BLANKOM®

Professional Headend Solutions

Device manual

MPEG-2 ENCODER/ MULTIPLEXER

SDI/ A/V → ASI(TS)

>> **EMA 207
Part Nº: 9172.x1**

...setting signals

Contents

1. Installing and operating instructions

1.1 Safety instructions

- When assembling and commissioning the EMA 207 and executing the settings, always follow the accompanying instructions exactly.
- The devices are not to be assembled and brought into use by anybody who is not an authorised technician.
- When components are being installed in areas where reception is important, ensure that EMC regulations are observed.
- All assembly, installation and cable connection must take place when no electricity has been connected.
- The provisions of DIN EN 50083 must be observed at all times when working with the equipment. In particular, DIN EN 60728-11 [1] regarding safety may on no account be ignored.
- The devices come under protection classification I. It is absolutely necessary, therefore, to insert the mains plug into a fused socket.
- **Warning**
  Connecting external video sources of which the mass has a different potential from that of the EMA 207 may cause "wow" (avoided by matching the potentials or isolating them from each other).

1.2 Contact

If there are any questions or problems, help is available from:

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e-mail:	info@blankom.de
web:	www.blankom.de

1.3 General description of functions

The EMA 207 with "cascade" facility is an MPEG encoder and transport stream multiplexer. With it, the user's own digital programme "bouquets" can be produced; also, pre-existing programmes. They are transmitted as a DVB compatible MPEG transport stream in the ASI format. This signal can be broadcast or fed into the cable TV network with the aid of appropriate modulators.

The EMA 207 encodes both analogue A/V signals and digital A/V signals (SDI, uncompressed) into an MPEG-2 transport stream. Up to four input signals are encoded at each device and inserted into the output transport stream.

The output signal is a DVB transport stream as per ISO13818-1 [5] at a maximum data rate of 214 Mbps and is transmitted via the ASI interface. It can be sent either to a cascaded EMA 207 or to a downstream modulator.

By cascading EMA 207 devices (up to 8), a transport stream with up to 32 services can be produced or these services can be added to an incoming transport stream.

The EMA 207 ASI input port copes with a transport stream signal at a maximum rate of 214 Mbps. With adequate transmission rate on the part of the external transport stream, the internal encoded A/V signals can be embedded in accordance with the DVB standard using the multiplexer integrated into the EMA 207.

The output signal contains all the tables necessary to the programme and associated services (PAT, PMT and SDT). An NIT will be generated but will not contain any network-specific information. A downstream modulator is responsible for the necessary adaptation of the NIT.

1.4 Multiplexer/ Re-multiplexer/ PID filter

A multiplexer has been integrated into the EMA 207 for processing the incoming transport stream. On condition that in this transport stream (requiring forwarding) an adequate transmission rate is available, or additional transport volume is achievable by raising the transport stream bit rate, new services and/ or programme components can be added.

Depending on the configuration of the 4 input interfaces, the analogue or digital A/V signals (SDI) will be converted into DVB data and pooled to a standard DVB signal or added to the DVB transport stream being forwarded.

The parameters necessary for the input interfaces and the transport stream parameters have been pre-set at the factory (see section 3.2).

See Section 3.3.3 for details of how EMA 207 cascade systems using multiple devices are brought into use and how the transport stream can be manipulated from the HTML user interface.

2. Explanation of the functional elements

2.1 Front view

Fig. 1: EMA 207, front view

POWER (green)

LED on	Device switched on

System (green)

LED on	Internal system components are ready for operation.
LED flashing	Wrong parameter is chosen/ configuration error is recognised.
LED off	Internal fault

INPUT VIDEO A, B, C, D (yellow)

LED off	Input port is deactivated.
LED flashing	No standard video signal is recognised at the input port.
LED on	Video signal is recognised at the input port.

INPUT TS (yellow)

LED off	Input port is deactivated.
LED flashing	ASI signal isn't recognised at the input port.
LED on	ASI signal is recognised at the input port.

2.2 Rear view

Fig. 2: EMA 207, rear view

Factory set

2.2.1 Input and output ports

VIDEO A, B, C, D	Video input port, FBAS/ SDI (configurable)
AUDIO A, B, C, D	Audio input port, analogue
ASI IN	DVB transport stream input port
ASI OUT	DVB transport stream output port
NET	Ethernet interface, network connection point (device control, etc.)
RS232	Serial connection (firmware update, restoration of delivery status)

The audio input ports are symmetrical. If they are used asymmetrically, Pin 1 and 3 must be allocated as signal lines and Pin 4,5 and 2 as return lines (shielding).
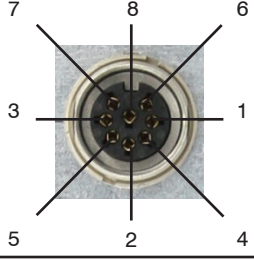
Mono	Dual	Stereo	Pin			Pin	Stereo	Dual	Mono
not in use	channel B	right channel	3 (+)	7 8 6		1 (+)	left channel	channel A	mono signal
			5 (-)	3 1 / 5 2 4		4 (-)			
				Pin 2 = shielding (6 ... 8 not used)					

Fig. 3: Pole allocation, audio socket

2.2.2 Further function and control elements

Mains connection block	Fuse, switch, low temperature outlet
Earth screw	For potential equalisation
FACTORY SET	Resetting to delivery status (see section 3.4.5)

3. Operating instructions

3.1 Commissioning of the EMA 207 (EASY, without configuration)

All assembly and connection work must take place when no electricity has been connected.

On no account may the safety notes (see section 1.1) be ignored. The device is intended to be installed on sliding rails in a 19-inch rack.

Contact must be made for the video, audio and ASI signals at the appropriate connection points on the rear of the device using appropriate cables.

As soon as all the wiring has been done for the signal, the the power supply can be connected and the device switched on. The operating status is shown by the LEDs on the front panel.

Warning:
When more than one device is being used ensure that identical network parameters have been set in all of them as the delivery status.

Before multiple devices can be linked into a network, they must be given individual IP addresses (see section 3.3.2.2.2). They should first be connected to the PC and have differentiated IP addresses set (see section 3.3.1). Ask the network administrator for an IP address space.

3.2 Basic settings on delivery (Factory settings)

The EMA 207 is delivered with optimal configuration for 4 A/V channels.

At the ASI output port a transport stream is produced with a bit rate of 38 Mbps into which the data of the 4 input signals will be included. The "ASI Main Input" is activated.

All programme details and transport stream information are neutral and can be adapted to match the requirements of the cable network operator.

