Professional Headend Solutions

B-IRD Eagle DRP 393

MPEG-4 Receiver / Decoder

Instruction Manual

DVB Digital Video Broadcasting

DOLBY DIGITAL *

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Important Notes!

This manual is for use by qualified personnel only. Handling this device or system requires special electrotechnical knowledge. To reduce the risk of electrical shock or damage to the equipment, do not perform any servicing other than the installation and operating instructions contained in this manual unless you are qualified to do so. This device operates in the given voltage and frequency range without requiring manual adjustment.

Special symbols that might appear on the equipment:

This symbol indicates that there are dangerous live parts within the equipment, which are not insulated. Do not touch these live parts, because serious injury or death may be the result!

This symbol indicates that there are components under risk from electrostatic discharge. To avoid equipment damages do not touch these components or, observe the respective handling rules!

For continued protection against fire, the fuses may only be replaced by identical fuses with the same electrical specifications which are designed for the corresponding fuse positions.

Installation Notes

All types of the DRP family are 19‟ devices with 1 RU height designed for installation in 19” racks. In addition to the front panel screws an internal module support is required at the rack. At least 1 RU space is required above the module for heat dissipation in the 19" rack.

Depending on the Frontend used and the operating adjustments, the input port carries DC voltage (13V / 18V, max. 500 mA).

By connecting a mains cable, the device can become functional without any auxiliary appliances. The power supply units are not designed for the wide range of 100-240V AC; a manual adjustment of the voltage is not necessary.

All the outputs are decoupled from one another. Thus, the circuit does not have any effect on the functioning of the device. Connections that are not required need not be terminated.

Suggestion: CAT 6E Ethernet cable for GigEthernet

Table of Contents

General description

DRP 393 is an MPEG-4 receiver / decoder in a 19" 1 RU housing. MPEG-2/MPEG-4 SD/HD signals can be processed. The input signals are demodulated, descrambled, decoded and are available as ASI transport stream / stream and also as a video and audio signal at the output. For the descrambling, DRP 393 has a twin DVB-CI slot, which enables appropriate CAM modules to decode the complete transport stream. Optionally, different Frontends are available (DVB-S/DVB-S2, IP-Frontend) for receiving the Transport stream. As a standard, the device has one ASI input. Optionally, the received transport Transport stream can also be streamed in an IP network via a Gigabit-Ethernet interface. Another option is that the A/V signal can be made available on a HD-SDI/SDI output.
The device is operated locally, either via a LCD display and an additional wheel or with the implemented web server via a web browser. A SNMP agent with the corresponding MIB is built in for the integration in a network management system. The device is controlled via a separate LAN connection, which has a separate IP address; thus, the device can also be accessed from a distance.

The basic version of the DRP 393 comprises:

- 1 x ASI input
- 2 x ASI output
- 1 x ASI test output (front side)
- Twin DVB common interface for the CAM modules
- MPEG2 / MPEG4 decoder
- 1 x Video output CVBS
- 1 x Video test output (front side)
- 2 x Audio output (Stereo / dual-tone, XLR balanced)
- 1 x Audio test output (front side)
- 1 x SPDIF output, two-channel decoded or Dolby Digital pass through
- 1 x SFP interface for inclusion of Gigabit Ethernet SFP modules
- 1 x data interface (output, max. 38,4 kbps, RS-232)
- 10/100 Mbit LAN interface for web browser and SNMP
- Isolated / potential-free switching contacts
- LCD display with wheel and status LEDs
- Wide-range power supply unit

The basic device can be extended with additional hardware / software options:

- DVB-S/DVB-S2 Frontend in 50 Ohm or 75 Ohm (with LNB supply and 22kHz switch signal) design, SCPC filter
- DVB-S/DVB-S2 16APSK-/32APSK Frontend, 50 Ohm and 75 Ohm design, SCPC filter
- DVB-T/DVB-T2 Frontend
- DVB-C/DVB-C2 Frontend
- IP Frontend (Gigabit-Ethernet) with electric / optical SFP module
- MPTS after SPTS transformation (for IP)
- Service filter, PID filter
- Descrambler function for IP and ASI outputs
- BISS descrambler
- 2 additional audio outputs with adapter cable
- Additional video output (not simultaneously with SDI output)
- HD-/SD-SDI output with embedded audio and additional AES/EBU interface

Input

Different DVB Input Frontends can be implemented. HF input variants are 75 Ohm F-port or 50 Ohm SMA-port.

ASI interface

There are 2 equivalent ASI outputs on the back side of the device. There is 1 ASI test output on the device front panel. If a fault occurs, the ASI operating outputs can be switched off. The test output cannot be switched off. Depending upon the (software) configuration and option, the originally received TS or the TS with one or more descrambled services can be maintained on the ASI outputs. As a standard, an ASI input is provided for on the back side of the device. If an additional frontend is implemented, it is possible to switch over between the ASI and Frontend input.

MPEG-4 video decoder

The decoder supports MPEG-4 part10 (AVC, H.264) as well as MPEG-2 decoding. During an anamorphous 16:9 video transmission, the decoder generates a Letterbox video format from this signal. Moreover, the decoder can generate a SDTV signal (720x576) in the Letterbox format from the HDTV signal (1920x1080i, 1280x720p) by "downscaling". This decoder also supports DVB subtitling. The output signal is the analogue CVBS signal.
DRP 393 supports extensive VBI functionalities: The teletext lines, the data lines and the WSS signal as well as the test lines are entered in the analogue output signal.
All the 13 data bytes are transferred to the VPS data line (line 16). The audio status is generated according to the selected audio output format (basis: Audio output 1). The CNI code can be manually entered if it is not available within the TS (Transport stream).
The test lines 17, 18, 330, 331 and 329 are generated within the device. Line 331 can be assigned the CCIR or ramp signal. Line 329 can be assigned the sinx/x signal, teletext or data line.
The WSS signal (line 23) is generated according to the aspect ratio of the video output signal. If the letterbox conversion leads to a disturbing stream like a "string of beads" in the enabled video signal, this can be suppressed with the WSS letterbox muting function (blanking / suppression of line 59).
A colour bar test signal can be enabled for the purpose of testing.

2nd Video output

Optionally a 2nd video output is available. This output cannot be simultaneously integrated in the device with the HD-/SD-SDI option.

HD-SDI/SDI output

The HD-/SD-SDI output is an optional setting / configuration for DRP 393. It is designed as an additional plug-in module. This option supports SD-SDI with a data rate of 270 Mbpsas well as HD-SDI with a data rate of 1.485 Gbps. Up to 4 additional audio channels can be embedded in the SDI signal. Besides, a separate output is available AES/EBU audio signal.

Audio decoder

The basic device has 4 audio output channels (2 stereo / dual-tone). Two audio PIDs can be decoded within the device. Thus, the audio track for blind persons (e.g. ZDF) and the dual tone can be generated from two stereo PIDs (e.g. Arte). The level of every audio output can be set individually.
Dolby Digital is decoded and given out as a stereo signal.
Optionally, 4 other audio output channels can be activated.
Note: Dolby Digital (AC3) and MPEG audio signals cannot be decoded simultaneously!

For test purpose, 1 kHz test signal, nominal level +6 dBm can be enabled. The test signal is available on all audio outputs.

Digital audio output SPDIF

The PID selected for audio decoder 1 can also be given out via the digital SPDIF output. If a Dolby Digital signal (AC3) is selected, the AC3 signal (which is not decoded) can also be given out ("pass thru").

Wide-range power supply unit:

DRP 393 has a wide-range power supply unit. The input voltage range is 100V AC – 240V AC. In the event of an operational disturbance or a fault in the mains supply the configuration is stored in a non-volatile memory. Upon restart the operation automatically continues from the last setting.

