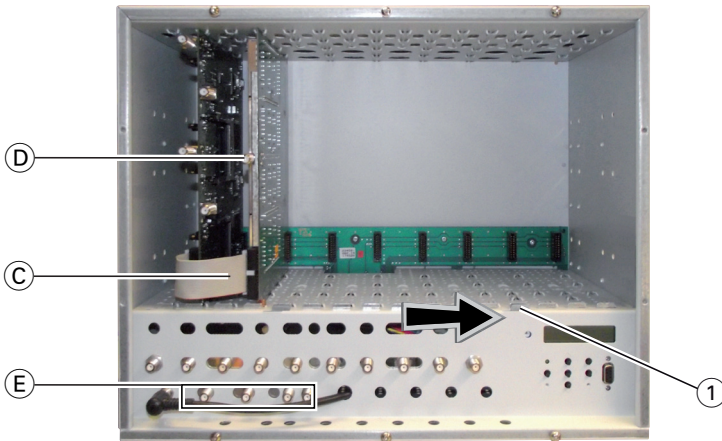
7 CHANNEL AND FREQUENCY TABLES

CCIR – BAND I/III (FREQUENCY GRID 7 MHz)

Channel	Picture carrier frequency [MHz]	Channel	Picture carrier frequency [MHz]	Channel	Picture carrier frequency [MHz]	Channel	Picture carrier frequency [MHz]	Channel	Picture carrier frequency [MHz]
C 2	48.25	S 5	133.25	C 5	175.25	C 11	217.25	S 15	259.25
C 3	55.25	S 6	140.25	C 6	182.25	C 12	224.25	S 16	266.25
C 4	62.25	S 7	147.25	C 7	189.25	S 11	231.25	S 17	273.25
S 2	112.25	S 8	154.25	C 8	196.25	S 12	238.25	S 18	280.25
S 3	119.25	S 9	161.25	C 9	203.25	S 13	245.25	S 19	287.25
S 4	126.25	S 10	168.25	C 10	210.25	S 14	252.25	S 20	294.25

CCIR – HYPERBAND (FREQUENCY GRID 8 MHz)

Channel	Picture carrier frequency [MHz]	Channel	Picture carrier frequency [MHz]	Channel	Picture carrier frequency [MHz]	Channel	Picture carrier frequency [MHz]	Channel	Picture carrier frequency [MHz]
S 21	303.25	S 25	335.25	S 29	367.25	S 33	399.25	S 37	431.25
S 22	311.25	S 26	343.25	S 30	375.25	S 34	407.25	S 38	439.25
S 23	319.25	S 27	351.25	S 31	383.25	S 35	415.25	S 39	447.25
S 24	327.25	S 28	359.25	S 32	391.25	S 36	423.25	S 40	455.25
								S 41	463.25

CCIR – BAND IV/V (FREQUENCY GRID 8 MHz)

Channel	Picture carrier frequency [MHz]	Channel	Picture carrier frequency [MHz]	Channel	Picture carrier frequency [MHz]	Channel	Picture carrier frequency [MHz]	Channel	Picture carrier frequency [MHz]
C 21	471.25	C 31	551.25	C 41	631.25	C 51	711.25	C 61	791.25
C 22	479.25	C 32	559.25	C 42	639.25	C 52	719.25	C 62	799.25
C 23	487.25	C 33	567.25	C 43	647.25	C 53	727.25	C 63	807.25
C 24	495.25	C 34	575.25	C 44	655.25	C 54	735.25	C 64	815.25
C 25	503.25	C 35	583.25	C 45	663.25	C 55	743.25	C 65	823.25
C 26	511.25	C 36	591.25	C 46	671.25	C 56	751.25	C 66	831.25
C 27	519.25	C 37	599.25	C 47	679.25	C 57	759.25	C 67	839.25
C 28	527.25	C 38	607.25	C 48	687.25	C 58	767.25	C 68	847.25
C 29	535.25	C 39	615.25	C 49	695.25	C 59	775.25	C 69	855.25
C 30	543.25	C 40	623.25	C 50	703.25	C 60	783.25		

OIRT – D/K (Frequency grid 8 MHz)

Kanal Channel	Bildträgerfrequenz Picture carrier frequency [MHz]	Kanal Channel	Bildträgerfrequenz Picture carrier frequency [MHz]	Kanal Channel	Bildträgerfrequenz Picture carrier frequency [MHz]	Kanal Channel	Bildträgerfrequenz Picture carrier frequency [MHz]
R 1	49.75	s15	279.25	C23	487.25	C49	695.25
R 2	59.25	s16	287.25	C24	495.25	C50	703.25
R 3	77.25	s17	295.25	C25	503.25	C51	711.25
R 4	85.25	s18	303.25	C26	511.25	C52	719.25
R 5	93.25	s19	311.25	C27	519.25	C53	727.25
s 1	111.25	s20	319.25	C28	527.25	C54	735.25
s 2	119.25	s21	327.25	C29	535.25	C55	743.25
s 3	127.25	s22	335.25	C30	543.25	C56	751.25
s 4	135.25	s23	343.25	C31	551.25	C57	759.25
s 5	143.25	s24	351.25	C32	559.25	C58	767.25
s 6	151.25	s25	359.25	C33	567.25	C59	775.25
s 7	159.25	s26	367.25	C34	575.25	C60	783.25
s 8	167.25	s27	375.25	C35	583.25	C61	791.25
R 6	175.25	s28	383.25	C36	591.25	C62	799.25
R 7	183.25	s29	391.25	C37	599.25	C63	807.25
R 8	191.25	s30	399.25	C38	607.25	C64	815.25
R 9	199.25	s31	407.25	C39	615.25	C65	823.25
R10	207.25	s32	415.25	C40	623.25	C66	831.25
R11	215.25	s33	423.25	C41	631.25	C67	839.25
R12	223.25	s34	431.25	C42	639.25	C68	847.25
s 9	231.25	s35	439.25	C43	647.25	C69	855.25
s10	239.25	s36	447.25	C44	655.25		
s11	247.25	s37	455.25	C45	663.25		
s12	255.25	s38	463.25	C46	671.25		
s13	263.25	C21	471.25	C47	679.25		
s14	271.25	C22	479.25	C48	687.25		

