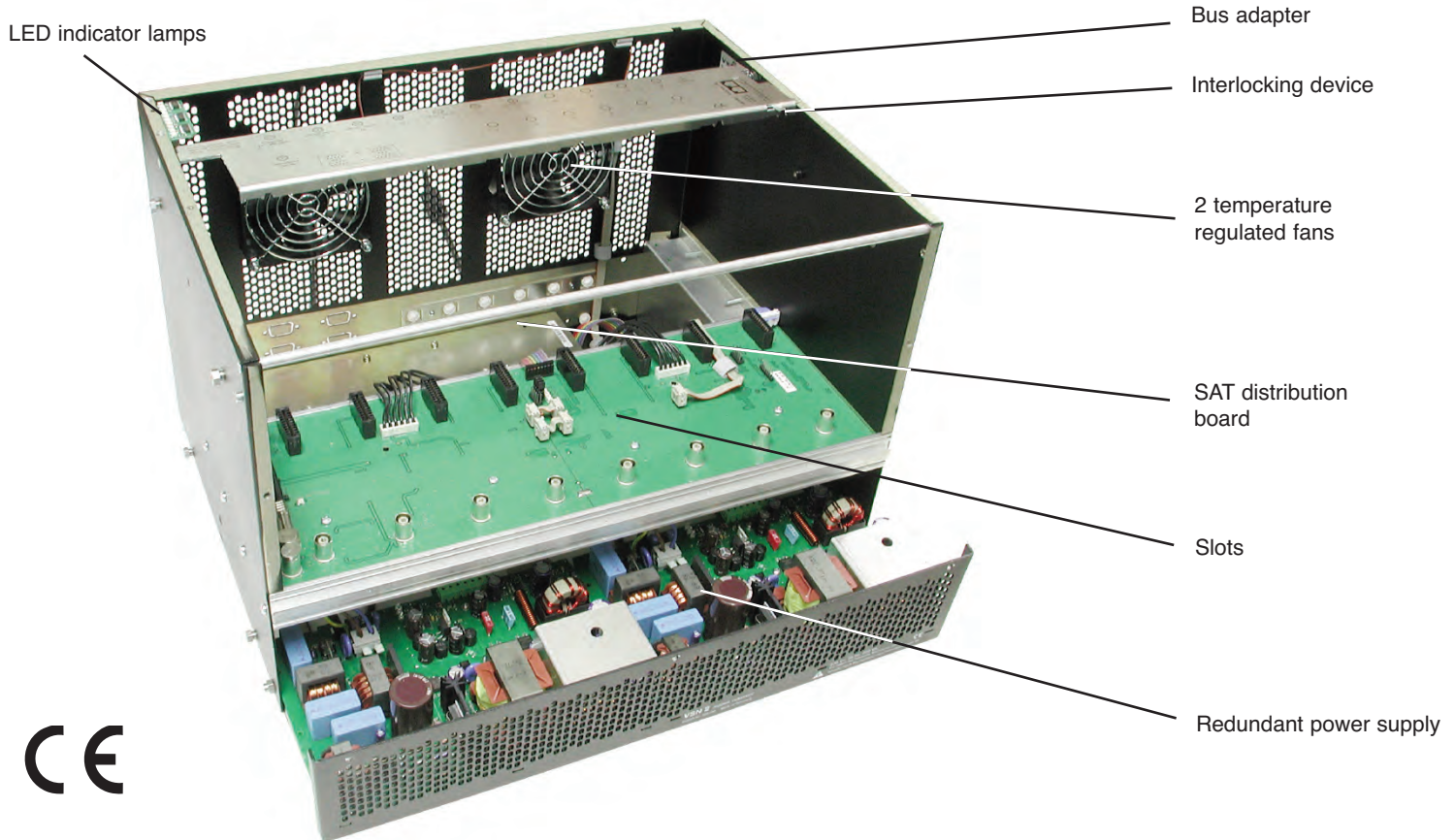- Slot 1
- Slot 2
- Slot 3
- Slot 4
- Slot 5
- Slot 6
- Slot 7
- Slot 8
- Power A
- Power B

ASTRO®

V16

SAT-HEADEND

V16 Base Unit without Cards

LED indicator lamps

Bus adapter

Interlocking device

2 temperature regulated fans

SAT distribution board

Slots

Redundant power supply

C E

The V16 is CE certified and complies with all relevant EN standards.
Changes and printing errors reserved. Version: 02 / 2009.