Ordering Codes

Name	Type	Ordering code	Remarks
DRP 393, ASI Input	**DRP 393**	**D103.01**	

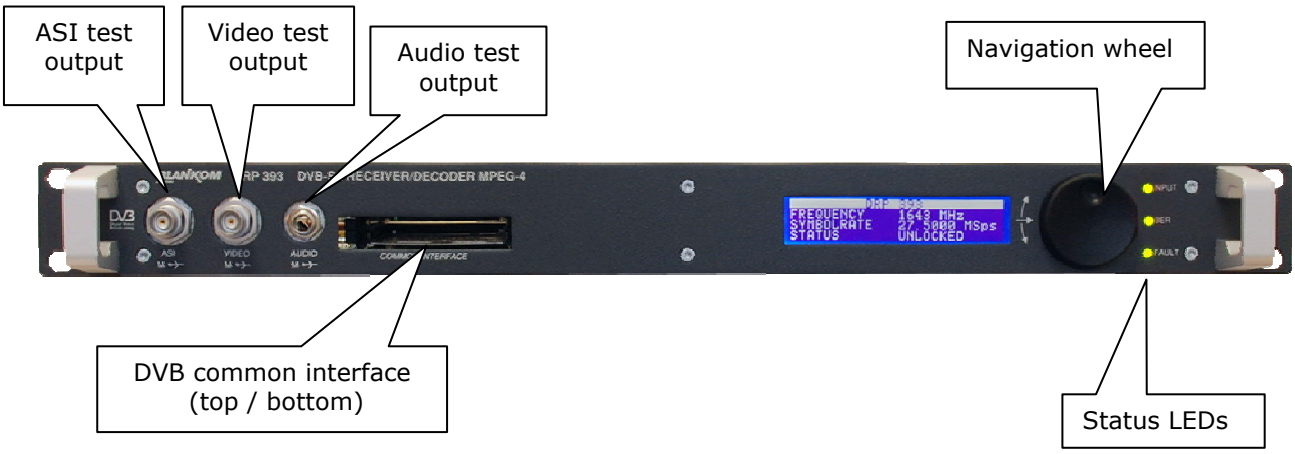
Input	DVB-S/S2, 75 Ohm	OPD103-02	OPD10301 0200	Option
	DVB-S/S2, 50 Ohm	OPD103-13	OPD10301 1300	Option
	DVB-T/C, 75 Ohm	OPD103-03	OPD10301 0300	Option
	DVB-T/C 50 Ohm	OPD103-15	OPD10301 0400	Option
	DVB-S/S2 APSK	OPD103-09	OPD10301 0900	Option

Output	SDI Genlock	OPD103-06	OPD10301 0600	Option
	SDI AES/EBU	OPD103-07	OPD10301 0700	Option
	2. Videoausgang	OPD103-14	OPD10301 1400	Option
	Adapter Mini-Combicon-D-SUB-9	PUZ157	Z120.01	Option
	Adapter D-SUB-15 – XLR,	PUZ158	Z121.01	Option
	Adapter XLR – DIN,	PUZ159	Z122.01	Option
	SFP koax, RJ45	SFP 100	F070.01	Option
	SFP optisch			Option
	SFP koax + MPTS	OPD103-30	OPD103013000	

Softwareoptions	**H.264AVC MPEG-4**	APA103-50	**OPD10301 5000**	**Standard Option**
	IP-Input	APA103-51	OPD10301 5100	Option SFP-Module necessary!
	IP-Streaming (MPTS) + Filtering	APA103-52	OPD10301 5200	
	IP-Streaming (SPTS) + Filtering	APA103-53	OPD10301 5300	
	Multi-Service-Decryption	APA103-55	OPD10301 5500	
	NDS	APA103-56	OPD10301 5600	
	BISS Decryption	APA103-57	OPD10301 5700	
	DVB-Subtitling	APA103-58	OPD10301 5800	

Activation of software options is described under *Download*.

Front view



LED Marking	Colour	Function
INPUT	Green Red Orange	Input signal available Input signal missing Invalid input signal
STATUS	Green Red Orange	Function OK Function faulty (see LCD display) Function critical (see LCD display)
FAULT	Red	Internal hardware fault

Control with display and navigation wheel

All configurations are made by turning and pressing the navigation wheel located at the front of the device at the right side. By turning the wheel, one can navigate through the entire menu. The selected menu is shown inversely. You can select the menu by simply pressing the navigation wheel.

If the navigation wheel is not operated for 30 minutes, the display illumination is automatically switched off. If you start a new operation, the lights will be switched on once again!

Configuration mode (CFG)
For changing the configurations, the user must select "CFG" in the corresponding menu and keep the wheel pressed for at least 3 sec. until a * appears behind "CFG". Then, the user can select the corresponding parameters with the wheel, which are presented with a blinking display.
You can now change the configuration with the navigation wheel. If a parameter is changed "SAVE" appears in the display; by pressing the navigation wheel, this parameter can be selected for saving. "SAVE" is displayed inversely; the configuration is saved in the device by simply pressing the wheel.

After 30 sec. the configuration mode is switched off automatically if the navigation wheel is not in use.

Operation display
If an input signal is connected the most important information about the configured channel are displayed. Example:

Description of menu

The main menu items can be selected with the navigation wheel. By pressing the wheel, the user navigates to the sub-menus, which are selected in the same manner. The configurations can only be changed in the configuration mode (select "CFG" and press the wheel for at least 3s).

Main Menu	Sub-menu Parameter	Description
Input DVB-S / DVB-S2	**Status**	
	Frequency	Configuration satellite IF frequency
	Symbol rate	Configuration symbol rate
	DVB-S Mode	Configuration DVB-S/DVB-S2 receiving mode **DVB-S** Receive only DVB-S signals **DVB-S2** Receive only DVB-S2 signals **Automatic** Automatic identification of DVB-S and DVB-S2 signals
	LNB Voltage (only at 75 Ohm)	Configuration LNB voltage (selection sat. polarization) **OFF** LNB Power off **13V** Polarization vertical **18V** Polarization horizontal
	LNB 22 kHz Tone (only at 75 Ohm)	Configuration 22KHz tone (selection low/high-band) **OFF** low band **ON** high band
	SCPC Mode	**ON / OFF** Configuration of transport stream ID for SCPC signals
Decoder	Under preparation	
Audio	Under preparation	
Video	Under preparation	
Logbook	**Events**	Display of all 256 logbook entries
	Erase	Erase all logbook entries
System	**Reset / Preset**	**Reset:** Restart with stored parameters **Preset:** Attention: Preset resets the IP addresses LAN default: 192.168.0.202
	Version	Display of the device type, SW versions and serial no.
	Date / Time	Configuration date and time
	LCD Contrast	Configuration contrast of display
Common Interface	**Top Slot**	Display CA module informationen
	Bottom Slot	
LAN	**Control**	**IP address** (192.168.000.202) **Subnet mask** (255.255.255.000) **Gateway address** (192.168.000.001) **MAC address** Display
	Data	(Option)

Control with web server

DRP 393 has an integrated web server. This web server allows the configuration and status requests with a standard web browser. If you enter the current IP address of the DRP 393 into the web browser, the device can be operated.

For deliveries that are made ex works, the following default IP addresses are configured. If the IP address is not known, the factory configuration can be restored via Preset.

Factory configuration Control Port	Standard IP address:	192.168.0.202
	Subnet mask:	255.255.255.0
	Gateway address:	192.168.0.1
Data Port (SFP option)	Standard IP address:	192.168.0.203
	Subnet mask:	255.255.255.0
	Gateway address:	192.168.0.1

Home

After configuring the current IP address of DRP 393 on the web browser, the device notifies itself with the following status information. You can request for further information and configurations by selecting the corresponding menu items on the left side.

Under ***System***, you can configure the date, time and LCD contrast of the display. If you press *Reset*, the device restarts with the saved parameters.

If you click *Preset*, the device is reset to the factory parameters.

Note: While *Presetting* via the web browser or SNMP the IP address is **not** reset to the factory setting!
While *Presetting* via the front panel, the IP address is reset to the factory setting (192.168.0.202 and 192.168.0.203).

License show all the available as well as activated software options. It is also possible to activate further options at a later time through a license file that can be applied for.

For activating another software option, select "Get configuration" under the menu item "Download". The file that is read out must be sent to Blankom Digital along with the purchase order for the option. A file that is delivered by Blankom Digital having the corresponding options is then loaded in DRP 393 via "Download". Activation of software options is not free of cost.

Logbook shows all logbook entries of the DRP 393. A maximum of 256 logbook entries can be stored. Then the oldest entries are overwritten by new events. *Clear logbook* delete all entries, *Save logbook* save all entries in a Textfile "LOGBOOK_DRP393_xxxxxxx.log" (xxxxxxx=serial-no) in the specified Downloadarea.

Logout exits the configuration mode with a security message.

All the configuration entries are password-protected. Thus, the following login window appears after you click *a configuration menu item*:

The default login settings are:

Name: ***admin***
Password: ***Blankom***

Requests for status and logbook entries are allowed without login. Click the logout button to exit the configuration mode after the device is configured so as to avoid unauthorized access to the device. If no further entries are made, the system automatically exits the configuration mode. The fallback time can be adjusted by the user.

