

Operating instructions



8 pole IP-/ ASI-TV Modulator

IP/ SFP/ ASI (H.264/ AVC, MPEG2) → 4x CI → ATV (8x AM)



PALIOS-IPM4CI
Part N°: 5113.01



Contents

1. Safety and operating instructions	3
2. Device variants	3
3. General	3
4. Main features	3
5. Front view	4
6. Functional description	4
7. Meaning of the LED's	4
7.1 LED's at the 10/ 100/ 1000 Mbit stream port 1	4
7.2 LED's at the 10/ 100/ 1000 Mbit stream port 2	5
7.3 LED at the ASI socket	5
7.4 Status LED's	5
7.5 LED's at the 10/ 100 Mbit control port	5
8. Adjusting by web server	6
8.1 Network connection to the computer	6
8.2 Setting of individual parameters	7
8.2.1 Menu "Overview"	8
8.2.2 Menu "IP input"	9
8.2.2.1 SFP option	10
8.2.3 Menu "CI setup"	11
8.2.4 Menu "Routing"	13
8.2.5 Menu "Transponders"	14
8.2.6 Menu "Adjustment"	14
8.2.7 Menu "Language"	17
8.2.8 Menu "Setup"	17
8.2.9 Menu "Service"	22
8.2.10 Menu "Level"	22
8.2.11 Menu "Status"	23
9. Factory settings	24
10. Block diagram	25
11. Application example	25
12. Technical data	26
13. Glossary	26
14. Bibliography	27
15. Notes on the device software	27
16. Document history	27
CE Declaration of Conformity	28

1. Safety and operating instructions



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



The modules may only be installed and started up by authorized technical personnel. There are only permitted the mounting styles indicated in the quick start guide, included with each module.



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



The assembly and wiring have to be done without voltage. For installation, only the supplied accessories (DIN rail clip with screws and 19" accessories) may only be used.



All active modules may only be powered by the power supplies of the HELIOS family or QUASARIOS. Only connect the module with the accessory cables provided.



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



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].



The unit must only be mounted vertically. The ventilation slots as well as the circulation perforation of the modules is not be obstructed in any way.



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



For **DIN rail mounting** is important to note that between the heat sink and a neighboring module, a distance of 2 cm is required. If the modules mounted on top of each, so they must be spaced 20 cm apart.



For **19" mounting** all devices in the rack must be fitted with 19" Edge Guide. Mounting the device using only the screw holes at the front panel is insecure and discouraged. Furthermore, the operation of a fully occupied rack is only allowed with an underlying 1-U fan box (at least 3 fans, 176 mm deep).



WEEE-Reg.-Nr. DE 50389067

2. Device variants

PALIOS-IPM4CI 5113.01 IP/ SFP/ ASI (H.264/ AVC, MPEG2) → 4x CI → ATV (8x AM)

3. General

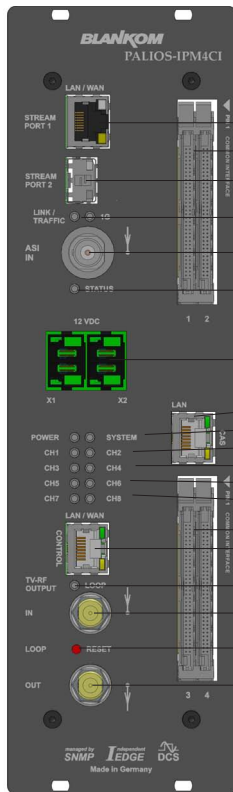
The Smart Business Line (SBL) is a modern head end system, that is distinguished by its modular and compact design. A userfriendly operating concept facilitates setup, configuration and maintenance of the system.

The PALIOS-IPM4CI module selects 8 programs from up to 8 adjacent IP transport streams or from an ASI transport stream and converts these into analog TV signals to transmit it in cable networks. In this case, a maximum of 8 analog television channels are generated from the available H.264/ AVC or MPEG2 transport streams. To decode encrypted programs two CI slots for 4 CA modules are implemented.

4. Main features

- 8x IP SPTS/ MPTS input
- IP streaming via RJ45 or SFP with redundancy
- 1x ASI input
- 4x Common Interface according PCMCIA standard, cascadable, multi decryption capable
- MPEG 2/4 HD/ SD decoding
- multi-standard PAL modulator
- IEdge signal processing
- switchable RF output as single or with loop
- control of the module via HTML or SNMP

5. Front view



- Stream port 1 (RJ 45) incl. LED's
- CI slot 1+2
- Stream port 2 (SFP)
- Stream port 2 LED's "LINK/ TRAFFIC" + "1G"
- ASI input
- ASI LED "Status"
- Power connections
- CAS port (for future use)
- Status LED "POWER" / "SYSTEM"
- Status LED channel 1/ channel 2
- Status LED channel 3/ channel 4
- Status LED channel 5/ channel 6
- Status LED channel 7/ channel 8
- CI slot 3+4
- Control port (LAN/ WAN) incl. LED's
- Status LED "LOOP"
- Output coupler "input"
- Reset button
- Output coupler "output"

Independent
EDGE



managed by
SNMP

6. Functional description

The module receives a data stream via Gigabit Ethernet and can receive 8 transport streams from the included IP encapsulated transport streams. The 8 transport streams are further processed in 8 H.264/ AVC & MPEG2 decoders. The analogue TV modulation and the freely adjustable up-conversion in the cable network range (45 ... 862 MHz) is carried out by a high-performance FPGA. To decode encrypted programs two CI slots for 4 CA modules are implemented. 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 switchable directional coupler to the output jacks.

7. Meaning of the LED's

7.1 LED's at the 10/ 100/ 1000 Mbit stream port 1

Designation, colour	Status	Meaning of display
GbE connect LED, green	permanently on	only illuminated when the connection is a GbE connection (does not light up at a 10/ 100 Mbit connection)
	off	no GbE connection
Connect/ data LED yellow	permanently on	cable connection is established
	flashing	data is received
	off	no cable connection



7.2 LED's at the 10/ 100/ 1000 Mbit stream port 2

Designation	Colour	Status	Meaning of display
1G	green	permanently on	only illuminated when the cable connection is a GbE connection (does not light up at a 10/ 100 Mbit connection)
		off	no GbE connection
LINK/ TRAFFIC	amber	permanently on	cable connection is established
		flashing	data is received
		off	no cable connection or option is not enabled

7.3 LED at the ASI socket

Designation	Colour	Status	Meaning of display
STATUS	green	permanently on	ASI transport stream is present
		flashing	no ASI transport stream
		off	option is not enabled

7.4 Status LED's

Designation	Colour	Status	Meaning of display
POWER	green	permanently on	module is on
		amber	module is in standby
		off	module is off, operating voltage is not applied
SYSTEM	green	permanently on	module is ready for work
		flashing	software update is running
	amber	permanently on	temperature is high, fan is already activated
		flashing	temperature is critical. The device will no longer work or is forced to shut down.
	off	module is not ready for work	
CH 1 ... CH 8	green	permanently on	channel operates without error
		amber	permanently on
	amber	flashing	hardware is faulty
		off	channel is off
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

7.5 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

8. Adjusting by web server

8.1 Network connection to the computer

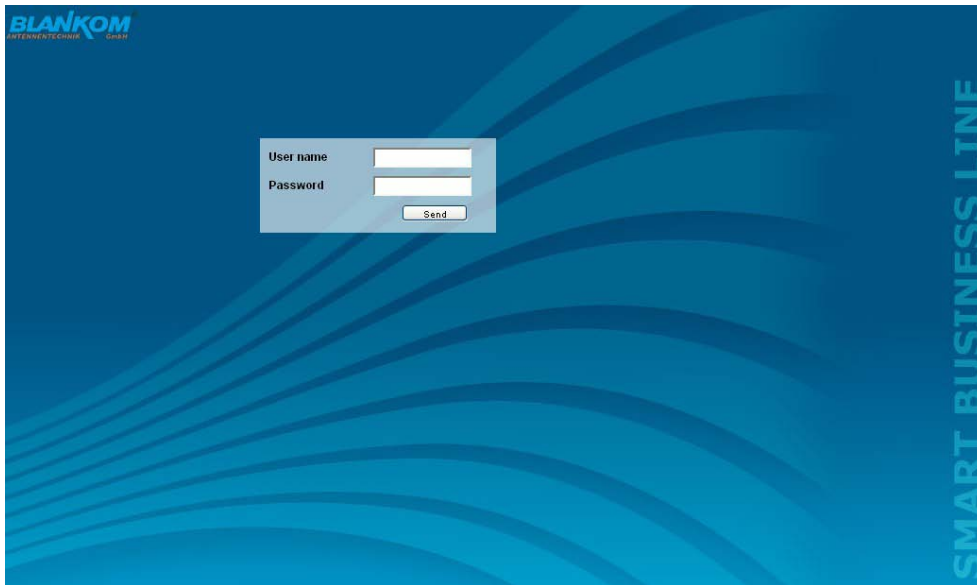
System requirements:

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

Setup the connection:

The PALIOS-IPM4CI module has to be connected to PC network using an Ethernet cable. The IP address of the PALIOS-IPM4CI module is 192.168.1.100 on delivery. If several SBL modules should be controlled or adjusted via an Ethernet switch, each module must first be configured **individually** to its provided IP address within the network. To do so the address of the network port on the PC (temporary) must be adapted to the IP address of the SBL module (subnet mask: 255.255.255.0, IP address: 192.168.1.XXX, where XXX is not the same as the corresponding value of the SBL module IP address).

