

Device manual



SAT-TV Transmodulator

DVB-S/ -S2 (8x QPSK/ 8PSK) → 4x CI → DVB-C (8x QAM)



A-QAMOS-4CI
Part N°: 5102.81

...setting signals

Contents

1. Safety and operating instructions	3
2. Device variants	3
3. Software options	3
4. General	3
5. Functional description	3
6. Explanation of the operating elements	4
6.1 Front view	4
6.2 Meaning of the status LED's	4
6.3 Rear view	4
6.4 Meaning of the LED's on rear	5
6.4.1 LED's at the satellite ports	5
6.4.2 Status LED at the output coupler	5
6.4.3 LED's at the 10/ 100 Mbit control port	5
7. Adjusting by web server	6
7.1 Network connection to the computer	6
7.2 Initial installation using the wizard	7
7.3 Setting of individual parameters	9
7.3.1 Menu "Overview"	10
7.3.2 Menu "SAT selection"	11
7.3.3 Menu "CI setup"	13
7.3.4 Menu "Transponders"	15
7.3.5 Menu "Adjustment"	16
7.3.6 Menu "Language"	17
7.3.7 Menu "Service"	18
7.3.8 Menu "Setup"	18
7.3.9 Menu "Level"	24
7.3.10 Menu "Status"	24
7.3.11 Menu "NIT"	25
7.3.11.1 Automatic NIT processing	25
7.3.11.2 Manual NIT processing	26
7.3.12 Menu "LCN"	27
7.3.13 Menu "Program table"	27
8. Factory settings	28
9. Conversion tool to produce a compliant TS file for A-QAMOS-4CI	29
9.1 Functional scope	29
9.2 Installation requirements	29
9.3 Installation and integration of the conversion tool on a Windows (XP) system	29
9.4 Error prevention	31
9.5 Glossary - parameter declaration [min. ... max. range]	31
10. Block diagram	32
11. Application example	32
12. Technical data	33
13. Glossary	33
14. Bibliography	34
15. Notes on the device software	35
16. Document history	35
CE Declaration of Conformity	36

1. Safety and operating instructions



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



The devices may only be installed and started up by authorized technical personnel.



When assembling the devices into the receiving points, the adherence of the EMC regulations is to be ensured.



The assembly and wiring have to be done without voltage.



With all work the defaults of the DIN EN 50083 have to be considered. It is especially important to follow DIN EN 60728-11[2].



If installed in mounting cabinets a adequate heat circulation must be guaranteed. The mounting in closed cabinets without air sufficient flow is **not allowed**.



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



WEEE-Reg.-Nr. DE 50389067

2. Device variants

A-QAMOS-4CI 5102.81 DVB-S/ -S2 (8x QPSK/ 8PSK) → 4x CI → DVB-C (8x QAM)

3. Softwareoptionen

CKB 205	5100.55	activation advanced NIT processing
CKB 214	5100.64	activation media player/ SD card

4. General

The SAT-TV Transmodulator A-QAMOS-4CI is a device of the head end system A-LINE, which is conceived as a complete system for big and middle sized networks.

The A-QAMOS-4CI converts digital satellite signals into QAM signals to transmit it in cable networks. In this case, up to 8 QAM channels from the available satellite IF signals are generated, which are attached via two inputs. Two Common Interface slots enables the use of up to 4 CA modules for the reception of scrambled satellite signals/ programmes. In particular, the internal processing allows the output of DVB signals in full HD resolution.

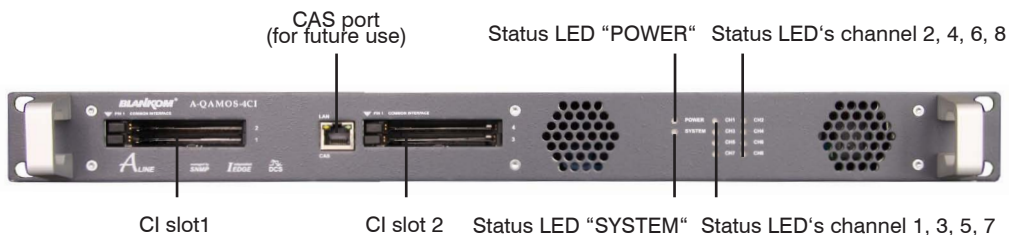
5. Functional description

The satellite IF signal is fed through 2 inputs or a loop-through input by means of a switching matrix to 8 DVB-S/ S2 input parts and their QPSK/ 8PSK demodulators. The resulting 8 transport streams are fed a high-performance FPGA. The transport stream processing or filtering, the QAM modulation and the freely adjustable up-converting in the cable network range (45 ... 862 MHz) take place in the FPGA. Two Common Interface slots enables the use of 4 CA modules, which are cascable, for the reception of scrambled satellite signals/ programmes.

The eightfold modulator is adjacent channel compatible. A highly-clocked digital to analogue converter (DAC) is responsible for the spectrally pure output of the cable signal. After amplification and sum level adjustment, the cable signal is coupled through a directional coupler to the output jacks.

6. Explanation of the operating elements

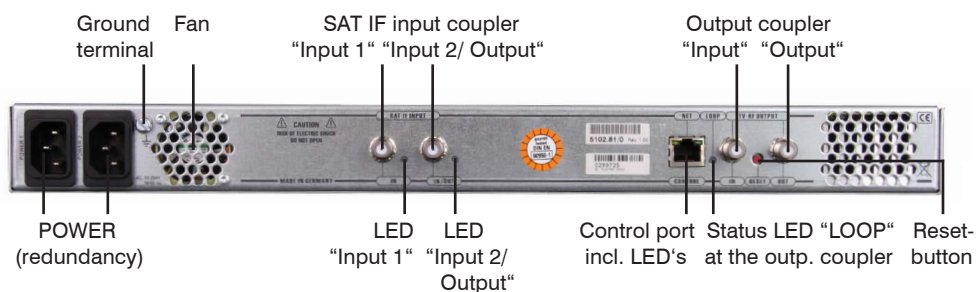
6.1 Front view



6.2 Meaning of the status LED's

Designation	Colour	Status	Meaning of display
POWER	green	permanently on	device is on
	amber	permanently on	device is in standby
		off	device is off, operating voltage is not applied
SYSTEM	green	permanently on	device is ready for work
		flashing	software update is running
	amber	permanently on	temperature is high, fan is activated
		flashing	temperature is critical, the device will no longer work or is forced to shut down
		off	device is not ready for work
CH 1 ... CH 8	green	permanently on	channel operates without error
	amber	permanently on	error warnings, depending on signal: - input and/ or output without sync - input sync, but in bad quality (eg. mosaic effect in the TV picture)
		flashing	hardware is faulty
		off	channel is off

6.3 Rear view



6.4 Meaning of the LED's on rear

6.4.1 LED's at the satellite ports

Colour	Status	Meaning of display
green	permanently on	satellite signal port has been configured as input, works properly
amber	permanently on	satellite signal port has been configured as output (only port "IN/ OUT")
	flashing	LNB overcurrent (e.g. by short circuit) and/ or LNB overheated, port is disabled temporarily.
	off	no tuner is locked on this input or port is deactivated (only port "IN/ OUT").

6.4.2 Status LED at the output coupler

Designation	Colour	Status	Meaning of display
LOOP	green	permanently on	loop active, i.e. nominal level range 62 ... 82 dB μ V
		off	no loop, i.e. nominal level range 74 ... 94 dB μ V

6.4.3 LED's at the 10/ 100 Mbit control port

Designation, colour	Status	Meaning of display
Connect LED, yellow	permanently on	network cable is connected
	off	no cable connection
Data LED, green	flashing	data is exchanged
	off	no data exchange

7. Adjusting by web server

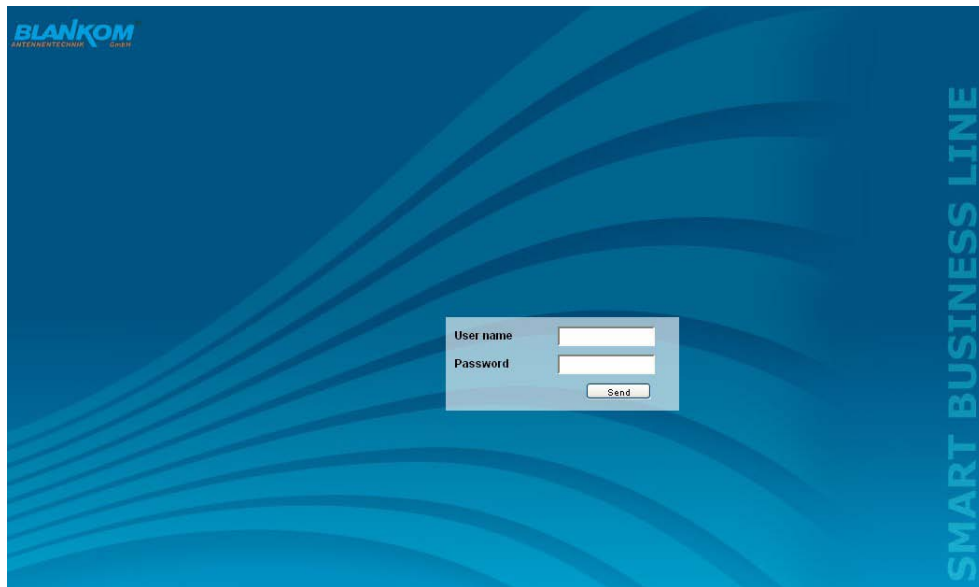
7.1 Network connection to the computer

System requirements:

- PC/ laptop with 10/ 100 Mbit Ethernet interface
- Internet browser (e.g. Windows Internet Explorer), which accept JAVA script.

Setup the connection:

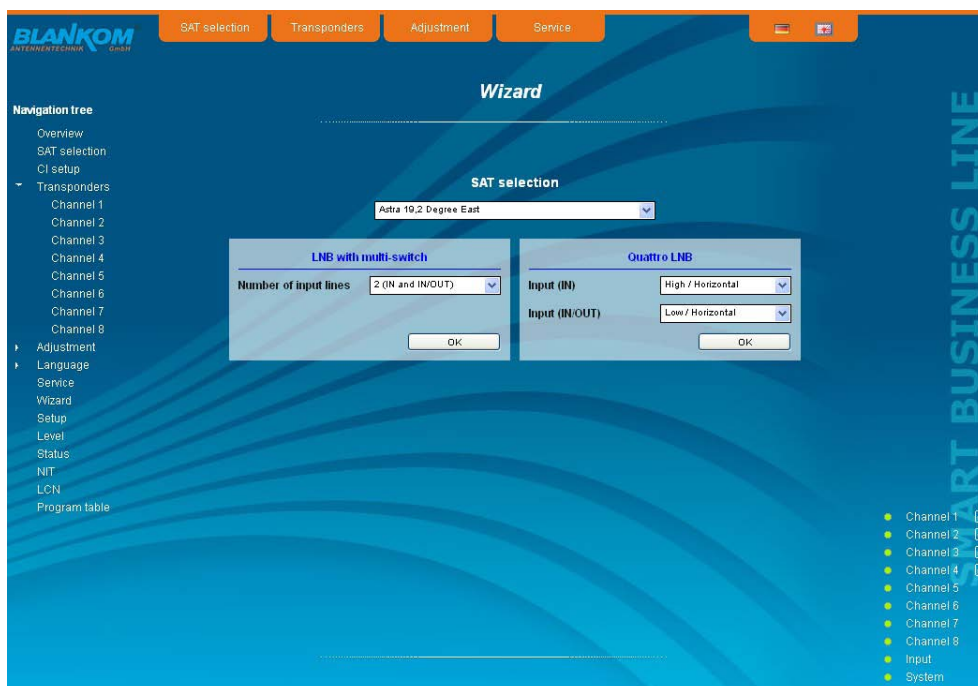
The A-QAMOS-4CI has to be connected to PC network using an Ethernet cable. The IP address of the device is 192.168.1.100 on delivery. If several A-LINE-SBL devices should be controlled or adjusted via an Ethernet switch, each device must first be converted individually to its provided IP address within the network. To that the address of the network port on the PC (temporary) must be adapted to the IP address of the A-LINE-SBL device (subnet mask: 255.255.255.0, IP address: 192.168.1.XXX, where XXX is not the same as the corresponding value of the A-LINE-SBL device IP address). After the network configuration of the device(s) the IP address of the control PC is converted to the provided IP address and the devices can be accessed through the browser with their new IP addresses. First appears the login window, if the password and user testing were activated on the setup page (see chapter 7.3.8):



After successful registration or successful connection establishment without password (default setting) the start page of the device, the menu "Overview" (see chapter 7.3.1), appears.

7.2 Initial installation using the wizard

The easiest way to set the A-QAMOS-4CI is to use the wizard. By pressing the "Wizard" menu in the navigation tree you get to the home page of the wizard. As with any other browser page at the top right hand it can also change the language.



First choose the configuration of the system. If the system is equipped with LNB and multiswitch, so you can select the number of feeds on the left. If the system is operated with a Quattro LNB, so you choose from the right side, which satellite level contact with the corresponding input jack. By pressing the "OK" button, the corresponding data are loaded and you will be forwarded to the selection of the channel or transponder.



In the left column, all available channels are loaded according to the selected satellite from the database. The listing is in alphabetical order, the start of the list can be selected under the list by selecting the first letter. Alternatively, you can also enter a string (e.g. "HD") in the text box next to the letter sequence. In this case all the channels are listed that contain that search string in their names.