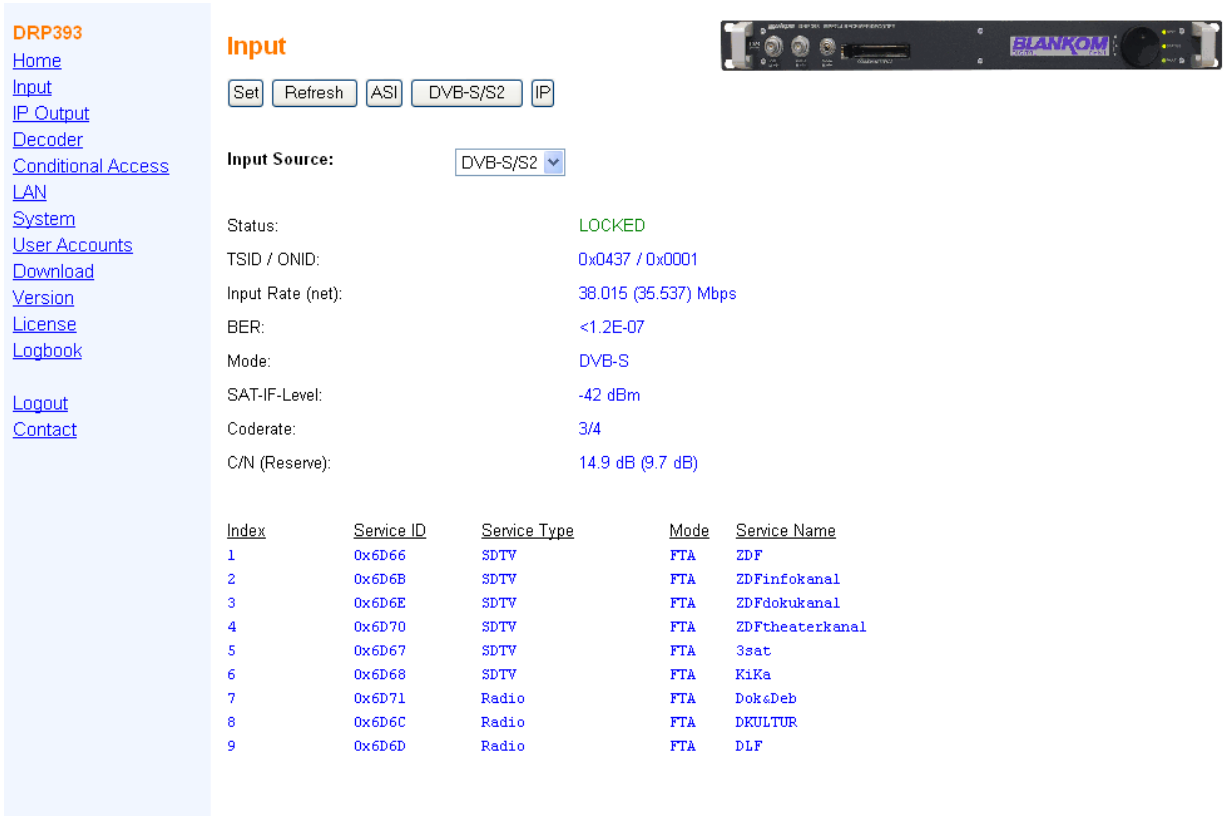
After making all the entries, the configuration must be transferred to the device by clicking *Set.*
If you click ***Refresh***, the data can be once again read in by the device. Thus, you can check the changes made to a configuration.

Input

If the input source ASI is selected the status, the transport stream ID (TSID), the original network ID (ONID) as well as the gross and net data rate are displayed.

Depending upon the implemented Input Frontend, the user can obtain corresponding status information by clicking on *Input*. The image presented above applies to the input source ASI (Basic).

Input-DVB-S/S2 (Option)



If you click the *DVB-S2* button, you will go to the following configuration menu, where you can configure the parameters required for DVB-S/DVB-S2. Click *Set* to transfer the configured data to the device. Afterwards click *Refresh* so that the data will be read out once again. In this way the SAT-ZF DVB-S/S2 signal is selected as the input signal. ASI and IP Input are disabled.

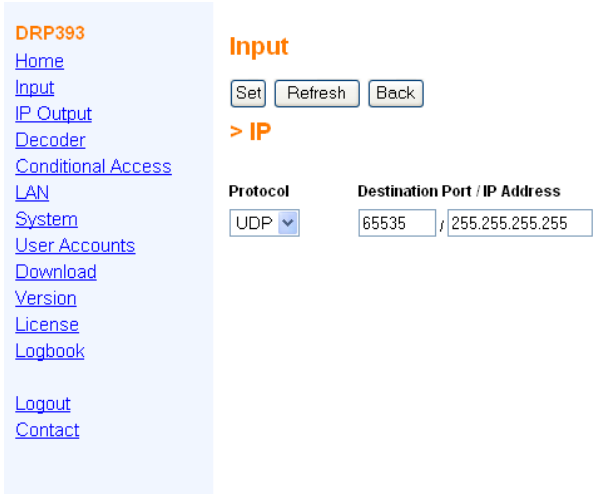
The lock-in range of the input frequency is ±5 MHz while the retaining range is ±12 MHz. The symbol rate must be precisely specified. The lock-in range of the symbol rate is ≤ ± 100 ksps. By pre-selecting the DVB-S modes DVB-S or DVB-S2 the tuning procedure of the DRP 393 is accelerated. However the usual mode of operation is AUTOMATIC.

The menu items 'LNB Voltage' and 'LNB 22 kHz Tone' are only displayed for the 75 Ohm variant and can be configured accordingly.

The SCPC mode should be enabled if a narrow-band transport stream (< approx. 5 Msps) has to be received and if there are several narrow-band transport stream on the transponder at the same time. By entering the transport stream ID (SCPC TSID) it is ensured that the DRP 393 tunes on the selected transport stream. The TSID must be entered in hexa-decimal format.

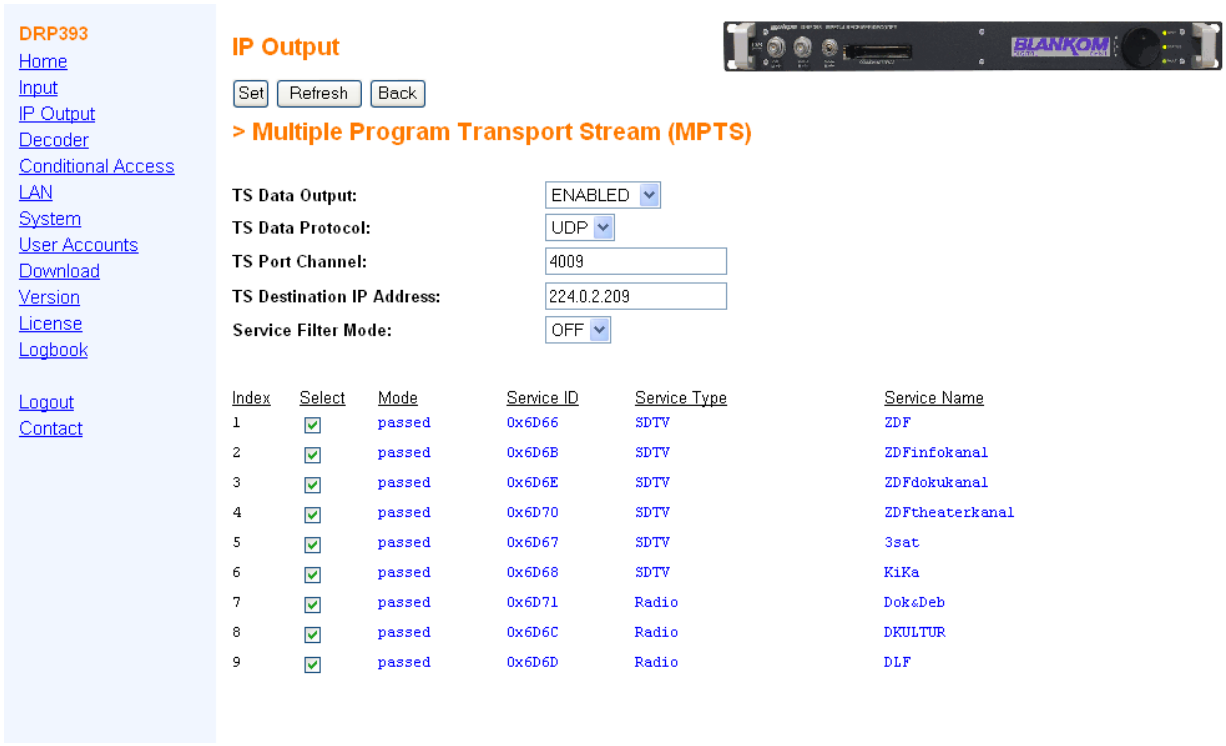
IP Input (option):

The menu item "IP Input" is accessible if this option is activated. The configuration of the IP Frontend is given below.



Standard data protocol is UDP. RTP or proMPEG is optionally available. RTP enables fault detection during transmission. ProMPEG includes fault protection that can correct transmission faults but needs additional band width. The selected data protocol must correspond to the IP source protocol! In the same manner the IP address and the port channel of the source must match. Multicast is possible by selecting the corresponding IP addresses. Addresses in the range 224.0.0.0 to 239.255.255.255 are reserved for Multicast transfer (one source, multiple recipients).