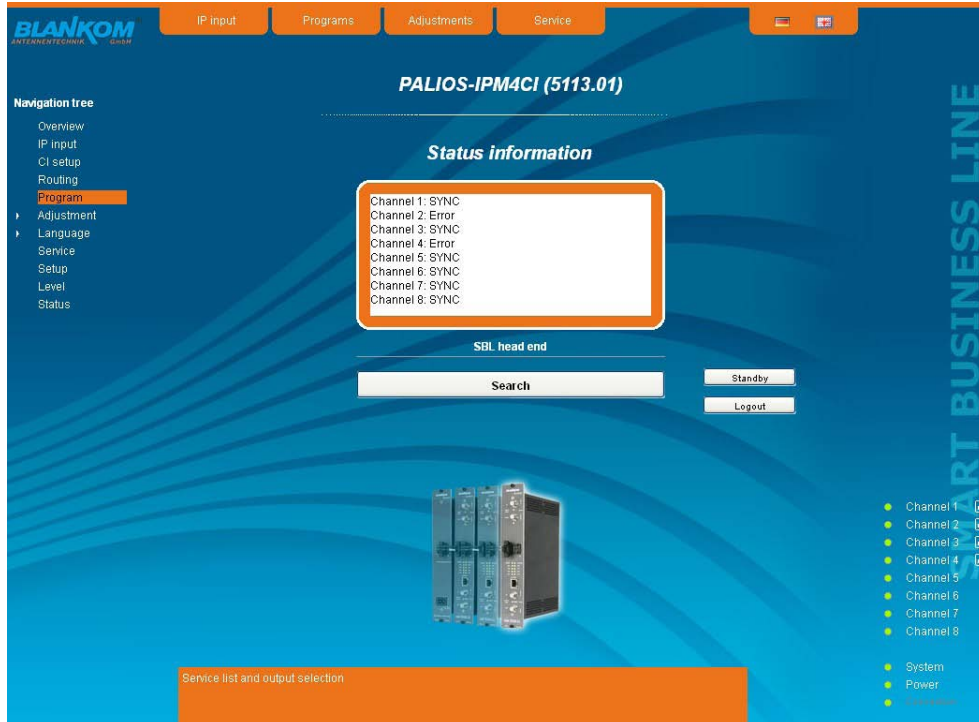
After the network configuration of the module(s) the IP address of the control PC is converted to the provided IP address and the modules can be accessed through the browser with their new IP addresses. The user must authenticate himself with his credentials (user name and password), if the password and user testing were activated on the setup page (see chapter 8.2.8):



After successful registration or successful connection establishment without password (default setting) the start page of the module is the menu "Overview" (see chapter 8.2.1).

8.2 Setting of individual parameters

Using the web site, you can set certain parameters of the module or perform configurations on the module 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 8.2.8) may be selected so 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 module is displayed. By changing the “Setup” menu, the status information can also be moved to the right (see also chapter 8.2.8). 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 configured yet, or the RF output is turned off. Status information about the system is mirrored in the same way. 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.

State Temperature ...	
Base board temperature	37,1 °C
Base board FPGA temperature	48,0 °C
Temperature Cryptos	43,2 °C
Fan 1	okay
Fan 2	okay

The last displayed point indicates the connection status between the network interface and the module. 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 PALIOS-IPM4CI module 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 module. To save these settings the “send” button must be pressed. In all menus, the language selection is possible between German and English top right.

8.2.1 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 the display “Off” appears behind the respective channel.



In addition, below the status window the head end display is visible. There all SBL modules are listed, which are in the same network and which have been associated with the head end in the “Setup” menu (see 8.2.8). This is significant because functions over all modules such as the NIT processing between modules of the 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 module. If no head end was configured, a “Search” button appears, which forwards to the “Setup” menu and scans the network for other SBL modules. Then all available modules are listed and can be selected and added to the head end.

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

8.2.2 Menu “IP Input”

This menu contains the network configuration for the streaming port and for the 8 IP transport streams from which then the 8 desired programs for transmitting can be selected.



On top the configuration options for the two stream ports are displayed. It should be noted that the stream port 2 is available only after enabling the associate software option (see section 8.2.8). The IP address, subnet mask and gateway can be configured for each port. The next step is to configure the setup parameters of the 8 IP input transport streams (IP input channels). Again, IP address, port and transport protocol (UDP or RTP) have to be entered for each IP channel. Everything is confirmed by pressing the “send” button. If not all 8 ports are used, the unused ports can be disabled by entering the IP address 0.0.0.0. Identical settings within these 8 IP channels are not permitted and are automatically marked red.

Note:

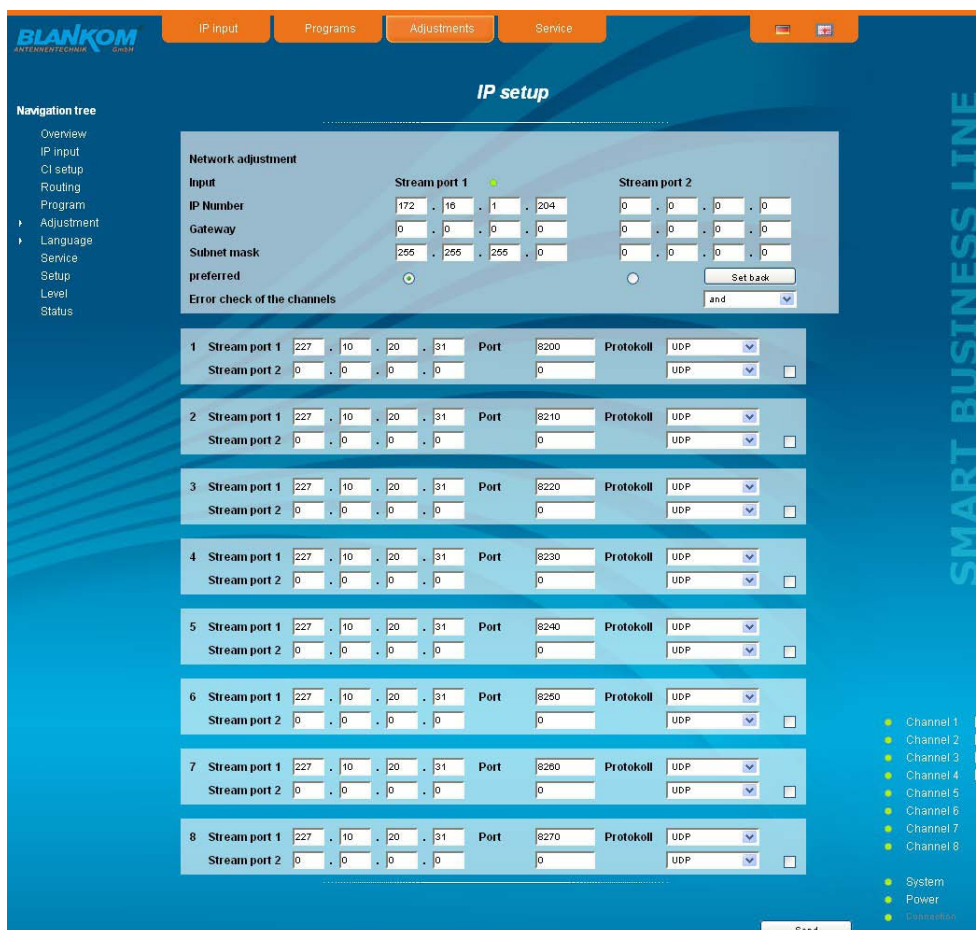
Some switches, it can happen that a configuration change concerning on the multicast group will take effect after the end of the switch set query interval:

Some switches ignore an unsolicited IGMP join message. If the querier is set in the switch to a longer period of time, it may occur, that after a configuration change the stream is not applied immediately, because the switch ignores the directly emitted IGMP message. Upon expiration of the query interval, the switch then asks himself after memberships in multicast groups. Also to this request, the device responds and sends a corresponding response message - this is then accepted by the switch, which thus transmits the stream to the device.

8.2.2.1 SFP option

The SFP option allows the connection of different modules for the IP input. Depending on the SFP module thus various management and media types can be connected to the PALIOS-IPM4CI. The IP input can be expanded to another IP data source. The SFP module figures as the stream port 2, so that either “Stream port 1” or “Stream port 2” can be used as an IP input. Simultaneously there is the ability to define one of the two IP inputs as the preferred source and the respective other IP input as redundancy source. When an IP data source fails, then switches to the other data source. For this purpose, individual rules can be defined for when and how to switch. Inclusion in the monitoring is configured on a per-channel basis. This is a global option, deciding when to switch: either when an input channel is down or all monitored channels have failed. The switching occurs even when no signal should be present at the redundancy input.

