

**Professional Headend Solutions** 

# **Device manual**



## **QAM Modulator**

ASI - TS  $\rightarrow$  DVB-C / ITU-T J.83 Annex B, C



... Setting Signals



### **QAM Modulator** ASI -TS $\rightarrow$ DVB-C / ITU-T J.83 Annex B, C



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## 2. Device variants

AMA 299

9859.81 ASI - TS  $\rightarrow$  DVB-C / ITU-T J.83 Annex B, C 9859.82 ASI - TS  $\rightarrow$  IFI  $\rightarrow$  DVB-C / ITU-T J.83 Annex B, C

## 3. General

The QAM Modulator AMA 299 is a module of the head end system A-LINE which is conceived as a complete system for big and middle-sized networks. The module converts one digital transponder into the digital cable standard DVB-C, ITU-T J.83 Annex B or C. The signal will be transcoded from the ASI transport stream into cable TV channels.

The status of the assembly will displayed with LEDs (see section 5.2 "Meaning of the LED signals").

## 4. Functional description

The data stream which results from the ASI input is passed to a FIFO. All services of the resulting transport stream which shall be processed into the QAM modulator will be choosen by controling software of the module. The SI and PSI tables affected (i.e. the PAT, PMT, SDT, EIT, NIT) are automatically corrected. The changed SI an PSI tables are fed into the QAM modulator and an IF signal is generated at the output channel. There is a free choise of frequency in the output channel from 45 to 862 MHz. On the output side, the modulator does not leak to adjacent channels. 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 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 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 illuminated	Device is ready for working
	off	Device off, without current supply
STATUS (green)	permanently illuminated	Device working, everything ok
	flashing	Dysfunction depending in signal (e.g. in case of invalid service)
	off	RF output is deactivated
SYNC. (green)	permanently illuminated	ASI input is synchronous
	flashing	ASI not sync (e.g. in case of missing input signal)
ERROR (red)	permanently illuminated	Device is on standby
	flashing	Device faulty (hardware)

### 5.3 Front panel keypad and tuning wheel



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)

BACK

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 Editmode. 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  $\dashv$  ENTER and confirm it by pressing the tuning wheel. The display switches back to the selection mode of the parameter display!





### 6. Programming by web server

#### 6.1 Network connection to computer

Connect to 192.16	58.30.175	×
<b>R</b>	GE	
The server 192.166 username and pass Warning: This serve password be sent in without a secure co	8.30.175 at user account requires a sword. er is requesting that your username and n an insecure manner (basic authentication onnection).	
<u>U</u> ser name:	🖸 user 💌	]
Password:	••••••	
	Remember my password	
	OK Cancel	J

#### 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 AMA 299 must be connected to PC Network using an Ethernet cable. The IP address of the AMA 299 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 AMA 299 (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 AMA 299. The IP address of the AMA 299 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.

## $\begin{array}{l} \textbf{QAM Modulator} \\ \textbf{ASI - TS} \rightarrow \textbf{DVB-C} \ / \ \textbf{ITU-T} \ \textbf{J.83 Annex B, C} \end{array}$

#### 6.2 Device status

	Sprache auswa	ählen ⊻
<ul> <li>Mandagane" Ana 200 Gala modellarida</li> <li>Aure vice and bit</li> </ul>		:]]
AM Modulator - AMA 2	299	
tus Std. settings Ext. settings Program	filter NIT-Table Software IP-Netwo	rk MIB
	AST input	
SI-Input	SYNC	
arket size	188	Byte
Data	rate overview	-,
nout data rate	38.015	Mbps
ata rate by filter	34.203	Mbps
ax. QAM-Data rate	38.152	Mbps
eserve	3.948	Mbps
De	vice settings	
lentifier	xxxx	
requency	314000	kHz
evel	-10	dBm
evel monitoring	On	
plerable level variation	+/- 1	dB
AM-Symbol rate	6900	kSps
AM-Modulation mode	64	QAM
Signal	On	
perating mode QAM-Modulator	Transcoder	
AM-Standard	DVB-C(AnnexA)	
IT-Processing	On	
AT-Processing	Off	
hange ID's	Off	
ogram filter function	On	
irginal TS-ID's	TS-ID: 1073/Network-ID: 1	
I	nformation	
S-Interface	Transport stream OK	
S-Manager/QAM-Modulator	ОК	
p Converter	ОК	
F-Amplifier	ОК	
ate	02.04.09	
ime	10:48	12/24
evice number	0250180	
evice index	00	