IP Output MPTS



The outgoing MPTS-IP data stream is configured in this menu. Standard protocol is UDP, RTP or proMPEG are optionally available on request. The most efficient protocol is UDP. The proMPEG protocol increases the data rate by up to 100% depending on the configuration A port must be selected for establishing a connection with the receiver. The source (DRP 393) and the receiver must use the same port. Furthermore the IP address of the receiver must be entered (Unicast).

Multicast is possible by selecting the destination IP address. IP addressed in the range 224.0.0.0 to 239.255.255 are Multicast addresses. The receiver must be set on the corresponding Multicast address.

Individual services from the transport stream can be removed if these do not have to be transferred in MPTS. For this, three settings are available in the "Service Filter Mode":

OFF: The service filter is disabled and all services of the input data stream are given out via MPTS.

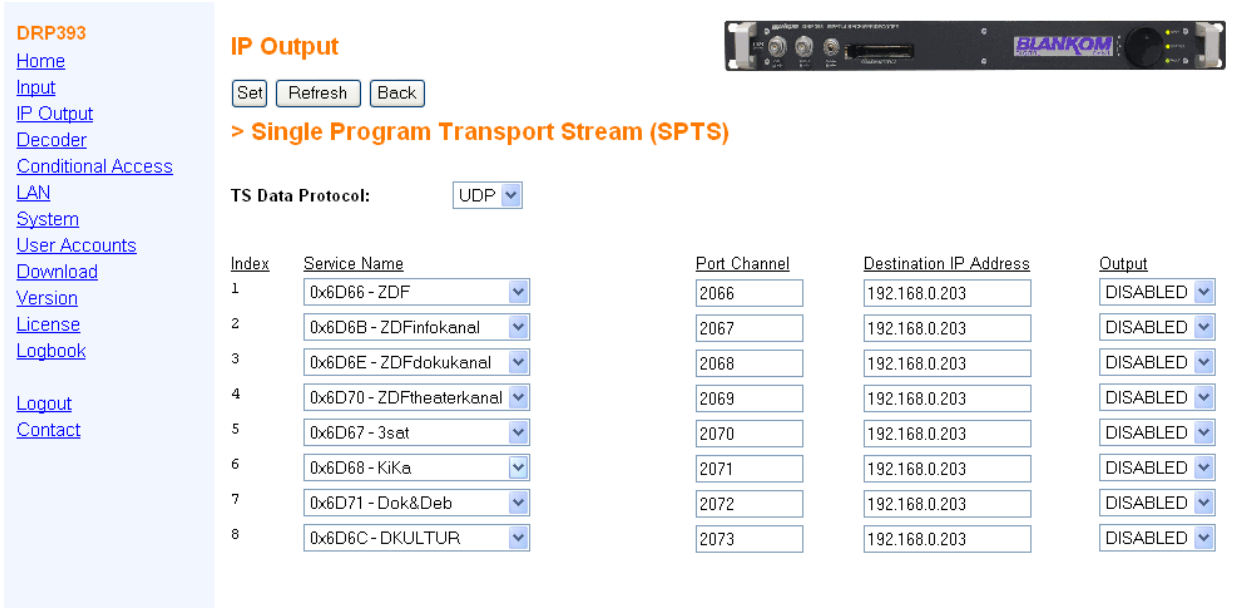
PASS MODE: All services that are marked in the overview (selected services are ticked) are transferred. All other services are blocked. If services are transmitted only occasionally in an input transport stream or if the program assignment is changed only the marked services are transferred and all the other services in the TS are blocked.

DROP MODE: In the drop mode all services that are marked are filtered out. All other services are transferred. If the multiplex of the transport stream changes the changed or new services to be added are also transferred. Only the marked services are removed from the TS.

If a service is removed from the transport stream all the elementary PIDs belonging to this service are filtered out. All PIDs belonging to a service are listed in the PMT (Programme Association Table). DRP 393 gets the assignment from PID and Service. The elementary PIDs include video PID, audio PID, Teletext PID, subtitle PID etc.

IP Output SPTS

The processing of the SPTS data streams can be configured in the following menu for the signal processing of IP boxes.



A MPTS input data stream can be converted into several SPTS IP output signals in DRP 393. Every individual service can be transferred as SPTS via different ports or receiver IP addresses.

Decoder

The decoder menu item has other sub-menu items with Audio, Video and Streaming. Basically you can select the program in the Decoder main menu and the desired audio PIDs. Further configuration is made in the following sub menu.

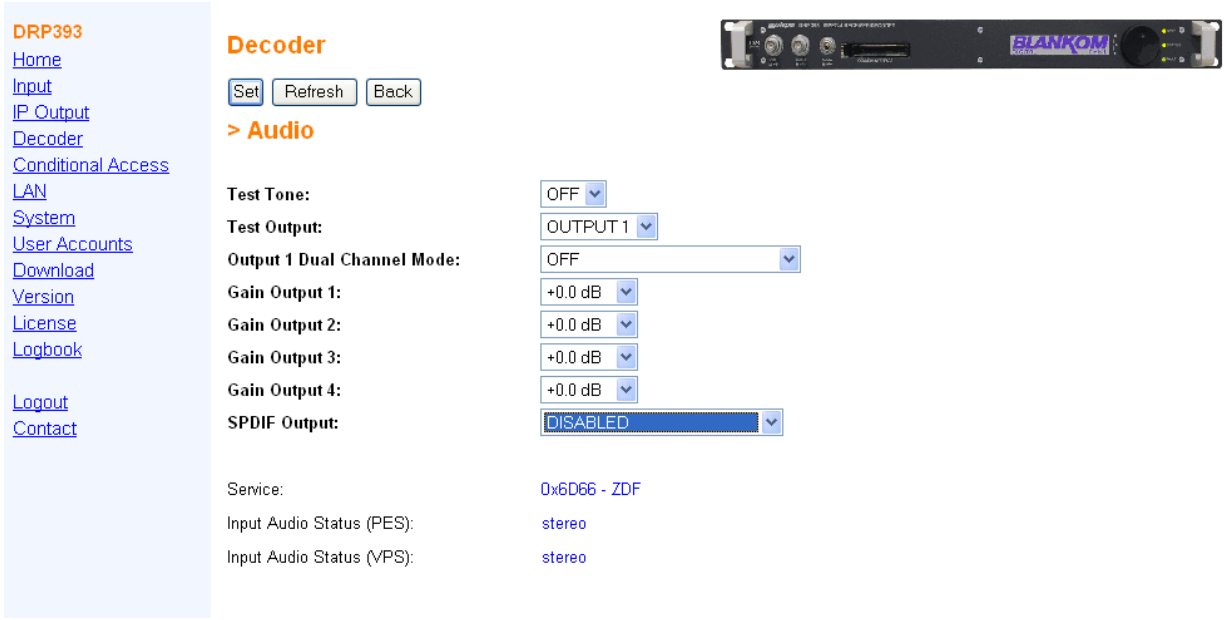
All the programs available in the transport stream are listed in the selection screen "Program". The service ID and the name of the programs are displayed. If a HD programme is selected a downscaling automatically takes place. At the CVBS output an analogue video signal conforming to the standard is available. MPEG4 AVC, H.264, MPEG2HD as well as MPEG2 encoded video transport streams can be decoded.

If the selected service offers several audio PIDs the audio stream to be decoded can be selected in the menu "Audio". The audio PID, language as well as audio coding type are displayed. Two audio streams that are encoded in the same manner and are available via the corresponding analogue outputs can be decoded simultaneously.

A mixed decoding of MPEG and AC3-encoded audio streams is not possible!

The DRP 393 supports the following audio codecs: MPEG1, MPEG2, Dolby Digital, Dolby Digital Plus, HE AAC, HE-AAC+.

Decoder audio



A 1 kHz test tone can be enabled for testing. The nominal level of the test tone is +6 dBm. The test tone is available on all analogue outputs. The audio test output (6.3 mm phone jack) on the front side can be connected on the four analogue outputs that are available. The level of the test output is -20 dBr relative to the selected audio output.

DRP 393 has two audio decoders. Thus two audio streams (PIDs) can be decoded simultaneously. A dual tone signal can be generated from both the decoded stereo signals via the function "Output 1 Dual Channel Mode" that is then given out at the audio output 1. For this select "continuous" under Channel mode. The "ZDF" particularly is transmitting an audio stream for blind people that is not sent continuously but only for special broadcastings. This is indicated in a special identification signal (DC status). Select the mode "EN301775 DC STATUS ONLY" for activation.

The amplification of all four audio outputs can be set separately. The setting range is -30 dB to +10 dB. 0 dB corresponds to an audio output level of +6 dBm at a digital level control of -6 dBFS. Individual outputs can be switched off with "MUTE". The audio output signal at output 3 corresponds to the audio signal of output 1; accordingly the audio signal at output 4 is identical with the audio signal at output 2.