CE - Declaration of Conformity

<table>
<tr>
<td>GSS</td>
<td align="center">**Konformitätserklärung**
Declaration of Conformity / Déclaration de Conformité
019/ 11</td>
<td align="center">C E</td>
</tr>
</table>

Der Hersteller/Importeur The manufacturer/importer Le producteur/importateur	**GSS GRUNDIG SAT-Systems GmbH**
Anschrift / Address / Adresse	**Beuthener Straße 43, D-90471 Nürnberg, Germany**

erklärt hiermit eigenverantwortlich, daß das Produkt:
declare under their sole responsibility that the product: / déclare, que le produit:

Bezeichnung / Name / Description	**Vierfach Modulator**
Type / Model / Type	**GSS HMS 480**
Bestell-Nr. / Order-No. / Nº de réf.	**GAK 9000**

folgenden Normen entspricht:
is in accordance with the following specifications: / correspond aux normes suivantes:

EN 50083-2:	*2006*
EN 60950-1 :	*2001*

Das Produkt erfüllt somit die Forderungen folgender EG-Richtlinien:
Therefore the product fulfils the demands of the following EC-Directives:
Le produit satisfait ainsi aux conditions des directives suivantes de la CE:

2006/95/EG **Richtlinie betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen**
Directive relating to electrical equipment designed for use within certain voltage limits
Directive relatives au matériel électrique destiné à être employé dans certaines limites de tension

2004/108/EG **Richtlinie über die elektromagnetische Verträglichkeit**
Directive relating to electromagnetic compatibility
Directive relatives à la compatibilité électromagnétique

Nürnberg, 15. November 2011

Michael Bierschneider
Leiter Entwicklung
Manager Development / Directeur Dèveloppement

Der Hersteller/Importeur The manufacturer/importer Le producteur/importateur	**GSS GRUNDIG SAT-Systems GmbH**
Anschrift / Address / Adresse	**Beuthener Straße 43, D-90471 Nürnberg, Germany**

erklärt hiermit eigenverantwortlich, daß das Produkt:
declare under their sole responsibility that the product: / déclare, que le produit:

Bezeichnung / Name / Description	**Vierfach Modulator**
Type / Model / Type	**GSS HMM 480**
Bestell-Nr. / Order-No. / Nº de réf.	**GAK 8900**

folgenden Normen entspricht:
is in accordance with the following specifications: / correspond aux normes suivantes:

EN 50083-2:	*2006*
EN 60950-1 :	*2001*

Das Produkt erfüllt somit die Forderungen folgender EG-Richtlinien:
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2006/95/EG	**Richtlinie betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen** **Directive relating to electrical equipment designed for use within certain voltage limits** **Directive relatives au matériel électrique destiné à être employé dans certaines limites de tension**
2004/108/EG	**Richtlinie über die elektromagnetische Verträglichkeit** **Directive relating to electromagnetic compatibility** **Directive relatives à la compatibilité électromagnétique**

Nürnberg, 15. November 2011

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Manager Development / Directeur Dèveloppement

Der Hersteller/Importeur
The manufacturer/importer
Le producteur/importateur

GSS GRUNDIG SAT-Systems GmbH

Anschrift / Address / Adresse   **Beuthener Straße 43, D-90471 Nürnberg, Germany**

erklärt hiermit eigenverantwortlich, daß das Produkt:
declare under their sole responsibility that the product: / déclare, que le produit:

Bezeichnung / Name / Description   **Vierfach Modulator**

Type / Model / Type   **GSS HMM 480 OIRT**

Bestell-Nr. / Order-No. / Nº de réf.   **GAK 9100**

folgenden Normen entspricht:
is in accordance with the following specifications: / correspond aux normes suivantes:

EN 50083-2:	*2006*
EN 60950-1 :	*2001*

Das Produkt erfüllt somit die Forderungen folgender EG-Richtlinien:
Therefore the product fulfils the demands of the following EC-Directives:
Le produit satisfait ainsi aux conditions des directives suivantes de la CE:

2006/95/EG   **Richtlinie betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen**
Directive relating to electrical equipment designed for use within certain voltage limits
Directive relatives au matériel électrique destiné à être employé dans certaines limites de tension

2004/108/EG   **Richtlinie über die elektromagnetische Verträglichkeit**
Directive relating to electromagnetic compatibility
Directive relatives à la compatibilité électromagnétique

Nürnberg, 17. November 2011

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