

Operating instructions

Audio/ Video-Modulator

A/V → ATV (AM)



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VMB 199
Part N°: 9229.01

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 head end, the adherence of the EMC regulations is to be secured.



The assembly and wiring have to be done without voltage.



All active modules may only be operated with the Headend Controller HCB x00 or Bus Extender BEB x00.



The mains voltage and the operating voltage of the modules working by DC have to be in compliance to the operating parameters described in the technical data.



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



WEEE-Reg.-Nr. DE 50389067

2. Device variants

VMB 199 9229.01 A/V → ATV (AM)

Minimum software requirements for Headend Controller HCB x00:

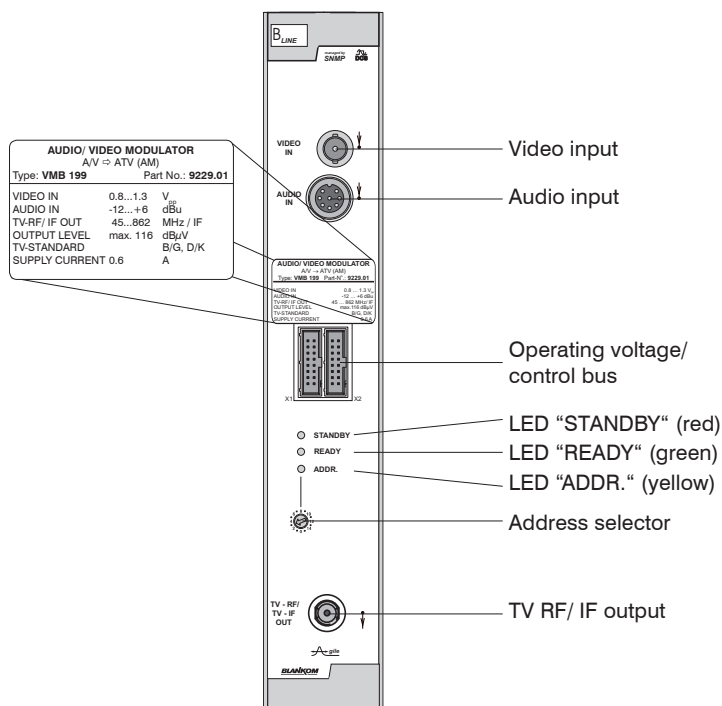
9650.03: version 2.34*
9650.04/.05: version 3.18*
9652.01: version 3.23*
9653.01: version 3.27*
9653.02: version 3.28*

*) Updates: www.blankom.de

3. General

The Audio/Video Modulator VMB 199 is a module of the B-LINE head end system which is conceived as a complete system for middle sized distribution networks. The module generates an analog cable-TV signal (45...862 MHz) in selected standards (multi standard functionality) at the output. The module is programmed at the central control unit and is working independently afterwards. The status of the module is displayed via LEDs (see chapter 7 "Meaning of the Status LED's").

4. Front view



managed by
SNMP

5. 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 the sync pulse and the black level of the video signal in accordance with the standard; otherwise 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 stereo/ dual tone-coder. These coder allows remote accesses via corresponding contacts into the audio socket (see 8.2). There is the possibility to configure an asymmetric audio input. An electronically switch connects pin 4 and 5 inside the device on ground (see 8.1). The digital signal processing from audio- /video-input to the RF output assure a high transmission quality. The output channel is free adjustable between 45...862 MHz. A mode as IF modulator is also possible. The modulator is adjacent channel fitted at the output. The device is equipped with a monitoring circuit for the incoming video signal and the RF output signal. The green LED is flashing in case of video input signal loss. If the output level is failing the red LED will be flashing. The automatically reference level adjustment of the output signal follows after programming (level, frequency), after restart, earliest after 100 sec. The same error messages can be displayed in case of mismatch or interrupted output cable. A trap message is triggered after recognition of a failure. This option is adjustable. SNMP trap message: level error, video signal error

6. Adjustments

6.1 Adjustment with the Headend Controller

- Adjustment of the addresses at the Bus Extender BEB x00 and at the modules.
- Activation of the programming mode on each module by selecting the line (BEB x00) and the module position (01... 15) at the Headend Controller (HCB x00).
 - yellow LED illuminates until the beginning of the parameter adjustment.
- Adjustment of the VMB 199 parameters (see chapter 10) → green LED is switched on.
- After the programming the VMB 199 will be automatically switched into the operating mode.
 - yellow LED flashes shortly/ green LED is switched on.