DRP 393 also has a digital SPDIF audio output. The audio signal of the audio decoder 1 is available at SPDIF if selected. In the "BYPASS" mode the audio data stream is not decoded but directly routed to output. Thus an AC3-encoded audio signal is available at the output and can be processed externally. In the "DECODED" mode the audio stream available as decoded signal. In the "DECODED AND DOWNMIX" mode a stereo signal is generated from a multi-channel AC3 signal (e.g. Dolby 5.1).

Decoder video

DRP 393 has extensive VBI processing options. Teletext is extracted from the input transport stream and inserted in the corresponding lines of the analogue CVBS output signal. The Teletext line in use are displayed in the Teletext info field.

If a VPS data unit is available in the input data stream this is extracted, evaluated and inserted in line 16 of the analogue output signal. In this process **all** 13 relevant data bytes of the VPS data line are processed. The current tone status of the output signal is modified according to the selected settings. Thus the corresponding dual tone identification is inserted in the VPS line at time of the conversion of 2 stereo audio signals. If no VPS data unit is available in the input data stream a VPS data line is generated internally that contains the current audio tone status information. In that case the VPS CNI code should also be entered manually so that the television receiver can correctly display and save the program setting. The configured CNI code is also inserted in the data line.

The WSS information (Wide Screen Signalling) is extracted from the WSS data unit that is available in the input data stream. Depending upon the selected aspect ratio this information is modified and inserted in line 23. The video signal is converted to the Letterbox format at a 16:9 anamorphous video transmission and at a selected aspect ratio of 4:3. The aspect ratio of the video signal available at the CVBS output corresponds to the identification that is inserted in the WSS line 23.

Video test lines (VITS) specified by CCIR and/or ITU are generated in DRP 393. Thus the standard lines 17, 18, 330 and 331 are inserted in the CVBS signal. Either the standardised CCIR G2 signal for line 331 or optionally a ramp (for SNR measurements) is inserted in line 331 depending on configuration. Line 329 can be used in DRP 393 in different ways. Firstly an additional test line "sinx/x" can be entered for group delay time measurements and secondly this line can also be used for further VPS information if data is available for this line or if the line can be reserved for the assignment of Teletext.

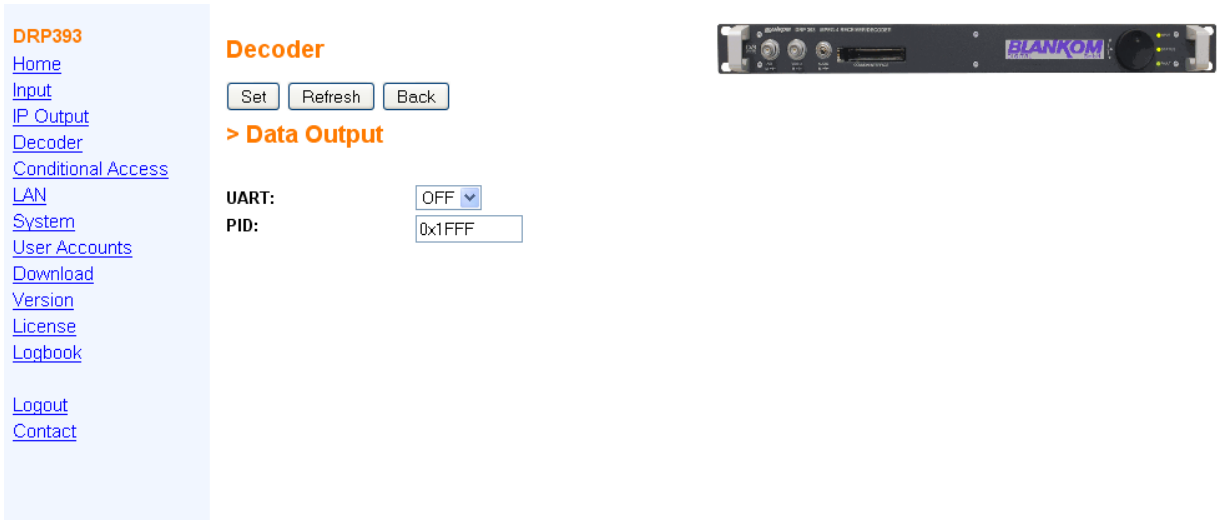
A test image can be generated in DRP 393 for testing (colour scale, colour bar 75%). If this menu item is enabled the test image is exclusively given out. The decoded video signal is suppressed. VBI information is not generated.

The DVB Subtitling can be enabled via the menu item "Subtitling". If the programme supplier offers several subtitling languages you can select a corresponding language.

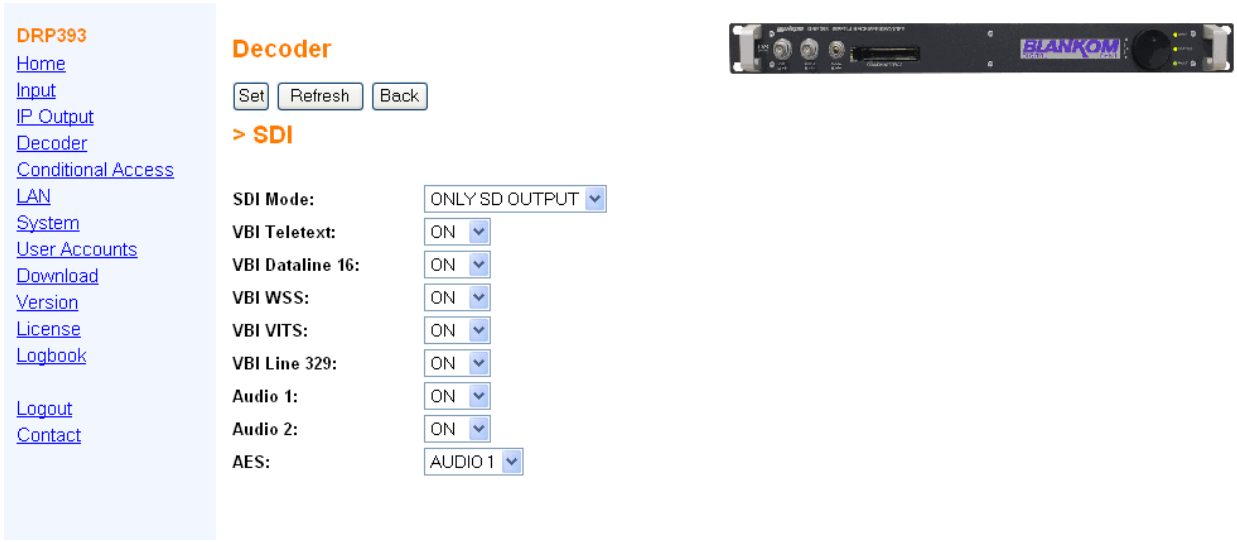
In some cases the video encoders of the programme supplier may completely interpret the analogue line 23 as an active video line. If the video signal is transmitted as a 16:9 anamorphous signal and if a Letterbox signal is generated from this in the decoder the corresponding line 23 then appears as line 59 in the visible picture area. This appears in the form of white spots that are disturbing. With the menu selection "WSS Letterbox Mute" line 59 can be inserted as black line. This setting does not influence the entering of VBI information of DRP 393. The WSS information generated in the device is also inserted in the Letterbox format in the "correct" line 23 for the video output.

Data output

In the Data output sub-menu, you can select a PID data stream and transfer it to the data output (Submin-D: Data). Please ensure that the PID stream has a maximum data rate of 38.4 kbps. The data rate to be achieved depends on the uniformity of the packets of the data stream. The PID of the low-speed data stream must be entered via the menu "PID".



Decoder SDI (Option)



If DRP 393 is equipped with the SDI option the menu "SDI" appears in the decoder main menu. The "Decoder SDI" menu appears when you click on "SDI".

There are two selection options in the "SDI Mode" menu:

SD / HD OUTPUT: The SDI output signal corresponds to the resolution of the decoded video signal i.e. if a SD video signal is decoded a 270 MbpsSD-SDI signal is available at the SDI output. In that case the analogue CVBS video output also carries the corresponding analogue video signal.
If a HD video signal is decoded a HD-SDI signal with a data rate of 1.485 Gbps is available at the SDI output. In this case the analogue CVBS output is disabled.

SD ONLY OUTPUT: The SDI signal is given out with a data rate of 270 Mbps. If a HD programme is decoded a downscaling takes place on the basis of the SD resolution. The analogue CVBS video signal is given out simultaneously.

If a SD-SDI signal is given out there is an option of transferring VBI information in the SDI. Information for Teletext, data line 16, WSS, test lines and line 329 is directly transmitted digitally in the corresponding lines. The individual VBI information can also be disabled. Disabling the VBI transmission via SD-SDI does not have any influence on the insertion of VBI information in the analogue CVBS signal. The VBI information is not available for a HD-SDI output.

