BLANKOM®

Professional Headend Solutions

# Device manual


## Audio/ Video Modulator

**A/V → ATV (AM)**

## VMA 191
## Part N°: 9228.8x/ .9x

...Setting Signals

## Contents

# 1. Safety and operating instructions

When assembling, starting-up and adjusting the modules, it is necessary to consider the system specific references in the manual instruction!

The modules may only be installed and started up by authorized technical personnel!

When assembling the modules into the receiving points, the adherence of the EMC regulations is to be secured!

The assembly and wiring have to be done without voltage!

With all work the defaults of the DIN EN 50083 have to be considered! Especially the safety relevant execution of the DIN EN 60728-11 [1] is necessary!

The devices come under protection classification I. It is absolutely necessary, therefore, to insert the mains plug into a socket with protective contact

# 2. Device variants

| | | |
|---|---|---|
| VMA 191 | 9228.82 | A/V → IFI → ATV (AM) Norm B/G |
| VMA 191 | 9228.85 | A/V → IFI → ATV (AM) Norm M |
| VMA 191 | 9228.91 | A/V → IFI → ATV (AM) Norm D/K 1* |
| VMA 191 | 9228.92 | A/V → IFI → ATV (AM) Norm D/K 2* |
| VMA 191 | 9228.94 | A/V → IFI → ATV (AM) Norm D/K 4* |

* D/K 1: standard D/K with sound carrier 6.5 MHz and 6.25 MHz
D/K 2: standard D/K with sound carrier 6.5 MHz and 5.74 MHz
D/K 4: standard D/K with sound carrier 6.5 MHz

# 3. General

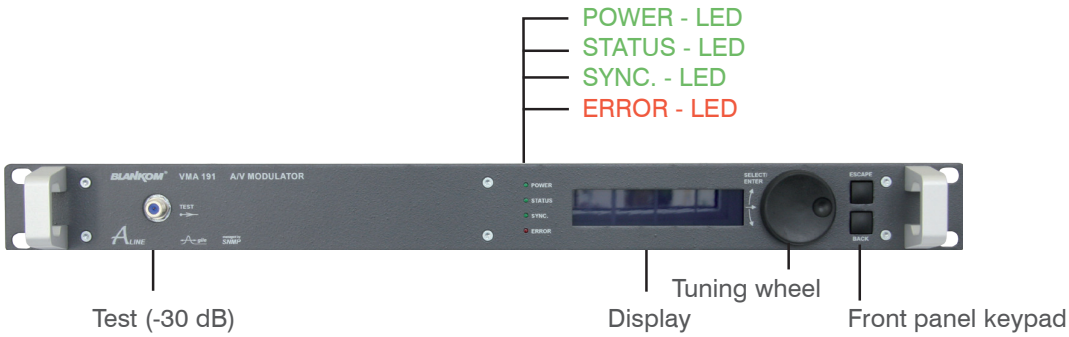
The Audio/ Video Modulator VMA 191 is a module of the head end system A-LINE which is conceived as a complete system for big and middle-sized networks. The VMA 191 generates an analogue TV signal in whole cable frequency range.

# 4. Functional description

The video processing contains a video low pass with a sound trap, a group delay-pre-equalization, clamping circuit and a switchable video AGC. The video AGC function requests one white pulse per field in any line within the source signal (white level adjustment control); alternatively AGC has to be deactivated. The magnitude of the residual carrier is determined by video amplitude of the input signal in this case. The audio processing contains a symmetric input amplifier, an audio low pass, a level setting element and a switchable audio summing unit in the 9228.85 respectively a switchable stereo/ dual tone-coder otherwise. These unit respectivly coder allows remote accesses manually, VPS controlled or via corresponding contacts into the audio socket (see chapter 5.6). There is the possibility to configure an asymmetric audio input. An electronically switch connects pin 4 and 5 inside the device on ground. Analog video and audio signals are fed to separate modulators and summarized at IF mixer. After IF filtering follows the conversion in the wanted output channel by the help of a duplex frequency conversion. The operation of high level mixers and fractional N-PLL's assure a high output performance. The output channel is free adjustable between 45…862 MHz. The modulator is adjacent channel fitted. For level error reporting a reference level is generated internally and is compared with current value permanently. After each programming of the level and/or frequency values an automatic measurement of the reference level takes place. The monitoring of the input signal is done at the output of the VMA 191. If the IF loop is activated the IF input is weighted.
The integrated management unit consists of the data interface for PC/LAN/WAN (IP/ Ethernet interface / RJ 45). The management of the module can be done via PC/Laptop (see programming). The status of the module will displayed with LEDs (see section 5.2 "Meaning of the LED signals"). The IP address of each device can be edited and adjusted to the respective LAN.