6.2 Adjustment with the PC/ laptop

- Prerequisite for the remote programming is an “online-connection” according the IP standard and an ethernet connection at the PC/ laptop.
- Adjustment of the line/ position addresses at the Bus Extender BEB x00 as well as at the modules.
- At the Headend Controller HCB x00 input provided IP address (default: 192.168.2.80).
- For “direct connection” between a PC and HCB x00 use crossover cable (RJ 45).
- For connection over a hub use a normal straight through patch cable.
- Start-up HTML browser and enter provided IP address as target address.
- If connected correctly the web interface will be opened on the pc and a blue LED (LINK) at the HCB x00 will be lit up.
- All adjustments of the modules are specified on the web interface.

6.3 Adjustment with SNMP

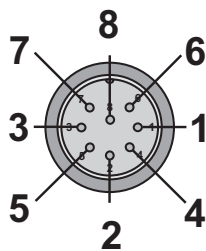
- Prerequisite for the SNMP functionality is the use of HCB x00 with enabled SNMP software option CKB 100.
- Supported is SNMP version 1.0 [2].
- Automatic creation of the MIB based on the current head end configuration by the HCB x00.
- For setting and reading out the parameters and is to receive traps from an SNMP management software required.
- Further notes on the SNMP functionality of BLANKOM modules are listed in the SNMP manual (download: www.blankom.de).

7. Meaning of the Status LED's

Designation (colour)	Status	Meaning of display
STANDBY (red)	permanently on	Module is in standby
	flashing	Module faulty (hardware error) or level error
READY (green)	permanently on	Module working properly
	flashing	Error warnings, depending on signal: - no input signal
ADDR. (yellow)	illuminated/ flashing	remote control connection/ data being exchanged

8. Audio socket

8.1 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)

8.2 External control of the audio mode

- Mono** Pins 6/ 8: Connection open
Pins 7/ 8: Connection closed
- Stereo** Pins 6/ 8: Connection closed
Pins 7/ 8: Connection open
- Dual** Pins 6/ 8: Connection closed
Pins 7/ 8: Connection closed
or
Pins 6/ 8: Connection open
Pins 7/ 8: Connection open

9. Programming by web server*

9.1 Main menu

AUDIO/ VIDEO-MODULATOR, VMB 199 (9229.01 / 00), Address 00 / 02	
Description	xxxx
Output	
TV standard	B/G
Mode	RF
Frequency table	E12 (224,250 MHz)
Attenuation	31,5 dB
Module settings	
Operating status	On [On]
SNMP-Trap message	On
Level monitoring	On
Default set	Load
<input type="button" value="Software Option"/> <input type="button" value="Extended settings"/> <input type="button" value="Status"/>	
<input type="button" value="Update"/> <input type="button" value="Clear"/> <input type="button" value="Transmit"/>	
<input type="button" value="<<<<"/> <input type="button" value="Back"/> <input type="button" value=">>>>"/>	

name of device, item number, address in head end

Description name of the program (max. 30 characters)

Output

TV standard selection: B/G, D/K1, D/K2, D/K3 **

Mode selection: RF, IF

Frequency table *** channel selection:

standard B/G channel 2...69

standard D/K1..3 channel R1...69

Intermediate

frequency (IF) *** displays the output IF (38,9 MHz in standards B/G and D/K1..3)

Attenuation adjustment range: 0...31.5 dB

Module settings

Operating status selection: On, Off, Reset

SNMP-Trap message On, Off, if SNMP option in HCB x00 enabled, otherwise "locked" displays

Level monitoring at output port. selection: On, Off

Default set see menu 3

Routing to the appropriate adjustment menu:

Software option see menu 1

Extended settings see menu 2

Status see menu 4

** D/K1: sound carrier 6,5/ 6,25 MHz

D/K2: sound carrier 6,5/ 5,74 MHz

D/K3: sound carrier 6,5/ 6,74 MHz

*** In RF mode a frequency table of the selected standard appears to adjust the output channel. In IF mode the fixed output frequency (38,9 MHz in standards B/G and D/K1..3) is displayed.