## 6.3 Standard settings

			Sp	orache ausw	ählen 💙
ALANDERY ANALON GAN NODELATOR			n ī		
AM Modulator - A	MA 299				
Status Std. settings Ext. settings	Program filter	NIT-Table	Software	IP-Netwo	ork MIB
	Identi	fier			
Name			X000X		
	Outp	ut			
Channel			S21 (306	.00 MHz) 💌	
Level				+14 💌	dBm
QAM-Symbol rate				5310 🛩	kSps
QAM-Modulation mode				64 💌	QAM
Interleaver				12/17 💌	
RF-Signal				On 🛩	
Level monitoring				On 💌	
Tolerable level variation				*/- 1 💌	dB
	IF-Lo	ор			
Input/Output			Dea	ctivated 💌	
Input frequency				36.000 💌	MHz
Output frequency				36.000	MHz
	SNM	Р			
SNMP trap message				On 💙	
Debe	Date/1	ime			00.000
Date			_	_	06.10.09
Time					08:20
					Transm

#### Choose language

**ASI input** ASI-Input

Packet size Data rate overview Input data rate Data rate by filter max. QAM-Data rate Reserve

**Device settings** Identifier Frequency Level Level monitoring Tolerable level variation QAM-Symbol rate QAM-Modulation mode **RF-Signal** Operating mode QAM-Mod. QAM-Standard NIT-Processing CAT-Processing Change ID's Program filter function Original TS-ID's Information TS-Interface TS-Manager/QAM-Modul. Up Converter **RF-Amplifier** Date Time

Device number Device index Temperature

Choose language

#### **Identifier** Name

Output Channel Level QAM-Symbol rate

QAM-Modulation mode Interleaver

RF-Signal Level monitoring Tolerable level variation **IF-Loop** Input/ Output Input frequency

Output frequency SNMP SNMP trap message Date/Time Date Time german, english

ASI status display <u>SYNC</u>hronisation or <u>noSYNC</u>hronisation with the input in byte

used data rate at input used data rate after program filter max. used data rate max. QAM-Data rate minus data rate after filter

e.g. program name acc. adjustments in 6.3 acc. adjustments in 6.4 on/ off acc. adjustments in 6.4

status of transport stream

status of TS-Manager/ QAM-Modulator status of up converter status of RF-Amplifier acc. adjustments in 6.3 acc. adjustments in 6.3, 12/ 24-h-mode selectable display of the device number display of the device index (hardware) temperature of device, °C/ F selectable

german, english

independent text field for device identification (max. 30 characters)

channel selction (2 ... 69, standard B/G) adjustment range -10 ... +14 dBm selection: 6995, 6900, 6875, 6111, 6000, 3450, 1750 kSps selection: 16, 32, 64, 128, 256 QAM selection: 12/17 (DVB-C/ Annex A) 12/17, 8/16, 16/8, 32/4, 64/2, 128/1, ..., 128/8 (ITU-T J.83 Annex B) 12/17 (ITU-T J.83 Annex C) selection: on/ off selection: on/ off selection: ± 1 dB ... ± 5 dB, 0.5 dB steps

selection: Activated/ Deactivated selection: 36.000, 36.125, 36.150, 38.900, 44.000, 45.750 MHz 36.000 MHz

on/ off /locked (if not supported by software)

input format: dd.mm.yy input format: hh:mm (AM/ PM) 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.