# 5. Explanation of the operating elements

## 5.1 Front view



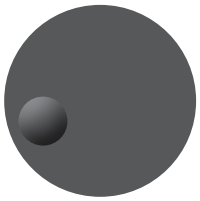

## 5.2 Meaning of the LED Signals

| Designation (Colour) | Status | Meaning of display |
|---|---|---|
| POWER (green) | permanently on | Device is ready for working |
| | off | Device is off, without current supply |
| STATUS (green) | permanently on | Device working properly |
| | off | RF output is deactivated |
| SYNC. (green) | permanently on | Video input is ok |
| | flashing | Video input is not ok (e.g. in case of missing input signal) |
| ERROR (red) | permanently on | Device is in standby |
| | flashing | Device is faulty (hardware error) |

## 5.3 Front panel keypad and tuning wheel

ESCAPE

BACK

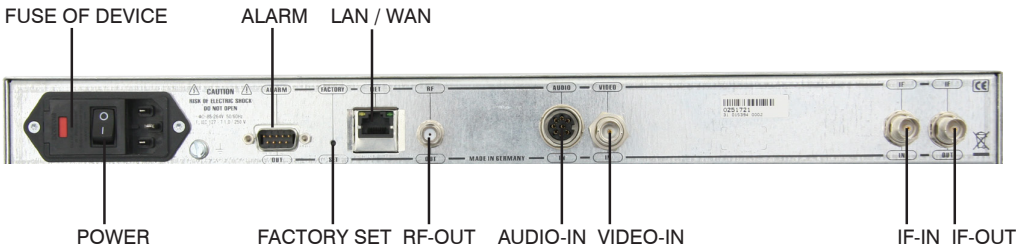


By activating the ESCAPE-Pad you exit the current menu cycle. The input function switches back to the inactive status and jumps to the status information (Start display)

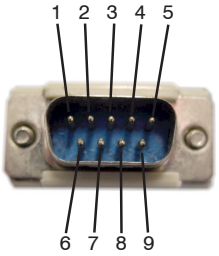
By activating the BACK-Pad you leave the current mode (Menu selection) without any acceptance of settings or adjustments. The cursor jumps one menu level higher.

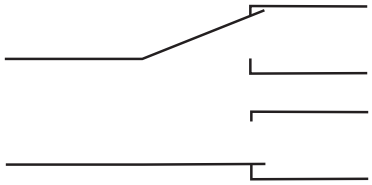
Pressing of the tuning wheel is equivalent to the ENTER-Function.
The cursor switches to the active mode. Tuning the wheel right or left enables to select an menu entry, the menu selection will be confirmed by pressing the wheel.
Each parameter function can be edited by pressing the tuning wheel (ENTER). By tuning the wheel you can position the cursor to the desired selection. By pressing the tuning wheel (ENTER) you switch to the Edit-mode. The text- and/or number positions can be individually selected by tuning the wheel. Pressing the wheel (ENTER) confirms your input and switches back to the selection mode. After a complete and correct adjustment you have to position the cursor right to the symbol ↵ ENTER and confirm it by pressing the tuning wheel. The display switches back to the selection mode of the parameter display!