Contents

1 Safety information

1   Pictographs and safety information

Warns about situations in which there is danger of lethal injury due to hazardous electrical voltage and non-compliance with these instructions.

Warns about various hazards to health, environment and materials.

This is a general information symbol.

Recycling: All of our packaging materials (packaging, identification sheet, plastic foil and bag) are fully recyclable.

Electrical scrap must not be placed in household refuse; it must be disposed of by means of a special waste recycling company. If you have any questions about waste disposal, your local environmental agency would be glad to give you further information about recycling.

2   Hazard and safety information

2.1   Installation instructions

The device may be installed only in dry rooms and on vertical surfaces.

Installation location: indoors

The device can be fastened to the wall using the supplied mounting materials.

The device must not come into contact with splashing or dripping water. Containers with liquid must not be placed on the device.

If there is condensation, wait until the device is completely dry. The device generates heat which must be able to escape. It is therefore important that the vents are never covered. The accumulation of heat negatively influences the service life of the device and is a source of danger.

The specified minimum distances (at least 30 cm above and below) must be strictly observed. This applies above all when several devices are installed one over the other. By means of appropriate measures (e.g. the use of a specially designed air flow unit), the minimum distance between devices can be reduced if required.

The permitted ambient temperature is 0...50°C. Installation in unventilated cabinets or alcoves is not permitted.

Installation is permitted **only** in rooms which maintain the permitted ambient temperature even in changing climatic conditions.

Warning: When the device is installed in places such as storage areas and roof trusses, it must be ensured that the permitted ambient temperature is maintained.

If auxiliary fans are used for convection, it must be ensured that in the event of fan failure the device is disconnected from the power supply by means of appropriated measures in order to prevent damage to the device.

Because of fire hazard due to lightening, it is recommended that all mechanical parts (e.g. V16, equipotential busbars, distributors, etc.) are mounted on non-combustible underlays. Combustible materials include wooden beams, wooden boards, plastics, etc.

2.2   **Opening the housing**

Before opening the housing:

Be careful when doing maintenance work! Disconnect the power plug.

Appliances with operating display:
The operation display merely shows the existence of a DC voltage separated from the power grid, providing the components of the appliance.
If the operation display is not illuminated, this does not necessarily mean that the appliance is not connected to the power grid. The power must be cut before opening the appliance. Even when the power has been cut, the power supply unit of the appliance can be live.

Do not service during thunder storms.

Opening the device must be done only by authorized personnel according to the national regulations, or by sending the device to ASTRO with an exact description of the fault.
Replace the power cables only with an original part power cable.
Replace fuses only with those of the same type, value and melt characteristics.

Important:

DIN VDE 0701 - 0702, servicing; EN 50 083 Part 1, safety requirements

2.3   **Potential equalization and grounding**

The proper **grounding** and installation of the system must comply with **EN 50 083 Part 1**.

The VSN 1 and VSN 2 power supplies may be operated only in devices for which these power supplies have been approved and, due to high discharge current, only in power supply networks with a protected (grounded) circuit system (TN systems in compliance with EN 60950).

Regulations in compliance with EN 50083 Part 1 and national regulations concerning IT/TT power supply networks must be observed.

2.4   Main connection

During operation the V16-type appliance (protection class I) must be connected to a safety socket.
The power plug must be easily operable as the means of cutting power to the appliance, i. e. the socket, must be easily accessible.

3   Preparing the base unit

3.1   Mounting bracket

Fasten the supplied mounting bracket either on the front panel (19" installation, Fig. 1) or rear panel (wall mounting, Fig. 2).

Fig. 1

Fig. 2

To do this, place bracket slots over the fittings on the base unit, push to the stop and fasten securely with the middle screw.

3.2   Installation and deinstallation of SAT VMS 616 distribution board

If a SAT VMS 616 distribution board is to be subsequently installed to a V16 base or an already installed VMS 616 is to be removed, the change must be set in the software of the base device. This can be done either by using the ASTRO HE programming software or the KC 3 manual device. For this, after installing or removing the VMS 616, close the housing, apply mains voltage, and connect the KC 3.

```
ASTRO   V16
Version X.XX
  1= deutsch
   (next◇)
```

The following display appears:

After pressing the "Menu" key the setup display appears.

```
V16   Setup
VMS 616      Yes
Power        A+B
Password     Off
```

Select **line 2** with the ↑ or ↓ arrow key. Use the ← or → arrow key to set VMS 616 installation status.