## $\label{eq:QAM Modulator} \begin{array}{l} \mbox{QAM Modulator} \\ \mbox{ASI -TS} \rightarrow \mbox{DVB-C} \ / \ \mbox{ITU-T J.83 Annex B, C} \end{array}$





#### Choose language

#### Output

Frequency QAM-Symbol rate Spectrum QAM-Standard

Operating mode QAM-Mod.

#### Table processing

<u>NIT</u>

NIT-Processing NIT-Distribution Network name Network ID

CAT-Processing CA-System-ID Operator-ID

Transport stream Change ID's TS-ID Network ID german, english

adjustment range 45000...862000 kHz adjustment range 1000...7200 kSps selection: normal/invers selection: DVB-C (Annex A), ITU-T/J.83 (Annex B), ITU-T/J.83 (Annex C) selection: Transcoder, Testlevel, Testsignal ( (

activate or deactivate activate or deactivate selectable (max. 30 characters) selectable (0...65535)

activate or deactivate selectable (0...65535) selectable (0...65535)

activate or deactivate selectable (0...65535) selectable (0...65535)

#### 6.5 NIT table



Choose language

german/english

NIT table with all additional entered informations.

By clicking of the button all NIT entries are cleared.



## $\begin{array}{l} \textbf{QAM Modulator} \\ \textbf{ASI - TS} \rightarrow \textbf{DVB-C} \ / \ \textbf{ITU-T} \ \textbf{J.83 Annex B, C} \end{array}$

CE

LINE

### 6.6 Program filter

CAM Modulator - AMA	Sprache	auswählen ⊻	Choose language	german, english
Status Std. settings Ext. settings Program	n filter NIT-Table Software IP-N	letwork MIB		
Program	n filter configuration		Program filter configuration	
Program filter function		On 💌	Program filter function	activate or deactivate
Other transponder information		Pass 💌	Other transponder	
Pro	gram selection			where an always of a delition of informations
Operating mode of program filter	-	Drop 💌	Information	pass or drop of additional informations
Service ID	Program name	Selection		(e.g. electronic program guide), which are
0x6E2E	rbb Berlin			contained in data stream as "other"
0x6E3A	ARD-Data-2			
0x6E3D	ARD-TEST-1		Program selection	
0x6E40	NDR FS MV		Operating mode program	
0x6E41	NDR FS HH			
0x6E42	NDR FS NDS		filter	pass or drop of the market programs
0x6E43	NDR FS SH			
0x6E44	MDR Sachsen			
0x6E45	MDR S-Anhalt			
0x6E46	MDR Thüringen			
0x6E47	SWR Fernsehen RP			
0x6E5A	ARD-Data-1		Reserve selection	all not marked programs are choosen
0x6E3B	{Empty}			or vice versa
	Reverse selection Sel	ect all Clear all	Select all	all programs of the list are marked
		Transmit	Clear all	no program the list is marked

german/english

#### 6.7 Software overview

	Sprache auswählen ⊻	Choose language
ARANDON ANA 200 GAN NOOLLATON     OF THE ANALYSIS CAN NOOLLATON     ALARY ANN THE BA		
AM Modulator - AMA	299	Software versions:
tatus Std. settings Ext. settings Progr	am filter NIT-Table Software IP-Network MIB WEB-Frontend	WEB-Frontend
WEB Server	9859_ <u>81_90_03</u> Webserver V1.03 01.04.2009	WEB Server
s	iystem software	System software
System controller	9859.81-88.03 Systemcontroller V1.05 01.04.2009 JR	System controller
FPGA-Boot controller	9659.81-88.01 FPGA Boot Controller(1) V1.03 16.10.08 JR	FPGA-Boot controlle
rS-FPGA image	959-01-01-01 TS-Mux;QAM-Modulator V1.05 13.01.2009 WE,JR	TS-FPGA image
TS-Processing	9859.81-90.01 TS-Manager V 1.05 02.04.2009 JR	TS-Processing
ASI-Boot controller	9950.02-88.01 FPGA Download Controller V1.35 08.09.2008 M.P, PK	ASI-Boot controller
ASI-FPGA image	9850.02-87.01 ASI Input FPGA V1.45 27.03.2009 WE,MF	ASI-FPGA image
Up Converter	9199.01-88.02 internal Controller V2.00 26.06.2008 JH	Up Converter
RF-Amplifier	9859.81-88.02 Amplifier controller V1.04 01.12.2008 PK	RF-Amplifier
Display controller	9859.81-88.05 Display controller V 0.38 26.03.2008 PK	Display controller