## 5.4 Rear view




## 5.5 9-pin D-SUB connector configuration (alarm contact)



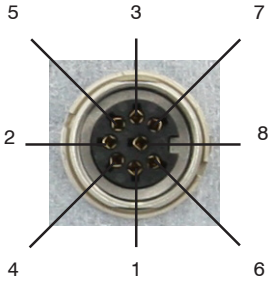



Alarm active:
Pin 8 and Pin 9 are closed
Pin 8 and Pin 7 are open

Normal operation
Pin 8 and Pin 9 are open
Pin 8 and Pin 7 are closed

## 5.6 Audio socket

### Pin assignment




1 stereo left+ / dual A+ / mono+
2 screening / earth
3 stereo right+ / dual B+
4 stereo left- / dual A- / mono-
5 stereo right- / dual B-
6 control line contact 1
7 control line contact 2
8 control line return path (earth)

### External control of the audio mode

9228.82/ .91/ .92:

| | |
|---|---|
| **Mono** | Pins 6/ 8: Connection open<br>Pins 7/ 8: Connection closed |
| **Stereo** | Pins 6/ 8: Connection closed<br>Pins 7/ 8: Connection open |
| **Dual** | Pins 6/ 8: Connection closed<br>Pins 7/ 8: Connection closed<br>or<br>Pins 6/ 8: Connection open<br>Pins 7/ 8: Connection open |

9228.85:

| | |
|---|---|
| **Mono L** | Pins 6/ 8: Connection open<br>Pins 7/ 8: Connection closed<br>or<br>Pins 6/ 8: Connection closed<br>Pins 7/ 8: Connection closed<br>or<br>Pins 6/ 8: Connection open<br>Pins 7/ 8: Connection open |
| **Mono L+R** | Pins 6/ 8: Connection closed<br>Pins 7/ 8: Connection open |

### 5.7 Factory settings

By pressing of the switch “FACTORY SET“ at the rear side of the device all settings stored in the EEPROM will be deleted and replaced by the default settings. The device will go back to these default values. The default settings are listed in chapter 8 (Menu structure of display handling).

## 6. Programming by web server

### 6.1 Network connection to computer


**System requirements:**
- PC/ laptop with 10/100 Mbit Ethernet interface
- Internet browser (e.g. Windows Internet Explorer), which accept JAVA-Script.

**Setup the connection:**
The VMA 191 must be connected to PC Network using an Ethernet cable. The IP address of the VMA 191 control port is 192.168.2.80 on delivery. The address of the network connection at the compter must be adapted to the IP address of the VMA 191 (subnet mask: 255.255.255.0, IP address: 192.168.2.XXX). Don`t be use the same combination lock for XXX like the IP address of the VMA 191. The IP address of the VMA 19x is entered onto the browser interface.
When the link up has been successfully made, the device starts with the device status page.

The language (english/ german) can be selected on the right side of each page. To change the settings of the device at the first user log-in window will be open automatically.

The access to the configuration menu is password protected.
Access data (factory settings):

| Registration details | Valid string |
|---|---|
| User name | user |
| Password | password |

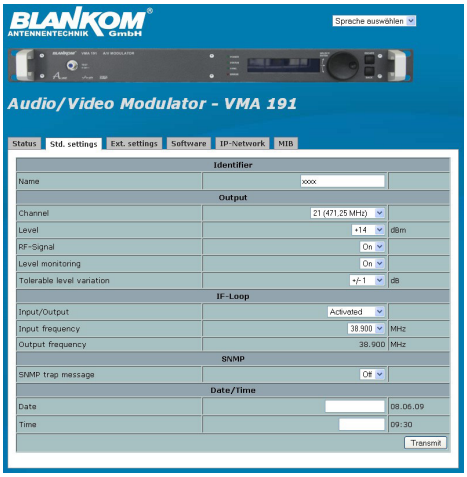
After successful log-in the parameters can be modified.

The user log-in is only temporarily. The connection has to be refreshed after some time.