SD- and HD-SDI signals are transmitted with embedded audio. 2 stereo-/dual-tone (4-channel) audio signals can be transmitted in the SDI signal. The sampling rate for embedded audio signals is specified as 48 kHz by default. If a service is received with another audio sampling rate (e.g. 32 kHz, 44.1 kHz) and transmitted via SDI the sampling rate is internally automatically converted to 48 kHz. Besides a digital audio output conforming to AES/EBU is available. A stereo-/dual-tone signal can be transmitted via AES/EBU.

Conditional Access

This menu gives an overview of the programs included in the transport stream (TS). Moreover the user procures information as to whether the TS is encoded and how many elementary stream PIDs of a service are in the transport stream.

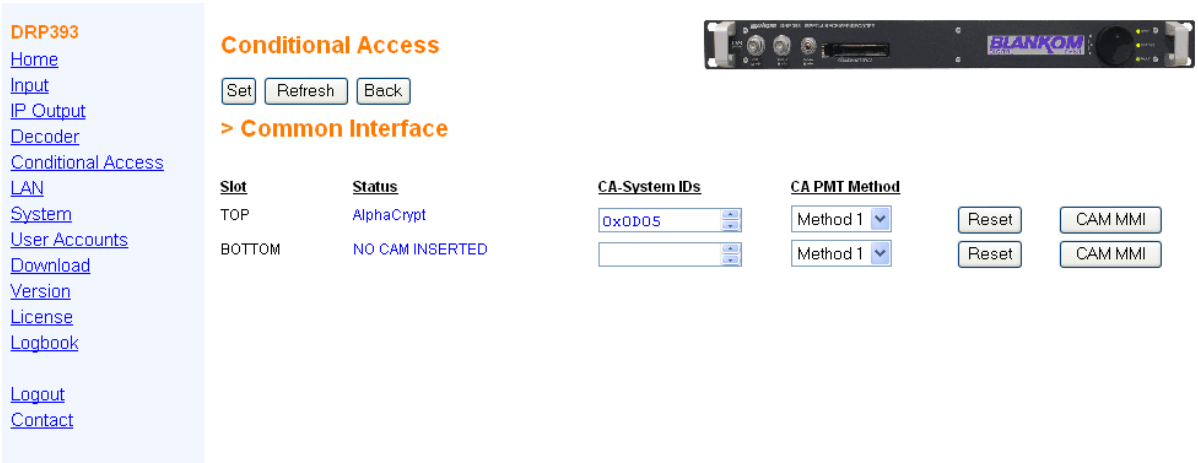
Multiple Service Decryption (also called Multi-decryption or Bulk Descrambling) is supported. Depending on the CAM in operation up to 16 PIDs can be decoded in general. Professional CAMs support up to 32 PIDs. There are a lot of different CAMs with different hardware and software option on the market please contact your CAM vendor for more information about the number of services the CAM can descramble.

If you click on *ES-PIDs* the Descrambling Monitoring System (DMS) menu will open. Here you can select individual elementary PIDs for decoding via the common interface. After finishing all entries the configuration must be transferred to the device by clicking *Set Config.*

The menu item *Common Interface* provides information about the used CAM and the supported CA System ID of the encoding system. With the CA-PMT method, you can select from different initialisation methods during the Multi-Decryption function. Some CAMs do not support all the methods.

- Method 1: The CA-PMT list is activated via 'only' and 'add' commands.
- Method 2: The CA-PMT list is activated via 'first', 'more' and 'last'.

The *Reset button* allows a targeted resetting of one CAM.



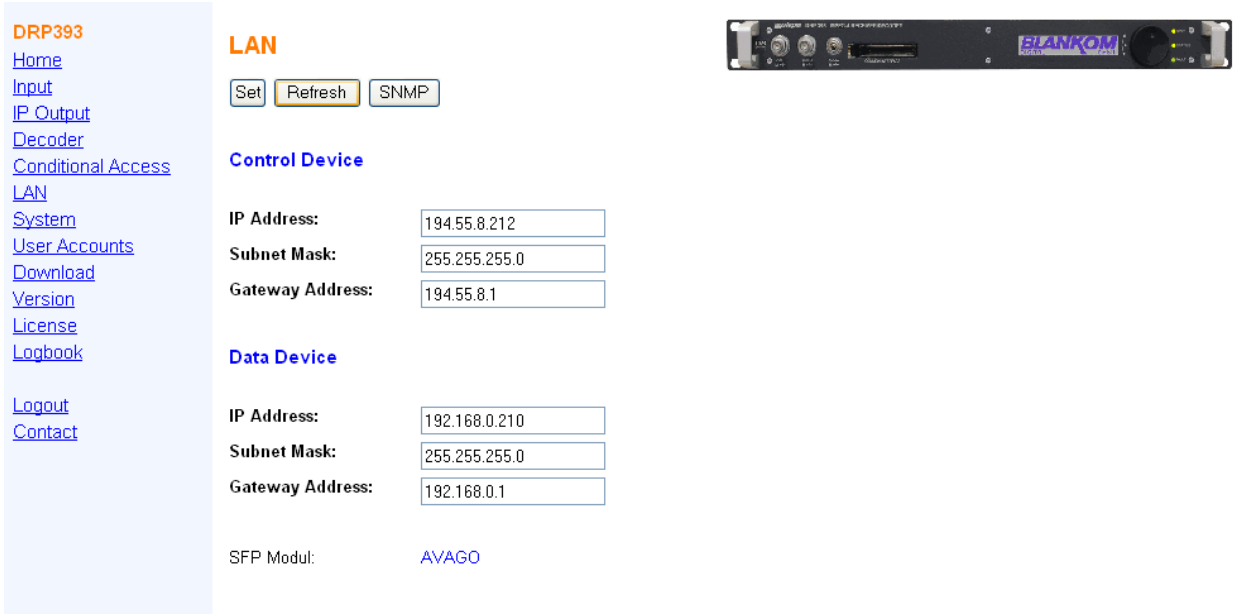
A click on *CAM MMI* gives the access to more information about CAM and Smart Card via an additional menu.

TS Service-BISS (Option)

For applications with BISS codes the parameters can be set in the following menu window.

LAN

All the IP configurations for the Ethernet interfaces for the control port (RJ45, control port) and the optional Gigabit Ethernet Port (SFP, data port) are made under *LAN*.

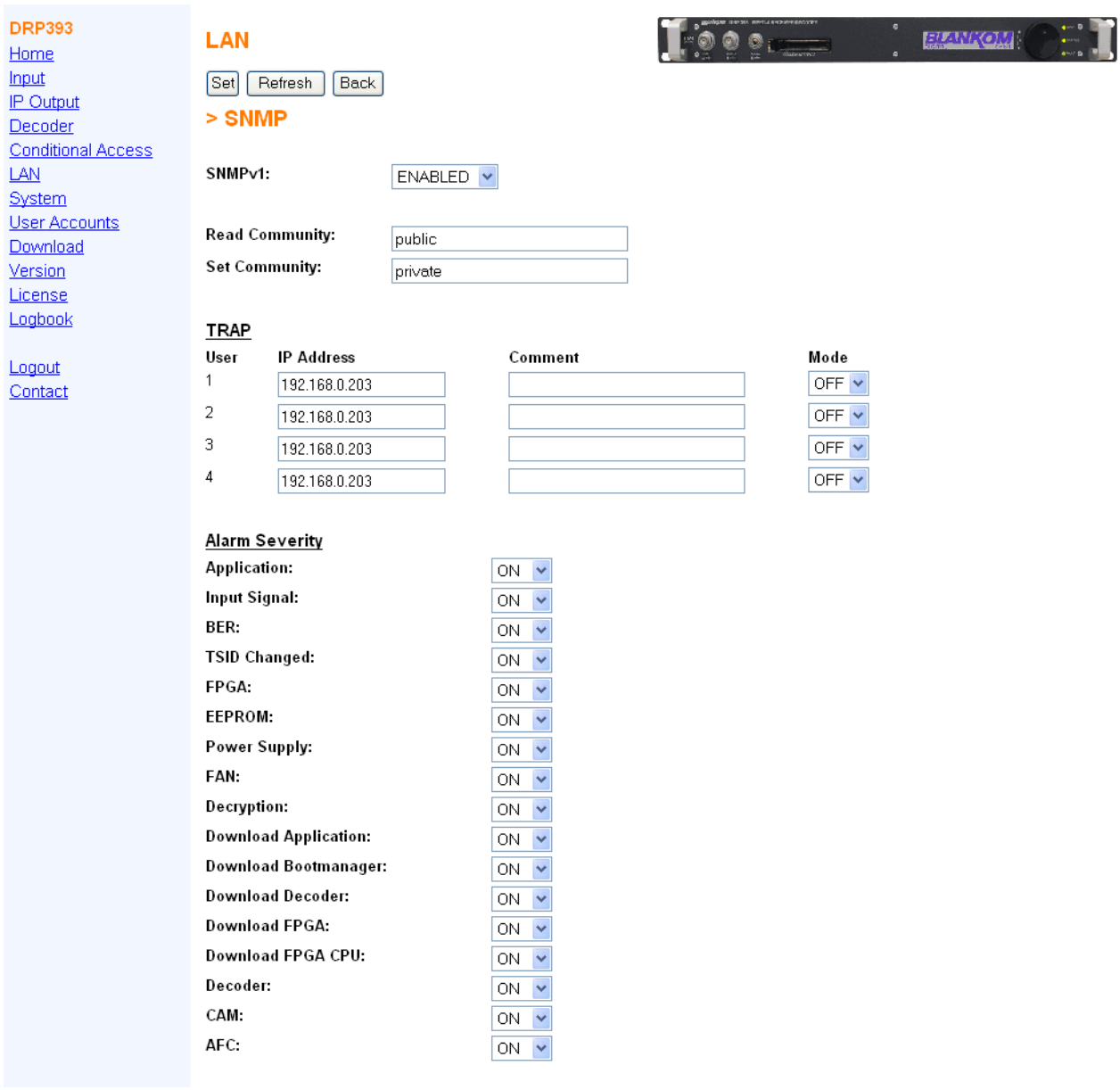


The IP addresses that have to be entered here are addresses of the control and data port of DRP 393. A web browser can be accessed via the IP address of the control port of the DRP 393. SNMP protocol and traps are also sent from this address.