To change the configuration, the HTML user interface is provided via the Ethernet interface (see section 3.3). The basic settings of the EMA 207 are shown in the following list:

Encoder-Input	CVBS	FBAS (PAL), analogue audio
ASI Main Input	ON	ASI input port is activated.
DHCP	OFF	The set IP address will be used.
IP-Address	192.168.2.86	Destination address (target)
IP-Net-Mask	255.255.255.0	
TS-OUT Bitrate	38,000 Kbps	Range: 1,000 – 214,000 Kbps
System-Bitrate	6,000 Kbps	Bandwidth for each input channel (encoder)

Table 1: Basic settings

The delivery status can be restored via "Factory setting" at any time (see section 3.4.5).

3.3 Configurations via the Ethernet interface

If it is necessary to change the basic configuration or to create a cascade of more than one EMA 207 to create a DVB transport stream (see Fig 15), the particular HTML user interface must be called up on a computer connected to the device(s). All the settings can be made via Internet Browser. How the user interface works is almost self-explanatory. Any special features of use will be explained in the following chapters.

3.3.1 Network connection to the computer

System requirements:

- PC/ laptop with an Ethernet interface 10/ 100 Mbps
- Internet browser (such as Windows Internet Explorer, Mozilla Firefox or similar)

Making the connections:

The PC and the EMA 207 must be connected to the network using an Ethernet cable. If the EMA 207 is connected directly to the PC, a cross-link Ethernet cable must be used. To establish the connection, the IP addresses of the devices must first be matched up.

That of the EMA 207 is **192.168.2.86** on delivery. The address of the network connection in the PC must be adapted to the IP address of the EMA 207 (subnet mask: 255.255.255.0, IP address: 192.168.2.XXX). Do not let XXX be exactly the same as the IP address of the EMA 207.

When cascades are being configured initially, it is necessary to ensure that there is always only **one** EMA 207 connected to the network, as the IP addresses of all the devices are identical on delivery. Once the IP addresses have been individualised, all the devices can be connected to the network.

When the IP address for the device has been entered into the address field of the browser, a connection will be made to the relevant device and the appropriate log-in window will be displayed:

enter password

43426 serial number

**** password

Send

Fig. 4: Log-in window

serial number: Here, the 5-digit serial number of the device is entered. This number can be found on the rear of the device and is repeated at various points in the device documentation on a label. These labels should be stuck to the device where they can be seen once it has been installed, or should be used for the documentation of the equipment as a whole. Doing this will make access much easier later.

password: Access to the configuration menu is password protected. On delivery, the password is: **neu**.

If the password or the IP address are unknown or have been forgotten, pressing the FACTORY SET key on the rear of the device will return the details to what they were on delivery (see section 3.4.5.).

The device will then have access and basic settings as described above. Any setting which has already been individualised, will, of course, be lost.

3.3.2 Configuration menu (HTML page)

The configuration menu will appear on successful log-in. It is divided into the two following sections:

1. Status information and help functions

Change Passwort, Help, Factory setting, Set Date & Time und Status xxx (Drop-Service and Table Script, when activated)

2. Configuration
General Input Selection, Ethernet Interface, Channel MUX, ASI Main Input, Encoder (1st, 2nd, 3rd and 4th for Input-A ... D), Sys-Parameters

Please note: items selected from the "General Input Selection" menu require certain fields to be completed in the subsequent menu. If the selection is altered, the details so far must be saved (with Save), so that the relevant fields are actually adjusted.
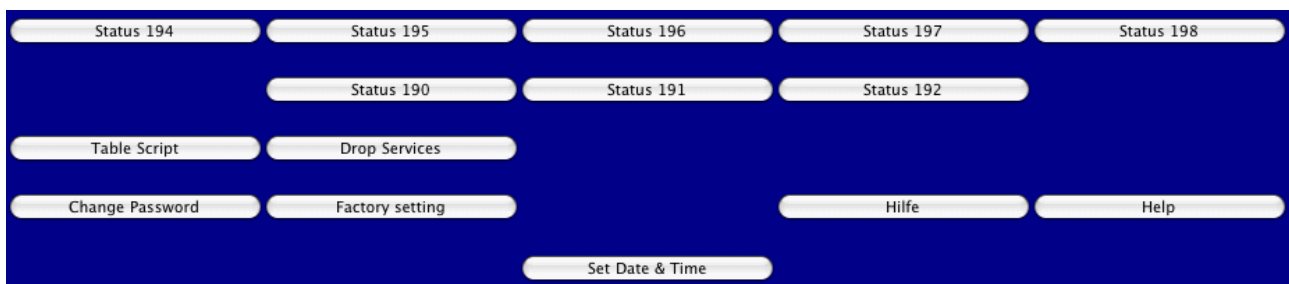
3.3.2.1 Status information/ help functions

Fig. 5: Web Interface, status information/ help functions (section 1)

EMA 207
Part N°: 9172.x1

MPEG-2 ENCODER/ MULTIPLEXER
SDI/ A/V → ASI(TS)

A CE
LINE

Status 19x:

The status pages regularly deliver updated internal information for maintenance checks on the status and functioning of the device. They also can called up directly by input of IP address followed by page number. E.g. the input status delivers the page 190: "http://192.168.2.86/190.htm".

Table Script:

Configuration of parameters outside the specified default.
The connection of this function is realized in the parameter field "Mux Channel". (see 3.3.2.2.3)

The option "Table Extention" provides a tool with which specific DVB system parameters outside the given range in the web interface can be set or changed.
After activating the feature in the "Channel MUX", "Extension Table" and subsequent retention of configuration ("Save" or "Save to device") will appear above the web interface the function button "Script Table" on the call the Script Editor is used.

Edit Table Script

```
#SA

#CHN:A
;  [SID,PMT,VID,AUD,TTX] = value
;  [Bright,Contrast,Saturation,Hue] = [-127..0..127];  CVBS only!
;  AChn = [A,B,C,D (E,P)];  Additional Audio Channel(s)

#CHN:B

#CHN:C

#CHN:D

#CHN:P        ; TS-Player

#CHN:Y        ; Dyn-PMT
; [SID,PMT] = value

#NIT
;  NDES = Tag,Len,Data      ; 1st Loop Descr.
;  TDES = Tag,Len,Data      ; 2nd Loop Descr. (own TSID only)
;  Name = "name"           ; set Network Name
;  LCN  = lcn,sid           ; set Logic Channel Number to SID
;  LCN  = ...              ; must stay together as a block!

#Extern              ; Services
;  VTX = xxx [,yyy]       ; Add intern VTX to max 2 Services
;  AUD = xxx             ; Use Audio with 'AChn=E'

#ASI:drop             ; Drop Services from ASI-IN
SRV = 0, 0, 0, 0, 0,

#SEnd
```

(Send / Abschicken)   (Cancel / Abbrechen)

Fig. 6: Opend script editor of the web interface with prepared "empty" script

Script structure:

- The key lines #SA and #SEnd condition are.
- Each section (starting with #) shall be permitted only once.
- An NIT section is only functional when the device creates its own NIT. In this case, all NIT of ASI-IN deleted (The mixing of external and internal NIT is not possible).
- Spaces are delimiters before or between the words, but no significance.
- An apostrophe ";" opened the comment section.
  Values can be decimal, hexadecimal and expressed as a byte value with "A".