An incorrect setting of the VMS 616 installation status leads to faulty functions in the choice of band / polarization of the installed plug-in cards!

3.3   Power supply changeover (VSN 1 ◇ VSN 2)

Warning:

Installation work on the power supply unit may be performed only if the power plug(s) is disconnected.

The power supply unit (power supply carrier) is secured with outside screws and screws at two points inside. These have to be loosened for deinstallation.

(Fig. 3 & 4)

When uninstalling, it's best first to remove the plug-in cards at slot 1 and slot 8 using the plug-in card removal tool.

To press out the power supply unit carriers, the plug-in card removal tool is alternately placed on the nuts on the side and pressed. This releases the plug contacts of the power supply carrier from the base.
(see Fig. 5).

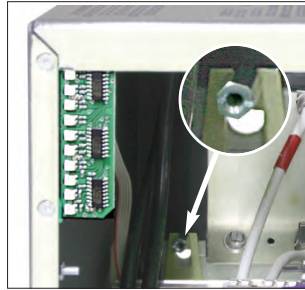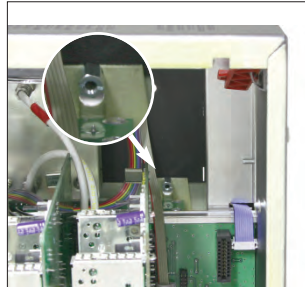(See also Chapter 5.5. Installing plug-in cards.)
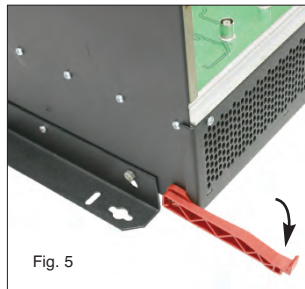

Fig. 3

Fig. 4

Fig. 5

If in a V16 base a single power unit (VSN 1) is to be subsequently exchanged for a redundant one (VSN 2) or vice versa, the change must also be set in the software of the base device. This is done using the KC 3 manual device. After exchanging the power unit, close the housing, apply mains voltage, and connect the KC 3.

The following display appears:

```
ASTRO V16
Version X.XX
1= deutsch
(next◇)
```

After pressing the "Menu" key the setup display appears.

```
V16 Setup
VMS 616      Yes
Power        A+B
Password     Off
```

Select **line 3** with the ↑ or ↓ arrow key.
Use the ← or → arrow key to set the installation status to VSN 1 (Power A) or VSN 2 (Power A+B).

An incorrect setting of the VSN … installation status leads to faulty signaling (front LEDs) and incorrect function displays of the HE programming software.

☞

3.4   **LNB remote supply (for VMS 616)**

When using the internal SAT VMS 616 distributor field, the LNB remote power supply can be switched on for up to four of the six SAT inputs (each max. 250 mA, short-circuit proof). On the mainboard there are four jumpers between card slot four and five with
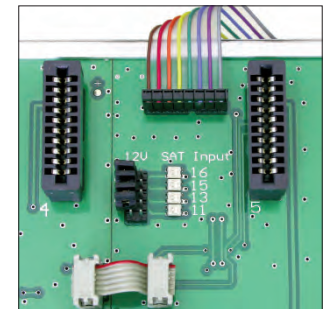

Fig. 6

which the remote power supply can be activated for each of the inputs. Activated remote power supplies are indicated by adjacent LEDs (Fig. 6).