9.2 Software option (menu 1)

AUDIO/ VIDEO-MODULATOR, VMB 199 (9229.01 / 00), Address 00 / 02	
Activation software option	
Option	Status
Test lines	activate
Enter licens key: <input type="text"/>	
Lizenz Index:0 Device number:0000000	
<input type="button" value="Back"/> <input type="button" value="Transmit"/>	

name of device, item number, address in head end

Dialogue for entering code to activate the "test line" (CKB 101) software option.

When the page is called up, the current state of activation for the relevant option will be displayed.

* For further details see the HCB manual

9.3 Extended settings (menu 2)

AUDIO/ VIDEO-MODULATOR, VMB 199 (9229.01 / 00), Address 00 / 02		
Input		
Audio impedance	12000	Ohm
Audio signal	balanced	
Audio level	0	dBu
Audio mode	auto(VPS)	
Video AGC	off	
Output		
Sound carrier2	On	
Sound deviation	30	kHz
Vision-/ sound carrier1 separation	13	dB
Picture carrier frequency	224250	kHz
Test lines		
Line 17	Off	
Line 18	Sinus x/x	
Line 330	Off	
Line 331	Off	
<input type="button" value="Back"/> <input type="button" value="Transmit"/>		

name of device, item number, address in head end

Input

Audio impedance selection: 600, 12000 Ohms
 Audio signal selection: balanced, unbalanced
 Audio level adjustment range: +6...-11.6 dBu
 Audio mode selection: auto(VPS), extern, mono, stereo, dual (2 sound carriers)
 auto, monoL, monoL+R (1 sound carrier)
 Video AGC selection: On, Off

Output

Sound carrier 2 selection: On, Off
 Sound deviation selection: 30 kHz (2 sound carriers)
 30 kHz, 50 kHz (only 1 sound carrier)
 Vision-/ sound carr.1 separation selection: 13, 16 dB
 Picture carrier frequency* frequency input in kHz
 Intermediate frequency (IF)* displays the output IF (38,9 MHz in standards B/G and D/K1..3)

Test lines

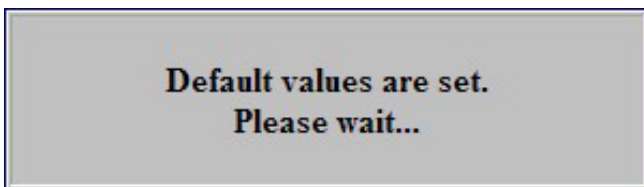
(will only be available if "Test lines" option is on)
 Line 17 a test signal can be sent on all four of these lines, the signal selection is:
 Line 18 Off, CCIR 17, CCIR 18, CCIR 330,
 Line 330 CCIR 331, Sinus (x)/x, Ramp
 Line 331

* In RF mode the input field for frequency adjustment appears. In IF mode the fixed output frequency (38.9 MHz in standards B/G and D/K1..3) is displayed.

9.4 Factory settings (menu 3)



When this menu item is requested, at first a security query whether it really set all parameters to the factory default settings pops up.



Affirming the query, all settings stored in the EEPROM will be deleted and replaced by the default settings (see chapter 10). The module will go back to these default values. Once the setting process is over, there will be an automatic return to the main menu. It takes about one minute.