- The activation of a script is done by "Send".
  Changed values can be reviewed at the transport stream output.
- The basic function can be checked via the status page 190th. In the lower part of the table of the error status of the script processing TblErr: is displayed:

  0: Skript OK
  2: Error in NIT section
  8: Error in CHN section (x=0..3 for CHN A..D)

The archiving or creating a backup script is executable only by copying the relevant lines from the Windows clipboard, and subsequent storage place in a text file.

Example of a scripting application:

```
#CHN:A
SID = 1010 ; sets the service ID to 1010
PMT = 0x400 ; sets the PMT PID to 1024 (400 Hex)
#CHN:C
Bright = 20 ; the brightness of the composite signal applied at input C is raised to the value 20
; The values range is from -127 to +127.
PMT = 100 ; sets the PMT PID to 100
#NIT
LCN = 20,1010 ; sets the logical channel number of the service 1010 to 20.
```

"Reset" of scripts

If you run the downloaded script version does not and should not lead to modifications of the target version, the script is a factory setting is enforced.
Steps to reset the script:

- entire script delete
- blank window send to the device
- call by pressing "Table Script" the editor with the default script.

Drop Services

Filter function for the activated transport stream input (TS-IN) to remove unwanted services (programs).
The function is only available when in "General Input Selection" in the field "Main Input ASI" the mode "Flt-DROP & MUX" is selected and with "Send" is enabled.

There is a table with all applied services (programs) at the input available. The selected services will be removed from the transport stream.

No	SID (hex)	SID (dec)	Name	Drop
1	0010	16	Eros 1	☑
2	0014	20	Filmfestival	☐
3	0015	21	Magazin MUX	☐

Services to DROP from ASI-Input

Send | Cancel | Select All | Deselect All

Fig. 7: Opened drop-table

Displayed are all the ASI-IN existing services. Services in the column "Drop" marked will not be forwarded.

Change Password:

The password for the configuration access is a maximum of eight characters; allowed characters: Letters in uppercase and lowercase letters and numbers (no special characters, no umlauts).
When delivered, the password is: **neu**

Factory setting:

All parameters are set to the values of the factory default. The process takes about 10 seconds. During this time at the ASI transport stream output no signal is available. In this function, the set IP address is **not** reset to factory default.
Factory setting (see 3.4.5) on the button on the backside of the device sets the IP address to 192.168.2.86 and the password to **neu**.

Hilfe/ Help:

Call to the help pages in German or English.

Set Date and Time:

Transfer of the PC's settings Date and time on the device.

Download MIB:

With this function, a MIB parameter file can be downloaded from the EMA 207 to the PC. The file is used to configure the system via SNMP.
The functionality of the SNMP management is established solely for the Compiler "NetDecision" by NetMechanica.

3.3.2.2 Settable parameters for the EMA 207

(Anything pre-set under "Factory Setting" will be underlined in the display.)
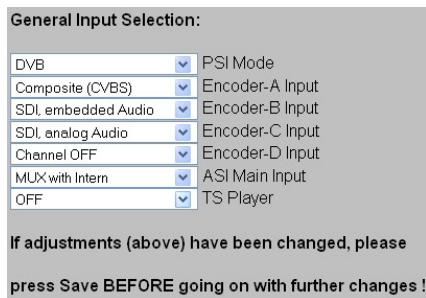
3.3.2.2.1 General Input Selection

Fig. 8: Selection of types of input signals

This is the area in which the expected audio and video signal standards are allocated to the input ports.

Options: If any input ports are switched off in the configuration as delivered or if any input components are not installed, a grey field with the text "Channel OFF" will be displayed; this cannot be altered.

Encoder A ... D:
> Here, the type of operation which is desired for each channel can be selected by clicking through the list:
>
> "Channel OFF":
> No data is reaching the multiplexer via the channel.
>
> "Composite (CVBS)":
> In this case, analogue signals are expected for both video and audio.
>
> "SDI, embedded Audio":
> Here, the input signal is serial digital video (SMPTE 259M-C, 270 MHz) with integrated audio (AESEBU, 48 kHz) and possibly with video text (WST/ PAL). (For details, see section 3.4.2)
>
> "SDI, analog Audio":
> SDI processing, possibly with video text, together with analogue audio input (for details, see section 3.4.2)
> options: test mode (OverScan) for both input types [Test-CVBS], [Test-SDI]

ASI Main Input:

> "OFF":
> There will be no processing of data from this input port
>
> "Loop -> ASI-Out":
> Looping through the ASI transport stream from the input to the ASI output. No processing is done.
>
> "Flt-DROP & MUX":
> Function like "Mux with Intern". Additionally, you can select in a table ("Drop Services"), what programs (services) from the applied transport stream on ASI input are to be removed.
>
> The transport stream of the ASI input is multiplexed with the internal sources to a common data stream. This input is primarily designed for cascading multiple devices, but can also process other (foreign) streams. In this case, it is essential to ensure that there are no overlaps of the PID/ SID. A selection or a mapping is not possible in this mode!
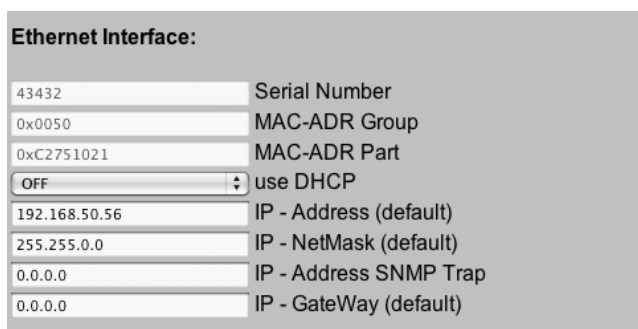
3.3.2.2.2 Ethernet interface

Fig. 9: Settings for the Ethernet network interface

Serial Number:
> 5-digit serial number of the devices (information)

Mac ADR Group/ MAC-ADR Part:
> Hardware-specific addresses of the IP module (information)

Use DHCP: [ON/ OFF]
> Allocation of IP address, default : 192.168.2.86

> "ON":
> One-time at the start an IP address via a DHCP server is requested. If the probe fails, will use the default IP address.

> "OFF":
> The default IP address is used.

IP-Address: [0.0.0.0 ... 192.168.10.88 ... 255.255.255.255]
> A default IP address for the case that "use DHCP" is set to OFF, or no DHCP server could be reached.

IP-Netmask: [0.0.0.0 ... 255.255.255.0 ... 255.255.255.255]
> The mask corresponding to the IP address.