#### **QAM Modulator** ASI -TS $\rightarrow$ DVB-C / ITU-T J.83 Annex B, C



#### 6.8 IP network

<ul> <li>will be open autom.</li> <li>Following successfican be changed.</li> <li>Following successfican be changed.</li> <li>Concel</li> <li>Concel</li> <li>Choose language</li> <li>Factory settings are</li> <li>Network settings</li> <li>Network settings</li> </ul>	<ul> <li>will be open autom.</li> <li>Following successfican be changed.</li> <li>Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).</li> <li>User name:  admin ecount requires a generating for a dimin ecount a secure connection.</li> <li>User name:  admin ecount requires a generating for a dimin ecount a secure connection.</li> <li>User name:  admin ecount requires a generating for a dimin ecount a secure connection.</li> <li>User name:  admin ecount requires a generating for a dimin ecount a secure connection.</li> <li>User name:  admin ecount requires a generating for a dimin ecount a secure connection.</li> <li>User name:  admin ecount requires a dimin ecount a secure connection.</li> <li>Choose language</li> <li>Factory settings are Network settings</li> <li>Network settings</li> <li>User the set in a iso secure to the settings</li> <li>User the set in a manner iso secure economic iso settings</li> <li>User the settings iso settings</li> <li>User the settings</li></ul>	<ul> <li>will be open autom.</li> <li>Following successfican be changed.</li> <li>Warning: This server 192,168.30.175 at admin account requires a username and password.</li> <li>Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).</li> <li>User name:  admin emember my password</li> <li>Remember my password</li> <li>Remember my password</li> <li>Choose language</li> <li>Factory settings are Network settings</li> <li>Network settings</li> <li>Network settings</li> <li>Network settings</li> <li>User max:  10103076</li> <li>Network settings</li> <li>Login settings</li> </ul>	will be open autom Following success	will be open autom Following successf can be changed. Concession Concession Concession Concession Choose language Factory settings are Network settings IP-Address: Subnet mask: Default gateway: NaC-Address: Conservery: Login settings How does on the settings How	will be open autom Following successf can be changed. Following successf Following successf Following successf Can be changed. Following successf Following succ	will be open autom Following success	will be open autom Following success	will be open autom Following successic Following successic Cancel Following successic Following successic Following successic Following successic Following successic Cancel Following successic Following successi
Following success   The server 192.168.30.175 at admin account requires a   Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).   Liser name:    @ admin    Bassword:     @ admin    Bassword:     @ admin    Bassword:     @ admin    Bassword:     @ admin    Bassword:     @ admin   Bassword:     @ admin    Bassword:     @ admin    Bassword:     @ admin   Bassword:     @ admin       Bassword:    @ admin    Bassword:    @ admin   Bassword:     @ admin    Bassword:    @ admin    Bassword:    @ admin    Bassword:    @ admin          Bassword:    @ admin    Bassword:    @ admin     @ admin         Bassword:     <	Following success   The server 192.168.30.175 at admin account requires a   Warning: This server is requesting that your username and   password be sent in an insecure manner (basic authentication   User name:   Image: Imag	Following success   The server 192.168.30.175 at admin account requires a   Warning: This server is requesting that your username and   password be sent in an insecure manner (basic authentication   Without a secure connection).   User name:   @ admin   Password:   @ member my password   OK   Cancel   Choose language Factory settings are Network settings Network settings In the settings Network settings User name: Paddress: Submet max: S	Following success   The server 192.168.30.175 at admin account requires a   Warning: This server is requesting that your username and   password be sert in an insecure manner (basic authentication   User name:   @ admin   Bassword:   @ admin   @ Bernember my password   OK   Cancel    Choose language Factory settings are Factory settings are Network settings Paders: <	Following success   The server 192.168.30.175 at admin account requires a   Warning: This server is requesting that your username and   password be sent in an insecure manner (basic authentication   User name:   @ admin   Password Be sent in an insecure manner (basic authentication   @ member my password   @ Modulator - AMA 299   Choose language Retwork settings Retwork settings Packades: </th <th>Following success   The server 192.168.30.175 at admin account requires a   Warning: This server is requesting that your username and   password be sent in an insecure manner (basic authentication   User name:   @ admin   Password:   @ member my password   OK   Cancel    Choose language Factory settings and Network settings Paddees: Paddees:&lt;</th> <th>Following success   The server 192.168.30.175 at admin account requires a   Warning: This server is requesting that your username and   password be sent in an insecure manner (basic authentication   User name:   @ admin   Password:   @ member my password   OK   Cancel    Choose language Factory settings and Network settings Paddees: Network settings Paddees: Network settings User name: Default gateway: NAC-Address: Default gateway: NAC-Address: Login settings Administrate Legin:</th> <th>Following success   The server 192,168,30,175 at admin account requires a   Warning: This server is requesting that your username and   password be sent in an insecure manner (basic authentication   Warning: This server is requesting that your username and   password be sent in an insecure manner (basic authentication   Warning: This server is requesting that your username and   password be sent in an insecure manner (basic authentication   Remember my password   OK   Cancel    Choose language Ractory settings Ractory settings Paddress: Submet maxi: 10150376 Paddress: Submet maxi: 10150376 Ractory settings Paddress: Submet maxi: 101503</th> <th>Following successing   The server 192.168.30.175 at admin account requires a   Warning: This server is requesting that your username and   password be sent in an insecure manner (basic authentication   Without a secure connection).   User name:   Image: Image:</th>	Following success   The server 192.168.30.175 at admin account requires a   Warning: This server is requesting that your username and   password be sent in an insecure manner (basic authentication   User name:   @ admin   Password:   @ member my password   OK   Cancel    Choose language Factory settings and Network settings Paddees: Paddees:<	Following success   The server 192.168.30.175 at admin account requires a   Warning: This server is requesting that your username and   password be sent in an insecure manner (basic authentication   User name:   @ admin   Password:   @ member my password   OK   Cancel    Choose language Factory settings and Network settings Paddees: Network settings Paddees: Network settings User name: Default gateway: NAC-Address: Default gateway: NAC-Address: Login settings Administrate Legin:	Following success   The server 192,168,30,175 at admin account requires a   Warning: This server is requesting that your username and   password be sent in an insecure manner (basic authentication   Warning: This server is requesting that your username and   password be sent in an insecure manner (basic authentication   Warning: This server is requesting that your username and   password be sent in an insecure manner (basic authentication   Remember my password   OK   Cancel    Choose language Ractory settings Ractory settings Paddress: Submet maxi: 10150376 Paddress: Submet maxi: 10150376 Ractory settings Paddress: Submet maxi: 101503	Following successing   The server 192.168.30.175 at admin account requires a   Warning: This server is requesting that your username and   password be sent in an insecure manner (basic authentication   Without a secure connection).   User name:   Image:
Can be changed. Can be changed.	The server 192.168.30.175 at admin account requires a username and password.   Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).   User name:	Can be changed.     The server 192.168.30.175 at admin account requires a username and password.     Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).   User name:      admin         Password:   admin           admin         Password:     admin <b>Choose language Choose language Factory settings are Network settings Network settings Network settings Network settings Network settings</b>	Can be changed.   The server 192.168.30.175 at admin account requires a username and password. Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).   User name:  admin   Password:  admin   Bassword:  admin   Cox Cancel   Choose language Factory settings are Network settings Interview settings Interview settings Default gateway: 192.603.0175 Login settings Login settings	Can be changed. Can be changed	Can be changed. Can be	Can be changed. Can be	Can be changed. Can be changed.	Choose language  Choose