SAT inputs for which LNB remote power supply can be activated: **inputs 11, 13, 15 and 16.**

3.5

3.5 Remote supply voltage on HF output

If an ASTRO network (U901 or VZN9) is employed for the active signal consolidation of multiple V16s, the power supply required for this device can be provided by a V16 base unit. Located on the mainboard at slot one is a jumper with which the remote supply voltage can be activated for the HF output. The activated remote supply voltage is indicated by an adjacent LED (Fig. 7).
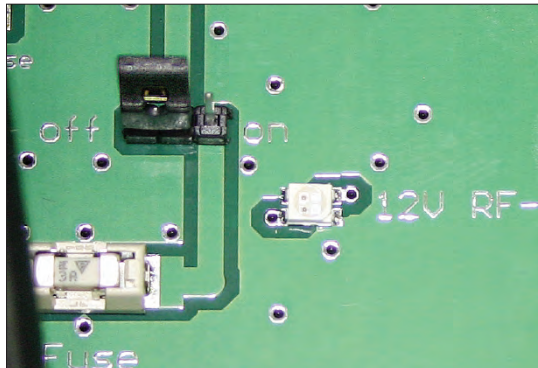

Fig. 7

4

Configuration of V16 and VMS 616

Apply mains voltage and connect KC 3.
The following display appears:

```
ASTRO V16
Version X.XX
1= deutsch
(next<>)
```

Line 2 displays the software status of the mainboard processor. Pressing "1" selects German.

```
V16 Parameter
VMS -Inputs  11-14
Bus adress   XXX
TemperatureXX°C
```

Select the next menu with the   arrow key. The V16 parameters are displayed.

4.1

Setting VMS 616 mode

The internal SAT VMS 616 distribution board has two operating modes:

Standard mode:
Inputs 11-14 can be switched via software to all 16 outputs (card 1 tuner A to card 8 tuner B).

This mode is always recommended if not more than four different polarization levels for all installed conversion cards are required.

Expanded mode:
Inputs 11, 12, 15 and 16 can be switched via software to the first four outputs (card 1 tuner A to card 2 tuner B). Inputs 11-14 can be switched via software to the last 12 outputs (card 3 tuner A to card 8 tuner B). geschaltet werden.

This mode is to be activated if more than four different polarization levels for all installed conversion cards are required.

For this operating mode, of course the plug-in cards have to be positioned in the base device in accordance with the connected satellite polarizations!

Select line 2 with the ↑ or ↓ arrow key. Use the ← or → arrow key to set the standard mode (VMS inputs 11-14) or the expanded mode (VMS inputs 11-16).

This setting can also be made with the ASTRO HE programming software.

4.2   Setting bus address

If several ASTRO base devices (V16, X-8 twin or X5-twin) are to be linked by means of the bus system, all connected devices must be set to different bus addresses.

A bus controller (BC 1 or BC 2) is absolutely necessary in order to use the bus system.

Select **line 3** with the ↑ or ↓ arrow key. Use the ← or → arrow key to set the bus address (1-241).

This setting can also be made with the ASTRO HE programming software. When doing so, it must be ensured that only the base device to be set is connected to the PC directly or via the bus system.

4.3   Temperature

The current temperature (mainboard surface) is displayed in line 4.

5   Installing plug-in cards

Lift out and remove the interlocking device by lightly pressing to the right (Fig. 8).


Fig. 8

(It's a good idea to place the bar on top of the V16 while the card is being installed. The connection labels speed up correctly assigning, for example, the SAT inputs. Further, thanks to the identification of the connected orbit positions and polarizations and the terrestrial antennas, easy maintenance is ensured in the future.)

**5.1   Cards with SAT tuner
(SAT VMS 616 distribution board)**

Twin cards
Ensure that all tuners (A and B) of the plug-in cards to be installed have a separate connection cable (Fig. 9).

Fig. 9

Remove any loop through cables or distributor cables that are present and install the supplied cable. Plug in the card. Connect the tuner A connection cable to the corresponding output of the SAT VMS 616 distributor field (e.g. 1 A). Connect the tuner B connection cable to the corresponding output of the SAT VMS 616 distribution board (e.g. 1 B).
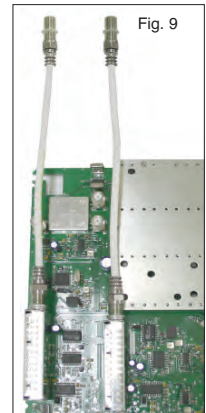
Single cards
Plug in the card. Connect the tuner connection cable to the corresponding **output A** of the SAT VMS 616 distribution board (e.g. 1 A).

5.2 **Cards with SAT tuner (SAT VSF 8 distribution board)**

First, through exact program and output channel planning, determine which satellite signal is required for the pro-

Fig. 10

grams to be implemented and thereby the number of required connections for each satellite and polarization. If necessary, connect VSF 8 by means of a loop through output (Fig. 10).