A-QAMOS-4CI

Part N°: 5102.81

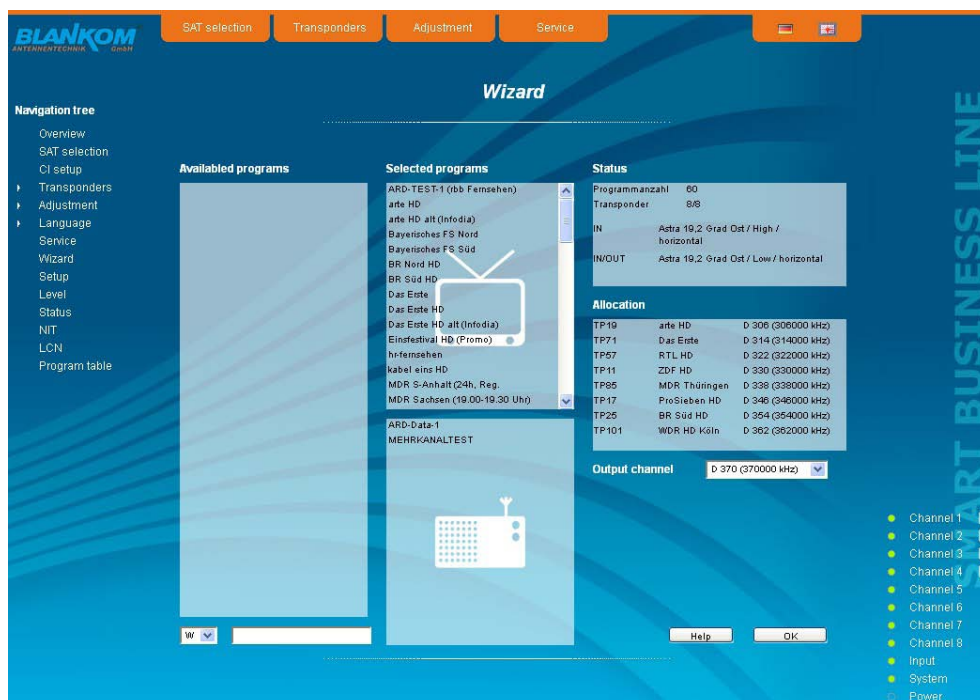
SAT-TV Transmodulator
DVB-S/ -S2 (8x QPSK/ 8PSK) → 4x CI → DVB-C (8x QAM)

A^{CE}
LINE

You select the output channel in the selection box right before the transmitter or transponder selection is made. The selection begins with channel S 21 and D 306 (306.00 MHz). But the channels of the entire frequency range of 45 ... 862 MHz can be chosen freely in the selected channel spacing (see chapter 7.3.8). From the channel list on the left you can select by double click the desired program, and thus the entire transponder (which contains this program), which is then transmitted in that output channel. After the selection all channels in this package will be listed in the middle list box. In the upper part the television programs are listed and in the lower part the radio programs. In the upper right list box status information will appear for the selected transponder. In the right list box below there is the list of already selected transponder to the output channel in which they are to be transmitted.



In this way, now up to 8 transponders per A-QAMOS-4CI can be selected to be transferred. First, as the output channel the next higher channel to the last selected program package is offered. But for each packet the output channel can be chosen freely in the total frequency range. If an incorrect selection is made, it can be removed by double-clicking the unwanted selected transponder in the right field .



Clicking on the "OK" button, the selection is accepted and set in A-QAMOS-4CI. The browser will be redirected to the home page (see chapter 7.3.1).

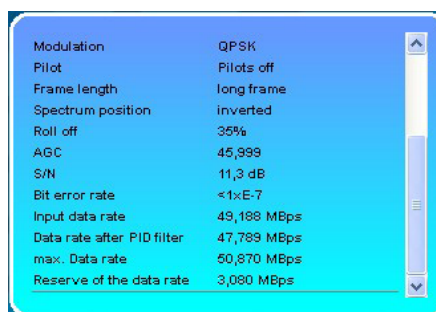
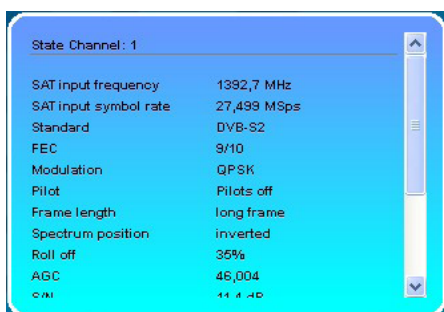
By a reopening of the wizards left in the navigation tree you can always do a complete reinitialization of the device. The changes will be accepted and set only by pressing the "OK" button. Additional or specific settings can be made by using the adjustment menus.

7.3 Settings of individual parameters

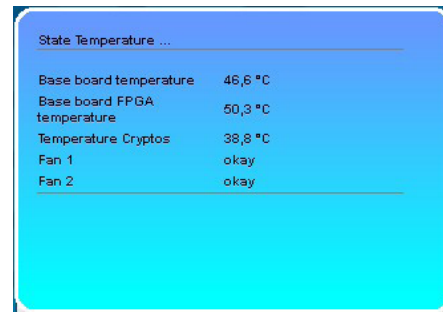
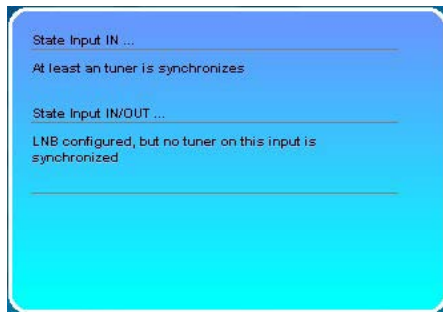
Using the web site, you can set certain parameters of the device or perform configurations on the device or the user interface. The various setting menus can be selected in the navigation tree on the left side. The setting is supported by an online help. Hovering the parameters by the mouse in the lower part of the site an orange colored text box appears with explanations for each parameter. By setting in the "Setup" menu (see chapter 7.3.8) it may be selected that the help appears in the status bar of your browser. If appropriate setting changes in the browser options are necessary.



In addition, in the lower part of the navigation tree status information for the device is displayed. By changing the setup menu, the status information can also be moved to the right (see also chapter 7.3.8). All 8 channels are listed individually. A green LED symbol before the "channel ..." means that both input and output are synchronized and that the channel operates without error. An orange colored symbol indicates that an error has occurred in that channel. An overview of the status of various parameters of the channel is obtained by clicking the corresponding channel. In the browser interface, a status overview appears.



A transparent LED symbol means that the channel is not programmed and set, or the RF output is turned off. Furthermore, we obtain the same way status information about the inputs and about the system parameters. In this case too an orange colored LED symbol displays an error state during which a green LED symbol displays error-free working condition. The detailed status information is available by clicking the name field.

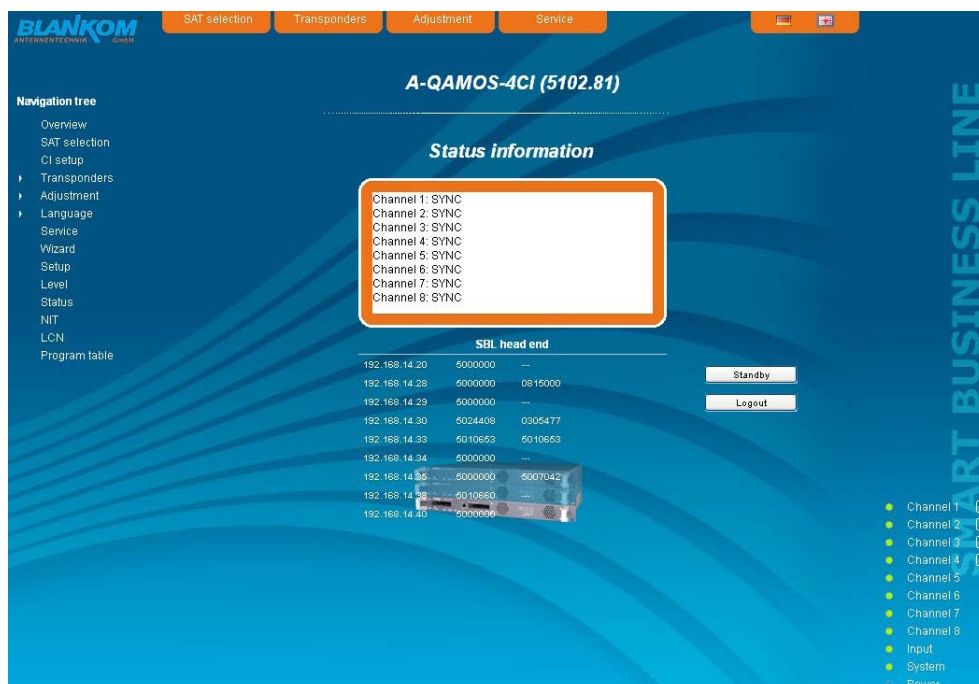


The last displayed point indicates the connection status between the network interface and the device. Green means that the connection is established. A transparent LED light indicates that there is no connection or the connection is failed.

Settings with the selection box or input fields are taken over by pressing the “send” button and stored permanently, and the A-QAMOS-4CI is set on these values after a restart too. Settings with the check box are usually performed immediately but not stored in memory, so they would be lost on a possible restart of the device. To save these settings the “send” button must be pressed. In all menus, the language selection is possible between German and English top right.

7.3.1 Menu “Overview”

This page provides a status overview of the 8 channels. If a channel is working without errors, “SYNC” is displayed. If errors occur you will see an “Error” display. If the RF power is switched off there is no display value behind the channel.



In addition, below the status window the head end display is visible. There all A-LINE-SBL and SBL devices are listed, which are in the same network and which have been associated to the head end in the setup menu (see 7.3.8). This is significant because functions over all devices such as the NIT processing between devices of the A-QAMOS and QAMOS product group can be extended to all components of the head end. The individual components of a head end are listed with their IP address, which is also provided with a link to this address, so you can switch easily to the next device. If no head end was configured, a “Search” button appears, which forwards to the setup menu and scans the network for other A-LINE-SBL and SBL devices. Then all available devices are listed and can be selected and added to the head end.

By clicking the “Logout” button the user logs out of the device and the login window appears. By pressing the “Standby” button the device is switched to standby, which is displayed by an amber POWER LED on the device. The “Standby” button will be replaced by an “ON” button, and by pressing this the device will be switched back on.

7.3.2 Menu "SAT selection"

In this menu you can make the choice of the satellites and the input configuration of the device. In the left part of the user interface there is the configuration menu of the input part.



The setting screen is divided into two sections "LNB Control" and "Program tables for", for the two satellite jacks 1 (IN) and 2 (IN/ OUT). The parameters of both sections can be adjusted separately with the "send" button below and then transferred. If the second sat jack (IN/ OUT) is configured as a loop-through output, or not used, then the input configuration parameters of the LNB control and program table are grayed out and not adjustable.

	IN	IN/OUT
Mode		Input
LNB control	On	On
DiSEqC	Off	Off
Satellite	A	A
Tonburst	Off	Off
22 kHz	On	Off
Voltage	18V	18V
	Scan	Scan
		Send
Program tables for		
Satellite	Astra 19.2 Degree	Astra 19.2 Degree
Band	High	Low
Polarization	horizontal	horizontal
		Send

Mode¹
LNB control

DiSEqC
Satellite²
Tonburst
22 kHz
Voltage

Satellite

Band
Polarization

selection of sat jack 1 (IN) and 2 (IN/ OUT)

selection: not used, input, output
selection: on, off (remote supply off completely),
unicable

selection: on, off
selection: A, B, C, D
selection: off, A, B
selection: on, off
selection: 13 V, 18 V

¹ only for sat jack 2 (IN/ OUT) adjustable

² only adjustable, if DiSEqC is on

selection: Astra 19,2° East, Eutelsat 13° East,
Eurobird 9° East

selection: Low, High
selection: vertical, horizontal

In the selection field "LNB control" the item "unicable" is available for both satellite ports. Thus, it is possible that before the respective satellite input a unicable module can be switched on then the transponder selection can be made according to the receiving equipment installed there. So it is possible, to assign up to 8 satellites levels (one or more satellites) to the unicable module. From this assigned levels the required transponders can then be selected and assigned.

Unicable

Input 1

Title: V/LowA 0

LNB Ozs.: 9750 0

Input 2

Title: V/LowA 0

LNB Ozs.: 9750 0

Input 3

Title: V/LowA 0

LNB Ozs.: 9750 0

Input 4

Title: V/LowA 0

LNB Ozs.: 9750 0

Input 5

Title: V/LowB 0

LNB Ozs.: 9750 0

Input 6

Title: V/HighB 0

LNB Ozs.: 10600 0

Input 7

Title: V/HighB 0

LNB Ozs.: 10600 0

Output frequency [MHz]	
User band 1	974 0
User band 2	1076 0
User band 3	1178 0
User band 4	1280 0
User band 5	1382 0
User band 6	1484 0
User band 7	1586 0
User band 8	1688 0

If the point "unicable" is selected for one or both satellite ports, the input mask is expanded by the unicable settings. If only one satellite port is set to unicable, the settings for the other port is disabled and grayed out. For an active unicable port the other settings are inactive and grayed out.

First for a maximum of 8 satellite accesses the input of the corresponding LNB oscillator frequency and a freely selectable name for each satellite level is done. This name is then found in the "Adjustment" menu (see also section 7.3.5) again, because in the case of unicable use, you have to enter the corresponding satellite level in the downlink frequency input field, that is identified by this name. Next, for the up to 8 resulting user bands the intermediate frequency must be entered, on which the unicable module converts the respective satellite transponder. These values, which are given in the documents of the unicable module, have to enter, then confirm by pressing the "send" button. The trouble-free functionality was tested using the SUS 4481 F unicable module of the company Spaun. For stable operation, we recommend using a separate power supply for these modules. Trouble-free operation can not be guaranteed when using other unicable assemblies.

If unicable is not used on an input port, in the right part of the GUI a table of available transponders, which is updated according to the selected satellite, band and polarization, appears. The transponders are listed by name, downlink frequency, sat-socket assignment and contained programs. This is based on an internal database with the current assignments of the satellite transponder positions Astra 19.2° East, Eutelsat 13° East and Eurobird 9° East.

If the transponder allocations should change, you can customize this table and even edit. By double-clicking the relevant transponder number you entry into the edit menu and can change the data accordingly.