The server 192.168.30.175 at admin account requires a username and password.   Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).   User name:  admin     Password:  Image: The member my password    OK Cancel     Choose language     Factory settings    AM Modulator - AMA 299   Modulator - AMA 299   Image: Modulator - AMA 299	The server 192.168.30.175 at admin account requires a username and password.   Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).   User name:    @ admin    Password:    @ admin     Password:     @ member my password     OK      Cancel       Choose language Factory settings are Network settings IP-Address:     Submet mark:      Default gateway:      Nac-Address:     Default gateway:     Nac-Address:	The server 192.168.30.175 at admin account requires a username and password.   Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).   User name:    @ admin    Bassword:    @ admin    Bassword:    @ admin    Bassword:     @ admin    Bassword:     @ admin    Bassword:     @ admin    Bassword:     @ admin    Bassword:     @ admin    Bassword:     @ admin    Bassword:     @ admin    Bassword:     @ admin    Bassword:     @ admin    Bassword:     @ admin    Bassword:     @ admin    Bassword:     @ admin    Bassword:     @ admin    Bassword:     @ admin     @ admin    Bassword:     @ admin    Bassword:    @ admin    Bassword:    @ admin    Bassword:    @ admin    Bassword:    @ admin    Bassword:    @ admin     @ admin    Bassword:     @ admin     <	The server 192.168.30.175 at admin account requires a username and password.   Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).   User name:    @ admin    Password:     @ admin    Password:     @ admin    Password:     @ admin    Password:     @ admin    Password:     @ admin    Password:     @ admin    Password:     @ admin    Password:    @ admin   @ admin    Password:    @ admin <td>The server 192.168.30.175 at admin account requires a username and password. Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection). User name:</td> <td>The server 192.168.30.175 at admin account requires a username and password. Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection). User name: @ admin @ @ admin @ @ admin @ @ admin @</td> <td>The server 192.168.30.175 at admin account requires a username and password.   Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).   User name:    @ admin    Password:    @ admin    Password:    @ member my password     OK    Cancel      Choose language Factory settings are Network settings Networ</td> <td>The server 192.168.30.175 at admin account requires a username and password.   Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).   User name:      admin    Password:      admin    Password:      emember my password   OK Cancel    Choose language Factory settings are Network settings N</td> <td>The server 192.168.30.175 at admin account requires a username and password. Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection). User name:</td>	The server 192.168.30.175 at admin account requires a username and password. Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection). User name:	The server 192.168.30.175 at admin account requires a username and password. Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection). User name: @ admin @ @ admin @ @ admin @ @ admin @	The server 192.168.30.175 at admin account requires a username and password.   Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).   User name:    @ admin    Password:    @ admin    Password:    @ member my password     OK    Cancel      Choose language Factory settings are Network settings Networ	The server 192.168.30.175 at admin account requires a username and password.   Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).   User name:      admin    Password:      admin    Password:      emember my password   OK Cancel    Choose language Factory settings are Network settings N	The server 192.168.30.175 at admin account requires a username and password. Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection). User name:
Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).   User name: <ul> <li>admin</li> <li>emember my password</li> <li>Remember my password</li> </ul> OK Cancel   Choose language   Factory settings are   AM Modulator - AMA 299   Network settings   P-Address: Subnet mask:	Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).       Image: Content of the second content of the sec	Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).   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first the administrator log-in window ally.