Ensure that all tuners (A and B) of the plug-in cards to be installed have a separate connection cable (Fig. 11).

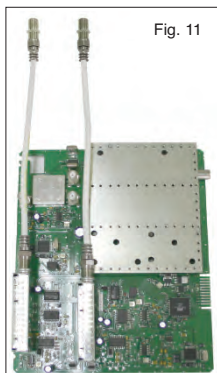Remove any present loop through cables or distributor cables and install the supplied cable.

Fig. 11

Plug in the card. Connect the tuner A connection cable to an available output of the SAT VSF 8 distribution board that carries the required polarization.

Twin cards
Proceed correspondingly with the connection cable from tuner B.

5.3 **Cards for terrestrial conversion**

Because the SAT VMS 616 distribution board is suitable exclusively for SAT intermediate frequencies (950-2150 MHz), the inputs from terrestrial cards (e.g. X-TU 860, X-FM twin, X-FM amplifiers or X-DVB-T/Pal) must be fed in via external inputs.
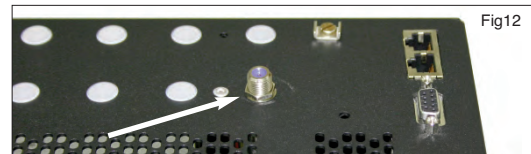
Fig12

Remove the nut screwed onto the connection cable and remove the washer. Plug in the card. Remove the plastic cover of the required external input. Install the F-connector of the connection cable in the required external input hole (Fig. 12)

5.4 **(De-) Modulator cards**

Install the D-sub connectors supplied with the card in the provided feedthroughs (Fig. 13) after previously breaking out the pre-punched metal covers.
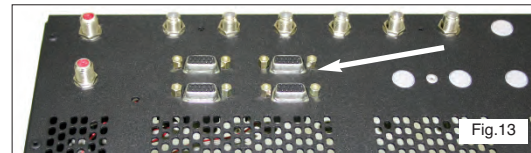

Fig.13

Because the feedthroughs for the D-sub connectors are located on the left side of the V16, (de-) modulator cards (X-twin AV and X-twin demod) should be installed at slot 1 or 2.

Plug in the card. Connect the 6-pin post connector in accordance with the operating instructions of the plug-in card.

5.5   **Uninstalling plug-in cards**

After disconnecting the cable connections, lift out the plug-in cards with the supplied plug-in card removal tool. Place the lever between the card and the aluminum frame and press down. This disconnects the plug contacts of the card from the mainboard (Fig. 14).

Fig. 14
Lever of the card
removal tool in position
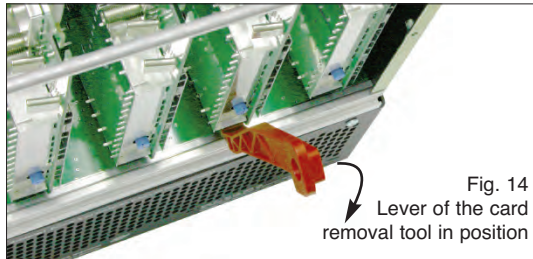
6   **Configuration of all plug-in cards**

Detailed information about setting the individual plug-in cards is available in the supplied operating instructions.

7   **Indicators (front LEDs)**

- Slot 1
- Slot 2
- Slot 3
- Slot 4
- Slot 5
- Slot 6
- Slot 7
- Slot 8
- Power A
- Power B

On the front side of the V16 base device are 10 two-color LEDs that monitor functions.
The topmost 8 LEDs provide information about the installed plug-in cards (top LED, slot 1, far left to eighth LED, slot 8, far right):

LED off: no plug-in card installed

Red LED: plug-in card installed but not functioning correctly (e.g. no SAT signal)

Green LED: plug-in card installed and in operation

- Slot 1
- Slot 2
- Slot 3
- Slot 4
- Slot 5
- Slot 6
- Slot 7
- Slot 8
- Power A
- Power B

The bottom two LEDs indicate the state of the power supply   unit(s):

For an installed VSN 1 (single power supply):
Lowest LED (Power B) always off.

Power A green LED: Power supply in operation
All LEDs off: Power plug not connected or power supply is defective.