Edit of the transponder

Transponder: TP95

Downlink: 12304 MHz

Symbol rate: 27500 kSps

Input: IN

Erase all programs of the tp. ☐

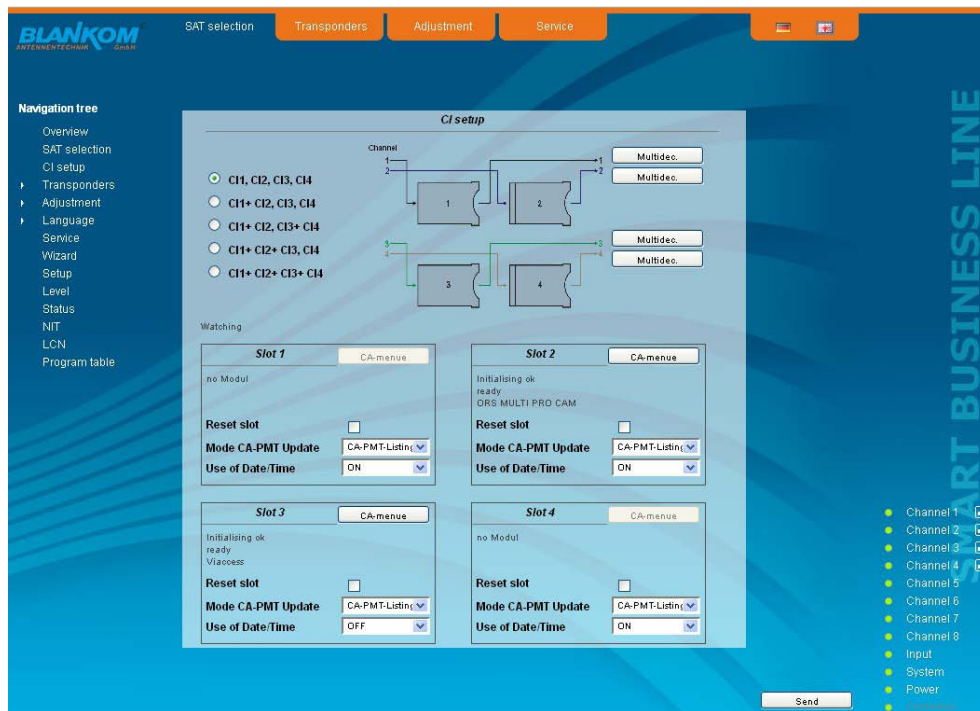
Save entries ☒

Append Erase Apply Cancel

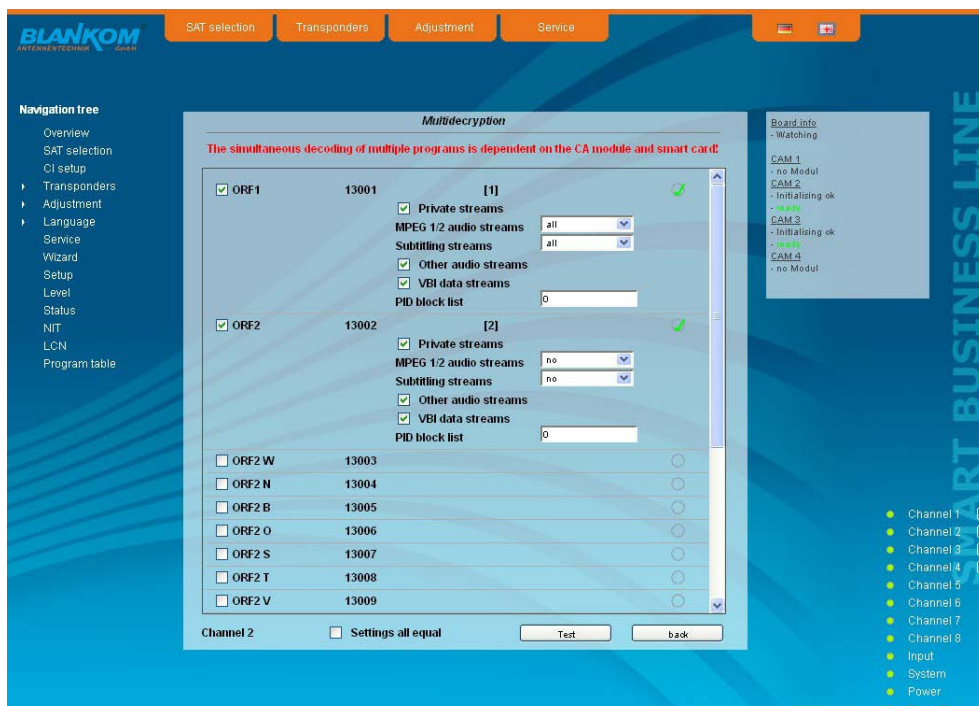
Existing entries can be changed or new ones are attached. By clicking the appropriate box the program list of the transponder can be deleted and changed or additions can be stored into the database permanently. If the box "Save entries" is not clicked, the changes will remain only as long as the user interface is open. With the next start of the user interface the changes are lost. In this simple way, the program data is kept up to date.

7.3.3 Menu "CI setup"

In this menu there is the configuration of the Common Interfaces of the device. The A-QAMOS-4CI has 2 double-CI slots for a maximum of 4 CA modules. The modules can be cascaded, i.e. a transport stream can be routed through one up to a maximum of every 4 modules for decryption of services. For this reason, initially there is the decryption configuration, i.e. it determines which transport stream is passed through that module. In principle, set the transponder with the services to be decrypted on the channels 1...4, since only these can be routed by the CA modules. First you select the pathway of transport streams of the 4 channels. The first selection point is, channel 1 to be passed through module 1, ..., channel 4 to be passed through module 4. Next, you can route channel 1 through module 1 and then through module 2, channel 3 through module 3 and channel 4 through module 4 and channel 2 through no module. Correspondingly are the other possibilities. For better illustration of the signal path it is displayed on the right side of the select box graphically. Did you choose the right setting, so this is to confirm by pressing the "Send" button that you can perform all other settings for each module.



After the selection above one can make the multi-decryption settings for each signal path through one or more CA modules, if necessary. For this purpose the "Multidec" button is to press and leads to the following menu:



In this menu all services of the adjusted transponder and their CA status are listed. If you want to make adjustments or changes first the "Refresh" button must be activated to get the current transponder allocation. The services are selectable for decryption. For each of this selected services one can determine, what streams or PID's are to be decrypted. That's important because the maximum number of the decryptable PID's is limited and this limit has a different size per CA module.

In the selection boxes "MPEG 1/2 Audio Streams" respective "Subtitling Streams" all, no or individual streams are selectable. If one wants to select more than one stream, but not all, the selection field "all" in the box is to be selected and in the column "PID block list" all PID's have to be entered, that shall not be decrypted.¹

In the column "PID block list" all PID's are listed, that shall not be decrypted. The PID's can be given in decimal or hexadecimal format and have to be separated by a semicolon. The maximum number of PID's is 10.² If "Settings all equal" is clicked, only one service for PID selection is offered and the taken settings are automatically transferred to all other services to be decrypted.

By clicking the "Test" button the CA module will be initialized and all services, which are saved in the CA-service-list, will be tested for the current decryption status. After the end of the test the result of the test appears on right side, where a green check mark means, that the test was successful. On the other hand a red cross means that the test was not successful and the requirements for this service must be corrected, e.g. too much PID's were selected.

¹ "Other Audio Streams" includes all AC3-, DTS- and AAC-Streams. "Private Streams" selects all streams which are not captured by the other selection fields.

² Particularly PID's can be given here, which are active only at times and no authorisation for decryption is available for them.

The default is that the table editing (SDT, PMT, EIT) is performed. Thereby the CA descriptor 0x09 will be replaced in the PMT through the user-defined descriptor 0xFE. If this descriptor is already used by the service provider, in the "Setup" menu and then "GUI settings" (see section 7.3.8), the field "Tag selection (for decoded pid)" must be enabled. Thus, the option "DVB tag (decoded TS)" also appears in multidecryption menu at each service. At this point, a user-defined descriptor from the range of 0x00 to 0xFF will be selected. It should be noted that this descriptor is not already used in the service.

ORF1 13001 [1]

☒ Private streams

MPEG 1/2 audio streams all

Subtitling streams all

☒ Other audio streams

☒ VBI data streams

PID block list 0

DVB tag(decoded TS) 0xfe

After returning from the multidecryption menu each of the 4 CA modules can be configured. Per slot is shown here that the module is initialized, if there is readiness for work and which type of module it is.

Slot 2 CA-menu

Initialising ok
ready
ORS MULTI PRO CAM

Reset slot ☐

Mode CA-PMT Update CA-PMT-Listing

Use of Date/Time ON

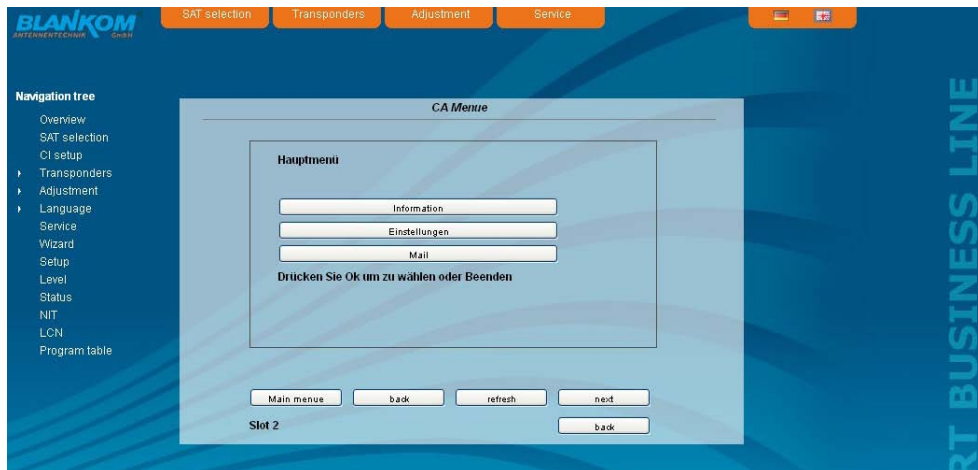
Individual CA modules must be initialized before setting the CA services. For this purpose the box "Reset slot" is clicked.

The mode of the CA-PMT update will be adjusted on the next line. You can select between CA-PMT list and CA-PMT entry, where the latter is not supported by all CAM's.

Some CA modules require the resource "Date & Time" for initializing. For all other modules this setting should be disabled.

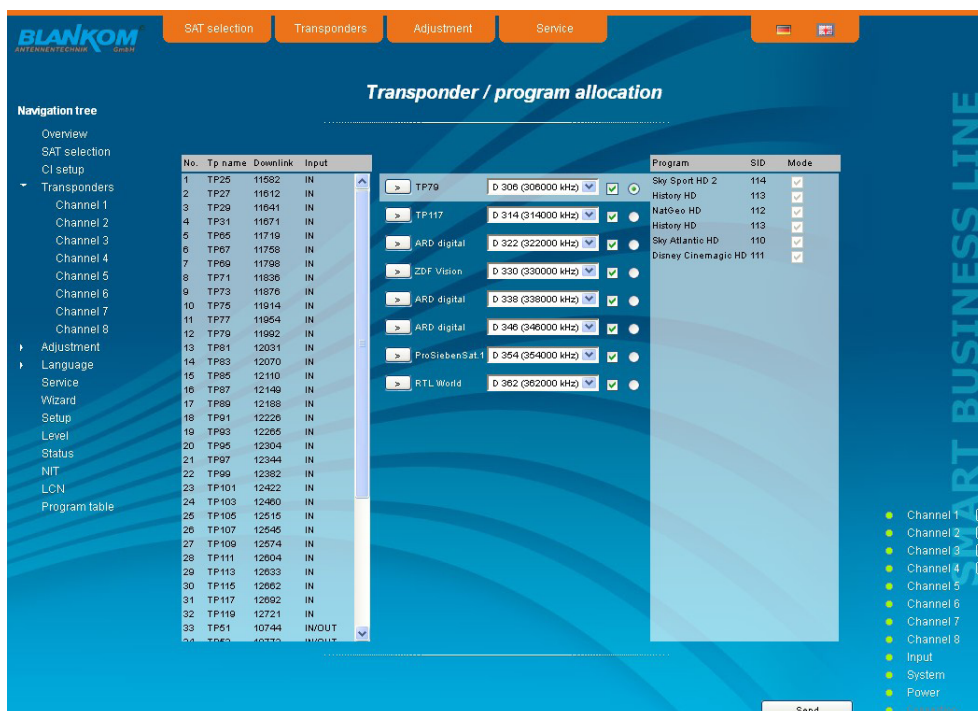
Click the button above right to get into the CA menu. There, the menus implemented in the CA module are offered the user. The menus can be selected individually or sequentially accessed in order to make necessary adjustments or to retrieve information to the CA module.

It should be noted that when changes in the channel (e.g. transponder switching, CA module change or removal) are done, the full menu has to be passed through to update the internal tables. For this purpose, as described above, first the necessary changes in the signal path are to determine and then call the multidecryption menu for the affected channels. First there must be called again the channel list by pressing the "Refresh" button, and then the appropriate stream selection must be made. This is also necessary if a module has been removed and a free transponder is to be transmitted in this channel. Finally, in the "CI setup" the change is to confirm by pressing the "Send" button that this is also taken internally.



7.3.4 Menu "Transponders"

In this menu, the transponder selection, and so the program selection too, is done for all output channels. The user interface is divided into three tables. To the left there is the list of the selectable satellite transponders. This list results automatically from the selected satellite setting (see chapter 7.3.2). The transponders are listed with their name, the downlink and the input allocation. In the middle there is the current transponder allocation of the 8 channels, where on left side there is the selected satellite transponder and on right side there is the corresponding output channel. Outside right next to the output channel there are two selectors: with the first the RF signal of the respective channel is turned on or off, with the second you can select one of the 8 channels for setting. In the right table, the television and radio programs, that are transmitted on the selected channel, are listed with their name and service ID.



To make changes, you must first select the desired channel. This is done either by clicking the appropriate selector outside right next to the output channel in the middle of the channel list or by clicking "Channel" in the navigation tree on the left side, which is listed as a point of the menu "Transponders".