Switching back to the preferred IP input is not automatic, but can only be done manually via the user interface. Please note that actual monitoring on a particular channel starts for real one if actually receives data.

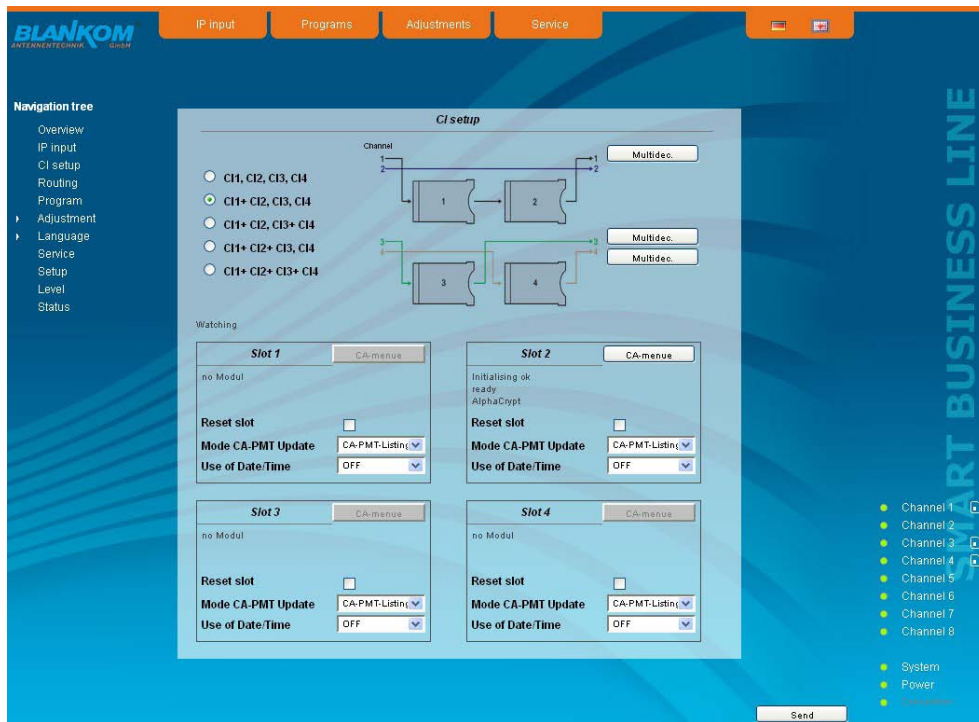


The form of the network settings also includes means for selecting the preferred IP input. The selection is made by pressing the appropriate option button. “Error check of the channels” as described above configures the device for switchover if only one of the monitored channels fails (“or”) or only when all monitored channels have failed (“and”).

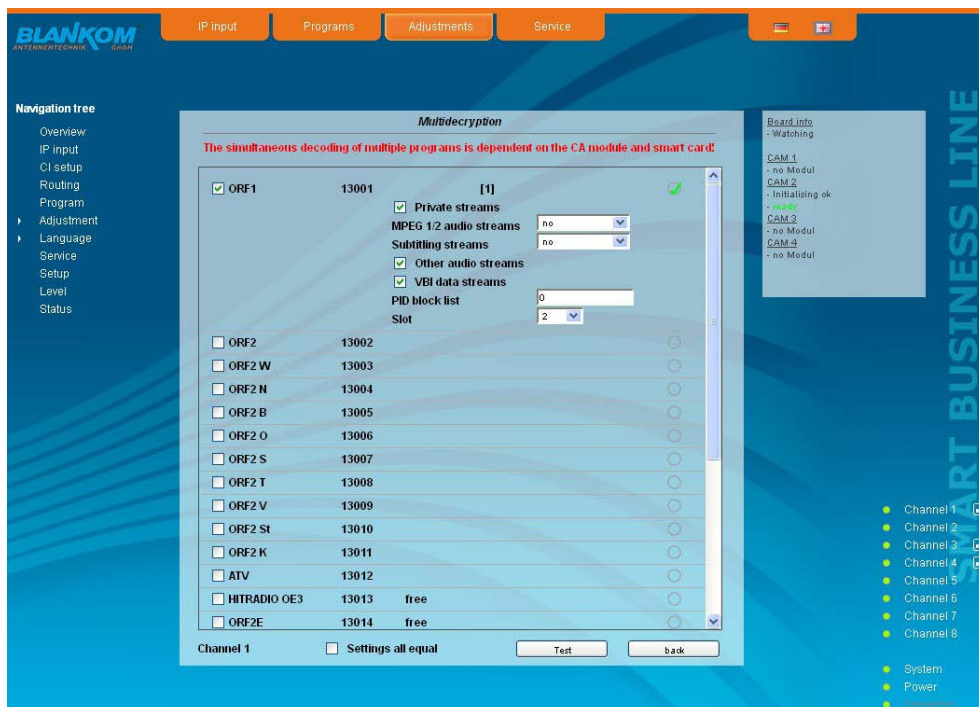
At the right of the configuration of each of the 8 IP input transport streams, there is a check box. By marking this box, the respective transport stream is included in the monitoring.

8.2.3 Menu "CI setup"

In this menu there is the configuration of the Common Interfaces of the device. The PALIOS-IPM4CI has 2 double-CI slots for a maximum of 4 CA modules. The modules can be cascaded. That means, that 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 PALIOS-IPM4CI, 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 than 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

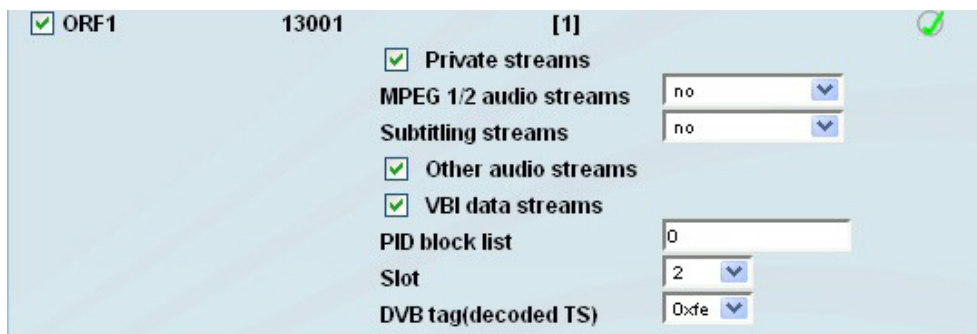
In the column "PID block list" all PID's are listed, that shall not be decrypted. The PID's can be given in decimal or hexadecimal format and have to be separated by a semicolon. The maximum number of PID's is 10. ² If "Settings all equal" is clicked, only one service for PID selection is offered and 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.

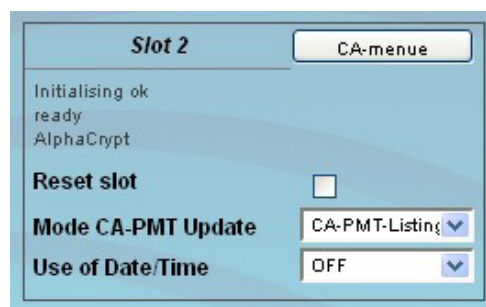
¹ "Other Audio Streams" includes all AC3-, DTS- and AAC-Streams. "Private Streams" selects all streams which are not captured by the other selection fields.

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 8.2.8), 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.



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.



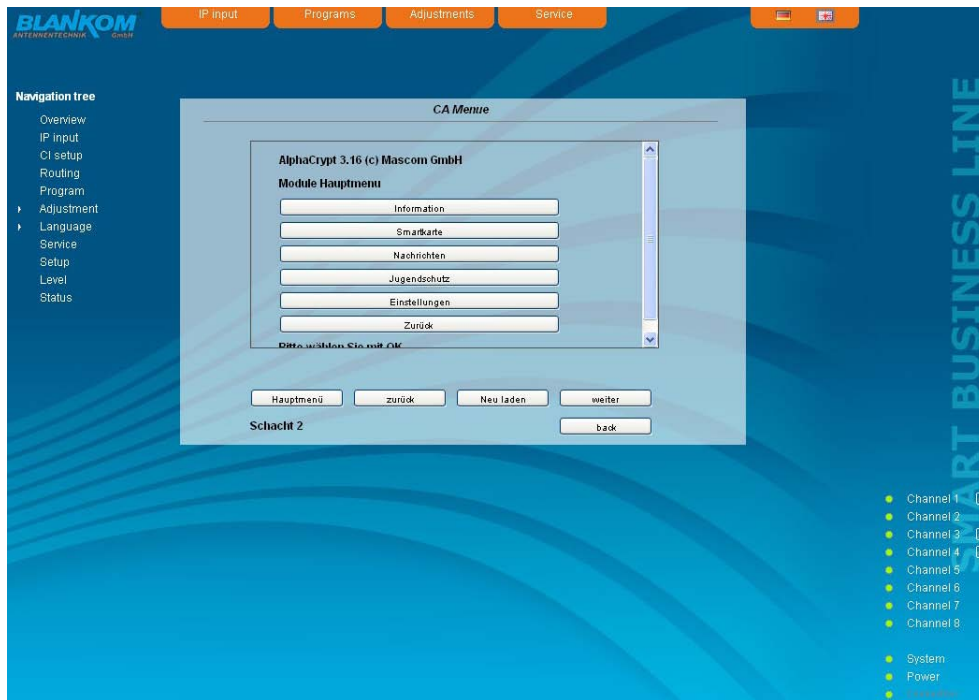
Individual CA modules must be initialized before setting the CA services. For this purpose the box "Reset slot" is clicked.