- Slot 1
- Slot 2
- Slot 3
- Slot 4
- Slot 5
- Slot 6
- Slot 7
- Slot 8
- Power A
- Power B

For an installed VSN 2 (redundant power supply):
Power A green LED
and
Power B green LED: both power supplies in operation.

Slot 1
Slot 2
Slot 3 Power A green LED
Slot 4 and
Slot 5 Power B red LED: Power supply A in operation
Slot 6   Power plug B not connected
Slot 7   or power supply B defective
Slot 8
● Power A
● Power B

Slot 1 Power A red LED
Slot 2 and
Slot 3 Power B green LED: Power supply B in operation
Slot 4   Power plug A not connected
Slot 5   or power supply A is defective.
Slot 6
Slot 7 All LEDs off: Power plug not connected or
Slot 8   power units defective.
● Power A
● Power B

Note:
If only one power LED is lit with an installed VSN 2
redundant power supply, or if both power LEDs are lit
with an installed VSN 1 single power supply, the device
settings have to be corrected as described under 3.3.

8   Level adjustment

The optimal output level (measured at the output of the
base device) is as follows:
- 100 dBμV for PAL channels
- 90 dBμV for QAM channels
- 96 dBμV for radio (FM) channels

To enable the setting, the level regulators of the indivi-
dual plug-in cards are set accordingly (Fig. 14).
The level adjustment can be done via HE programming
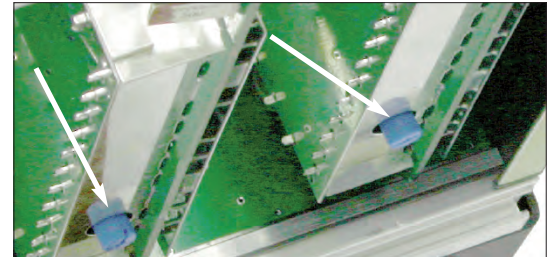software depending on the plugin-card.

Fig.14
Level regulators

Note:
Under no circumstances should a skewed position be
set to compensate outgoing cable attenuation by means
of different level adjustments of the plug-in cards! For
this purpose use output coupling field **U-901** (order no.
380 190) or **VZN 8** (order no. 380 191).

V 16 + VSN

VSN 1
VSN 2

XF-450

KLASSE **A** **CLASS**

V16 technical specifications   SAT processing, base unit without cards

V16 Base unit		
Supply voltage	[V~/Hz]	230 / 50
EMC		EN 50083 Pt 2 / A1 compliant
Permitted ambient temp.	[°C]	0 … +50
Housing (H x W x D) without mounting bracket with front side mounting bracket with rear mounting bracket	[mm]	340 x 426 x 277 (19" / 7 HE Basis) 340 x 491 x 277 340 x 491 x 290 + 3 HE for air flow unit
Weight of V16.1 base unit	[kg]	9,6

**VSN 1 power supply / VSN 2 redundant power supply**   power supply plug-in unit

Type		VSN 1 single power supply	VSN 2 dual power supply
Order no.		350 210	350 220
Rated voltage	[V~]	230 , (+6/-10 %) 50/60 Hz	230 , (+6/-10 %) 50/60 Hz
Power input	[VA/W]	196/190	208/200
Power output		5 V/13,5 A, 12 V/6,5 A, 28 V/200 mA	
Mains Fuse		T 1,25 A "L", IEC60127-2/3	

XF… internal jumper cable

Type		XF-450	XF-700
Order no.		790 450	790 700
Length	[mm]	450	700
Shielding	[dB]	> 90	
Connections	[Ω]	75, F-connector	

Technical enhancements, design modifications, and errors reserved.
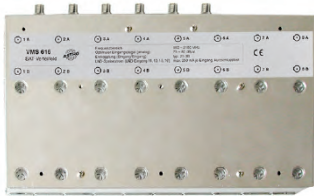
VMS 616 SAT distribution board   SAT distribution board with 6 switchable inputs and 16 outputs

Type		**VMS 616**
Order no.		380 260
Inputs/outputs		6/16
Input freq. range	[MHz]	950 – 2150
Optimum input level	[dBμV]	72 – 78
Transmission loss	[dB]	12
Decoupling input/input	[dB]	25
Remote voltage supply 12 V	[mA]	250 (4 outputs)
Current consumption @ 5V	[mA]	650

VMS 616

VSF 8 SAT distribution board   SAT distribution board with 1 input, 8 outputs and 1 loop through output