If you want to change the input settings, one marked the first desired transponder with a single click in the left table. By pressing the button ">" left next to the input transponder in the middle of this overview, the transponder is adopted into the channel. At the same time the channel assignments associated with the service ID and filter check box is listed in the right table. With this box you can select which channels of the transponder are transmitted and which are filtered out of the package. To transmit a program, it must be selected in that box. If you want to change the output channel, so you click the select box in this channel and selects the desired output channel. On double assignments within these 8 channels is called attention to this automatically. Clicking the "Send" button, the settings are taken and stored.

7.3.5 Menu "Adjustment"

In this menu, the settings of the device are made. Each channel can be adjusted individually according to individual requirements. The channel selection may be either left in the navigation tree or above the set-up tables.

The following parameters are adjustable:

Input	
Transponder	TP79
Input	IN/OUT
Downlink	11992 MHz
Symbol rate	27500 kSps

Input

input parameters of the channel

Transponder
Input
Downlink¹

name of the transponder, editable
selection of the satellite input: IN, IN/ OUT, player
input in MHz, if unicable is used, selection of
the satellite level additionally (see chapter 7.3.2)
input in kSps

Symbol rate¹
¹ not adjustable, if input is "player"

Output	
Frequency input	Channel
Output frequency	D 306 (306000 kHz)
Output level offset	0 dB
QAM constellation	256
Symbol rate	6900 kSps
RF signal	On
Spectrum position	normal
Mode	Transcoder
QAM standard	DVB-C (Annex A)

Output

output parameters of the channel

Frequency input
Output frequency
Output level offset
QAM constellation
Symbol rate
RF signal
Spectrum position
Mode
QAM standard

selection: channel, frequency²
selection from channel table/ input in kHz²
display of the level offset³
selection: 16, 32, 64, 128, 256 QAM
input in kSps
selection: on, off
selection: normal, inverted
selection: Transcoder, Test signal, Test level
DVB-C/ ITU-T J.83 Annex A (fixed)

² If selected at the frequency input "channel", so you can select the output frequency in the pre-selected channel spacing (see chapter 7.3.8). If, however, at the frequency input "frequency", then the output frequency is selectable in kHz steps.

³ Adjustment of the offset of each channel to the basic level, see chapter 7.3.8

Transport stream processing	
SDT processing	Off
Original network ID	0
Original transport stream ID	0
NIT processing	Off
Network name	no name
Network ID	0

Transport stream processing

SDT processing
Original network ID
Original transport stream ID

selection: on, off
adjustment range: 0...65535
adjustment range: 0...65535

NIT processing
Network name
Network ID

selection: on, off
name of the network (max. 30 characters)
adjustment range: 0...65535

CAT processing

CA system ID

Operator ID

LCN processing

Standard SD

CAT processing
CA system ID
Operator ID

selection: on, on with CA filter, off
 adjustment range: 0...65535
 adjustment range: 0...65535

LCN processing
Standard SD

selection: on, off
 selection: IEC 62216, NorDig (V1)

If the LCN processing was turned on, you can switch to LCN editor by pressing the "Editor" button to make the necessary adjustments (see chapter 7.3.12).

In the table "Program filter", the program filter function of the channel can be executed. If the program filter is turned off, all programs of the received transponder can be transmitted. At the left of the overview all programs with the associated service ID are listed. To the right is one check box to tag the program. In the right part of the overview there is the selector of the filter activation at the top. In the second box "Filter mode", you choose whether the selected channels are blocked or allowed to pass. In the box "Information of other transponders", it may be selected if additional information about SDT data from other transponders, which are transferred in the data stream under the "Other", are filtered out or are transmitted. Possible EPG information from other transponders, which can also be transferred under the "Other" in the data stream, are always transmitted with. With the first of the 4 buttons right below the current program list can be loaded, the other 3 are used to simplify the selection of the program list

Program filter

Program	Service ID	Select
RTL Television	12003	<input checked="" type="checkbox"/>
RTL Regional NRW	12004	<input checked="" type="checkbox"/>
RTL HB NDS	12005	<input checked="" type="checkbox"/>
RTL FS	12006	<input checked="" type="checkbox"/>
RTL2	12020	<input checked="" type="checkbox"/>
RTL Living	12030	<input type="checkbox"/>
SUPER RTL	12040	<input type="checkbox"/>
SUPER RTL CH	12041	<input type="checkbox"/>
VOX	12060	<input type="checkbox"/>
RTLNITRO	12061	<input type="checkbox"/>
Channel 21	12080	<input type="checkbox"/>
n-tv	12090	<input type="checkbox"/>
Channel 21 ALT	12095	<input type="checkbox"/>

Program filter

Filter mode

Information of other transponders

7.3.6 Menu "Language"

In this menu, the selection of the user interface language is executed. You can choose between German and English. The transition can be made either to the left in the navigation tree in the subtree of the point "language" or top right of the language selection box.

BLANKOM SAT selection Transponders Adjustment Service

A-QAMOS-4CI (5102.81)

Navigation tree

- Overview
- SAT selection
- CI setup
- Transponders
- Adjustment
- Language
 - german
 - english
- Service
- Wizard
- Setup
- Level
- Status
- NIT
- LCN
- Program table

Status information

Channel 1: SYNC
 Channel 2: SYNC
 Channel 3: SYNC
 Channel 4: SYNC
 Channel 5: SYNC
 Channel 6: SYNC
 Channel 7: SYNC
 Channel 8: SYNC

SBL head end

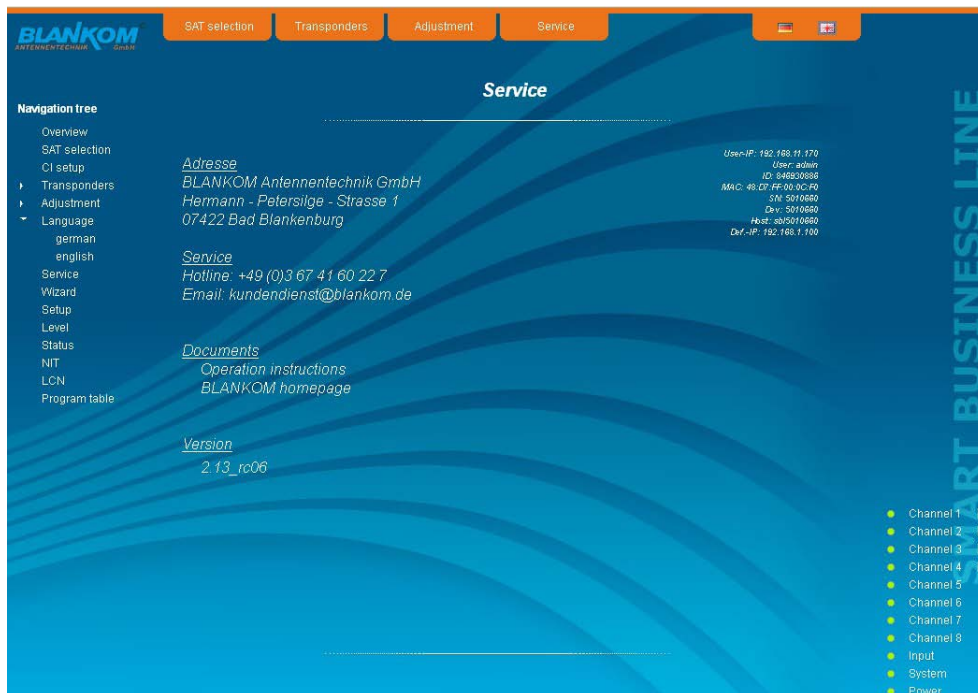
192.168.14.130	5000005	5000819
192.168.14.131	5000002	5000816
192.168.14.132	5000003	5000817
192.168.14.133	5000001	5000815
192.168.14.134	5010853	5010853
192.168.14.135	5007462	0000000
192.168.14.139	5010860	...

SMART BUSINESS LINE

- Channel 1
- Channel 2
- Channel 3
- Channel 4
- Channel 5
- Channel 6
- Channel 7
- Channel 8
- Input
- System
- Power

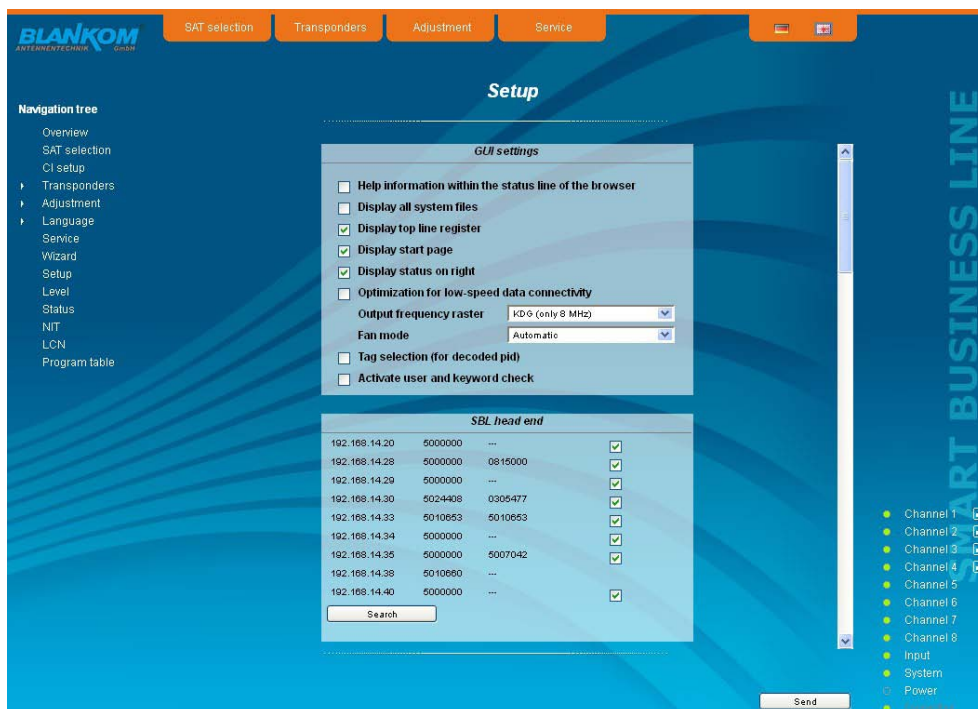
7.3.7 Menu "Service"

In this menu you will find all information about the service for the A-QAMOS-4CI in particular the BLANKOM service hotline and the service email address. In addition, the implemented operating instructions may be downloaded or viewed as PDF. If there is an internet connection the BLANKOM homepage can be started, offering the latest software release or descriptions. Finally, the currently installed software release is displayed.



7.3.8 Menu "Setup"

In this menu, various administrative and system settings are made.



Specifically, the following can be configured:

GUI settings

Help information within the status line of the browser

By default, the online help is displayed in an orange text box at the bottom of the page. If you click this option, the help texts are displayed in the status bar of your browser. Depending on your browser sometimes such use has to be allowed in the browser settings.

Display all system files

The default is, that the system files can be subjected to upload or download as a package under "Backup" in the submenu "System administration". By clicking this box, the system files are listed individually and can be individually subjected to an up or download.

Display top line register

By default, the registers are shown in the upper part of the user interface, to move more quickly to the most frequently used menus. By removing the box marking the registers are hidden.

Display start page

The default is to start with the menu selection by the command buttons after every restart of the user interface (see chapter 7.1), where you can select the desired setup menu. If this item is disabled, this page will be skipped and you reach instantly the "Overview".

Display status on right

By clicking the box, the status of the channels or the system is shifted to the right of the user interface.

Optimization for low-speed data connectivity

By clicking the box the data volume of the browser pages is greatly reduced. So it is possible to adjust the device, if there is only a low-speed connectivity (GSM). The restrictions are: there are no wizard and no program respective transponder lists. Furthermore, the size of all pictures is reduced.

Output frequency raster

With this selection box you can set the output channel spacing, which is pre-set for adjustment of the QAM channels. To choose there are the standard B/G raster, the standard G raster (continuous 8 MHz) and the channel spacing of the cable company Kabel-Deutschland-Gesellschaft (KDG).

Fan mode

This selection field you can specify whether the internal fans of the device are be operated in accordance with the implemented control or whether they permanently are on.

Tag selection (for decoded pid)

By click there is the possibility that in the PMT processing the CA descriptor is replaced by a self-selected user-defined descriptor of the range 0x00 .. 0xFF. The default value is 0xFE (see Section 7.3.3)

Activate user and keyword check

This selection is only available if you are logged in as administrator. If the box is disabled, the log-in is skipped after each GUI reboot. Otherwise, user login and password are required (see chapter 7.1).

IP address	SBL ID	SBL head end ID	
192.168.14.130	5000005	5000819	<input checked="" type="checkbox"/>
192.168.14.131	5000002	5000816	<input checked="" type="checkbox"/>
192.168.14.132	5000003	5000817	<input checked="" type="checkbox"/>
192.168.14.133	5000001	5000815	<input checked="" type="checkbox"/>
192.168.14.134	5010653	5010653	<input checked="" type="checkbox"/>
192.168.14.135	5007462	0000000	<input checked="" type="checkbox"/>
192.168.14.139	5010660	...	<input type="checkbox"/>
192.168.14.155	5010642	...	<input type="checkbox"/>

Search

SBL head end

All A-LINE-SBL and SBL devices, which are located in the same network, are listed. By pressing the "Search" button the list is updated. All marked devices belong to the head end are displayed on the "Overview" page.

A-QAMOS-4CI

Part N°: 5102.81

SAT-TV Transmodulator
DVB-S/ -S2 (8x QPSK/ 8PSK) → 4x CI → DVB-C (8x QAM)

A^{CE}
LINE

Oscillator frequency of LNB

Low	<input type="text" value="9750"/>	MHz
High	<input type="text" value="10600"/>	MHz
Changeover frequency (Downlink)	<input type="text" value="11550"/>	MHz

Oscillator frequency of LNB

Low

input of the Lo-frequency for receiving of the low band (in MHz)

High

input of the Lo-frequency for receiving of the high band (in MHz)

Changeover frequency (Downlink)

input of the frequency for point of entry from the low into the high band (in MHz)

System administration

	SBL to PC	PC to SBL
Backup	<input type="button" value="Save"/>	<input type="button" value="Load"/>
Update		<input type="button" value="Load"/>
<input type="button" value="View logbook"/>		

System administration

The default is displaying of the shortened list of files (top).