IP-Address SNMP Trap: [0.0.0.0 ... 255.255.255.255]
> A default IP address of an SNMP Trap managers, if SNMP monitoring should be implemented.

IP-Gateway: [0.0.0.0 ... 255.255.255.255]
> A default IP address for the device to a possibly active exploitation of a gateway in the network, such as sending an SNMP Trap message.

3.3.2.2.3 Channel MUX (settings for the transport stream)

Channel MUX:

Continuous (98Mbps max)	ASI-Output Mode
188	Bytes per Packet
50000	TS-Out BitRate (1.000-214.000 Kbps)
43439	TS-ID (PAT,SDT,NIT)
ViTex	Provider Name
dummy	Create NIT
ON	Create TDT/TOT
100	Network ID
1	Original Network ID
1	Cascade Number within Network (1..64)
1	Device within Cascade (1..8)
ON	Table Extension

Fig. 10: Parameter settings for the transport stream configuration

ASI Output Mode: [Interleave/ Burst/ Loop]
> Interleave mode: All the individual bytes in the output stream have a fixed temporal distance from each other, so is the set of bit rate. Maximum possible in this mode are 98 Mbps.
> Burst Mode: All bytes of a packet are sent without a space, as a burst (27 MHz). The bit rate is enforced by the spacing of the packets from each other. A maximum of 214 Mbps is possible here.

Loop IN -> OUT:
> Loop through of the input signal to the output. The packet length at the output is always 188 bytes.

Bytes per Packet: [188/ 204]
> Here are 188 or 204 set (does not apply to LOOP).

TS Out Bit Rate: [1 000 ... 214 000]
> The output bit rate can amount to 1,000 .. 214,000 Kbps. It should be chosen depending on the ASI output mode. (see also section 3.3.4)

TS-ID: [1 ... 65 535]
> (Transportstream Identifier) ID of the generated transport stream in the transponder. All devices of a cascade must use the same TS ID.

Provider Name: [Provider]
> For the formed transport stream, the „Program Provider" can assign a name. The name for any particular TS ID should be the same in all devices in a cascaded system. The length of the name is limited to 16 characters.

Create NIT: [OFF, dummy, Cable, Satellite, Terrestrial]
> dummy: The multiplexer creates an empty NIT (network information table) as place-holder, and this table will
> be filled in by the succeeding device, if any; a QAM modulator, for example.
> Cable, Satellite, Terrestrial: The NIT is produced with the appropriate specification but without any details of frequency.
> OFF: In this case, no NIT is generated.

Create TDT/ TOT: [OFF, ON]

With the help of the internal RTC (Real Time Clock) and the "Local Time Offset" the tables for time are generated here.

Network ID: [1 ... 100 ... 65 535]

Unique identifier for the network, for instance, number of the cable network. The network ID of all transport streams generated in a network should be the same.

Original Network ID: [1 ... 65 535]

When programmes or transponders are being forwarded, the origin of the data can be indicated here by inserting the "original" network ID for purposes of information.

Cascade Number within Network: [1 ... 8]

The number of the cascade is inserted here to distinguish between the EMA 207 cascades installed. It must be the same number for all the EMA 207s of a cascade and it serves to generate unique programme numbers (designated by service ID) within a network.

Device within Cascade: [1 ... 14]

The number of the device within the cascade is inserted here to distinguish between the EMA 207s installed within the cascade. The number must be different for all the EMA 207s of this cascade and it serves to generate unique programme numbers (designated by service ID) and PIDs within a transport stream. The order in which the devices are wired is of no significance for he numbering.

Table Extension: [OFF, ON]

Switch to active/ deactivate advanced configuration via script control.
If the function is activated, the configuration must be saved first, click on "Save" at the end of the configuration list. The call of the editor is then provided on the button in the status field of the web interface. (see 3.3.2.1)

OFF: Function deactivated
ON: Table script editor activated

3.3.2.2.4 ASI Main Input

This field is not available if the input "ASI Main Input" in the configuration field "General Input Selection" is switched off [OFF].

ASI Main Input:

OFF	Input
OFF ▼	Cable Equalizer
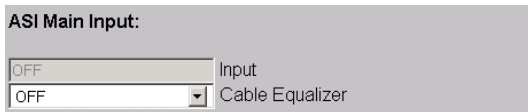
Fig. 11: electrical adjustment of the ASI input

Cable Equalizer: [OFF, ON]

It is possible to set up an equaliser at the input port if long lengths of cable are being used.

3.3.2.2.5 1st Encoder (input A)

(All the following setting notes apply equally to encoders 2 … 4.)

1st Encoder (Input-A)

Prog−A	Program Name
deu	Program Language
PAL/SECAM (50Hz)	Video System / (Radio)
6000	System Bitrate [1000...15000 kbps]
64 kbps	Audio Bitrate
Stereo	Audio Mode
Composite (CVBS)	Encoder-A Input
16:9	Video Format
0	Audio Input Level: +6...-20dB (0dB = 6dBu)
600 Ohm	Audio Input Impedance
Video−IN	TTX Processing
OFF	VPS-WSS-CC
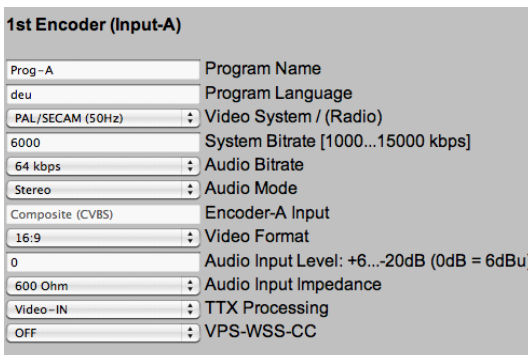
Fig. 12: Setting of encoder parameters for the individual input channels. Illustrated example is for analogue input signals.

1st Encoder (Input-A)

Prog−A	Program Name
deu	Program Language
PAL/SECAM (50Hz)	Video System / (Radio)
6000	System Bitrate [1000...15000 kbps]
64 kbps	Audio Bitrate
Stereo	Audio Mode
SDI, embedded Audio	Encoder-A Input
16:9	Video Format
1+2	Audio Channel Pair
+ / − 0	'dB' Audio Volume
OFF	Cable Equalizer
Video−IN	TTX Processing
OFF	VPS-WSS-CC

Fig. 13: Alternative setting parameters for a configuration with SDI input signal. The selection of operating mode is via "Gerneral Input Selction"

Program Name:
> This is where a programme name is allocated for each encoder input port. The programme name will be displayed by the set-top box. The programme name must be unique and may appear only once in a cascade of encoders. The maximum length is 16 characters.

Program Language: [deu, eng, ...]
> Identifies the language for the audio data stream and teletext. It should be designated as per ISO 639-2 [4].