Tests of the connection of the data port can be done with the ping-command.

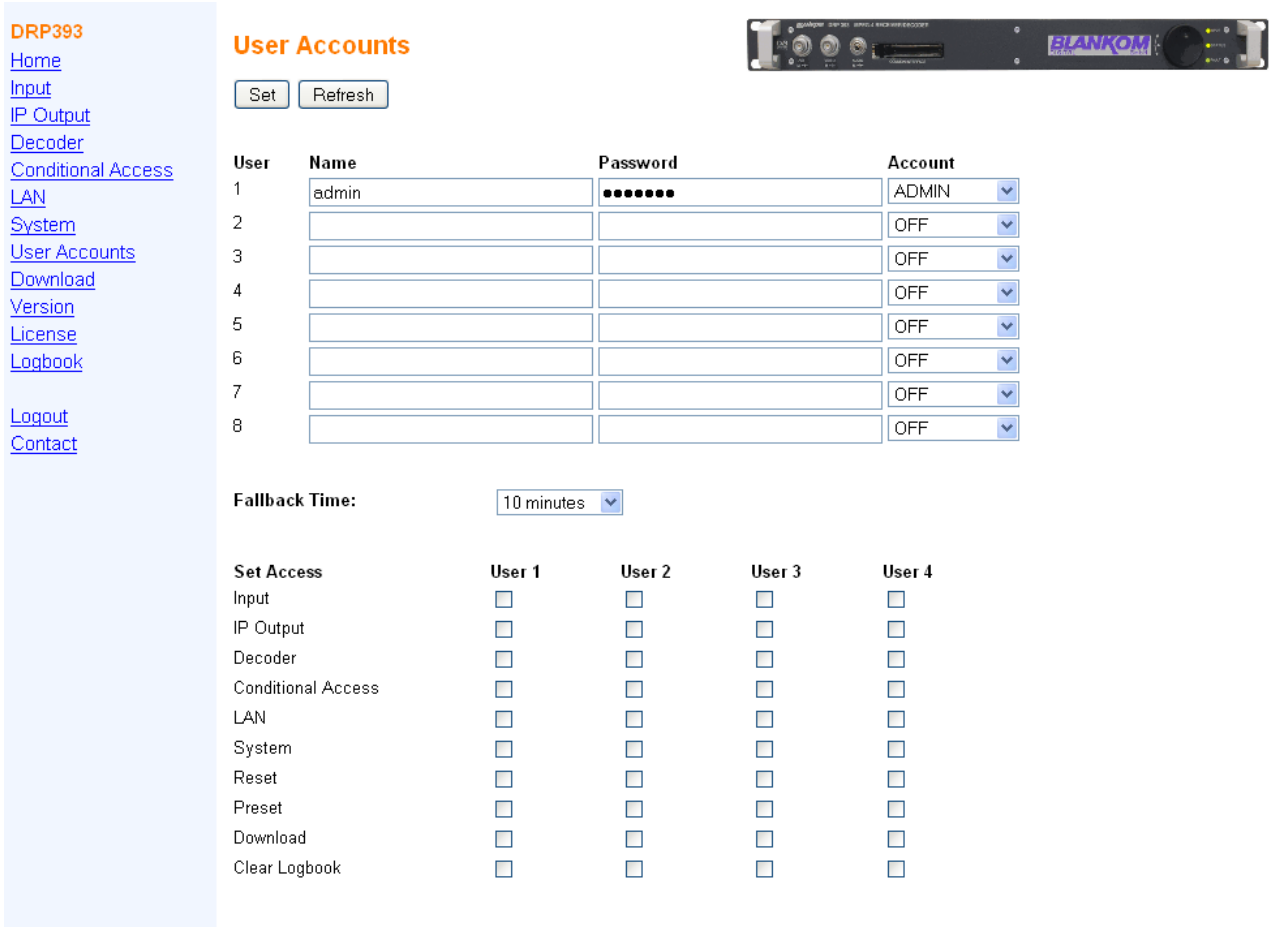
LAN-SNMP

The DRP 393 has an built-in SNMP agent. With this agent the device can be integrated in an Network Management System (NMS). If an error / fault occurs corresponding traps are sent to the NMS. The target addresses for the ztraps can be entered in this menu.



Alarm Severity enables the user to activate SNMP traps for different types of events.

User Accounts allows the configuration of access rights for other users. Besides you can change the standard login according to the user requirements so that the security of the device in a network is guaranteed. Under *Fallback Time* you can configure the automatic fallback time after a login.



Admin is able to choose between four different classes of user rights for different accounts. The user rights and accounts can be assigned by the *Admin* only.

Version lists information of the internal status of the device. No configurations can be done.

The different software files for a new release of the DRP 393 are compressed in a zip file with the name *DRP393-Release-yy.zip*. The meaning of the different files in the zip file is given in the table below.

	Name of the SW file	Remarks
Bootloader Version		
Application Version	**drp393-application-vxxx.drp**	
Decoder Version	**drp393-decoder-vxxx.drp**	
FPGA Version	**drp393-fpga-v210.drp**	DRP 390 without Option SDI
	drp393-fpga-main-sdi_board-added-vxxx.drp	DRP 393 with Option SDI
FPGA CPU Version	**drp393-fpga-cpu-vxxx.drp**	
SDI FPGA Version	**drp393-fpga-sdi-v100.drp**	DRP 393 with Option SDI

For software update select Download

- Select Softwarefile (.drp) via *Durchsuchen (Select)*
- Click *Download*
- An automatic Reset updates the SW version.

To check the success of a download please click refresh and verify the software version.

Download

In the ***Download*** menu the following actions can be done:

1. Software update (see under *Version*)
2. Get configuration
3. Activation of software options

Get Configuration

The config file contains system relevant settings. It is possible to get this file to save it and to write it back to the DRP393 again.

- *Click Get Konfiguration*
- Save Config file „DRP393_xxxxxxx.dat".

Activating of Software Options

- Click *Get Configuration*
- Save the configuration file „DRP393_xxxxxxx.dat" and
- Send it via email to Blankom Digital (service@blankom-digital.de).

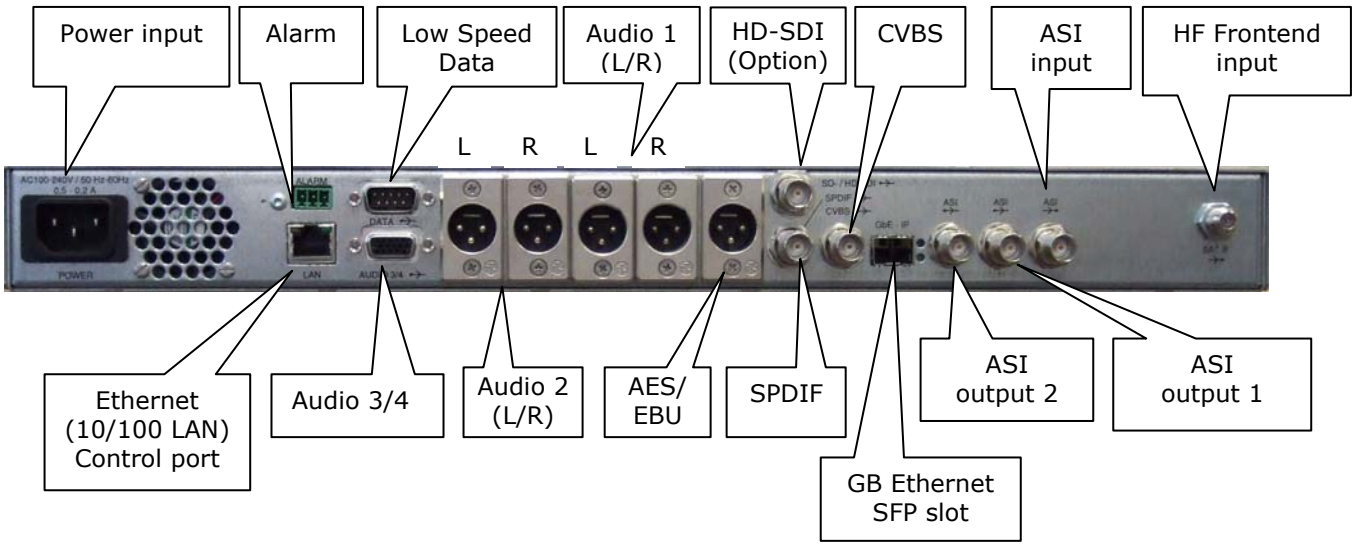
After receiving a written Order Blankom Digital will

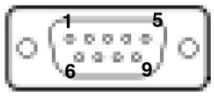
- Create a Key file „DRP393-Option-Key-SerNr_xxxxxxx.dat" and
- send it back via email to the customer
- Click *Durchsuchen(Select)*
- Select Key file.
- Click *Download*

An automatic Reset after this procedure updates the option list.