Backup

Here the system files can be loaded or saved as a package (except Logbook and Status). Thus, it is possible, for example to copy the system files from an A-QAMOS-4CI to another. If under "GUI setup" "Display all system files" is selected, the system files can also be loaded or saved separately (see figure below). Moreover, additional system files can be added (e.g. other satellite assignments).

Software Update

By clicking the "Load" button, the internal software components can always be brought up to date.

System administration

	SBL to PC	PC to SBL
Backup	<input type="button" value="Save"/>	<input type="button" value="Load"/>
Update		<input type="button" value="Load"/>
Transponder config.	<input type="button" value="Save"/>	<input type="button" value="Load"/>
SBL configuration	<input type="button" value="Save"/>	<input type="button" value="Load"/>
Language	<input type="button" value="Save"/>	<input type="button" value="Load"/>
SBL system	<input type="button" value="Save"/>	<input type="button" value="Load"/>
NIT configuration	<input type="button" value="Save"/>	<input type="button" value="Load"/>
Logbook	<input type="button" value="Save"/>	
Status	<input type="button" value="Save"/>	
astra.xml	<input type="button" value="Save"/>	<input type="button" value="Load"/>
eutelsat.xml	<input type="button" value="Save"/>	<input type="button" value="Load"/>
eurolbird.xml	<input type="button" value="Save"/>	<input type="button" value="Load"/>
<input type="button" value="View logbook"/>		<input type="button" value="Delete"/>
<input type="button" value="Append"/>		

Pressing the button "View logbook" leads to an overview, in which all the processes have been documented since the start of the GUI. Each operation is listed by date, time and description. If operations have been executed, the logged on user, who initiated the action, is saved too. By pressing of the "Erase" button all entries are deleted, when you are logged in as administrator.

BLANKOM ANTENNENTECHNIK GMBH

SAT selection Transponders Adjustment Service

Logbook

Navigation tree

- Overview
- SAT selection
- CI setup
- Transponders
- Adjustment
- Language
 - german
 - english
- Service
- Wizard
- Setup
- Level
- Status
- NIT
- LCN
- Program table

26.11.2012,07:26:22;set_language,to 0, user: 0
26.11.2012,07:28:01;Setup_TTag_selection_(for_decoded_pid)_On (1)
26.11.2012,07:28:07;MultiEdit,2,2
26.11.2012,07:28:59;set_language,to 1, user: 0
26.11.2012,07:30:02;set_language,to 1, user: 0
26.11.2012,07:31:46;CdDlg,1,2
26.11.2012,07:31:46;XMLSerializer
26.11.2012,07:31:46;store;cam
26.11.2012,07:32:35;set_language,to 0, user: 0
26.11.2012,07:41:59;set_language,to 1, user: 0
26.11.2012,07:42:39;Basicmode_EIN (1)
26.11.2012,07:42:57;Basicmode_AUS (0)
26.11.2012,07:45:18;set_language,to 0, user: 0
26.11.2012,07:45:26;set_language,to 1, user: 0
26.11.2012,07:45:30;Basicmode_EIN (1)
26.11.2012,07:45:45;set_language,to 0, user: 0
26.11.2012,07:46:15;Basicmode_AUS (0)
26.11.2012,07:46:42;set_language,to 1, user: 0
26.11.2012,07:48:23;set_language,to 0, user: 0
26.11.2012,07:49:30;set_language,to 1, user: 0
26.11.2012,07:50:35;set_language,to 0, user: 0
26.11.2012,07:51:19;Programmfilter_1[EIN (1)
26.11.2012,07:51:27;check_[2]different lists IN<->OUT
26.11.2012,07:51:43;Programmfilter_2[EIN (1)
26.11.2012,07:53:30;set_language,to 1, user: 0
26.11.2012,07:54:43;set_language,to 0, user: 0
26.11.2012,07:55:44;set_language,to 1, user: 0
26.11.2012,07:56:49;set_language,to 0, user: 0
26.11.2012,07:58:32;set_language,to 1, user: 0
26.11.2012,07:59:37;set_language,to 0, user: 0
26.11.2012,08:00:45;set_language,to 1, user: 0
26.11.2012,08:01:50;set_language,to 0, user: 0
26.11.2012,08:02:22;Setup_Benutzer-_und_Passwort-Prüfung_On (1)
26.11.2012,08:02:27;Setup_Systemdateien_anzeigen_On (1)
26.11.2012,08:02:55;set_language,to 1, user: 0

Channel 1
Channel 2
Channel 3
Channel 4
Channel 5
Channel 6
Channel 7
Channel 8
Input

System

Location

System

Location

In this field a name for the A-QAMOS-4CI is made to identify the device easily. This name appears on the top right of the website under the language selection box and is provided via SNMP with the question of the field: Iso(1)org(3).dod(6).internet(1).mgmt(2).mib.2(1).system(1).sysLocation(6).

Logout

restart the user interface

Default

delete the settings and reset to default values (including IP address), available only if you have logged in as administrator

Reboot

restart of the A-QAMOS-4CI

Date and time

26.11.2012 08:14:11

Date and time

Clicking the "Set" button, the date and time will be set to that of the PC.

Enabling of

SNMP
enh. NIT
Multiplexer
Player

Enabling of

In this field, possible software options for the A-QAMOS-4CI can be enabled. The registration code must be entered in the input field and by pressing the "Send" button the option will be activated. Activated options are displayed in black, inactive are grayed out.

Web server

DHCP

IP number 192 168 14 139

IP subnet mask 255 255 255 0

Gateway 192 168 14 254

DHCP from 192 168 1 1

DHCP to 192 168 1 99

Web server

This setting appears only when you are logged in as administrator, so also have the authority to make administrative changes.

The A-QAMOS-4CI supports the DHCP functionality. DHCP-Client is factory default. Note, that after each factory reset the A-QAMOS-4CI is set to "DHCP-Client".

If the **DHCP functionality** is set to "Off", in the appropriate fields the IP number, subnet mask and gateway can be manually entered and then the settings of the A-QAMOS-4CI are adapted to the network.

Web server

DHCP

IP number 192 168 14 139

IP subnet mask 255 255 255 0

Gateway 192 168 14 254

DHCP from 192 168 1 1

DHCP to 192 168 1 99

If the device is set as "DHCP-Client", it automatically obtains an IP address from the DHCP server on the network. The manual network settings are grayed out and are therefore disabled.

DHCP

IP number 192.168.14.139

Subnet mask 255.255.255.0

Gateway 192.168.14.254

By pressing the "Info" button the automatically assigned network configuration of the device is displayed.

Web server

DHCP

IP number 192 168 14 139

IP subnet mask 255 255 255 0

Gateway 192 168 14 254

DHCP from 192 168 1 1

DHCP to 192 168 1 99

Please note if the device is set as "DHCP-Server", that the IP address 192.168.1.100 should not be set. If you select this address, you will get an error message. In addition to the IP settings you can configure the DHCP range from which the IP addresses of the connected clients are assigned. The address range must match the address range according to IP address and subnet mask of the server and should not be too small. The default is the area 192.168.1.1 to 192.168.1.99. Additionally with the DHCP server will also set up a local DNS (Domain Name Server). To use it in full extent a connected PC/ laptop must be configured as a DHCP client. Please note, that the client unit not only get its IP address from the DHCP server, but also its DNS server.

If the device is configured as a DHCP server or client and the client has received an IP address successfully, so the device can be accessed via a web browser with a name. This name is composed of the prefix "sbl" and the device number that is printed on the back of the device and on the packaging. For example, the device with the number 0123456 is called under "sbl0123456". Should there be problems with it among the local network conditions, the domain can be added. In the case that the above device is configured as a server, the call using the domain is then "sbl0123456.sbl". If another DHCP server is used, ask your administrator for the domain name.

An example of the simplification of the configuration or operation of the head end via DHCP, is, that an A-LINE-SBL device is as a server, the remaining devices and the connected PC/ laptop are configured as a client. By calling the browser "dhcp.sbl" the GUI of the server device is loaded. If not already done so, now the head end can be read. So all connected components are found and listed. The head end can now be stored in the "Setup" menu under the item "System administration". The head end overview can be changed quickly to the user interface of any other device by selecting the respective devices links.

There up to 256 IP addresses to receive the traps can be created or enabled. These are listed under "Receiver IP". Below, the events can be configured, whether and partly with what thresholds they should trigger traps. There are three ways to configure a trap:

- without parameters, e.g. fan on/ off
- with a freely selectable parameters for a medium priority
- with a selectable parameter from a list for a medium priority

Player file system		
Name	Description	MByte
5100_02-91_0	---	1167
<div>Upload file</div>		

Player file system

displays the stored files in media player with file name, description and file size

The media player is only available after activation of the media player software option. It offers the opportunity to install a file from a PC/ laptop to the A-LINE-SBL device via network. The file must be available in a transport stream format that corresponds to the DVB standard. The data rate of the whole data stream must be constant and shall not exceed 40 Mbit/s. The content of the data stream can be single or multiple transport streams (SPTS or MPTS). To create a transport stream file the free software ffmpeg is recommended (www.ffmpeg.org).

To upload the file you select the menu item "Setup". In the section "Player file system" the uploaded file is already displayed with their name, description and file size in kilobytes. To upload or change the transport stream file, click the button "Upload File". In the following dialog you select a file and can optionally specify a text description for this file. **Note, that neither in the file name nor in the text description are umlauts or special characters.** By clicking the "Upload" button, the previously selected file is transferred to the A-LINE-SBL device. A previously existing file is automatically deleted. For the time of file uploads the GUI is locked. A dialog shows the progress in percent. If necessary, the file upload may be aborted by pressing the "Cancel" button. Subsequently, the file can be used as input to any output channel. Do this, select as the input the entry "player" in the channel settings, item "Input", and confirm your settings by clicking the "Send" button (see chapter 7.3.5).

To produce a transport stream file in the appropriate format, the company BLANKOM provides a corresponding conversion tool. This may generate a corresponding file in the transport stream format, which the A-QAMOS-4CI can handle. A detailed description of the conversion tool can be found in chapter 9.

7.3.9 Menu "Level"

With the top box, the loop through output (loop) is enabled or disabled. If enabled, the underlying selection of the nominal level for all 8 channels may be set in the range from 62 ... 82 dB μ V. If the loop is disabled, the output level of the 8 channels may be set in the range of 74 ... 94 dB μ V. Below it each channel can be set individually with an offset of +3 ... -6 dB in 0.5 dB steps. The three lower buttons are used to simplify the offset level setting if you want to perform same adjusting for all 8 channels. With the left button the offset for all 8 channels is increased by 0.5 dB, decreased with the right button by 0.5 dB. The offset is set for all 8 channels to 0 dB with the middle button.

Output level

Loop output ☒

Nominal level 82 dB μ V

Offset

Channel	Offset	Unit
Channel 1	0	dB
Channel 2	0	dB
Channel 3	0	dB
Channel 4	0	dB
Channel 5	0	dB
Channel 6	0	dB
Channel 7	0	dB
Channel 8	0	dB

all + all = 0 all -

Send

7.3.10 Menu "Status"

It presents an overview of the status of the various components per channel, which is updated every 5 seconds. It lists only the current values, the naming of the parameter appears in the help box in the lower part of the user interface or in the status bar of the browser (as adopted configuration), if you hover the mouse cursor above the parameter.

Status table

	Channel: 1	Channel: 2	Channel: 3	Channel: 4	Channel: 5	Channel: 6	Channel: 7	Channel: 8
Frequency	1363.7 MHz	2092.5 MHz	1236.7 MHz	2092.5 MHz	1821.7 MHz	1665.7 MHz	1946 MHz	1587.7 MHz
Bitrate	27,500 Mbps	21,069 Mbps	27,500 Mbps	21,069 Mbps	27,500 Mbps	27,500 Mbps	22.0 Mbps	27,500 Mbps
DVB-S	DVB-S	DVB-S	DVB-S	DVB-S	DVB-S	DVB-S	DVB-S	DVB-S
QPSK	QPSK	QPSK	QPSK	QPSK	QPSK	QPSK	QPSK	QPSK
Inverted	inverted	inverted	inverted	inverted	inverted	inverted	inverted	inverted
SNR	35%	35%	35%	35%	35%	35%	35%	35%
LCN	10.0 dB	13.9 dB	11.5 dB	13.9 dB	14.0 dB	12.5 dB	14.0 dB	11.5 dB
Power supply	<1xE-7	<1xE-7	<1xE-7	<1xE-7	<1xE-7	<1xE-7	<1xE-7	<1xE-7
Base board temperature	39.015 MBps	33.790 MBps	38.015 MBps	33.791 MBps	38.015 MBps	38.015 MBps	33.791 MBps	38.015 MBps
Base board FPC temperature	36.599 MBps	31.060 MBps	35.068 MBps	30.134 MBps	25.192 MBps	35.057 MBps	31.063 MBps	36.854 MBps
Temperature Crypto	50.870 MBps	50.870 MBps	50.870 MBps	50.870 MBps	50.870 MBps	50.870 MBps	50.870 MBps	50.870 MBps
Fan 1	14.300 MBps	18.009 MBps	15.811 MBps	20.735 MBps	25.877 MBps	15.812 MBps	18.008 MBps	14.015 MBps
Fan 2	all ok [1]	all ok [2]	all ok [3]	all ok [4]				
Power supply								
Input IN								
Input IN/OUT								

Send

7.3.11 Menu "NIT"

The NIT processing for all to a head end associated devices of the A-QAMOS- and QAMOS product group can be done in 2 ways: as an automatic or manual NIT processing. The simplest and by installation and support expense safest way is the automatic NIT processing. The precondition is that all to the head end associated above mentioned devices have a different IP address and an Ethernet switch must be connected to each other so that the data exchange can take place automatically. The NIT settings must be made here only in one of the above mentioned devices of the head end and after confirmation they are automatically included of all other devices. The Ethernet connection among each other is not necessary for the manual NIT processing, but the settings must be made or maintained separately **in each device** of the head end, which means a much higher expense.