## 6.2 Device status

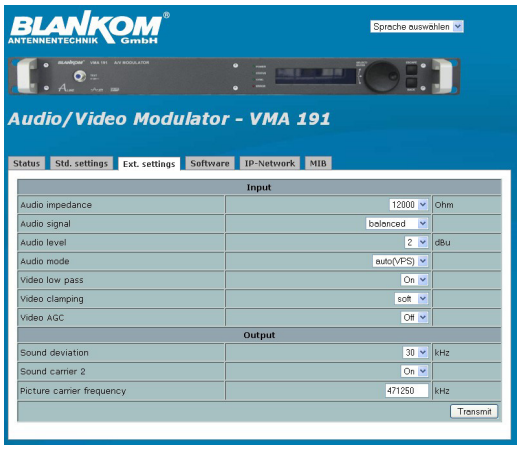

| | |
|---|---|
| Choose language | german, english |
| **Device settings** | |
| Identifier | e.g. programme name acc. adjustments in 6.3 |
| Frequency | acc. adjustments in 6.3 |
| Level | acc. adjustments in 6.3 |
| Level monitoring | acc. adjustments in 6.3 |
| Tolerable level variation | acc. adjustments in 6.3 |
| RF-Signal | on/ off acc. adjustments in 6.3 |
| **Information** | |
| Video input | display **SYNC** pulse or **noSYNC** pulse at the video input |
| Up Converter | status of up converter, not ok → device faulty |
| RF-Amplifier | status of RF-Amplifier, not ok → device faulty |
| VPS Data | display of reading VPS data: date, time, nation code + address range, sound data + special identification |
| Date | acc. adjustments in 6.3 |
| Time | acc. adjustments in 6.3, 12/ 24-h-mode selectable |
| Device number | display of the device number |
| Device index | display of the device index (hardware) |
| Temperature | temperature of device, °C/ °F selectable |

## 6.3 Standard settings




| | |
|---|---|
| Choose language | german, english |
| **Identifier** | |
| Name | independent text field for device identification (max. 30 characters) |
| **Output** | |
| Channel | channel selction (2 ... 69, standard B/G,<br>R1 ... 69, standard D/K,<br>2 ... 134, standard M) |
| Level | adjustment range: -10 ... +14 dBm |
| RF-Signal | selection: on/ off |
| Level monitoring | selection: on/ off |
| Tolerable level variation | selection: ± 1 dB ... ± 5 dB, 0.5 dB steps |
| **IF-Loop** | |
| Input/ Output | selection: Activated/ Deactivated |
| Input frequency | selection: 36.000, 36.125, 36.150, 38.900, 44.000, 45.750 MHz |
| Output frequency | 38.900 MHz |
| **SNMP** | |
| SNMP trap message | on/ off |
| **Date/ Time** | |
| Date | input format: dd.mm.yy |
| Time | input format: hh:mm (AM/ PM)<br>Date/Time input must be set to initialize internal clock (after first start-up of device or reinitializing after a longer shut-down).Additional selection of AM/PM in 12-h-mode. |

## 6.4 Extended settings




| | |
|---|---|
| Choose language | german, english |
| **Input** | |
| Audio impedance | selection: 600/ 12000 Ohm |
| Audio signal | selection: balanced/ unbalanced |
| Audio level | adjustment range: -6 ... 9 dBu |
| Audio mode | selection: auto (VPS), extern, mono, stereo, dual (if sound carrier 2 on) auto (VPS), extern, monoL, monoL+R (if sound carrier 2 off) |
| Video low pass | selection: On/ Off |
| Video clamping | selection: soft/ hard |
| Video AGC | selection: On/ Off |
| **Output** | |
| Sound deviation | selection: 30 kHz (if sound carrier 2 on) 30/ 50 kHz (if sound carrier 2 off) |
| Sound carrier 2 | selection: On/ Off |
| Picture carrier frequency | adjustment range: 45000 ... 862000 kHz |

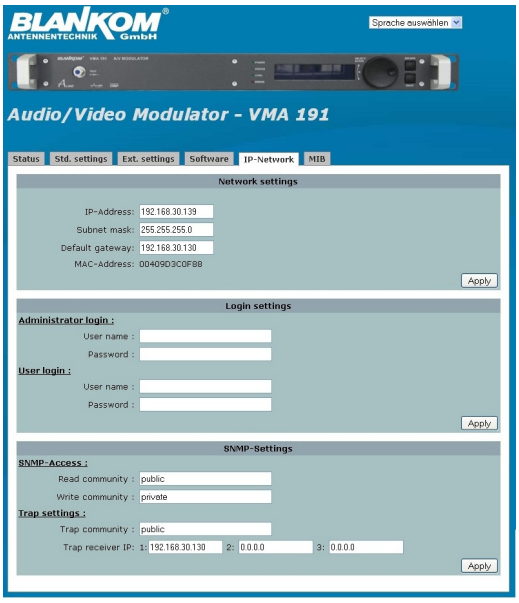
## 6.5 Software overview


| | |
|---|---|
| Choose language | german, english |
| **Software versions:** | |
| **WEB-Frontend** | |
| WEB Server | |
| **System software** | |
| System Controller | |
| Up Converter | |
| RF Amplifier | |
| Display Controller | |

## 6.6 IP network


Selecting this menu at first the administrator log-in window will be open automatically.