Via *License* the success of enabling a new option can be checked.

Connections



Type	Interface	Description
	Power Connector	100 to 240 V AC,
J 45	Ethernet (10/100 LAN)	1 TxD+, 2 TxD-, 3 RxD+, 6 RxD-
Mini CombiCon	Alarm	 Correct working: 1-3 closed Alarm: 1-2 closed
9-pin Sub-D	Data	 2: RxD 3: TxD 5: GND 7: RTS 8: CTS
15-pin Sub-D	Audio 3/4	1 B3+ 11 A3+ 2 B3- 12 A3- 4 B4+ 14 A4+ 5 B4- 15 A4- 3, 6-10, 13 GND
XLR	Audio 1/2 AES/EBU	 1: Ground 2: + 3: -
BNC	HD-SDI/SDI	Coaxial connector, 75 Ohm
BNC	SPDIF	Coaxial connector, 75 Ohm
BNC	CVBS	Coaxial connector, 75 Ohm
BNC	ASI Out 1/2	Coaxial connector, 75 Ohm
BNC	ASI In	Coaxial connector, 75 Ohm
F/SMA/BNC	Input	Depending on the frontend
SFP slot	GigEthernet (SFP)	SFP module Electrical or optical (Option)

Technical data

DRP 393	
SAT input (Option)	
Input frequency	950 MHz to 2150 MHz
Lock-in range	± 5 MHz
Retaining range	±12 MHz
Input impedance	75 Ohm, F Connector / 50 Ohm SMA-Connector
LNB supply:	
Voltage	13V / 18V, reversible, can be switched off
Current	Max 500mA, short-circuit proof
Input impedance (optional)	50 Ohm, SMA, without remote power supply
Input level	-65 dBm to -25 dBm
Bandwidth	36 MHz
DVB-S	
Modulation	QPSK
Symbol rate	1 to 45 Msps
Lock-in range	≤ ± 100 ksps
Roll-off	35%
Inner coding (FEC)	1/2; 2/3; 3/4; 5/6; 7/8 Viterbi, K=7
DVB-S2 (QPSK, 8PSK)	
Modulation	QPSK, 8PSK (incl. DVB-S)
Symbol rate	1 to 36 MS/s (QPSK) 1 to 30 MS/s (8PSK)
Roll-off	20, 25, 35 %
FEC Code rates (depending upon the type of modulation)	1/2; 3/5; 2/3; 3/4; 4/5; 5/6; 8/9; 9/10
DVB-S2 (16APSK, 32APSK)	
Modulation	QPSK, 8PSK, 16APSK, 32APSK (incl. DVB-S)
Symbol rate	1 to 50 MS/s (QPSK, 8PSK) 1 to 40 MS/s (16APSK) 1 to 30 MS/s (32APSK) t.b.d.
Roll-Off	20, 25, 35 %
FEC Code rates (depending upon the type of modulation)	¼; 1/3; 2/5; 1/2; 3/5; 2/3; 3/4; 4/5; 5/6; 8/9; 9/10
FEC-Frame	Normal (64800bits), Short (16200bits)
	CCM, ACM, VCM
DVB-T (Option)	
Modulation	COFDM
Symbol rate	All for 7 MHz and 8 MHz bandwidth
DVB-C (Option)	
Modulation	16-, 32-, 64-, 128-, 256-QAM
Symbol rate	2 Msps … 7 Msps
Bandwidth	2 MHz, 4 MHz, 7 MHz, 8 MHz
IP Frontend (Option)	
Input	SFP, electrical RJ45, optical LC
Format	Gigabit Ethernet, UDP, Uni-und Multicast RTP, proMPEG

IP Data Port (Option)	
Output	SFP, electrical RJ45, optical LC
Format	Gigabit Ethernet, UDP, Uni-und Multicast, RTP (Option), proMPEG (Option), MPTS (Option) , Service Filter (Option), SPTS (Option)
Decoding	
MPEG 2	MP@HL and lower level
MPEG 4 Part 10, H.264/AVC	MP@L4.0, HP@L4.0 and lower level
Audio	MPEG 1, MPEG 2, MPEG 4 AAC, AAC V2.0, AC3 (DD), EAC3 (DD+)
Descrambling	
Hardware	Dual PC-Card slot (CAM)
CA systems	Viaccess, Conax, Irdeto, Seca, Mediaguard, Nagravision, Premiere, NDS
BISS (option)	Mode 0, Mode 1, BISS-E
Number of descrambled services	Multiservice Descrambling, min 16 PIDs
Analogue video output	
Output	75 Ohm, BNC
Standard	PAL
Level	1 Vss
Reflection / return loss	>34 dB
Test output	75 Ohm, BNC
Video parameter	
Video-frequency signal / noise ratio	≥ 78 dB (line 19, weighted filter in conformance with CCIR Rec.567-1)
Video-frequency signal / noise ratio	≥ 72dB (unweighted)
Amplitude-frequency response	≤ ± 0.4 dB (10 Hz – 5 MHz, CCIR 18)
Differential amplification	≤ 1%
Differential phase	≤ 1.5 °
Pulse tilt / droop	≤ 0.5%
2-T pulse	K = ≤ 1%
DC offset	≤±70 mV
Analogue audio output	
Output	600 Ohm loaded impedance, XLR (pin)
Level	+6 dBm @ -6 dBFS, +10 dB…-30 dB variable
Clipping level	>+18 dBm
Amplitude distortion 20 Hz – 20 kHz	<±0.5 dB
Harmonic distortion attenuation 40 Hz -5 kHz	>90 dB
Signal-to-noise ratio	78 dB CCIR weighted, 85 dB CCIR unweighted
Channel cross-talk attenuation	>90 dB
Test output	6.3mm jack -20dBr
Other outputs	Sub-D plug-and-socket connector, 15-pole
SDI output (SD) (Option)	
Output	75 Ohm, BNC
Data format	Embedded Audio, embedded VBI (can be switched off)
Data rate	270 Mbps
HD-SDI output (Option)	
Output	75 Ohm, BNC
Data format	Embedded Audio,
Data rate	1,485 Gbps; 1,485/1,001 Gbps (US)

AES/EBU (AES3) Audio output (Option)	
Output	600 Ohm, 3pol XLR, plug
Audio level	+6dBm
Digital audio output SPDIF	
Output	75 Ohm, BNC
Data format	AC3, AAC, not decoded; PCM Audio, decoded
Data rate	32 kbit/s … 640 kbit/s
ASI output	
Output	2x ASI (in conformance with EN 50083-9), 75 Ohm, BNC
Reflection / return loss	> 18 dB
Format	188 Byte, can be switched over to descrambled TS
Test output (front side)	75 Ω BNC
Data output	
Output	Sub-D 9-pole, RS-232
Auxiliary Data	Max. 38,4 kbps (e.g. RDS)
Monitoring, configuration	
Ethernet	IP check port, RJ45, LAN
Format	10/100M, TCP/IP, SNMP, Web server, Software Download
Alarm	Potential-free relay contact
General	
Power consumption	25 Watt (without LNB powering/CAM)
Power supply	$100V_{AC}$ to 240 V_{AC}
EMC	EN 50083-2
Safety	EN 60950-1

History

Revision	Modifications	Date
A	First Release	1.04.2009
B	Screenshots added, BISS (Option)	28.04.2009
C	Screenshots added, SDI (Option)	8.07.2009
D	Revision	20.07.2009
E	SW Version: 2.00	6.10.2009
F	Download in more detail.	2.11.2009
G	SW Version: 2.20 New: LAN SNMP. User Accounts, Version, Frontend 50 Ohm	28.01.2010

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