The mode of the CA-PMT update will be adjusted on the next line. You can select between CA and CA-PMT PMT-list 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 in this setting should be disabled.

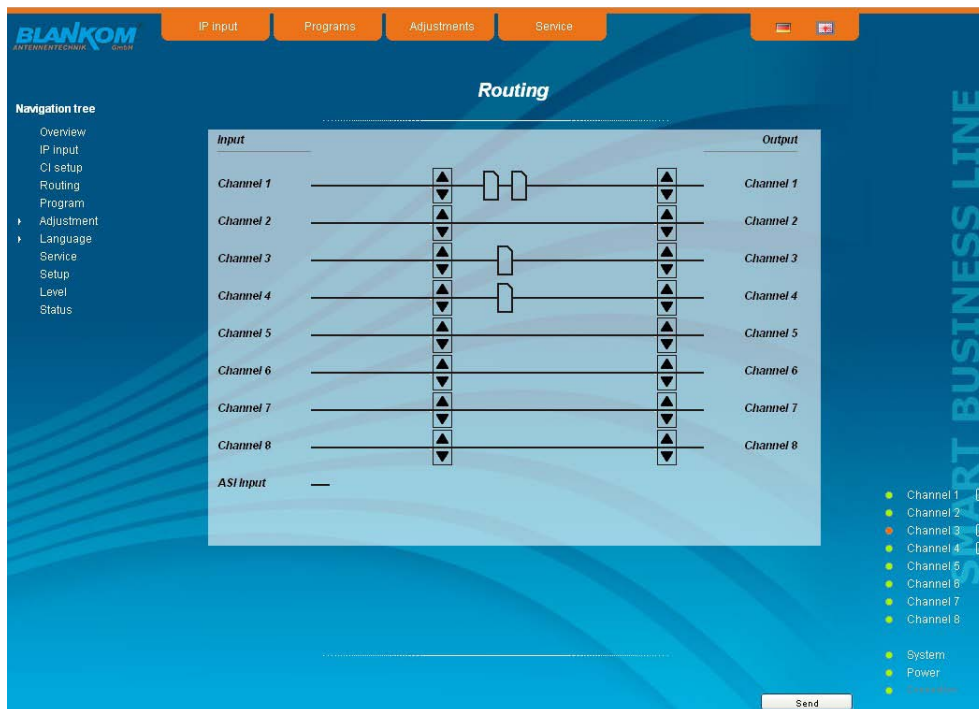
Click the button above right to get into the CA menu. There, the menus implemented in the CA module are offered the user. The menus can be selected individually or sequentially accessed in order to make necessary adjustments or to retrieve information to the CA module.

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.



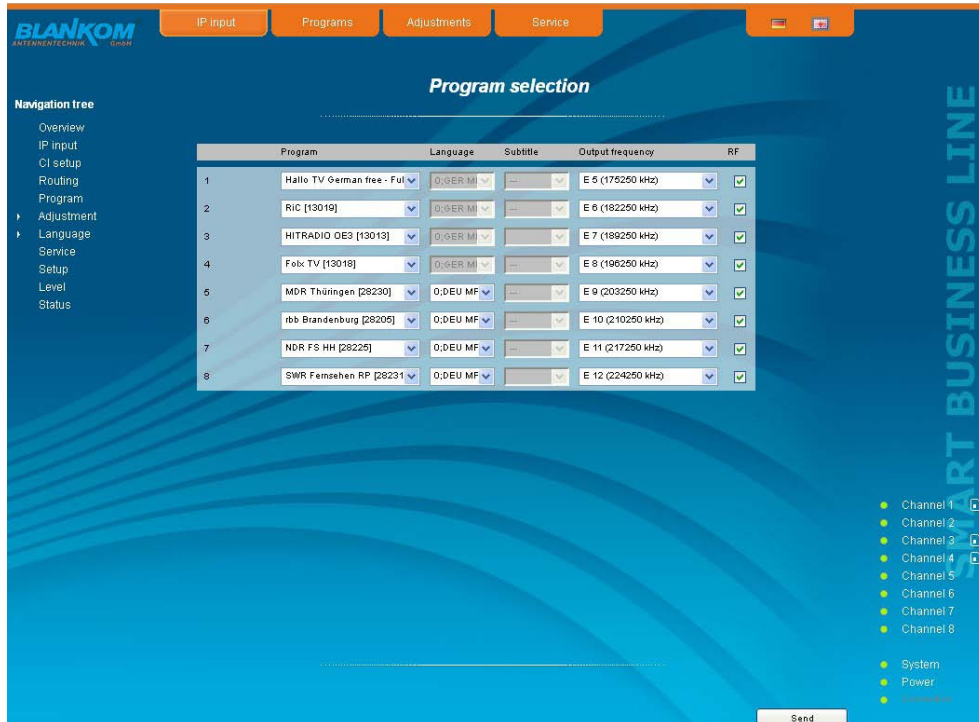
8.2.4 Menu "Routing"

In this menu you can make very clear the channel assignment of the inputs and 8 outputs. For each channel, there are two switching options: the first (left in the GUI) at the input and the second (on the right in the GUI) at the output. The setting is done by using the „▲“ or „▼“ button. Both on the input side as well as on the output side the assignment can be freely selected, i.e. on input side per channel the source (IP stream 1...8, ASI TS, player) can be freely selected for further processing, on the output side however, it can be chosen freely, from which input or media player, the transport stream including the desired TV program comes. Because this matrix of the output channel assignment is after the CA processing, it is thus possible to distribute several decrypted channels of a transponder (if the CA module and card support it) to various output channels.



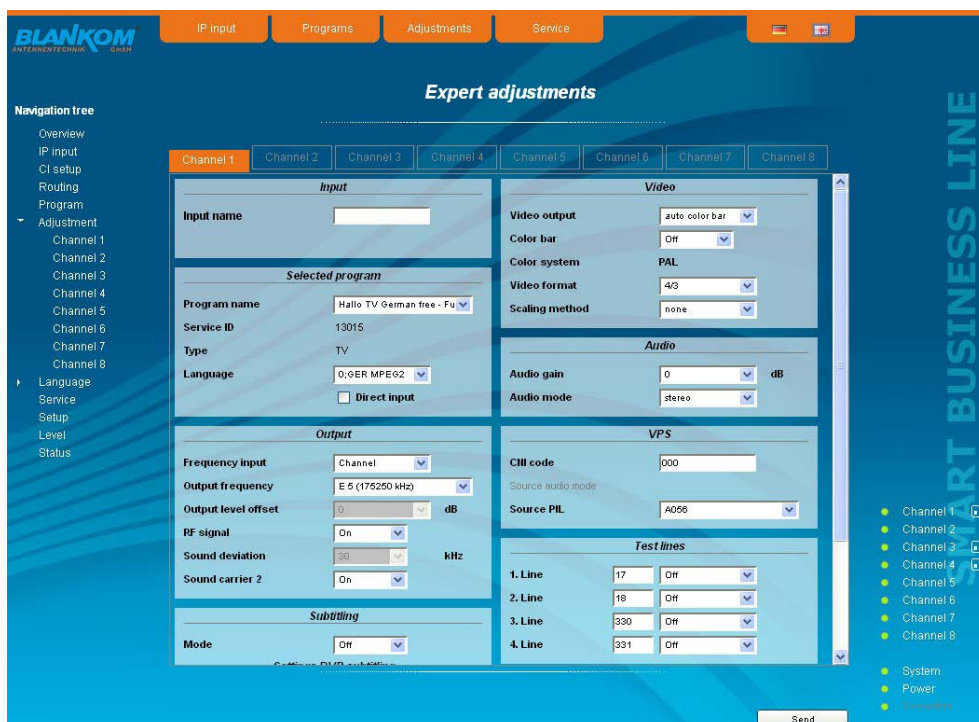
8.2.5 Menu "Transponders"

In this menu the program selection is done for all output channels. After call up of the menu at first the actual channel allocation of the PALIOS-IPM4CI module is listed. The following settings respective changes per channel are possible: in the column "IP" there can be selected the transponder, which contains the program to be transferred. In the next column the requested program can be selected. In the next both columns there can be selected the language respective the language of the subtitles, if there are more than one of them. In the column "Output frequency" there is to be selected the output channel of the program. On double assignments within these 8 channels is called attention to this automatically. With the checkbox "RF" the RF output of the channel is set to "on" or "off". Clicking the "Send" button, the settings are taken and stored..