Following successful log-in the network and log-in settings can be changed.




| | |
|---|---|
| Choose language | german/english |

Factory settings are:

**Network settings**

| | |
|---|---|
| IP-Address: | 192.168.2.80 |
| Subnet mask: | 255.255.255.0 |
| Default gateway: | 192.168.2.1 |
| MAC-Address: | display of MAC-Address |

**Login settings**

**Administrator login:**

| | |
|---|---|
| User name: | admin |
| Password: | password |

**User login:**

| | |
|---|---|
| User name: | user |
| Password: | password |

**SNMP-Settings**

**SNMP-Access:**

| | |
|---|---|
| Read community: | public |
| Write community: | public |

**Trap settings:**

| | | |
|---|---|---|
| Trap community: | | public |
| Trap receiver IP | 1 | 0.0.0.0 |
| | 2 | 0.0.0.0 |
| | 3 | 0.0.0.0 |

- Administrator- and/or user-login can be deactivated by clearing of user name and password.
- The addresses must be matched to the respective network.

# 7. SNMP management

## 7.1 Download MIB


Choose language german/english

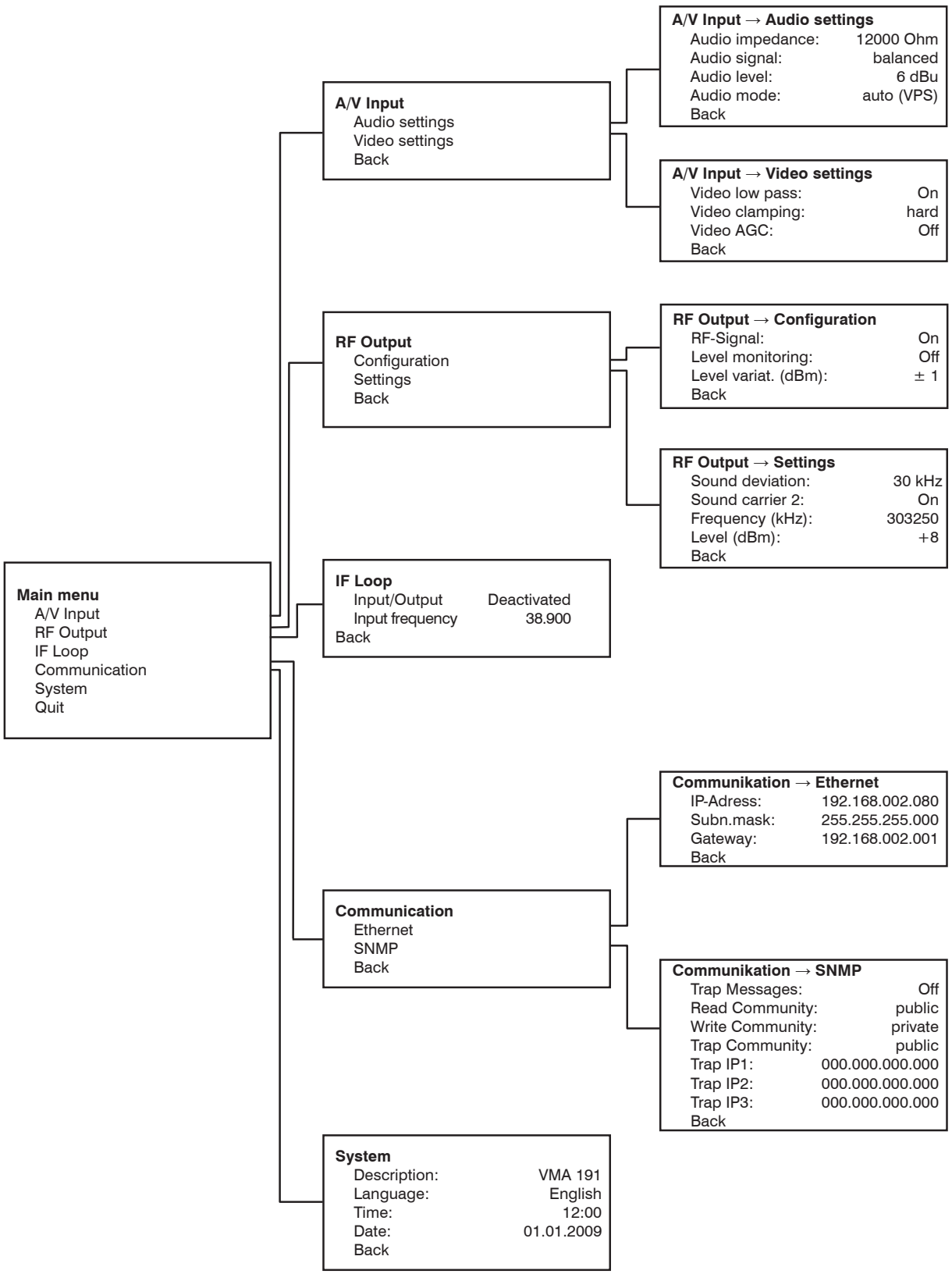
The complete MIB for an VMA 191 can be downloaded like descriped under “Instructions“ on this web-site and clicking the “MIB Download”-link. With the aid of an MIB browser, the relevant MIB can be decided upon and taken over to control the device via a SNMP manager and/or an network manager capable of SNMPv2c.