Video System: [PAL/ SECAM (50Hz), NTSC (60Hz), OFF (Digital Radio)]
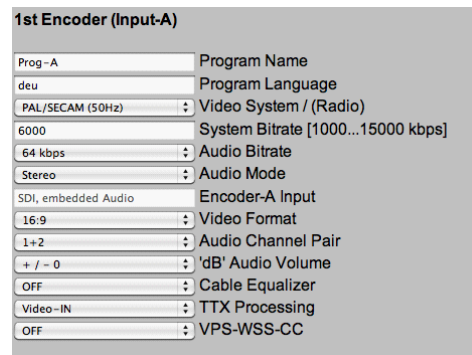> These options set the type of video signal being accommodated. If PAL is the type, there are the variants B, G, H, I, N; this and SECAM operate at 50 Hz. NTSC in the M version operates at 60 Hz. In the "OFF" setting, the video signal is ignored and a digital radio channel is generated.

System Bitrate: [1 000 ... 6 000 ... 15 000 kbps]
> Here the bandwidth is established for audio, video and table data in the relevant encoder. The value is only an upper limit. The bit rate actually generated will be slightly slower and will not be absolutely constant.
> **Warning:** The sum of all the bit rates (from bandwidth for channels) and the bit rate (the bandwidth) of the "ASI Main Input" used must be less than 90% of the "TS Out bit rate", otherwise data transfer cannot be guaranteed.

Audio Bitrate: [64 ... 320 ... 384 kbps]
> This determines the audio data bit rate. It is an element of the system bit rate.

Audio Mode: [Stereo, Joint Stereo, Dual Channel, Mono, use VPS]
> Here the type of audio data is identified.
> "Use VPS": here the identification transferred within the VPS signal is taken over into the MPEG data stream as audio header. Additional condition applying to "use VPS":
> TTX Processing = Video IN and VPS-WSS = VPS or VPS+WSS

Video Format: [4:3, 16:9, use WSS]
> This is how the means of interpreting the video input signal for the MPEG header is established. In respect of "use WSS", only the "16:9 Fullformat" is evaluated. Anything else will be transmitted as 4:3.For this it is a condition that TTX is set at "Video IN".

TTX Processing: [OFF, Video IN, Intern (ViTex)]
> Video IN: Here teletext from the video input signal is changed into data packets conforming to DVB and is transmitted in the transport stream.
> Intern: At this point, using special additional software (ViTex), it is possible to administer an internal video text carousel and transmit it in the transport stream.
> OFF: No teletext will be generated.

VPS-WSS-CC: [OFF, VPS, WSS, VPS+WSS, Closed Captions]
> VPS and/ or WSS lines in the video input signal will be converted into data packets conforming to DVB and transmitted in the transport stream. For this it is a condition that TTX is set at "Video IN".
> The selection of "Closed Captions" sets the text function of the NTSF standards in the digital area.
> Function with only NTSC: TTX-Processing to "OFF" and VPS-WSS-CC to "Closed Captions"

Audio Channel Pair: [1/2 ... 15/16]
> When SDI with embedded audio is being transmitted, the audio channel pair to be used for the transmission can be selected.

Audio Input Level: [+6 ... 0 ... -20]
> Decrease or increase the audio level at the input of the encoder.

Audio Input Impedance:
> Depending on the requirement, the impedance of the balanced audio inputs 600 ohms or 10 kilo-ohms are elected. The selection made is always for all inputs of the device.

3.3.2.2.6 System parameters

Sys - Parameter:	
enabled	Intern TTX (ViTex)
0xFF87	-- Video Lines with TTX
200	-- Max. Teletext Pages
ON (19x)	-- Status Pages in ViTex-TTX
1	Local Time Offset (to UTC)

Fig. 14: System settings for video text and real time

Video Lines with TTX: [0xFF87]

The lines used for the video text carousel being internally administered can be determined here in the vertical blanking interval (VBI) of the video signal, the areas from line 7 to 22 and 320 to 335. The setting is bit by bit: "1" means "use", "0" means "don't use". The entries are hexadecimal; line 7 is equivalent to 0x8000, line 22 to 0x0001.

The standard line use is equivalent to the setting 0xFF87:

TV line	7 320	8 321	9 322	10 323	11 324	12 325	13 326	14 327	15 328	16 329	17 330	18 331	19 332	20 333	21 334	22 335
Binary	1	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1
Hexadecimal, 0x ...	F				F				8				7			

Table 2: configuration of the line use for video text

Notes:

Lines 16 to 19 and 329 to 332 usually exclude teletext (kept as test lines). "0x" as a prefix indicates hexadecimal figures. A calculator can be used for the calculation of the hex figure, for instance the calculator in Windows. For the [Bin] element, the binary values 0 and 1 are entered in the desired order. When the display is switched over to hexadecimal [Hex], the hexadecimal result will appear.

Status Pages in ViTex-TTX: [ON(19x), OFF]

If the device is being used to manage its own videotext, status pages will be transmitted for service purposes, giving current system states and messages, using pages 190 … 199.
When the setting is "OFF", all the status pages are suppressed. This page range is available for conventional teletext tasks.

Local Time Offset (to UTC):

This is the difference between local time and "Coordinated Universal Time"
(e.g. Germany = 1).

Audio Frames per PES Block (1 ..8):

Although the standard allows 1 to 8 frames, this range is not supported from every connectable audio device with an ASI TS input port known to BLANKOM. This, with an inappropriate combination of frame value and audio bitrate, can lead to sound problems (for example, periodic breaks). With this menu item, it is now possible to adapt the BLANKOM device to accommodate the one connected.
All "audio only" devices tested so far will work reliably with the setting "1" or "2"; devices for digital video and audio signals (ASI TS) require the setting "4".

Audio Input Impedance:

Depending on the requirement, the impedance of the balanced audio inputs 600 ohms or 10 kilo-ohms are elected. The selection made is always for all inputs of the device.

3.3.3 Detailed configuration (for single and multiple device systems)

Depending on the task and the desired number of channels per DVB transport stream, the devices can be operated individually or in groups (cascades) of up to 14 devices.

3.3.3.1 The 1-device system

This is the configuration on delivery. Possible detailed configuration options are:

IP address	the default is 192.168.2.86
IP subnet mask	the default is 255.255.255.0
TS ID	the default is the 5-digit serial number
Provider name	the default is "Provider"
Network ID	the default is "100"
Program name	the defaults are "Prog-A" ... "Prog-D"
System bit rate	the default is 6,000 Kbps
TS Out bit rate	the default is 38,000 Kbps

All the setting options can be found in section 3.3.2 or on the on-line (Internet) help page. The default is 4 channels with standard figures for the system bit rate. It is possible to change these pre-set bit rates as long as the set "TS Out bit rate" is taken into consideration (see section 3.3.4).