Type		**VSF 8**	**VSF 42**
Order no.		380 280	380 281
Input freq. range	[MHz]	950 – 2150	
Optimum input level	[dBμV]	68–74	
Ripple	[dB]	>1	
Skew position	[dB]	2 ±1	
Return loss input/output	[dB]	>10	
Decoupling outputs	[dB]	typ. ≥40	
Transmission loss of loop through outputs 1–8	[dB]	0 ±1 8 ±1	
Inputs/outputs	[Ω]	75, F-connectors	
Current consumption @ 5V	[mA]	80	

VSF 8

VH 5

VAF

VH 5   (order no. 380 250) Adapter panel for accommodating up to five VSF 8 / VSF 42

VAF   (order no. 380 980) Air flow unit for optimizing heat dissipation of the V16 with 19" installation

X-BC … Buscontroller

X- BC 1

X- BC 1

The headend bus controller is for centrally setting all bus-capable headend devices via PC. Maintenance and re-programming of already set up headends can be done via modem.

Operation is only possible with the HE programming software!

- Control of up to 240 bus-capable headend devices
- Can be individually set, from ring tone to call reception (i.e. parallel operation with other terminals is possible)
- 8-digit identification code protects against unauthorized remote access
- Internal monitoring timer protects against excessive telephone charges (automatic hang-up if there is no communication within five minutes)
- Operating software can be updated via serial interface (i.e. software updates without installation work)

X- BC 1 rearpanel

X-BC 2 – additional features

- Remote control via GSM modem
- Error messaging via SMS (alarm messaging to max. 3 phone numbers)
- 4 time partitions can be set (for each time partition 6 switching times can be defined)

Typ		X-BC 1	X-BC 2
Order no.		330401	330400
Supply voltage	[DC]	6 V through plug-in power supply unit (230V~/50Hz)	
Current consumption	[mA]	35	
Permitted ambient temp.	[°C]	-15 … +50	

KC 3 external programming unit   for programming all setting parameters (order no.: 330 650)

KC 3

14

HE programming software

The HE programming software (**order no. 330 630**) facilitates programming X-5/X-8/V16 headend systems with a PC or laptop computer. The user can store all headend parameters in the office prior to commissioning, for example:

● received satellite
● SAT programs
● output channel
● program video and audio parameters on PC or laptop and save to storage media.

The user also has the option of remotely programming and maintaining headend devices via modem. These added features save the network operator service costs, for example when changes occur in transponder assignments. They mean rapid response in the event of processing card failure (replacement signal switching).

The software supports the replacement signal switching. To activate replacement signal switching, the network operator only needs to select the "failed module" and the "replacement module (redundancy)." Manually reconfiguring the operating parameters for the redundancy module is not required. The following processes are performed automatically:

● deactivating (HF) the failed module.
● copying all operating parameters of the failed module to the redundancy module.
● activating (HF) the redundancy module.

With the HE programming software up to twenty X-5/X-8/V16 headend devices can be saved in a configuration file. From the menu item "Display unit" the user has the option of accessing the program parameters of an already existing headend and can then easily edit and modify. Current program satellite assignments are stored in their own "SAT program files." The user can update and change these files when needed. ASTRO offers updating program assignments of the most common satellites via the Internet.
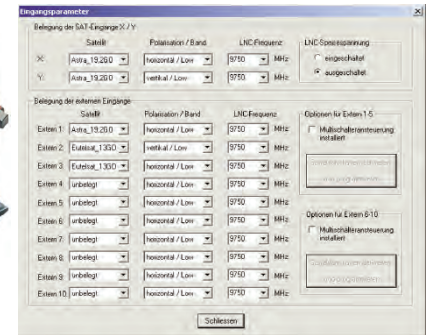
On - site –

during the commissioning –

the configuration data just have to be transferred to the headend-system via delivered zero-modem cable and PC-X-5/10-adapter, or via optional bus-system.

So the configuration of many programs is perfectly possible during several seconds.
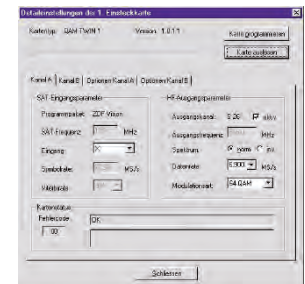
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