## 7.2 Trap messages

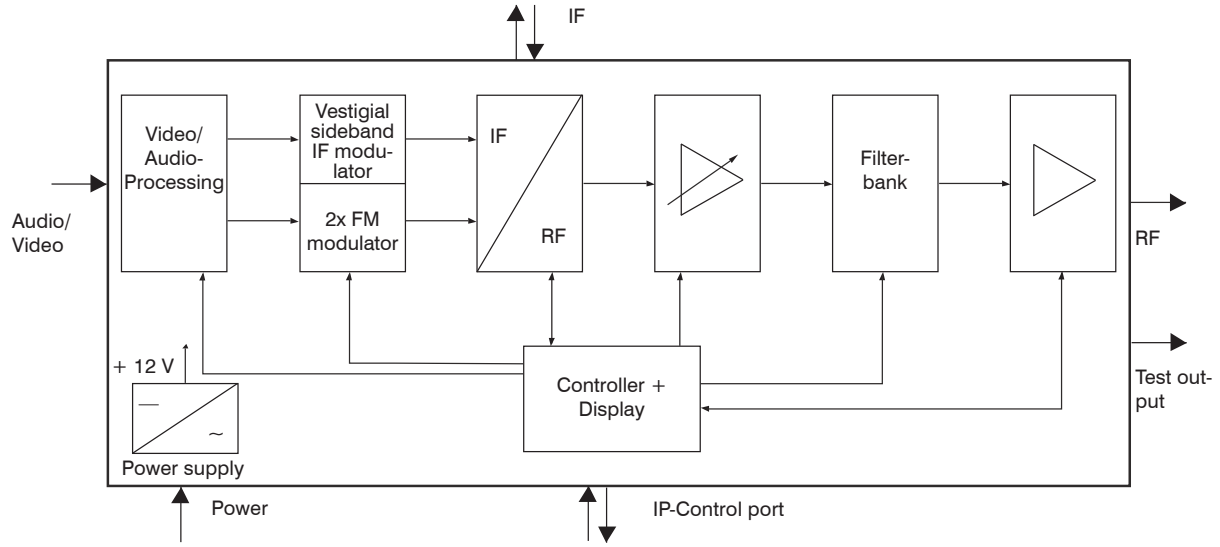
| Item | Message | Message Type | Explanation |
|---|---|---|---|
| 01 | System Reset | WARNING | reset by internal error |
| 02 | Signal ok | INFORMATION | module works correctly |
| 03 | Input not sync | WARNING | no signal at the video or IF input |
| 04 | IIC error | CRITICAL | IIC bus error |
| 05 | Internal controller reset | WARNING | error when accessing internal controller |
| 06 | No response to OPEN command | CRITICAL | error of an internal port |
| 07 | Up Converter: PLL1 not locked | CRITICAL | no funktion at the PLL 1 converter |
| 08 | Up Converter: PLL2 not locked | CRITICAL | no funktion at the PLL 2 converter |
| 09 | Up Converter: IF input too small | WARNING | IF level at Up converter input too small |
| 10 | Up Converter: IF input too large | WARNING | IF level at Up converter input too large |
| 11 | UP Converter: IF input ok | INFORMATION | IF level at Up converter input ok |
| 12 | Amplifier: RF Level too large | WARNING | RF level at amplifier too large |
| 13 | Amplifier: RF Level too small | WARNING | RF level at amplifier too small |
| 14 | Amplifier: RF Level ok | INFORMATION | RF level at amplifier ok |
| 15 | Input sync | INFORMATION | signal at video input ok |