EMA 207
Part Nº: 9172.x1

MPEG-2 ENCODER/ MULTIPLEXER
SDI/ A/V → ASI(TS)

$\mathbb{A}$ CE
LINE

3.3.3.2 The multiple device system (commissioning cascades)

The fact that the EMA 207 can be cascaded means that multi-device systems can be created so that DVB transport streams exist for up to 56 services. Multi-device systems have to be used if more than 4 new services (this means TV programmes with their additional informations) have to be combined into a transport stream or added to one. If this is done, changes need to be made to the set parameters for all devices from the HTML pages.

Additionally signal connections ASI-OUT to ASI-IN must be made between the devices using 75-ohms BNC cables. (see Fig. 15).
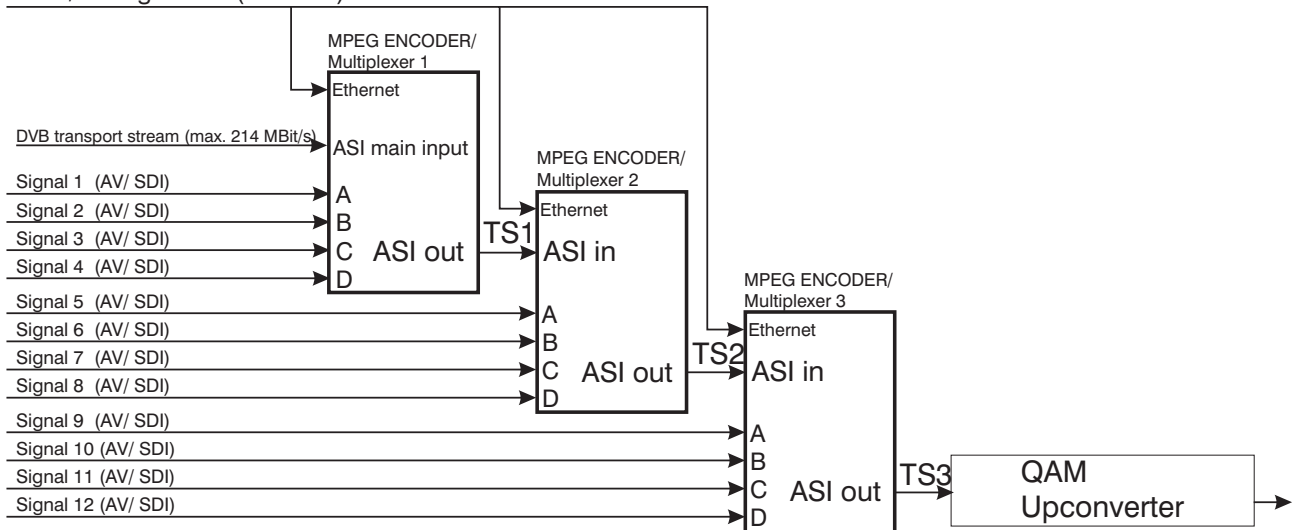

Fig. 15: Block diagram of a triple cascade (additionally with an external transport stream)

Every device is capable of adding 4 new programmes (services) to the existing DVB transport stream as long as there is enough transport stream capacity or extendibility. If devices have been completely individualised in their basic settings, each new service would be added as a transponder in its own right. To ensure the newly added services belong together, it is possible to link up to 8 devices in a logical order to become a single cascade. In this way each of the newly added services is allocated to a transponder.

The following settings must be identical for every device in a cascade, in order to ensure generation of a unique transport stream:

- **Transport stream identification (TS ID)** Unique identification of the transport stream is generated. The TS ID can be any number between 1 and 65 535. However, at the start the TS ID will be the 5-digit serial number of the EMA 207 being initialised.
  In the simplest case, the TS ID of the first device should also be entered for all the devices.
  IMPORTANT! In cable networks each TS ID is allowed to appear only once. For this reason, neither the different transport streams generated by means of the (possibly cascaded) EMA 207 nor the transport streams from other programme providers may have the same transport stream ID. The TS IDs of transport streams already existing in the cable must be known in this context.

- **Cascade within Network:** All devices belonging to a cascade within a single network (a head end) have to be designated with the same cascade number.

- **Network ID:** This identifies the distribution network (the head end); all transport streams generated or processed in a head end are given the same network ID.

The following settings must be unique to the relevant device or will be taken account of by only one device in the cascade:

- **IP address:** The IP address of each device must be unique within the IP network.

- **Device within Cascade:**
  Within a cascade of a maximum of 8 devices, each device must receive a unique ID [1 … 8]. The serial order due to the ASI cabling is quite irrelevant.

- **Create NIT:**
  If a blank Network Information Table is created for a device during configuration, the device configured to receive it will overwrite with the current values all NIT information contained in the transport stream. If this option is configured in more than one device, it will be the table in the last device which is functional.

- **Create TDT/ TOT:** s. o.
  If TDT or TOT tables are created for a device during configuration, the device configured to receive it will overwrite with the current values all the relevant information contained in the transport stream. If this option is configured in more than one device, it will be the table in the last device which is functional.

- **Program Name:**
  The program name is the designation of the service taken over via the relevant interface, A to D. If more than one device is in use, the default setting for each device will automatically generate the program name "Prog A" … "Prog D". These names will show in the programme tables of the reception devices. They should be unequivocal in meaning and should therefore be changed to represent the actual situation.

The information on cascades and positions which has been set in the configuration will be the basis for the distribution of the transport stream over the individual programmes (or services) and of the automatic allocation of neutral programme names and of AV PIDs and service IDs in ascending order. It is possible to change the programme names but not the PIDs.

Automatically allocated service IDs and PIDs

Device/N°.	Input port	Program name	Service	PMT	Video	Audio	TTX [2]	VTX [1]
EMA 207/ 1	A	Prog-A	0x10	0x110	0x210	0x310	0x410	0x414 [1]
	B	Prog-B	0x11	0x111	0x211	0x311	0x411	0x414 [1]
	C	Prog-C	0x12	0x112	0x212	0x312	0x412	0x414 [1]
	D	Prog-D	0x13	0x113	0x213	0x313	0x413	0x414 [1]
EMA 207/ 2	A	Prog-A	0x20	0x120	0x220	0x320	0x420	0x424 [1]
	B	Prog-B	0x21	0x121	0x221	0x321	0x421	0x424 [1]
	C	Prog-C	0x22	0x122	0x222	0x322	0x422	0x424 [1]
	D	Prog-D	0x23	0x123	0x223	0x323	0x423	0x424 [1]
EMA 207/ 3	A	Prog-A	0x30	0x130	0x230	0x330	0x430	0x434 [1]
	B	Prog-B	0x31	0x131	0x231	0x331	0x431	0x434 [1]
	C	Prog-C	0x32	0x132	0x232	0x332	0x432	0x434 [1]
	D	Prog-D	0x33	0x133	0x233	0x333	0x433	0x434 [1]
EMA 207/ 4	A	Prog-A	0x40	0x140	0x240	0x340	0x440	0x444 [1]
	B	Prog-B	0x41	0x141	0x241	0x341	0x441	0x444 [1]
	C	Prog-C	0x42	0x142	0x242	0x342	0x442	0x444 [1]
	D	Prog-D	0x43	0x143	0x243	0x343	0x443	0x444 [1]
...	...	...	...	...	...	...	...	...
EMA 207/ 8	A	Prog-A	0x80	0x180	0x280	0x380	0x480	0x484 [1]
	B	Prog-B	0x81	0x181	0x281	0x381	0x481	0x484 [1]
	C	Prog-C	0x82	0x182	0x282	0x382	0x482	0x484 [1]
	D	Prog-D	0x83	0x183	0x283	0x383	0x483	0x484 [1]