og-in the network and log-in settings

192.168.2.80 255.255.255.0 192.168.2.1 display of MAC-Address admin password user password public public public 0.0.0.0 Trap receiver IF 2 0.0.0.0

> Administrator- and/or user-login can be deactivated by clearing of user name and password.

0.0.0.0

german/english

• The addresses must be matched to the respective network.

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## 7. SNMP management

#### 7.1 Generate MIB



Choose language

german/english

The complete MIB for an AMA 299 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 one can be decided upon and taken over to control the device via a network and/or an SNMP manager capable of SNMPv2c

#### 7.2 Trap messages

Item	Message	Message Type	Explanation
01	Power Fail	CRITICAL	short circuit
02	System Reset	WARNING	reset by internal error
03	Signal ok	INFORMATION	module works correctly
04	ASI input not sync	WARNING	no input signal at the ASI input
05	IIC error	CRITICAL	IIC-Bus-error
06	TS-MUX not sync	WARNING	no transport stream at the FPGA
07	Internal controller reset	WARNING	error when accessing internal controller
08	FPGA: Program memory full	WARNING	overflow of program memory in the FPGA
09	FPGA: PID memory	WARNING	overflow of PID memory in the FPGA
10	FPGA: Directory full	WARNING	overflow of directory in the FPGA
11	FPGA: FAT memory full	WARNING	overflow of FAT memory in the FPGA
12	FPGA: TS-Packed buffer overflow	WARNING	overflow of TS-Packet buffer
13	QAM overflow	CRITICAL	overflow of QAM
14	Sync error data FIFO	CRITICAL	data FIFO doesn't work correctly
15	No response to OPEN command	CRITICAL	error internal port
16	Up Converter: PLL1 not locked	CRITICAL	no funktion at the PLL 1 converter
17	Up Converter: PLL1 not locked	CRITICAL	no funktion at the PLL 2 converter
18	Up Converter: IF input too small	WARNING	IF level at Up converter input too smal
19	Up Converter: IF input too large	WARNING	IF level at Up converter input too large
20	UP Converter: IF input ok	INFORMATION	IF level at Up converter input ok
21	Amplifier: RF Level too large	WARNING	RF level at amplifier too large
22	Amplifier: RF Level too small	WARNING	RF level at amplifier too smal
23	Amplifier: RF Level ok	INFORMATION	RF level at amplifier ok
24	ASI input sync	INFORMATION	signal at ASI input ok



#### **QAM Modulator** ASI - TS $\rightarrow$ DVB-C / ITU-T J.83 Annex B, C

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## 9. Block diagram



## 10. Technical data

#### ASI Input

Level range Connector Impedance ASI polarity

#### **ASI Output**

Level Connector Impedance ASI polarity

**ASI Signal processing** 

Data rate ASI transfer format Input Output TS transfer format Input Output Signal processing

#### **QAM Modulator**

Symbol rate	1.0	7.2 MSps	
QAM Modulation	ITU-T	J.83 Annex B, C	C, DVB-C
	Annex B	Annex C	DVB-C
QAM Constell.	64; 256	64	16; 32;64;
			128; 256
Roll off	12 %, 18 %	13 %	15%
Interleaving	Conv. I=128, J=4	Conv. I=12	Conv. I=1
Forward error	Reed Solomon (128,122)	Reed Solomon	Reed Solomo
correction (FEC)	+ Trellis	(204, 188,8)	(204, 188,8)

Test signals Measurement signal PSI-/SI processing Zero stuffing Signal processing

IF loop\* Output/ input

Output frequency Input frequency

Output/ input level Connector IF decoupling

200 ... 880 mV<sub>pp</sub> BNC socket 75 O regular / inverted

800 mV  $_{\rm pp}$  (± 10 %) BNC socket 75 Ω regular

0.625...213 Mbps continuous, burst

burst 188, 204 Byte 188. 204 Byte EN 50083-9 [1]

## 12 non

according adjustment symbol rate & QAM constellation unmod. carrier (signal level) disconnectable continously EN 300 429 [2] (DVB-C) ITU-T J.83[4] (Annex B, C)

internal jumpered or external available (switchable) 36.000 MHz 36.000, 36.125, 36.150, 38.900, 44.000, 45.750 MHz - 14 dBm (95 dBµV) 2 x BNC socket, 75 Ω ≥ 80 dB