8.2.6 Menu "Adjustment"

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



The following parameters are adjustable:



Program	Service ID	Select
rbb Brandenburg	28205	<input type="radio"/>
rbb Berlin	28206	<input type="radio"/>
ARD-TEST-1	28221	<input type="radio"/>
NDR FS MV	28224	<input type="radio"/>
NDR FS HH	28225	<input type="radio"/>
NDR FS NDS	28226	<input type="radio"/>
NDR FS SH	28227	<input type="radio"/>
MDR Sachsen	28228	<input type="radio"/>
MDR S-Anhalt	28229	<input type="radio"/>
MDR Thüringen	28230	<input checked="" type="radio"/>
SWR Fernsehen RP	28231	<input type="radio"/>
ARD-Data-1	28250	<input type="radio"/>

Program list (Transponder)

If “Program selection with select box“ in chapter “GUI settings“ is deactivated (see also chapter 8.2.8), the form at the left appears for program selection. All programs of the selected transponder are listed with name and service ID. The selection of the program is done by marking of the respective select box. The program name and the other parameters of the program are adopted automatically. In this case the program name in the menu “Selected program“, variant 1 is not selectable.



Input

Input name

input parameters of the channel
e.g. name of the program, editable



Selected program

Program name

Service ID
Type
Language
Direct input

variant 1: program selection menu
selection of the program from the program list of the transponder of the selected IP TS displays the service ID of the selected program displays the type of the program selection of the available language selection: selection menu, direct input (see below)

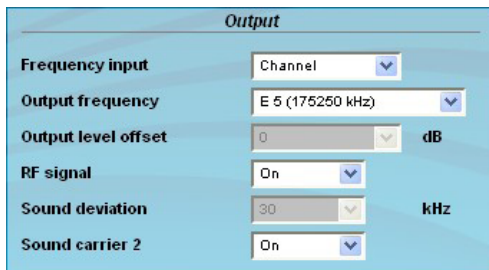


Selected program

Program name

Service ID
Type
Language

variant 2: direct input
displays the name of the program, which was selected in the input menu
input of the service ID of the requested program, adjustment range: 0...65535
selection of the program type: TV, Radio
input of the language n°, adj. range: 0..255



Output

Frequency input
Output frequency
Output level offset
RF signal
Sound deviation
Sound carrier 2

output parameters of the channel
selection: channel, frequency ¹
selection from channel table/ input in kHz ¹
display of the level offset ²
selection: On, Off
selection: 30, 50 kHz ³
selection: On, Off

¹ If at the frequency input “channel“ is selected, the output frequency can be chosen in the pre-selected channel spacing (see chapter 8.2.8). If, however, “frequency“ is selected, then the output frequency is selectable in kHz steps.

² Adjustment of the offset of each channel to the basic level, see chapter 8.2.10

³ Only selectable, if sound carrier 2 is set to “Off“. If sound carrier 2 is set to “On“, the sound deviation is permanently 30 kHz



Video

Video output
Color bar
Color system
Video format
Scaling method

setting of the video parameters
selection: On, auto Off, auto colour palette bar
selection: On, Off
displays the selected color system (see 8.2.8)
selection: 4/3, 16/9
selection: none, pillar or letter box, fullscreen center cut out

Audio

Audio gain dB

Audio mode

Audio

setting of the audio parameters

Audio gain
Audio mode

adjustment range: +6...-20 dB
selection 1: mono L, mono R, dual, dual invers, stereo, auto ⁴
selection 2: mono L, mono R, mono L+R, auto ⁵
⁴ if sound carrier 2 is set to "On"
⁵ if sound carrier 2 is set to "Off"

VPS

CNI code

Source audio mode

Source PIL

VPS

setting of the VPS parameters

CNI code

adjustment range: 0x000...0xFFFF (hexadec.)

Source PIL

selection: A056(PDC), A056, PDC, TimerControlCode

Subtitling

Mode

Settings DVB subtitling

DVB language index

Use extended ID's

Settings Teletext subtitling

Teletext page

Language group

Subtitling ⁶

adjustment of the parameters

Mode

selection: Off, Teletext, DVB

Settings DVB subtitling

DVB language index
Use extended ID's

adjustment range: 0...255
selection: yes, no

Settings teletext subtitling

Teletext page
Language mode

adjustment range: 0..65535
selection: West, East, Russian, Arabic, Farsi

⁶ only available, if "Subtitling" option is enabled (see chapter 8.2.8)

Test lines

1. Line	<input type="text" value="17"/>	<input type="text" value="Off"/>
2. Line	<input type="text" value="18"/>	<input type="text" value="Off"/>
3. Line	<input type="text" value="330"/>	<input type="text" value="Off"/>
4. Line	<input type="text" value="331"/>	<input type="text" value="Off"/>

Test lines ⁷

The PALIOS-IPM4CI offers the opportunity to output test signals on up to 4 image lines from the following selection: Off, CCIR 17, CCIR 18, CCIR 330, CCIR 331, Sin(x)/ x, Ramp. As a default, the image lines 17, 18, 330 and 331 are selected. The image lines selection is editable, i.e. the test lines can be output on each image line in the range 1..625.

⁷ only available, if "Test line" option is enabled (see chapter 8.2.8)

Decryption settings

BISS key

BISS-E injected ID

Decryption settings ⁸

BISS key
BISS-E injected ID

input of the 12-digit code in BISS mode 1 or of the 16-digit code in BISS mode E
input of the 14-digit code in BISS mode E, no input in BISS mode 1

⁸ only available, if "BISS" option is enabled (see chapter 8.2.8)

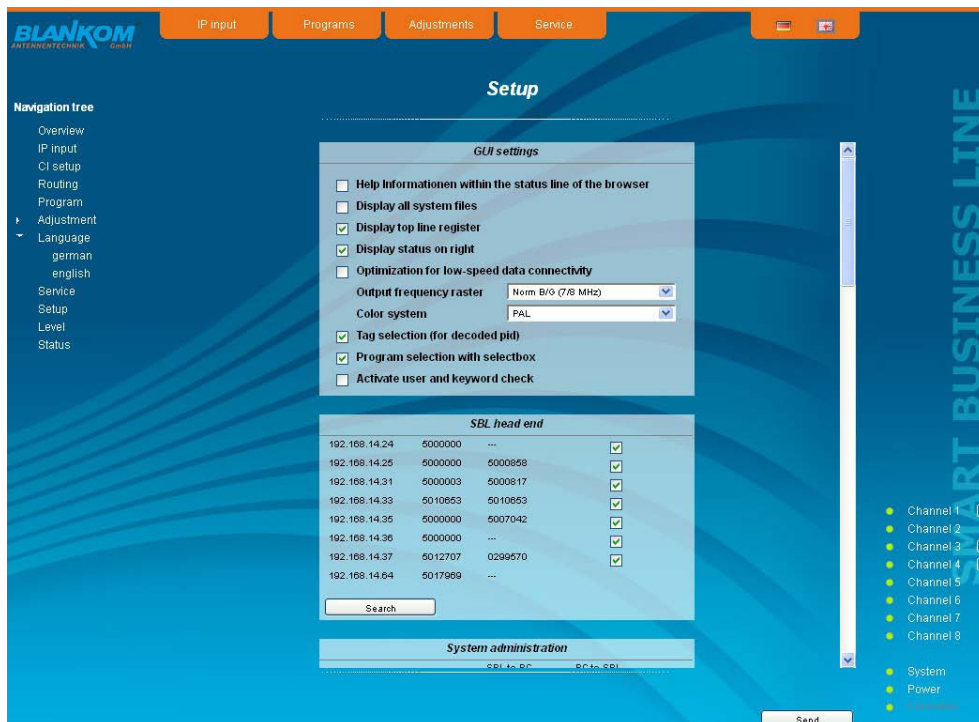
8.2.7 Menu "Language"

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 via the language selection box.

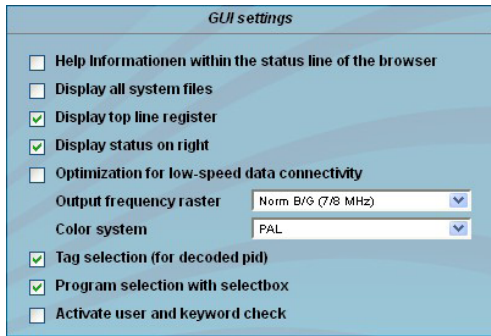


8.2.8 Menu "Setup"

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". If you click 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 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 module, if there is only a low-speed connectivity (GSM). The available reduction is achieved by reducing image size.

Output frequency raster

It is possible to choose between the standard B/G raster (7 or 8 MHz) and the D/K rasters. In case of D/K1 the sound carriers are at 6,5/ 6,25 MHz, D/K2 at 6,5/ 5,74 MHz and D/K3 at 6,5/ 6,74 MHz. Simultaneously in accordance with the selection, the group delay filter is set for standard B/G or D/K.

Color system

In this box you can select in which color standard, the 8 programs are to be transferred. You can choose between PAL and SECAM.

Tag selection (for decoded pid)

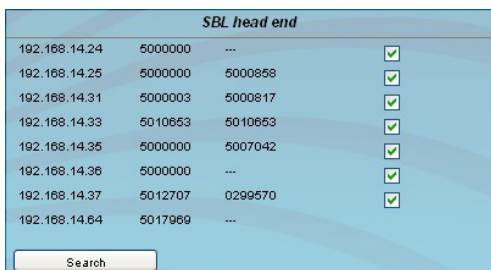
By click there is the possibility that in the PMT processing the CA descriptor is replaced by a self-selected user-defined descriptor of the range 0x00 .. 0xFF. The default value is 0xFE (see chapter 8.2.3)

Program selection with select box

If the box is deactivated, the program selection is done with the program list in the adjustment menu. Otherwise the program selection is done in the field "Selected program" (see chapter 8.2.6).