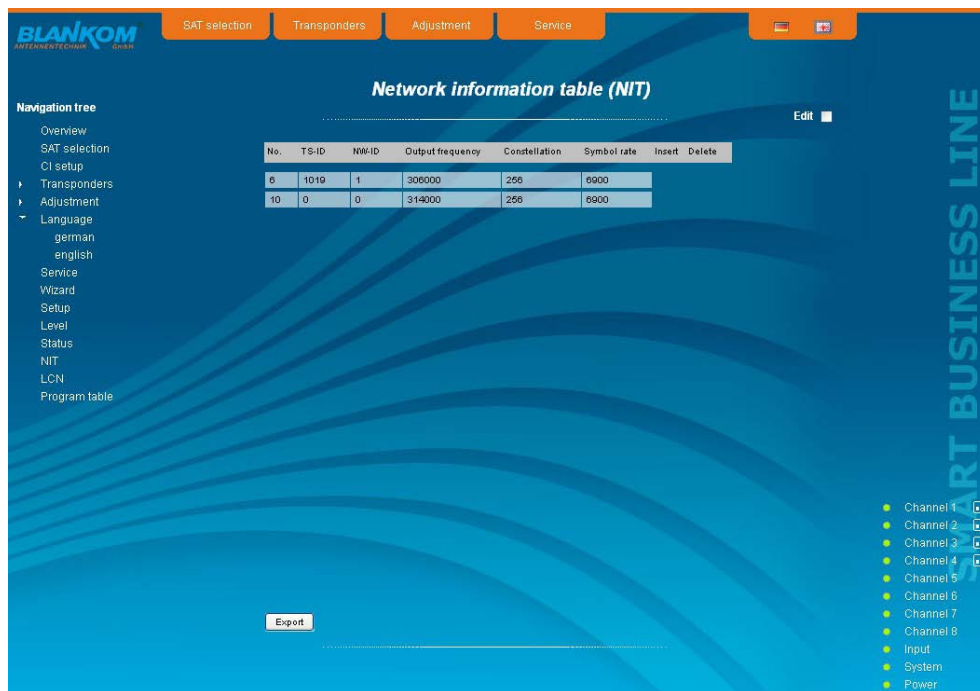
To start the NIT processing it is first necessary to put together the head end in the user interface. At first in the menu "Setup" (see chapter 7.3.8) at the point "SBL head end" the "Search" button is to press. Alternatively, you can press the "Read" button in the menu "Overview" (see Section 7.3.1) under the item "SBL head end" overview in the case of factory setting. First all devices of the A-QAMOS- and QAMOS product group are listed that are within the network. If there is no network connection between the mentioned devices (the case of manual NIT processing), here only this one device appears on which the settings are being implemented. The next step, all mentioned devices are selected, which should belong to the head end (in the case of the manual NIT processing the device itself) and the selection has to be confirmed with the "send" button. In the case of an automatic NIT distribution now the data of all selected devices are exchanged. Further adjustments must be performed only in one device and be adopted by all the other automatically.

In the case of a manual NIT processing this step must be implemented **in each device** of the head end. The data of the other devices must be taken manually in each device, as explained in subsequent chapters.

7.3.11.1 Automatic NIT processing

As explained above, all devices of the A-QAMOS- and QAMOS product group of the head end must be connected over an Ethernet switch for automatic NIT processing. The creation or editing of the NIT settings must only be done on one device of the head end and is then applied from all other devices automatically.

It presents the last created NIT table of the whole head end with continuous listing of the following parameters: transport stream ID, original network ID, output frequency in kHz, QAM constellation, symbol rate in kSps, insert and delete fields. A characteristic of the automatic NIT processing is that all channels of the devices are listed in frequency-ascending blue colored table cells. If the first time an NIT is created, a list appears with no table entries. The loading or update of the NIT is then in edit mode. By clicking the "Export" button, the NIT of the head end is saved as a .xml-file on the PC. In the editing mode this settings can be changed.



By clicking the box "Edit" in the top right of the user interface you can switch to edit mode and edit the NIT entries. With the "+" button, an entry will be added. The settings of the last table entry are accepted and must be adjusted accordingly. With the "Delete" button the table entry is removed. Also in this mode, you can save the NIT of the device with the "Export" button as .xml-file on the PC. By clicking the "Import" button, another NIT can be added, which was previously stored as a .xml file on the PC. In this way its easy possible to create a NIT of a system with multiple devices of the A-QAMOS and QAMOS product group. In the NIT processing all the selected table entries are included.

In the lower part of the GUI it appears additionally an overview of the settings for the NIT processing of all the channels of the head end. Here the NIT transmission per channel can be switched on or off easily and the network name and network ID can be changed. The settings are identical to the section "Transport stream processing" in the setup menu (see chapter 7.3.5).

If all settings have been made, with pressing the "send" button this NIT is automatically stored in all other devices of the A-QAMOS and QAMOS product group of the head end.

Navigation tree

- Overview
- SAT selection
- CI setup
- Transponders
- Adjustment
- Language
- Service
- Wizard
- Setup
- Level
- Status
- NIT
- LCN
- Program table

Network information table (NIT)

No.	TS-ID	NW-ID	Output frequency	Constellation	Symbol rate	Insert	Delete
30	1107	1	354000	256	6900	<input type="checkbox"/>	<input type="checkbox"/>
31	1091	1	354000	256	6900	<input type="checkbox"/>	<input type="checkbox"/>
32	1089	1	362000	256	6900	<input type="checkbox"/>	<input type="checkbox"/>
33	1073	1	362000	256	6900	<input type="checkbox"/>	<input type="checkbox"/>
34	1089	1	362000	256	6900	<input type="checkbox"/>	<input type="checkbox"/>
35	11	133	362000	256	6900	<input type="checkbox"/>	<input type="checkbox"/>
36	1107	1	402000	256	6900	<input type="checkbox"/>	<input type="checkbox"/>
37	1107	1	418000	256	6900	<input type="checkbox"/>	<input type="checkbox"/>
38	1107	1	650000	256	6900	<input type="checkbox"/>	<input type="checkbox"/>
39	1107	1	942000	256	6900	<input type="checkbox"/>	<input type="checkbox"/>
40	1107	1	958000	256	6900	<input type="checkbox"/>	<input type="checkbox"/>

NIT processing

☐ Channel 1 D 73 (73000 kHz)

☐ Channel 2 D 113 (113000 kHz)

☐ Channel 3 D 209 (209000 kHz)

☐ Channel 4 D 306 (306000 kHz)

☒ Channel 5 D 306 (306000 kHz)

☒ Channel 6 D 306 (306000 kHz)

☒ Channel 7 D 306 (306000 kHz)

☐ Channel 8 D 314 (314000 kHz)

☐ Channel 9 D 314 (314000 kHz)

☐ Channel 10 D 314 (314000 kHz)

Network name
no name

Network ID
0

7.3.11.2 Manual NIT processing

After the preparation or initializing of the NIT, described in 7.3.10, first it must be called the edit mode of the NIT in each device of the A-QAMOS and QAMOS product group of the head end, read the NIT of the device and stored on the PC by clicking the “Export” button. Then you append the NIT of the other mentioned devices, which belong to the head end, by repeatedly pressing the “Import” button in edit mode. As opposed to the automatic NIT processing here appear the added tables in white color. After the appropriate selection of channels of the NIT and any change in the network name or network ID the NIT of this device is stored and transferred by pressing the “Send” button. To facilitate the setting of all other mentioned devices of the A-QAMOS and QAMOS product group of the head end, this head end NIT can be stored in the PC by clicking the “Export” button. Now all the other devices of the head end have called successively, these stored NIT loaded by pressing the “Import” button and then adopted and saved by pressing the “Send” button.

Navigation tree

- Overview
- SAT selection
- CI setup
- Transponders
- Adjustment
- Language
- Service
- Wizard
- Setup
- Level
- Status
- NIT
- LCN
- Program table

Network information table (NIT)

No.	TS-ID	NW-ID	Output frequency	Constellation	Symbol rate	Insert	Delete
1	1101	1	306000	256	6900	<input checked="" type="checkbox"/>	<input type="button" value="Delete"/>
2	1073	1	314000	256	6900	<input checked="" type="checkbox"/>	<input type="button" value="Delete"/>
3	1201	1	322000	256	6900	<input checked="" type="checkbox"/>	<input type="button" value="Delete"/>
4	1051	1	330000	256	6900	<input checked="" type="checkbox"/>	<input type="button" value="Delete"/>
5	1093	1	338000	256	6900	<input checked="" type="checkbox"/>	<input type="button" value="Delete"/>
6	1117	1	346000	256	6900	<input checked="" type="checkbox"/>	<input type="button" value="Delete"/>
7	1007	1	354000	256	6900	<input checked="" type="checkbox"/>	<input type="button" value="Delete"/>
8	1089	1	362000	256	6900	<input checked="" type="checkbox"/>	<input type="button" value="Delete"/>
9	1107	1	370000	256	6900	<input checked="" type="checkbox"/>	<input type="button" value="Delete"/>
10	1017	1	378000	256	6900	<input checked="" type="checkbox"/>	<input type="button" value="Delete"/>
11	1079	1	386000	256	6900	<input checked="" type="checkbox"/>	<input type="button" value="Delete"/>
12	1011	1	394000	256	6900	<input checked="" type="checkbox"/>	<input type="button" value="Delete"/>
13	7	133	402000	256	6900	<input checked="" type="checkbox"/>	<input type="button" value="Delete"/>
14	1111	1	410000	256	6900	<input checked="" type="checkbox"/>	<input type="button" value="Delete"/>
15	1011	1	418000	256	6900	<input checked="" type="checkbox"/>	<input type="button" value="Delete"/>
16	12	133	426000	256	6900	<input checked="" type="checkbox"/>	<input type="button" value="Delete"/>

NIT processing

☐ Channel 9 D 370 (370000 kHz)

☐ Channel 10 D 378 (378000 kHz)

☐ Channel 11 D 386 (386000 kHz)

☐ Channel 12 D 394 (394000 kHz)

☐ Channel 13 D 402 (402000 kHz)

☐ Channel 14 D 410 (410000 kHz)

☐ Channel 15 D 418 (418000 kHz)

☐ Channel 16 D 426 (426000 kHz)

Network name
Headend

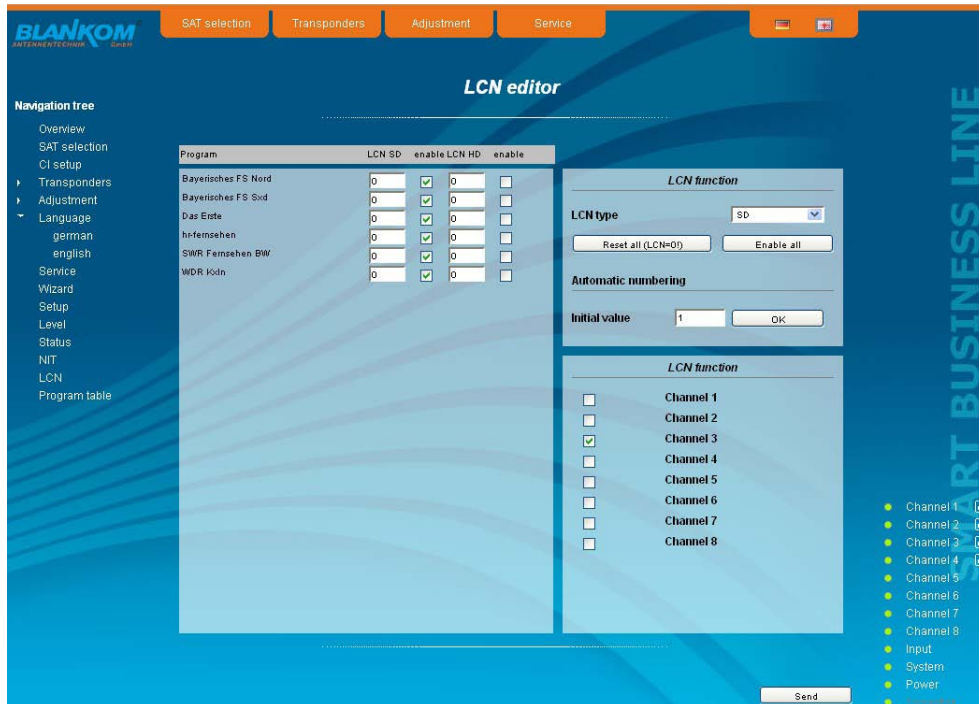
Network ID
1234

For changes of the NIT is to be noted that these changes must be made in the NIT of each device. It is therefore recommended to prefer the automatic NIT processing of the manual NIT processing.

7.3.12 Menu "LCN"

The allocation of a logical channel number (LCN) is a service that allocates a serial number to each TV program in all the channels, which are enabled for this service. If the set-top box supports this service at the subscriber, the TV programs are offered in the order established by program numbers.

To use this service, the LCN processing of all appropriate channels must be turned on. Then you can set the program order. It should be noted that the numbering is done separately for HD and SD programs. When you first load the LCN editor there in the left table cell, all the transferred services of the channels are listed that were marked in the lower right table for LCN processing. TV channels are already pre-selected, separated for HD and SD programs, all services are still provided with the number 0. You can now assign the LCN for the selected program automatically by pressing the "OK" button in the right box "automatic numbering", starting with the number registered there. The numbers can also be selected manually: individually by clicking the corresponding box in the left table, or all programs of a type by pressing the "Enable all" button. The numbering itself is performed again by pressing the "OK" button. In order to reverse the numbering for HD or SD programs, one selects the corresponding LCN type in the right table field and press the "Reset all (LCN = 0)".



7.3.13 Menu "Program table"

The program table gives an overview of the channel allocation of the A-QAMOS-4CI. The overview begins with the output frequency and output channel identifier for each transmission channel. Under them all TV and radio programs are listed, which are transmitted in this channel. By clicking the "Save" button, the program table can be saved as a text file on the connected PC.