Table 3: Automatically allocated service IDs and PIDs

[1] VTX: Teletext internally generated.
   The EMA 207 has the facility that a teletext carrousel can be generated for each particular device. This teletext can be allocated to one or all of the services being shown. This is an optional function and a charge is made for it.

[2] TTX: Teletext of the external signal at the Video IN ports A … D

Note

- The SID/ PID for the slots configured (the programmes and channels) is automatically allocated according to a fixed pattern. Inserting details of the device in the cascade and the number of the cascade ensures that the values will not overlap. If "outside" transport streams are being processed at the ASI input port, care must be taken to ensure that if the SID/ PIDs of any external and internal programme streams overlap, the internal programme streams have priority. Any "external" programme streams with the same names will be blocked at a filter and not fed into the output port.

Operating several cascades within a network (a head end)

To get unique service IDs if there are several cascades in one head end, an offset is automatically added for the parameter "cascade number within network" (CNr):

Cascade-N°.	1	2	3	4	5	6	7	8
Offset	0x00	0x04	0x08	0x0C	0x80	0x84	0x88	0x8C

Table 4: Offset for the service IDs if several cascades are operated in a network

3.3.4 Transport stream bit rate (TS out bit rate), system bit rate

The transport stream bit rate at the ASI output port can be set in the range between 1,024 Kbps and 214 Mbps (for continuous mode, the maximum is 98 Mbps), with steps of 1 Kbps.
The output bit rate can be selected independently of the input bit rate at the ASI input port. However, care must be taken to ensure that the entire volume of data is transmitted, including the DVB channels generated additionally by the EMA 207. It should be noted that the transport stream at the ASI input may contain components with a fluctuating data rate. When estimating the bandwidth which will be necessary for the transmission of newly generated programmes, this should be borne in mind.
The bit rate ("TS-Out bit rate") is selected in the configuration settings under Channel Mux.

For the EMA 207, the maximum TS-Out bit rate possible is 214 Mbps. When deciding the TS-Out bit rate it is necessary and important to check what is the maximum transport stream bit rate which can be processed or forwarded by succeeding components such as modulators and upconverters.

The bandwidth (bit rate) which is available can be distributed across the channels generated by the EMA 207 in any proportions desired. Whenever individual settings are made, care should be taken to ensure that the figures entered into the configuration mask make sense. The notes in the following sections should be observed in this respect.

Configuration of the system bit rates and "TS-Out bit rate", the output bit rate

When delivered and if reset is carried out with firmware, the system bit rates of each channel will be set to 6 Mbps. This setting should be seen simply as an upper limit and can be varied according to the content of the data being transmitted. It is possible to adjust the figures for each channel according to need. The "TS-Out bit rate", which is the data output rate, is preset to 38 Mbps, which gives enough scope for reliable operation as long as the "ASI main input", the input port, is deactivated. The output rate must be decided in relation to the content being added, with a safety margin of at least 10 per cent, since it is not possible definitely to exclude swings in the data rate taking it over the upper limit.

Examples of estimation of the "TS-Out bit rate", the output bit rate

Example 1: Single device with 4 encoders

ASI main input = "OFF"
The encoder input ports A ... D employ the following system bit rates:

> 3 x 6 Mbps and 1 x 10 Mbps, total **28** Mbps

This allocation, including the necessary 10% reserve for safety, gives a figure of 31 Mbps (minimum) to be set as the data output rate at the output port.

Example 2: Single device with 4 encoders and an ASI main input

ASI main input = „MUX with intern"
Here the incoming data stream has a bit rate of 50 Mbps, and 36 Mbps are used for the transport of the data. 14 Mbps are filled with "empty packets".

The encoder input ports A ... D employ the following system bit rates:

> 2 x 4 Mbps and 2 x 8 Mbps, total **24** Mbps

36+24=**60**, plus 10% safety margin, so that the data output rate at the output port is 66 Mbps (minimum).

3.4 Extended configuration, individual settings

The configurations explained so far suffice for the intended use of the EMA 207 to generate transport streams in conformity with DVB. There are further options possible for professional use with special functions.

3.4.1 TTX processing/ VPS/ WSS

These configuration settings control how teletext information contained in the analogue signal will be adopted and the VPS and WSS control signals will be captured, processed and forwarded in the transport stream.

The following settings and functions are possible:

Switches	State	Function
TTX processing	OFF	No teletext or VPS and WSS data adopted
VPS-WSS	Any	
TTX processing	Video IN	The teletext data contained in lines 7 to 22 and 320 to 335 are digitalised and transmitted in the DVB transport stream.
VPS-WSS	OFF	
TTX processing	Video IN	Teletext data from lines 7 to 22 and 320 to 335, will digitalised and transmitted in the DVB transport stream.
VPS-WSS	VPS WSS VPS+WSS	In addition, VPS, WSS or VPS+WSS (depending on what has been selected) will be digitalised and then transmitted as part of the DVB transport stream.

Table 5: Configuration for processing of teletext, WSS and VPS

3.4.2 SDI signal interface

The encoder input ports can be configured to process SDI input signals. A mixture (SDI/ CVBS) of different configurations for the 4 input components is possible. The operational fields in the configuration menu will be offered for each channel as appropriate to the configuration (see 3.3.2.2.1).

The following signal components can be processed:
- SDI video signals with accompanying analogue sound signal:
  Here the signal processing is as for FBAS with an analogue sound signal.

- SDI video signals with embedded digital sound signal (this is known as embedded audio)
  In this case, there are additional configuration options available for the processing of the audio signal:
  - Audio Input Level: Setting of the audio level (see 3.3.2.2.5)
  - Audio Channel Pair: Selection of stereo pair

  An SDI signal may contain a number of stereo sound channels carrying different signals.
  The EMA 207 can select any pair of signals from these and embed them in the DVB transport stream.