9.5 Status of the device (menu 4)

AUDIO/ VIDEO-MODULATOR, VMB 199 (9229.01 / 00), Address 00 / 02		
Status input		
Video-Status	SYNC	
Status audio VPS	dual	
Status audio external	dual	
Status output		
Signal level	ok	
Sound carrier1	5,5	MHz
Sound carrier2	5,74	MHz
Complementary data		
Test line insertion	Line 17: Off Line 18: Off Line 330: Off Line 331: Off	
Software versions		
AP Controller	9229.01-81.01 AP-Controller V0.04 31.05.2012 JH	
A/V modulator FPGA	9229.01-87.01 A/V Modulator FPGA V1.11 09.06.2012 PK	
Information		
Temperature	33	
Device number	0000000	
Device index	00	
<input type="button" value="Update"/> <input type="button" value="Back"/>		

name of device, item number, address in head end

Status input

Video-Status displays the status of synchronization of the video signal
 Status audio VPS displays the audio status in VPS data
 Status audio external displays the audio status of the external fed in audio signal (K1/ K2 signalling)

Status Output

Signal level displays status of signal level at the output (ok, too high, too low)
 Sound carrier 1/2 displays frequency of sound carrier 1 & 2

The following will only be displayed if the "test lines" option is switched on:

Complementary data

Test line insertion displays which test signal is set for the 4 lines

Software versions

Displays the software versions for the controllers as follows:

- Controller of terminals board

- A/V modulator FPGA

Information

Temperature Temperature of the device
 Device number displays the device number
 Device index displays the device index (hardware)

10. Manual menu control at the Headend Controller (HCB x00)

The values in the blocks setting are the default values. After pushing the button "default" settings on the main page, all settings stored in the EEPROM are erased and reset to default values. The device is set to these values again (see also chapter 9.4).

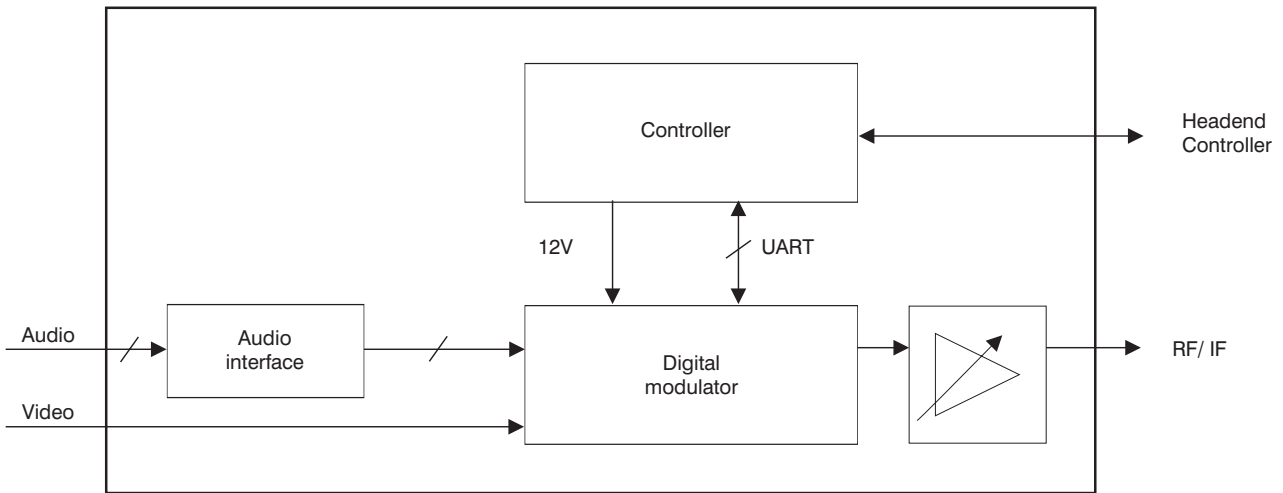
VMB 199 start	
Description	xxxx
Output	
TV standard	B/G
Mode	RF
Frequency	224250 kHz
Attenuation	0 dB
TV sound	
Sound carrier 2	On
Sound deviation	30 kHz
Audio settings	
Audio impedance	12000 Ohms
Audio signal	balanced
Audio level	0 dBu
Audio mode	auto(VPS)
Video settings	
Video AGC	On
Test lines*	
Line 17	Off
Line 18	Off
Line 330	Off
Line 331	Off
Device settings	
Operating status	On
Level monitoring	On
VMB 199 end	