## 8. Menu structure of display handling

The following settings are the default settings. After a reset by pressig of „FACTORY SET“ on the rear side of the device all settings stored in the EEPROM will be deleted and replaced by these defaults and the device will go back to these settings (see chapter 5.7).



## 9. Block diagram




## 10. Technical data

**Video input**

| | |
|---|---|
| Input voltage with AGC | 0,8 … 1,3 $V_{pp}$ |
| without AGC | 1 $V_{pp}$ |
| Impedance | 75 Ω |
| Connector | BNC socket |
| Input filter (disconnectable) | 5 MHz low pass |
| Clamping (switchable) | soft/ hard |
| AGC | disconnectable |

**Audio input**

| | |
|---|---|
| Input level | -6 ... +9 dBu |
| Input resistance (switchable) | 0.6/ 12 kΩ |
| Connector | 8-poles according to DIN 45326 (IEC 130-9-20) |
| Configuration (switchable) | balanced/ unbalanced |

**IF loop**

| | |
|---|---|
| Output/ input | internal jumpered or external available (switchable) |
| Output frequency | 38.900 MHz |
| Input frequency | 36.000, 36.125, 36.150, 38.900, 44.000, 45.750 MHz |
| Output/ input level | - 14 dBm (95 dBµV) |
| Connector | 2 x BNC socket, 75 Ω |
| IF decoupling | ≥ 80 dB |

**RF output**

| | |
|---|---|
| 9228.82 | |
| TV standard | B/G |
| Sound carrier frequencies | 5.5/ 5.742 MHz above pic. carrier |
| 9228.91: | |
| TV standard | D/K |
| Sound carrier frequencies | 6.5/ 6.25 MHz above pic. carrier |
| 9228.92: | |
| TV standard | D/K |
| Sound carrier frequencies | 6.5/ 5.742 MHz above pic. carrier |
| 9228.85: | |
| TV standard | M |
| Sound carrier frequencies | 4.5 MHz |
| 9228.82/ .91/.92: | |
| Sound procedure | FM dual carrier processing |
| Sound operation modes | mono/ stereo/ dual/ auto (VPS controlled)/ external |
| Sound dev. 1 mono carrier | 30/ 50 kHz |
| Sound dev. 2 mono carrier | 30 kHz |
| Sound dev. dual tone | 30 kHz |
| 9228.85: | |
| Sound procedure | FM one carrier processing |
| Sound operation modes | mono/ summing left-right/ auto (VPS controlled)/ external |
| Frequency deviation | ± 25 kHz |
| Output frequency range | 45 ... 862 MHz |
| Tuning step | 10 kHz/ 25 kHz* |
| Max. output level | 14 dBm (123 dBµV) |
| Level adjustment range | -10 ... +14 dBm |
| Channel allocation | adjacent channel ability |
| Connector | F socket, 75 Ω |
| Return loss | ≥ 18 dB 45 MHz |
| | - 1.5 dB/ Octave |
| Test output | - 30 dB (± 1 dB) |