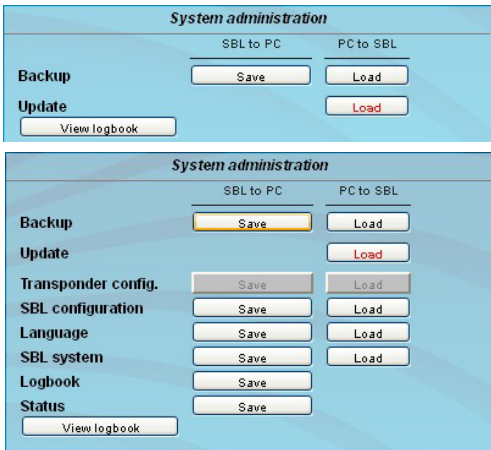
Activate user and keyword check

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 8.1).



SBL head end

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



System administration

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

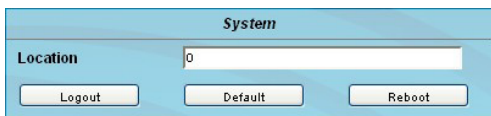
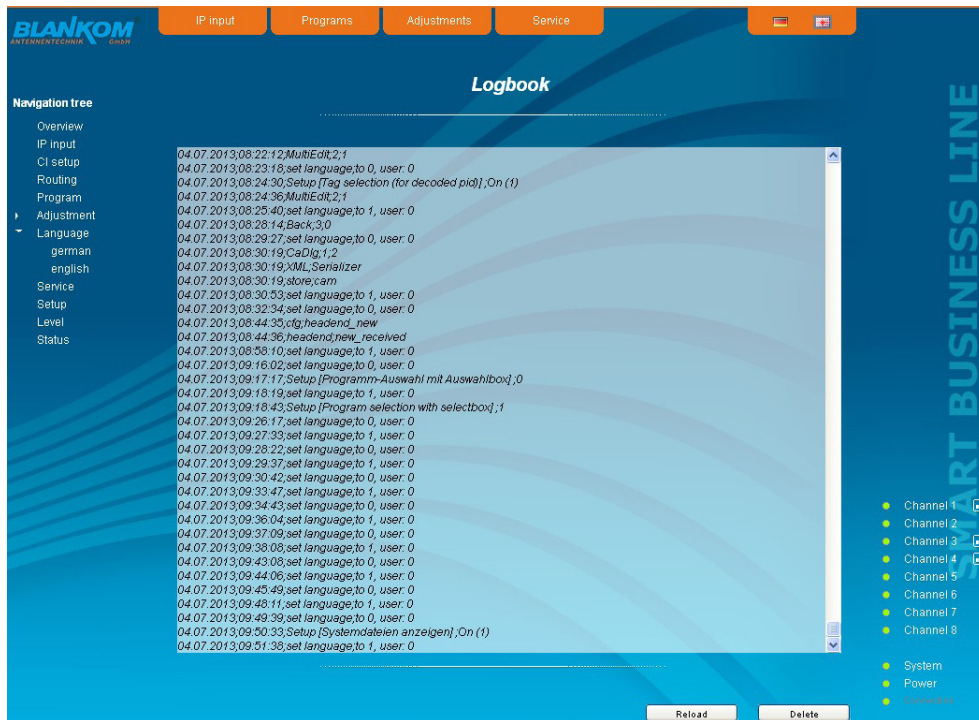
Backup

Here the system files can be loaded or saved as a package (except Logbook and Status). Thus, it is possible, for example in a simple way to copy the system files from a PALIOS-IPM4CI module 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.

Update

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

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.



System

Location

In this field a name for the PALIOS-IPM4CI is made to identify the module 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

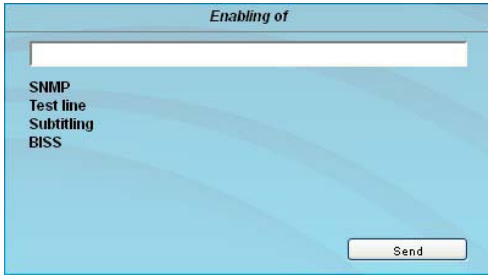
restart the user interface

Default

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

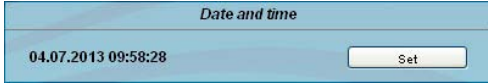
Reboot

restart of the PALIOS-IPM4CI module



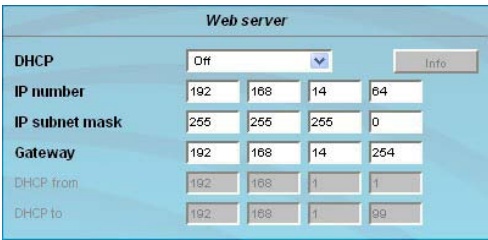
Enabling of

In this field, possible software options for the PALIOS-IPM4CI module 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 greyed out.



Date and time

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



Web server

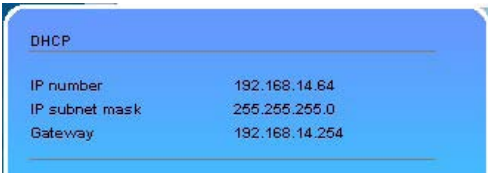
This setting appears only when you are logged in as administrator, and thus you have the authority to make administrative changes.

The PALIOS-IPM4CI supports the DHCP functionality. DHCP-Client is factory default. Note, that after each factory reset the PALIOS-IPM4CI is set "DHCP-Client".

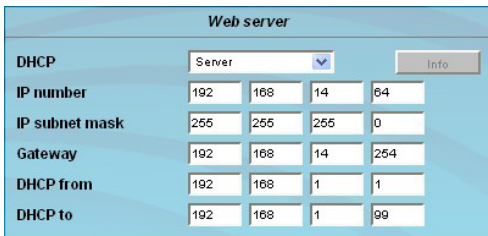
If the **DHCP functionality** is set to "Off", in the appropriate fields the IP number, subnet mask and gateway can be manually entered and then the settings of the PALIOS-IPM4CI module are adapted to the network.



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



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



Please note if the module 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 module is configured as a DHCP server or client and the client has received an IP address successfully, so module can be accessed via a web browser using its name. This name is composed of the prefix "sbl" and the device number that is printed on the back of the module and on the packaging. For example, the device with the number 0123456 can be 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 module 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 SBL module is as a server, the remaining modules and the connected PC/ laptop are configured as a client. By calling the browser "dhcp.sbl" the GUI of the server module 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 module by selecting the respective modules links.



SNMP option

The SNMP adjustment is only available after the “SNMP” option was enabled (see chapter “Enabling of”). In the first section, the SNMP functionality, including the sending of traps is enabled or disabled with the “Mode” selection field. With the selector “Version” you can select the SNMP version (version 1, 2 or 3). In the two boxes below it, the communities for versions 1 and 2 are given separately for reading and writing via SNMP. With version 3, these two fields are disabled because all registered users of the module (see menu “Passwords”) have the automatic read access to SNMP. The write access can be enabled or disabled for each user by clicking the SNMP check box in the “Passwords” menu. By clicking the “MIB” button the MIB of the module is generated and offered for download.

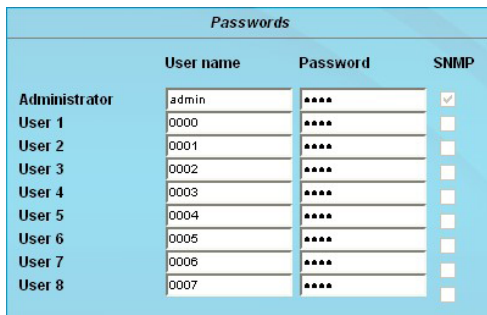
In the second section the trap settings are done. First, the trap version is selected:
 V1 trap - normal traps according SNMPv1 with specified community
 V2 trap - normal traps according SNMPv2 with specified community
 V2 inform - sends information traps according SNMPv2 and waits for an acknowledgment
 V3 trap - normal traps according SNMPv3
 V3 inform - sends information traps according SNMPv3 and waits for an acknowledgment

The community can be configured for traps of SNMP versions v1 and v2. User/ password and the using of the network MAC address as the engine ID can be configured for traps of SNMP version v3. These settings must correspond with the configuration of the trap receiver, so traps are successfully transferred. For this purpose a test trap can be sent by clicking the button “Test” to test the transmission of traps. If a test trap triggered, all pre-preserved traps are discarded.