8. Factory settings

A short pressing of the reset button on the rear of the device causes a reboot, i.e. it will restart the device and all stored values are adjusted. If the device is to be reset to factory settings, the reset button must be pressed so long to keep up until the "POWER" and "SYSTEM" LED will illuminate green permanently. This process takes about 15 seconds. In this case the device is set to the following:

Input parameters

	IN	IN/OUT
Mode		Input
LNB control	On	On
DiSEqC	Off	Off
Satellite	A	A
Tonburst	Off	Off
22 kHz	On	Off
Voltage	18V	18V
	Scan	Scan
		Send
Program tables for		
Satellite	Astra 19,2 Degree	Astra 19,2 Degree
Band	High	Low
Polarisation	horizontal	horizontal

Output parameters

Output level	
Nominal level	82 dBµV
Standard Values	
QAM constellation	256
Symbol rate	6900
Spectrum position	normal
QAM standard	DVB-C (Annex A)
Mode	Transcoder
NIT processing	Off
SDT processing	Off
CAT processing	Off
Program filter	Off
LCN processing	Off

Channel settings

No.	Tp name	Downlink	Input		Program	SID	Mode
1	UPC	11670	IN	> ARD digital	D 306 (306000 kHz)	arte	28724
2	DVB-S	11719	IN	> ARD HD	D 314 (314000 kHz)	EinsExtra	28721
3	SKY	11758	IN	> ARD digital	D 322 (322000 kHz)	Einsfestival	28722
4	betaresearch	11797	IN	> ZDF Vision	D 330 (330000 kHz)	EinsPlus	28723
5	ARD	11836	IN	> ARD digital	D 338 (338000 kHz)	Phoenix	28725
6	DVB-S	11875	IN	> ARD digital	D 346 (346000 kHz)	Test-R	28726
7	SKY	11914	IN	> ProSiebenSat.1	D 354 (354000 kHz)		
8	ZDFvision	11953	IN	> RTL World	D 362 (362000 kHz)		
9	UPC	11992	IN				
10	SKY	12031	IN				
11	x	12070	IN				
12	ARD	12109	IN				
13	x	12148	IN				
14	RTL World	12187	IN				
15	Globecast	12226	IN				
16	ARD WDR	12265	IN				
17	UPC	12304	IN				
18	CANALDIG	12343	IN				
19	SKY	12382	IN				
20	ARD	12421	IN				
21	BetaDigital	12460	IN				
22	CANALDIG	12515	IN				
23	ProSieben	12544	IN				
24	CANALDIG	12574	IN				
25	SES	12603	IN				

Setup settings

GUI settings	
<input type="checkbox"/>	Help information within the status line of the browser
<input type="checkbox"/>	Display all system files
<input checked="" type="checkbox"/>	Display top line register
<input checked="" type="checkbox"/>	Display start page
<input checked="" type="checkbox"/>	Display status on right
<input type="checkbox"/>	Optimization for low-speed data connectivity
	Output frequency raster: KDG (only 8 MHz)
	Fan mode: Automatic
<input type="checkbox"/>	Tag selection (for decoded pid)
<input type="checkbox"/>	Activate user and keyword check

Network settings

Web server				
DHCP		Client	Info	
IP number	192	168	14	139
IP subnet mask	255	255	255	0
Gateway	192	168	14	254
DHCP from	192	168	1	1
DHCP to	192	168	1	99

9. Conversion tool to produce a compliant TS file for A-QAMOS-4CI

With the media player option of A-QAMOS-4CI it offers the opportunity to install a TS file from a PC connected via network with the A-LINE-SBL device. The file must be present in a transport stream format conforming to the DVB standard.

To create a file in a compliant transport stream format, the BLANKOM provides a conversion tool. This can generate from a large number of video file formats a corresponding file in the transport stream format, which process the A-QAMOS-4CI and can provide as an additional channel to the customer.

9.1 Functional scope

"VideoKonverter.jar" intended for conversion of video files into the required transport stream format of the player. Thereby it is ensured that the resulting file has a constant bit rate, audio and video bit rate are set correctly and the meta data of the transport stream can be configured as desired. The user can choose between 3 resolutions SD, HD 720 and HD 1080.

"tsmux.exe" is an application that optimizes the generated transport stream for the player: the player is able to process transport streams, in which the null packets are compressed. This compression can be activated by means of "tsmux.exe".

The generation of the transport stream takes place by means "FFmpeg". However, it is based on a buffer model that is different from the player. Therefore, „tsmux.exe“ offers the possibility to arrange the packets in the transport stream so that caused by the wrong buffer model continue count error can be suppressed.

9.2 Installation requirements

The conversion tool "VideoKonverter.jar" is a Java program, which offers the advantage, that it is platform independent. For the preparation and installation of the program the following conditions are necessary:

1. Check the installed version of Java on your PC

For this check it necessary to establish an internet connection to the PC. To test it, the following link is called in the used browser:

<http://www.java.com/de/download/testjava.jsp>

If necessary, the Java software must be brought up to date by means of update offered there.

Alternatively, the Java version to be tested without an internet connection using command prompt as follows:

Open the command prompt by typing

java-version

followed by <Enter>.

Result is either an error message if Java is not installed or the version information of the existing Java installation.

2. Installing the necessary software "FFmpeg" to run the program

The software "ffmpeg", necessary for the execution of the conversion tool, is available at the following link:

www.ffmpeg.org

By clicking the "Download" button on this page you take to the corresponding versions, which are available for the individual operating systems. We recommend going to use only the 32-bit versions.

The current download link addresses are for

Linux: <http://ffmpeg.gusari.org/static/>

Windows: <http://ffmpeg.zerance.com/builds/>

MacOS: <http://www.evermeet.cx/ffmpeg/>

An installation of FFmpeg in the sense of a self-running process is not required. The downloaded, compressed files must be extracted into a target path freely chosen. This path should be reminded, because it is used later in the "VideoKonverter" software as an auxiliary path.

3. To preview the selected video the player installed as the default program is used. In Windows, this is for example the media player.

By BLANKOM falls the recommendation of a video player on the VLC player, because this player knows how to deal with non-standard video formats. If even one other video player is used, it can be used.

If you want to use the VLC player, the download is available at the following link:

<http://www.videolan.org/vlc/#download>

The installation of the VLC player runs on a self-running routine, which starts by calling the vlc.exe. This makes the program binds into the operating environment and can be easily "found" by the video converter tool.

When you install the software (Java, VLC player) it should take some time and read the message window to not allow third-party programs or other promotional activities.

For the following software releases, the functionality of the video converter tool has been tested successfully:

Operating systems: - Windows XP and 7

Java: - from version 6

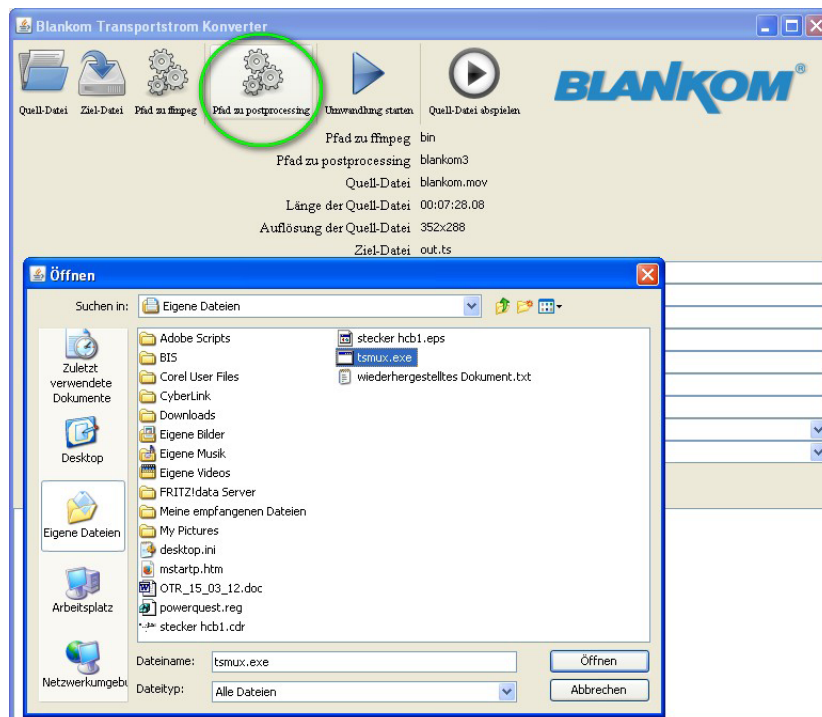
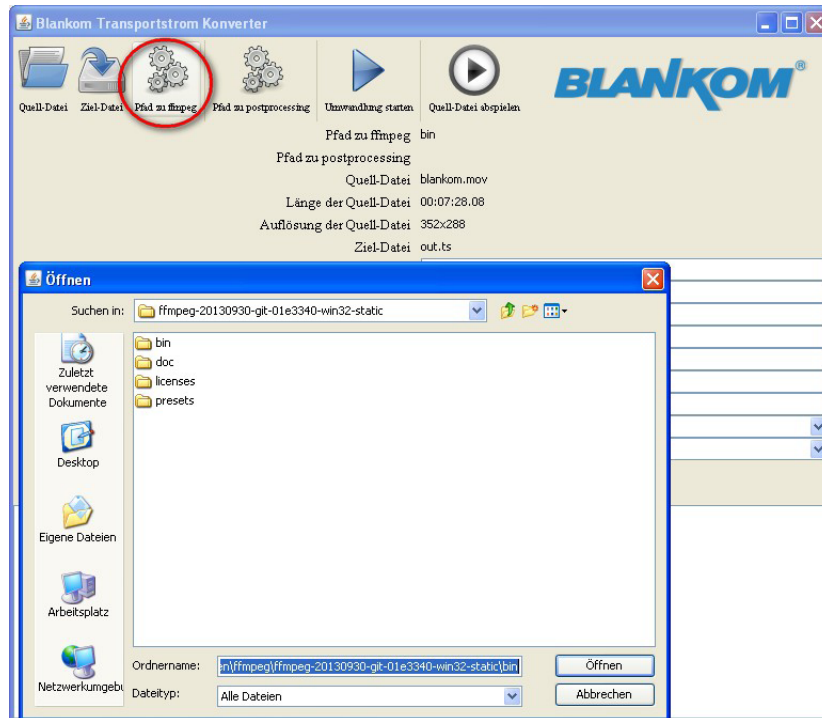
FFmpeg: - for Windows XP/ 7- 32bit from version 01e3340

9.3 Installation and integration of the conversion tool on a Windows (XP) system

First, the inclusion of the auxiliary path and the first conversion is illustrated.

After the files are unpacked from FFmpeg to the selected folder, you can also link this path in the converter. You simply select the button "path to ffmpeg" (pictured in red) and click their way there through their own folder structure to the path where the file was unzipped. There, select the "bin" folder and confirm by clicking the button "Öffnen" or "Open".

In order to perform post processing, you have to link the path to "tsmux.exe" in the converter. Then, click the button "path to post-processing" (pictured in green) and click it there by their own folder structure to the path where the file is located. There, choose the file "tsmux.exe" and confirmed by clicking the button "Öffnen" or "Open".



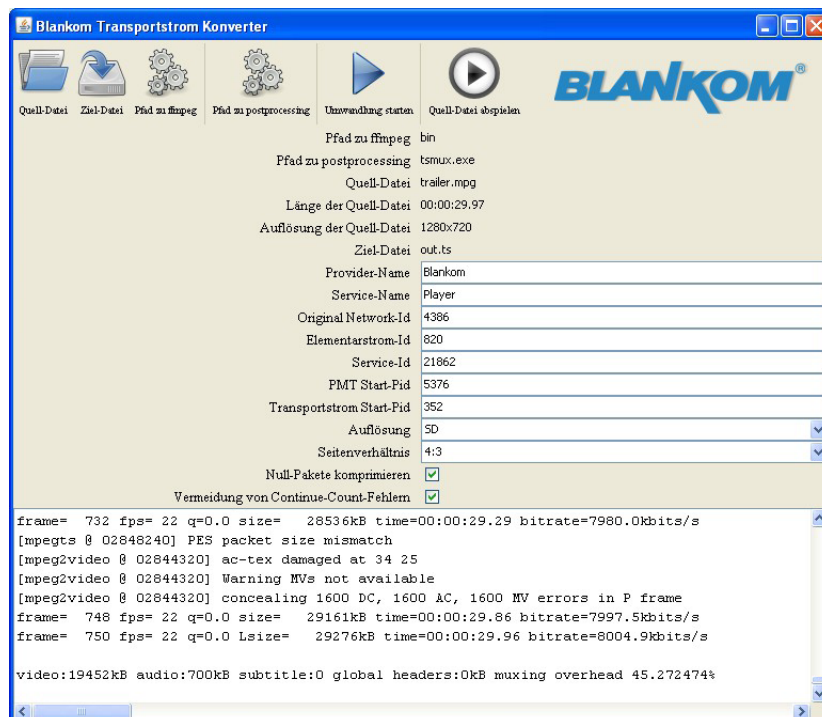
After the successful completion of the installation of the playback tool, you can select video converter already in a file. In the following, a video file is selected and clicked "Quell-Datei abspielen". This will open the video player and returns the selected file.

Using the button "Ziel-Datei" the path and name for the file is to be created are defined. The file extension will be denominated in any case *.ts and can not be changed. For a distinction between the individual films a unique name should be used, e.g. Infofilm.WBG.SD.4:3.PID65535.ts

If an error was made when entering - as a numerical figure is outside the permitted range - or were required fields not filled in, the start of transformation is blocked. Incorrectly filled fields are highlighted in red. The boundaries of the allowed values are displayed as a tooltip when the mouse pointer rests over the input field a long period of time.

After that the setting of the desired output parameters for the conversion follows. A detailed overview of the range and standard information found in the glossary of the program (see chapter 9.5). It should be stated only briefly that it is possible to create from SD also HD content, however considering that image information is added. The quality is therefore not to be compared with original HD content.