*will only be available if "Test lines" option is on

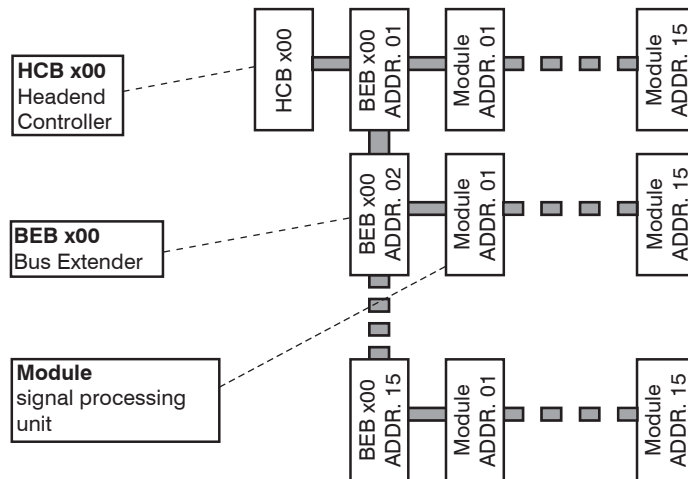
11. Trap messages

Item.	Message	Type	Explanation
01	Signal OK	INFORMATION	input synchronized
02	Input not sync	WARNING	input not synchronized
03	Init error	CRITICAL	initialization error
04	System reset	WARNING	reset by internal error
05	Output level too low	WARNING	Level of output signal too low
06	Output level too high	WARNING	Level of output signal too high
07	Output Signallevel ok	INFORMATION	Level of output signal ok
08	PLL error	CRITICAL	error of the sytem PLL
09	Communication error	CRITICAL	communication error
10	Audiomode=mono	INFORMATION	Sound mode set as mono (in mode auto VPS & external)
11	Audiomode=stereo	INFORMATION	Sound mode set as stereo (in mode auto VPS & external)
12	Audiomode=dual	INFORMATION	Sound mode set as dual (in mode auto VPS & external)

12. Block diagram

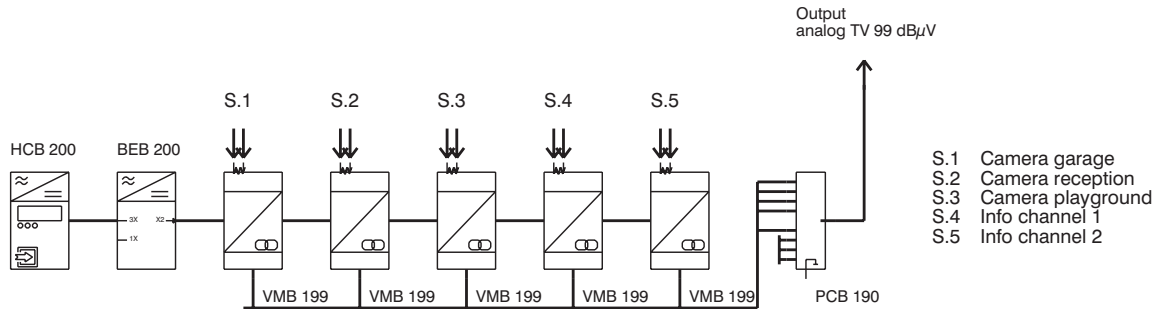


13. Head end bus structure



The number of the possible module connections (00 ... 15) to a BEB x00 depends on the total power consumption of this line.