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 parameter for a medium priority
 - with a selectable parameter from a list for a medium priority

References and notes:

All users using SNMPv3 must use passwords with at least 8 characters. For SNMPv3 the SBL supports only the authentication password, not the privacy password. The SBL only supports the MD5 algorithm for authentication password in SNMPv3. Information traps are specific traps that are possible up to SNMPv2. If there is no acknowledgment of the receiver, the transmitter attempts to transmit it later, until the confirmation is received. A SBL module holds up to 256 information traps that could not be sent successfully. If there are more unconfirmed traps, the older traps are discarded and noted in the logbook as having failed. A successful sent trap is also registered as such in the logbook. In case of power failure or reboot of the module the non-confirmed traps are lost. Details may be found in the help text for each event. The critical priorities are each covered with fixed values that can not be changed. If the web site of PALIOS-IPM4CI module is open, no changes are possible via SNMP.



	User name	Password	SNMP
Administrator	admin	****	<input checked="" type="checkbox"/>
User 1	0000	****	<input type="checkbox"/>
User 2	0001	****	<input type="checkbox"/>
User 3	0002	****	<input type="checkbox"/>
User 4	0003	****	<input type="checkbox"/>
User 5	0004	****	<input type="checkbox"/>
User 6	0005	****	<input type="checkbox"/>
User 7	0006	****	<input type="checkbox"/>
User 8	0007	****	<input type="checkbox"/>

Passwords

Again, this setting appears only when you are logged in as administrator, having the authority to make administrative changes. In addition the box “User and key-word check” in the submenu “GUI settings” has to be clicked. The user ID and password for the administrator can be set in the first line. The fixing of up to 8 user identification and passwords is possible. The limitations of user rights exist only in the fact that they are not authorized to change web server settings, user rights and password changes and default settings. The default **password** for the **admin** is: 1111 and for the **users**: 0000. If the SNMP option is enabled, to the right of each user appears an SNMP check box. By clicking the box, the writing rights for individual users can be awarded for the SNMP version 3 (see also section SNMP option).

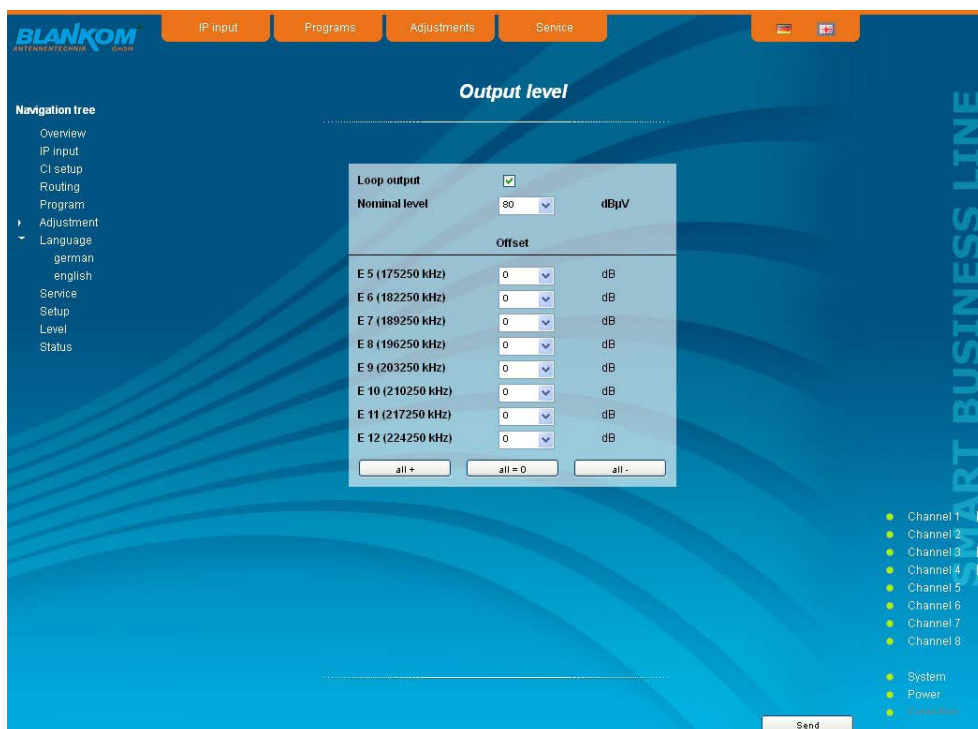
8.2.9 Menu "Service"

In this menu you will find all information about the service for the PALIOS-IPM4CI module 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.



8.2.10 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 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.



8.2.11 Menu "Status"

It presents an overview of the status of the various components per channel, it 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. The listing is in 3 groups: input, modulators and system. With the selection box at the top right you determine whether you have an overall view or only one of the 3 groups is listed.



The screenshot shows the 'Status table' interface with a navigation tree on the left and a main data table. The navigation tree includes: Overview, IP input, CI setup, Routing, Program, Adjustment, Language (german, english), Service, Setup, Level, and Status. The main table displays data for 8 channels and system parameters.

	Channel: 1	Channel: 2	Channel: 3	Channel: 4	Channel: 5	Channel: 6	Channel: 7	Channel: 8	
(IP Channel 1)	(IP Channel 2)	(IP Channel 3)	(IP Channel 4)	(IP Channel 5)	(IP Channel 6)	(IP Channel 7)	(IP Channel 8)		
33,811 Mbps	33,811 Mbps	33,811 Mbps	33,811 Mbps	38,022 Mbps	38,022 Mbps	38,022 Mbps	38,022 Mbps	38,022 Mbps	
975589	975589	975589	54055626	1095718	1095717	1097559	1097559		
0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0		
active input		Stream port 1							
Start time	10.09.25								
End time	10.14.25								
Datarate read	297,250 Mbps								
Data rate send	0,0 Mbps								
ASI Datarate	0,0 Mbps								
ASI Lock	no lock								
SYNC.	SYNC.	SYNC.	SYNC.	SYNC.	SYNC.	SYNC.	SYNC.		
SYNC.	SYNC.	SYNC.	SYNC.	SYNC.	SYNC.	SYNC.	SYNC.		
SYNC.	SYNC.	SYNC.	SYNC.	SYNC.	SYNC.	SYNC.	SYNC.		
SYNC.	SYNC.	SYNC.	SYNC.	SYNC.	SYNC.	SYNC.	SYNC.		
SYNC.	SYNC.	SYNC.	SYNC.	SYNC.	SYNC.	SYNC.	SYNC.		
SYNC.	SYNC.	SYNC.	SYNC.	SYNC.	SYNC.	SYNC.	SYNC.		
all ok [1]	all ok [3]		all ok [4]						
all ok [2]									
Base board temperature	40,5 °C								
Base board FPGA temperature	49,3 °C								
Temperature Cryptos	48,8 °C								
Fan 1	okay								
Fan 2	okay								
New configuration available.									

9. Factory settings

A short pressing of the reset button on the front of the module causes a reboot, i.e. the module restarts and all stored values are adjusted. If the module 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 module is set to the following:

Input parameters

Network adjustment			
Input		Stream port 1	
IP Number	0 . 0 . 0 . 0	0	0
Gateway	0 . 0 . 0 . 0	0	0
Subnet mask	0 . 0 . 0 . 0	0	0
<hr/>			
1 Stream port 1	0 . 0 . 0 . 0	Port 0	Protokoll UDP
2 Stream port 1	0 . 0 . 0 . 0	Port 0	Protokoll UDP
3 Stream port 1	0 . 0 . 0 . 0	Port 0	Protokoll UDP
4 Stream port 1	0 . 0 . 0 . 0	Port 0	Protokoll UDP
5 Stream port 1	0 . 0 . 0 . 0	Port 0	Protokoll UDP
6 Stream port 1	0 . 0 . 0 . 0	Port 0	Protokoll UDP
7 Stream port 1	0 . 0 . 0 . 0	Port 0	Protokoll UDP
8 Stream port 1	0 . 0 . 0 . 0	Port 0	Protokoll UDP

Output parameters

Standard Values	
Output	
Sound deviation	30 kHz
Sound carrier 2	On
Video	
Video output	auto color bar
Color bar	Off
Color system	PAL
Video format	letterbox
Audio	
Audio gain	0 dB
Audio mode	stereo
VPS	
CNI code	000
Source audio mode	A056(MPEG)
Source PIL	A056
Complementary data	
Teletext	On
WSS insertion	On

Loop output	<input checked="" type="checkbox"/>	
Nominal level	80	dBµV
Offset		
E 5 (175250 kHz)	0	dB
E 6 (182250 kHz)	0	dB
E 7 (189250 kHz)	0	dB
E 8 (196250 kHz)	0	dB
E 9 (203250 kHz)	0	dB
E 10 (210250 kHz)	0	dB
E 11 (217250 kHz)	0	dB
E 12 (224250 kHz)	0	dB
<input type="button" value="all +"/> <input type="button" value="all = 0"/> <input type="button" value="all -"/>		