#### **RF Output**

Output frequency range 45 ... 862 MHz 10 kHz / 25 kHz\*\* Tuning step 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  $\geq$  43 dB (14 dBm) MER  $\geq$  45 dB (11 dBm) ≥ 50 dB (14 dBm) Shoulder attenuation ≥ 58 dB (11 dBm)  $\geq$  60 dB (14 dBm) Spurious 45...862 MHz ≥ 63 dB (11 dBm) C/N (> 25 MHz space from channel center) typ. 79 dB BW = 6 MHzBW = 8 MHztyp. 78 dB 1 kHz; typ. -92 dBc/Hz Phase noise 10 kHz; typ. -101 dBc/Hz 100 kHz; typ. -108 dBc/Hz Max. frequency stability ± 30 kHz Output level stability ± 0.5 dB (5 .. 45 °C) Output level accuracy  $\pm$  1.5 dB Amplitude frequency max. 1 dB<sub>pp</sub> response channel (8 MHz) **Operation parameters**  $100 \ldots 240 \mbox{ V} \sim 50/60 \mbox{Hz}$ Voltage / current 100 ... 353 V = Power consumption 18 W **Enviromental conditions** Temperature range -10 ... +55 °C Temperature range (for data keeping) 5 ... 45 °C Relative humidity  $\leq$  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 only in device variant 9859.82 available

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

## $\label{eq:QAM Modulator} \begin{array}{l} \textbf{QAM Modulator} \\ \textbf{ASI -TS} \rightarrow \textbf{DVB-C} \ / \ \textbf{ITU-T} \ \textbf{J.83} \ \textbf{Annex} \ \textbf{B}, \ \textbf{C} \end{array}$

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#### 11. Glossary

ASI	Asynchronous Serial Interface
BW	Bandwidth
CA	Conditional Access
CAT	Conditional Access Table
DVB	Digital Video Broadcasting (-C Cable, -S Satellite, -S2 Satellite 2, -T Terrestrial)
EIT	Event Information Table
ETSI	European Telecommunications Standards Institute
FAT	File Allocation Table
FEC	Forward Error Correction
FIFO	First In – First Out
FPGA	Field Programmable Gate Array
HTML	Hypertext Markup Language
HTTP	Hypertext Transfer Protocol
I/Q	In-phase/Quadrature-phase
ID	<b>Id</b> entifier
IF	Intermediate Frequency
IFI	Intermediate Frequency Interface
IIC	Inter-Integrated Circuit (I <sup>2</sup> C bus, data bus within device)
IP	Internet Protocol
LED	Light Emitting Diode
MAC	Media Access Control
MER	Modulation Error Ratio
MIB	Management Information Base
MPEG	Moving Picture Experts Group
NIM	Network Interface Module
Nios	Product name of a processor
NIT	Network Information Table
PAT	Program Association Table
PCR	Program Clock Reference
PID	Program Identifier
PMT	Program Map Table
PSI	Program Specific Information
QAM	Quadrature Amplitude Modulation
RF	Radio Frequency
SDT	Service Description Table
SI	Service Information
SNMP	Simple Network Management Protocol
TS	Transport Stream

## 12. Bibliography

- [1] EN 50083-9: Cabled distribution systems for television, sound and interactive multimedia signals, part 9: Interfaces for CATV/SMATV head ends and similar professional equipment for DVB/MPEG-2 transport streams
- [2] EN 300 429: Digital Video Broadcasting (DVB): Framing structure, channel coding and modulation for cable systems
- [3] 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
- [4] ITU-T J.83 Digital multi-programme systems for television, sound and data services for cable distribution, Amendment to Annex B and C (2006)
- [5] RFC 1157 Request for Comments (RFC): RFC Database URL: Http://www.rfc-editor.org/rfc.html

## 13. Document history

Version	Date	Modification	Author
1.00	16.01.2009	basic dokument	Rudolph
1.01	07.04.2009	revision	Rudolph, Häußer
1.02	06.10.2009	revision (chapter 6.3)	Häußer

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

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## **C E** 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: QAM Modulator

Type: AMA 299

Product number: 9859.8x

#### 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: 25.02.2009

Signature:

Piero Kirchner (Managing Director)