It should be noted that without configuring the path for post-processing is not possible to optimize the transport stream file, i.e. the two check boxes "Null-Pakete komprimieren" and "Vermeidung von Continue-Count-Fehlern" remain inactive.



9.4 Error prevention

1. If you want to create HD video from SD material so it is to be reckoned with qualitative degradation because there data be added that were not in the original.
2. Provider name, service name, and original network ID are system dependent and are used to allocate the net sites of the operator and adjust its network.
3. To avoid serious disturbances in the network, the elementary stream ID should be unique throughout the network.

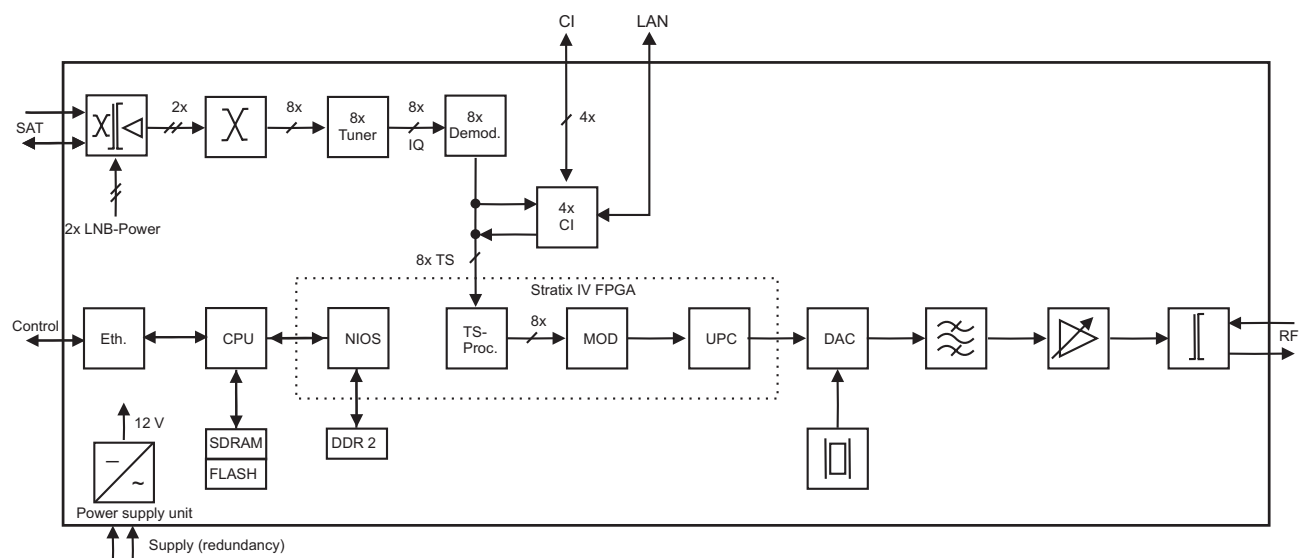
9.5 Glossary - parameter declaration [min. ... max. range]

Provider-Name	[freely selectable]	(provider name)
Service-Name	[freely selectable]	(service name)
Original Network-Id	[0 ... 65.536]	(original network ID)
Elementarstrom-Id	[256 ... 8.191]	(elementary stream ID)
Service-Id	[0 ... 65.536]	(service ID)
PMT Start-Pid	[4.096 ... 8.191]	(PMT start PID)
Transportstrom Start-Pid	[0 ... 65.536]	(transport stream start PID)
Auflösung	SD, HD 720, HD 1080	(resolution)
Seitenverhältnis	4:3, 16:9, 24:10	(aspect ratio)
Null-Pakete komprimieren ¹	yes, no	(compress null packets)
Vermeidung von Continue-Count-Fehlern ²	yes, no	(avoid continue count errors)

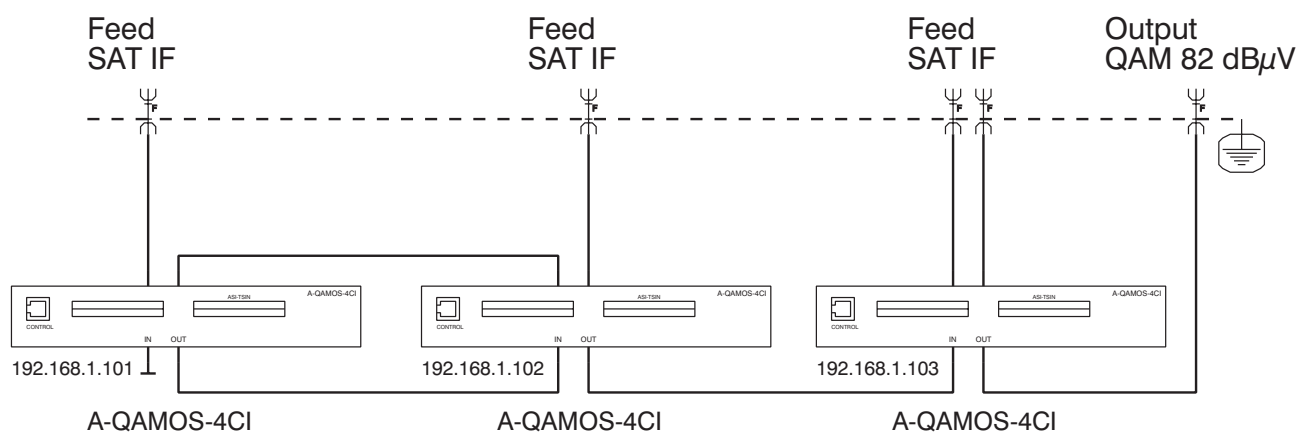
¹ This switch enables the compression of null packets in the transport stream. Thus, a significant reduction in file size is achieved especially for files that have a big difference between video and transport stream bit rate. However, the resulting files are not compatible with conventional software programs. These compressed files are used only by the A-QAMOS-4CI or compatible devices of BLANKOM company..

² This switch activates a function which suppresses the conversion resulting from the continue count errors due to the different buffer models. It is strongly recommended to enable this option in order to achieve optimal results.

10. Block diagram



11. Application example



12. Technical data

SAT IF input

Frequency range	950...2150 MHz
Frequency step	1 MHz
AFC range	± 3 MHz (SR < 10 MSps) ± 5 MHz (SR ≥ 10 MSps)
AGC level range	64 ... 94 dBμV
Connector	F socket
Through loss	≤ 3 dB
Impedance	75 Ω
LNB voltage	14/ 18 V
LNB current	max. 1x 0.4 A
DiSEqC	1.0

DVB-S demodulator (QPSK)

Symbol rate	1...45 MSps
Code rate (Viterbi)	1/2, 2/3, 3/4, 5/6, 7/8
Roll off	35 %
Signal processing	EN 300 421 [1]

DVB-S2 demodulator (QPSK, 8PSK)

Symbol rate	QPSK	2...47 MSps
	8PSK	2...31.5 MSps
Code rate (LDPC)	QPSK	1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
	8PSK	3/5, 2/3, 3/4, 5/6, 8/9, 9/10
Roll off		20, 25, 35 %
Signal processing		EN 302 307 [2]

Decryption interface

Common interface	4x PCMCIA-Slot according EN 50221 [7], cascable
Operating voltage	5 V
Multi-Service decryption	48 services max.
Input data rate	max. 75 Mbps acc. adjustment symbol rate & CAM

QAM modulator

Input data rate	max. 75 Mbps acc. adjustment symbol rate & QAM constell.
Symbol rate	1.0 ... 7.2 MSps
QAM modulation	DVB-C
QAM constellation	16; 32; 64; 128; 256
Roll off	15%
Interleaving	Conv. I = 12
Forward error correction/ FEC	Reed Solomon/ (204, 188.8)
PSI-/ SI processing	disconnectable
Zero stuffing	continuously
Signal processing	EN 300 429 [3]

Test signals:

QAM test signal	according adjustment symbol rate & QAM constellation
Measurement signal	unmod. carrier (signal level)

RF output

Output frequency range	45 ... 862 MHz
Tuning step	1 kHz
Max. output level	85 dBμV (per channel)
Total level settings	
without loop	74 ... 94 dBμV (1 dB steps)
with loop	62 ... 82 dBμV (1 dB steps)
Individual level settings (offset)	+3 ... -6 dB (0.5 dB steps)
Channel allocation	adjacent channel ability
Connector	F socket
Impedance	75 Ω
Return loss	≥ 18 dB 45 MHz - 1.5 dB/ octave

Signal quality

MER	≥ 45 dB
Shoulder attenuation	≥ 53 dB
Spurious 45...862 MHz	≥ 60 dB
max. frequency stability	30 kHz
Output level stability	± 0.5 dB

Operating parameters

Operating voltage	2x 90 ... 240 V~ 50/ 60 Hz including redundancy function
Power consumption	36 W (without CA modules)

Environmental conditions

Temperature range	-10 ... +55 °C
Temperature range for data keeping	5 ... 45 °C
Relative humidity	≤ 80 % (non condensing)
Method of mounting	horizontal
Location of mounting	splash-proof and drip-proof

Miscellaneous

Dimensions (w x h x d)	448 x 44 x 350 mm
Weight	5,600 g

Delivery content

2x power cord
1x RJ45 connection cable
2x terminating resistor
1x mounting kit

13. Glossary

8PSK
AFC
AGC
BER
BW
CA
CAT
DAC
DHCP
DIN
DiSEqC
DNS
DVB
EIT
EMC
EPG
ETSI
FAT
FEC

8 Phase Shift Keying
Automatic Frequency Control
Automatic Gain Control
Bit Error Ratio
Bandwidth
Conditional Access
Conditional Access Table
Digital-to-Analog-Converter
Dynamic Host Configuration Protocol
Deutsches Institut für Normung
Digital Satellite Equipment Control
Domain-Name-Server
Digital Video Broadcasting (-C Cable, -S Satellite, -S2 Satellite 2, -T Terrestrial)
Event Information Table
Elektro magnetic conformity
Electronic Program Guide
European Telecommunications Standards Institute
File Allocation Table
Forward Error Correction

FPGA	Field Programmable Gate Array
GSM	Global System for Mobile Communications
GUI	Graphical User Interface
HD TV	High Definition Television
HTTP	Hypertext Transfer Protocol
I/Q	In-phase/ Quadrature-phase
ID	Identifier
IF	Intermediate Frequency
IIC	Inter-Integrated Circuit (I ² C bus, data bus within device)
IP	Internet Protocol
LDPC	Low Density Parity Check Code
LED	Light Emitting Diode
MAC	Media Access Control
MER	Modulation Error Ratio
MIB	Management Information Base
MPEG	Moving Picture Experts Group
MPTS	Multi Program Transport Stream
NIM	Network Interface Module
Nios	Product name for a processor
NIT	Network Information Table
PAT	Program Association Table
PC	Personal Computer
PCR	Program Clock Reference
PID	Program Identifier
PMT	Program Map Table
PSI	Program Service Information
QAM	Quadrature Amplitude Modulation
QPSK	Quadrature Phase Shift Keying
RF	Radio Frequency
SDT	Service Description Table
SD TV	Standard Definition Television
SI	Service Information
SNMP	Single Network Management Protocol
SPTS	Single Program Transport Stream
TS	Transport Stream
TV	Television
URL	Uniform Resource Locator
WAN	Wide Area Network

14. Bibliography

- [1] EN 300 421: Digital Video Broadcasting (DVB): Framing structure, channel coding and modulation for 11/ 12 GHz satellite services
- [2] EN 302 307: Digital Video Broadcasting (DVB): Second generation framing structure, channel coding and modulation systems for Broadcasting, Interactive Services, News Gathering and other broadband satellite applications
- [3] EN 300 429: Digital Video Broadcasting (DVB): Framing structure, channel coding and modulation for cable systems
- [4] 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
- [5] EN 50083-2 : Cabled distribution systems for television and sound signals. Electromagnetic compatibility for equipment; EN 50083-2:2001
- [6] RFC 1157 Request for Comments (RFC): RFC Database URL: [Http://www.rfc-editor.org/rfc.html](http://www.rfc-editor.org/rfc.html)
- [7] EN 50221: Common interface specification for conditional access and other digital video broadcasting decoder applications; German version EN 50221:1997 + Corrigendum:2000

15. Notes on the device software

Device Software of the A-QAMOS-4CI
Copyright (C) BLANKOM Antennentechnik GmbH Bad Blankenburg

This device software based on top of Linux 3.6.8 is free software: you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation, either version 2 of the License, or (at your option) any later version.

You should have received a copy of the GNU General Public License along with FooBar. If not, see <<http://www.gnu.org/licenses/>>.

The source code is available upon request.
Please address requests to:

BLANKOM Antennentechnik GmbH
Hermann-Petersilge-Straße 1

07422 Bad Blankenburg
Germany

16. Document history

Version	Date	Modification	Author
1.00	21.11.2012	basic document	Häußer
1.01	14.02.2014	complete revision	Häußer

Options available upon request! Subjects to changes due to technical progress.

Declaration of Conformity

Manufacturer: BLANKOM Antennentechnik GmbH
Hermann – Petersilge – Straße 1
07422 Bad Blankenburg
Germany

Product Name: SAT-TV Transmodulator

Type Name: A-QAMOS-4CI

Type N°: 5102.81

BLANKOM Antennentechnik GmbH confirms that the mentioned product meets the guideline(s) of the Council for the approximation of legislation of the member states.

Electromagnetic compatibility (2004/ 108/ EC)

The following standards are met:

DIN EN 50083-2: 2007-04 (EN 50083-2:2006-06)

Low voltage guideline (2006/ 95/ EC)

The following standards are met:

DIN EN 60950-1: 2006-04 (EN 60950-1:2006-11)
Information technology equipment -Safety-

Restriction of hazardous substances (2011/ 65/ EC)

The following standards are met:

DIN EN 50581: 2013-02 (EN 50581:2012)

Bad Blankenburg, Germany, 2012-11-21



Dr. Piero Kirchner
(Managing Director)