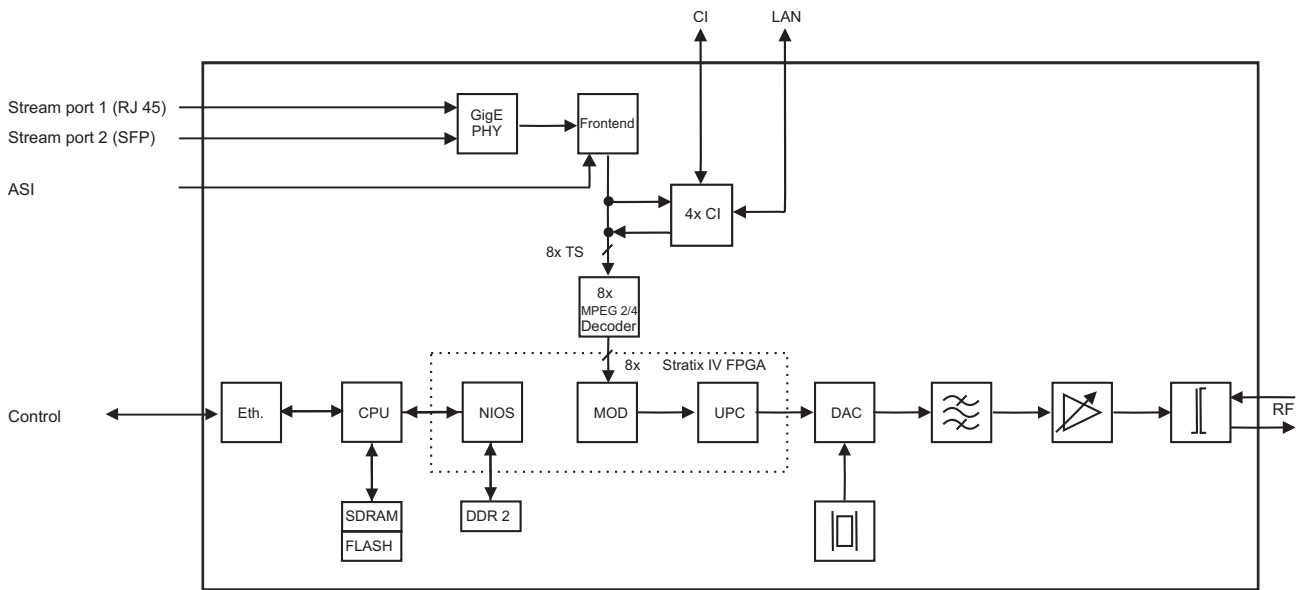
Setup settings

GUI settings	
<input type="checkbox"/>	Help Informationen 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 status on right
<input type="checkbox"/>	Optimization for low-speed data connectivity
	Output frequency raster: Norm B/G (7/8 MHz)
	Color system: PAL
<input type="checkbox"/>	Tag selection (for decoded pid)
<input checked="" type="checkbox"/>	Program selection with selectbox
<input type="checkbox"/>	Activate user and keyword check

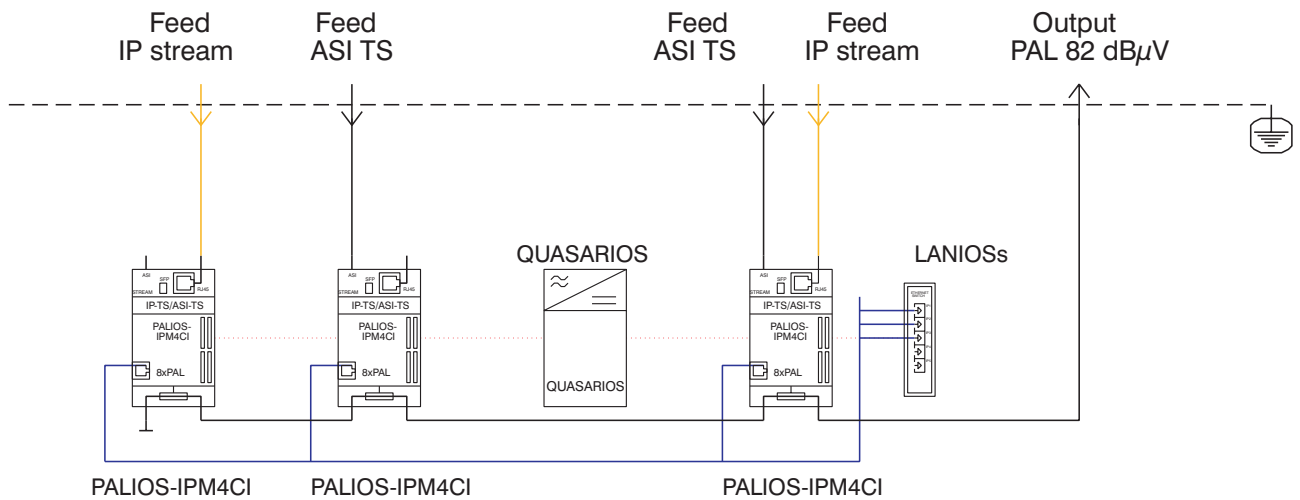
Network settings

Web server				
DHCP	Client	<input type="button" value="Info"/>		
IP number	192	168	14	64
IP subnet mask	255	255	255	0
Gateway	192	168	14	254
DHCP from	192	168	1	1
DHCP to	192	168	1	99

10. Block diagram



11. Application example



12. Technical data

IP input (stream port)

Network connection (LAN/ WAN)	Ethernet, 10/ 100/ 1000 Base-T
Connector	1x RJ 45, 1x SFP
Protocols	ARP, PING, IPv4
Streaming protocols	UDP, RTP, RTP-FEC
Streaming mode	CBR/ VBR

ASI input

Level range	200 ... 880 mV _{pp}
Data rate	270 Mbps
Connector	BNC socket
Impedance	75 Ω
ASI polarity	regular/ inverted

ASI signal processing

Data rate	0.625...75 Mbps
ASI transfer format	continuous, burst
TS transfer format	188, 204 Byte
Signal processing	EN 50083-9 [1]

Decryption interface

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

MPEG decoder

Video	H.264/ AVC Level 4.1 HP, MPEG-2 MP@HL
Audio	MPEG-1 Layer 1&2

TV output

TV standard	B/G, D/K
Sound type	double carrier FM
Sound carrier frequencies	B/G 5.5/ 5.742 MHz D/K1 6.5/ 6.25 MHz D/K2 6.5/ 5.742 MHz D/K3 6.5/ 6.742 MHz (each above picture carrier)
Sound mode	mono/ stereo/ dual/ auto (VPS controlled)
Audio deviation 1 mono carrier	30/ 50 kHz
Audio deviation 2 mono carrier	30 kHz
Audio deviation dual sound	30 kHz

Output frequency range	45 ... 862 MHz
Tuning step	1 kHz
Max. output level	97 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

C/N in channel (BW = 4,8 MHz)	≥ 65 dB
S/N ratio parallel sound (unweighted/ weighted)	≥ 65/ 60 dB
Spurious 45...862 MHz	≥ 60 dB
Max. frequency stability	30 kHz
Output level stability	± 0.5 dB

Operating parameters

Voltage/ current (without CAM)	12 V ± 0.2 V/ max. 3.9 A
Residual ripple of the supply voltage	10 mV _{pp}

Environmental conditions

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

Miscellaneous

Dimensions (w x h x d)	76 x 262 x 167 mm
Weight	1,900 g

Delivery content

1x supply cable
1x network cable
1x F connecting cable 180 mm
1x terminating impedance
1x DIN rail clip
1x mounting accessories

13. Glossary

AAC	Advanced Audio Coding
AM	Amplitude modulation
ARP	Address Resolution Protocol
ASI	Asynchronous Serial Interface
ATV	Analogue Television
BISS	Basic Interoperable Scrambling System
BISS-E	Basic Interoperable Scrambling System with Encrypted keys
CA	Conditional Access
CAT	Conditional Access Table
CNI	Country and Network Identification
DVB	Digital Video Broadcasting (-C Cable, -S Satellite, -S2 Satellite 2, -T Terrestrial)
FPGA	Field Programmable Gate Array
GbE	Gigabit-Ethernet
GUI	Graphical User Interface
HD(TV)	High Definition (Television)
HE-AAC	High Efficiency Advanced Audio Coding
HTTP	Hypertext Transfer Protocol
ID	Identifier
IF	Intermediate Frequency
IGMP	Internet Group Management Protocol



IIC	Inter-Integrated Circuit (I ² C bus, data bus within device)
IP	Internet Protocol
LED	Light Emitting Diode
MAC	Media Access Control
MPEG	Moving Picture Experts Group
Nios	product name for a processor
NIT	Network Information Table
PCR	Program Clock Reference
PID	Program Identifier
RF	Radio Frequency
SFP	Small Form-factor Pluggable
SNMP	Single Network Management Protocol
TS	Transport Stream
VBI	Vertical Blanking Information
VPS	Video Programming System
WSS	Wide Screen Signalling

14. 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 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
- [3] EN 50083-2 : Cabled distribution systems for television and sound signals. Electromagnetic compatibility for equipment; EN 50083-2:2001
- [4] RFC 1157 Request for Comments (RFC): RFC Database URL: [Http://www.rfc-editor.org/rfc.html](http://www.rfc-editor.org/rfc.html)
- [5] 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 PALIOS-IPM4CI
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	01.07.2013	basic version	Häußer

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

CE Declaration of Conformity

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

Product Name: 8 pole IP-/ ASI-TV Modulator

Type Name: PALIOS-IPM4CI

Type N°: 5113.01

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, 2013-07-01



Dr. Piero Kirchner
(Managing Director)