**Signal quality**

| | |
|---|---|
| Single channel intermodul. | ≥ 66 dB |
| Noise level 3rd order | ≥ 60 dB |
| Spurious 45 ... 862 MHz | ≥ 60 dB |
| C/N within cannel (BW = 4,8 or 4,2 MHz in 9228.85) | typ. 69 dB |
| C/N (> 25 MHz space from channel center; BW = 4,8 or 4,2 MHz in 9228.85) | typ. 80 dB |
| Parallel sound noise ratio unweighted/ weighted | typ. 68/ 59 dB |
| Max. frequency stability | ± 30 kHz |
| Output level stability | ± 0.5 dB (5 .. 45 °C) |
| Output level accuracy | ± 1.5 dB |
| Amplitude frequency response channel (8 MHz) | max. 1 $dB_{pp}$ |

**Operation parameters**

| | |
|---|---|
| Voltage / current | 100 ... 240 V ~ 50/60Hz |
| | 100 ... 353 V = |
| Power consumption | 18 W |

**Environmental conditions**

| | |
|---|---|
| Temperature range | -10 ... +55 °C |
| Temperature range (for data keeping) | 5 ... 45 °C |
| Relative humidity | ≤ 80 % (non condensing) |
| Mounting location | splash-proof and drip-proof |

**Delivery content**

| | |
|---|---|
| Dimensions (w x h x d) | 448 x 44 x 350 mm |
| Weight | 4,200 g |

* 25-kHz-step only with active IF loop and 36.125 MHz input frequency

## 11. Glossary

| | |
|---|---|
| AGC | **A**utomatic **G**ain **C**ontrol |
| AM | **A**mplitude **m**odulation |
| ATV | **A**nalogue **Tele**v**i**sion |
| AV | **A**udio/**V**ideo |
| BW | **B**and**w**idth |
| C/N | **C**arrier to **N**oise ratio |
| EMC | **E**lectro**m**agnetic **C**ompatibility |
| FM | **F**requency **m**odulation |
| HTML | **H**yper**t**ext **M**arkup **L**anguage |
| HTTP | **H**yper**t**ext **T**ransfer **P**rotocol |
| IF | **I**ntermediate **F**requency |
| IFI | **I**ntermediate **F**requency **I**nterface |
| IIC | **I**nter-**I**ntegrated **C**ircuit ($I^2C$ bus, device internal data bus) |
| IP | **I**nternet **P**rotocol |
| LAN | **L**ocal **A**rea **N**etwork |
| LED | **L**ight **E**mitting **D**iode |
| MAC | **M**edia **A**ccess **C**ontrol |
| MIB | **M**anagement **I**nformation **B**ase |
| RF | **R**adio **F**requency |
| SNMP | **S**imple **N**etwork **M**anagement **P**rotocol |
| TV | **Tele**v**i**sion |
| VPS | **V**ideo **P**rogramming **S**ystem |
| WAN | **W**ide **A**rea **N**etwork |

## 12. Bibliography

[1] EN 60728-11: Cable networks for television signals, sound signals and interactive services Part 11: Safety (IEC 60728-11:2005); German version EN 60728-11:2005

[2] RFC 1157 Request for Comments (RFC): RFC Database URL: Http://www.rfc-editor.org/rfc.html

[3] EN 50083-2 : Cabled distribution systems for television and sound signals. Electromagnetic compatibility for equip ment; EN 50083-2:2001

## 13. Document history

| Version | Date | Modification | Author |
|---|---|---|---|
| 1.00 | 13.08.2009 | basic document | Häußer |

Options and other TV standards available upon request! Subjects to changes due to technical progress.

# CE Declaration of Conformity

**The Manufacturer**

BLANKOM Antennentechnik GmbH · Hermann-Petersilge-Str. 1 · 07422 Bad Blankenburg · Germany

**herewith declares the conformity of the product group**

| | |
|---|---|
| **Product name:** | Audio/ Video Modulator |
| **Type:** | VMA 191 |
| **Product number:** | 9228.8x, 9228.9x |

**according to the following regulations**

EN 50083-2
EN 60728-11 (as far as relevant)

**and additional device-specific regulations, enclosed above, which these products are subjected to.**

**Date:** 13.08.2009

**Signature:**

Piero Kirchner
(Managing Director)