14. Application example



15. Technical data

Video input

Input voltage with AGC 0.8 ... 1.3 V_{pp}
 Input voltage without AGC 1 V_{pp}
 Connector BNC socket
 Impedance 75 Ω
 AGC disconnectable

C/N (> 25 MHz space from channel center; BW = 4.8 MHz) typ. 82 dB
 S/N ratio parallel sound unweighted/ weighted typ. 65/ 60 dB
 Output level stability max. 1 dB_{pp}
 Frequency stability $\leq \pm 30$ kHz

Audio input

Input level -11.6 ... +6 dBu
 Input impedance (switchable) 0.6/ 12 k Ω
 Connector 8-pole according DIN 45326 (IEC 130-9-20) [4]
 Configuration (switchable) balanced/ unbalanced

Operating parameters

Voltage/ current 12 V (± 0.2 V)/ 600 mA
 Residual ripple of supply voltage ≤ 10 mV_{pp}

TV output

TV standard B/G, D/K
 Sound type double carrier FM
 Sound carrier frequencies
 B/G 5.5/ 5.742 MHz
 D/K1 6.5/ 6.25 MHz
 D/K2 6.5/ 5.742 MHz
 D/K3 6.5/ 6.742 MHz
 (above picture carrier respectively)
 Sound mode mono/ stereo/ dual/ auto (VPS controlled)/ external

Environmental conditions

Temperature range -10 ... +55 $^{\circ}$ C
 Temperature range for data keeping 5 ... 45 $^{\circ}$ C
 Relative humidity ≤ 80 % (non condensing)
 Method of mounting vertical
 Location of mounting splash-proof and drip-proof

Miscellaneous

Dimensions (l x w x h) without 19" adapter 50 x 276 x 148 mm
 with 19" adapter 50 x 301 x 148 mm
 Weight 1,250 g

Audio deviation 1 mono carrier 30/ 50 kHz
 Audio deviation 2 mono carrier 30 kHz
 Audio deviation dual sound 30 kHz
 Output frequency range RF 45 ... 862 MHz
 Output frequency IF 38.9 MHz
 Tuning steps 1 kHz
 Output level max. 116 dB μ V
 Range for level adjustment 0 ... 31.5 dB (0.5 dB steps)
 Channel allocation adj.channel compatible
 Connector F socket
 Impedance 75 Ω

Delivery content

1 x bus connector

Software options

Test lines CKB 101 (9650.51)

Signal quality

Single channel intermodulation ≥ 66 dB
 Signal to noise ratio (S/N)
 3rd order ≥ 60 dB
 Spurious 45 ... 862 MHz ≥ 60 dB
 C/N in channel (BW = 4.8 MHz) typ. 62 dB

16. Glossary

AM	Amplitude modulation
AP	Anschlussplatte (terminals board)
ATV	Analogue Television
AV	Audio/ Video
BW	Bandwidth
CCIR	Comité Consultatif International des Radiocommunications
C/N	Carrier to Noise ratio
D/A	Digital/ Analog-
ETSI	European Telecommunications Standards Institute
FPGA	Field Programmable Gate Array
HTML	Hypertext Markup Language
HTTP	Hypertext Transfer Protocol
ID	Identifier
IF	Intermediate Frequency
IP	Internet Protocol
LED	Light Emitting Diode
MC	Microcontroller
MIB	Management Information Base
NTSC	National Television Systems Committee*
PAL	Phase Alternating Line*
RF	Radio Frequency
SECAM	Séquentiel couleur à mémoire*
SNMP	Simple Network Management Protocol
TV	Television
VPS	Video Programming System
WSS	Wide Screen Signalling

* colour-encoding systems of analogue television

17. 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 : Cable networks for television signals, sound signals and interactive services Part 2: Electromagnetic compatibility for equipment, German version EN 50083-2:2006
- [4] DIN 45326:1976-07 8-pole connectors for radio and associated sound equipment

18. Document history

Version	Date	Modification	Author
1.00	08.06.2012	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

Product name: Audio/ Video-Modulator
Type: VMB 199
Product number: 9229.01

according to the following regulations

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

and additional device-specific regulations, enclosed above, which this product is subjected to.

Date: 08.06.2012

Signature:


(Managing Director)