3.4.3 Options

The EMA 207 can access the signals when processed in a variety of ways. If there is a need for further functions, it is always possible to enquire about them (section 1.2, contact).
Adaptations or options supplied to customer specifications may be charged for.

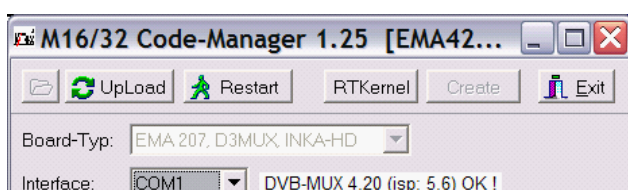### 3.4.4 Firmware updates (emergency program)

Fig.16: Update window

If a firmware update becomes necessary, a Windows update programme will be made available. The update will be carried out either via the Ethernet interface or via the (RS232) control interface on the EMA 207. For this purpose the computer and the EMA 207 must be connected to each other by means of either an Ethernet cable or a null modem cable (cross-linked cables in each case). After the program has been opened, the computer interface to be used must be selected in the update window. If the right interface is selected, the "Upload" button will be activated, allowing the update to be started with this button.

Firmware updates do not change any parameters already set (whereas the opposite is true of using the recessed "Factory setting" key, which restores settings to what they were on delivery of the device).

3.4.5 Re-set to status on delivery (Factory setting)

The following 3 possible ways of restoring the status on delivery:

Version 1:
Factory setting using the user software (HTML page)

This will only be possible if the IP configuration for the device is known, including network address subnet mask, and the device can be contacted via the Ethernet interface.
The Internet browser should be used as described in section 3.3.1 ("Connecting the network to the computer") to access the device operation system. When the access data have been entered, the configuration menu will appear. The "Factory Setting" box is displayed in the menu header.
If this box is clicked, all the parameters for the device which are capable of configuration, **excluding the IP address**, will be reset to those for the state the device was delivered in, and the device will be restarted.

Version 2:
Factory setting using the „Factory Set" key (on rear of device):

In order to re-set all configurable parameters **including the IP address for the device** so that they are as delivered, this key must be activated for at least 5 seconds, until all the LEDs on the front flash at the same time. The flashing LEDs are the confirmation that the factory set function has been carried out. When the key is released, a new start will follow automatically in which the parameters are as reset.
If the connection with the device has become invalid because of the restoration of the original IP address, the steps indicated in section 3.3.1, "Connecting the network to the computer" must be followed in order, after which access will again be possible.

Version 3:
Factory setting with the aid of the maintenance software (via RS 232):

The maintenance software is a Windows PC program module obtainable from BLANKOM Antennentechnik GmbH which will create the factory settings.
Firstly, the maintenance software has to be installed on the control PC and a cable connection must be established between this and the EMA 207. The cable must be a null-modem cable. When the program has been started and the various procedures run, the EMA 207 is restarted with all parameters reset.
When the second or third versions are used, the IP address of the EMA 207 after the re-start will be: of the EMA 207 after the re-start will be: 192.168.2.86 with the net mask 255.255.255.0.

3.4.6 Integration into the head end management system for B-LINE or C-LINE

If a EMA 207 is being used in association with B- or C-LINE head end components, the possibility exists (using HCB x00 „BLUE", from 9650.03 upwards) of integrating the encoder into the overview of the head end and calling it up from this screen. A hub will be necessary in this case, through which the Ethernet connections of the HCB x00 and the EMA 207 are networked. Before this happens, the "lowest" of the IP addresses of all the EMA 207 encoders must be entered in the configuration menu for the IP address of the HCB x00. It is only possible to enter (or change) IP addresses into the HCB x00 directly. This cannot be done from the html user interface.

Warning:
If multiple EMA 207s are being integrated, it is important to note that the HCB x00 will search in the network for any IP address (N) with the "lowest" value and will then search for nine more with ever "higher" addresses (N+1...N+9). In consequence, the maximum number of EMA 207s which can be included in the headend overview of an HCB x00 is ten. Switching on or re-setting the HCB x00 will cause any EMA 207 in the network to be read and shown in the overview along with the rest of the system. By clicking "Edit" (this word means "change" in German), a link is made to the IP address of the EMA 207 and the login window opens. Once the "serial number" and the "password" have been entered, the EMA 207 can be further configured as described in section 3.3.3.

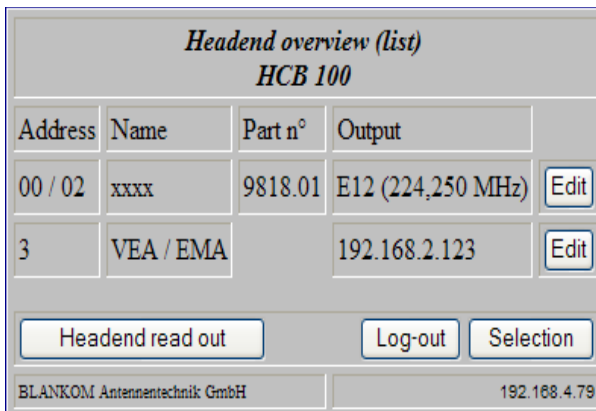| Headend overview (list) HCB 100				
Address	Name	Part n°	Output	
00 / 02	xxxx	9818.01	E12 (224.250 MHz)	Edit
3	VEA / EMA		192.168.2.123	Edit
Headend read out		Log-out	Selection	
BLANKOM Antennentechnik GmbH			192.168.4.79	

Fig. 17: User interface: HCB x00 head end overview

4. Appendix

4.1 Technical data

Device

Casing/ dimensions for installation	19" rack, 1 height unit (steel sheet), HxWxD = 44 x 444 x 300 mm
Operating voltage	85 ... 264 V~, 50/ 60 Hz or 110 ... 370 V-
Power consumption	15 VA
Weight	approx. 4,500 g

Video encoder

Standards	analogue 50 Hz: PAL/ SECAM, analogue 60 Hz: NTSC/ PAL, digital SDI, 270 Mbps (SMPTE 259M-C), Audio embedded (AES/ EBU, 48 kHz) oder Audio extern analogue
Compression	MPEG-2 (MP@ML)
Format	720 x 576 pixels
System bit rate	1,024 ... 15,000 kbps, settable for each individual channel (or slot), depending on the total bandwidth and the number of channels

Audio encoder

Compression	MPEG-1, Layer 2
Sample frequency	48 kHz, stereo
Bit rate	64 ... 384 Kbps

ASI transport stream output

Protocol	DVB-ASI, burst/ continuous mode (selectable)
TS data packet length	188/ 204 Byte (selectable)
Connection	BNC, 75 ohms, 800 mV$_{pp}$
Bit rate	1 ... 214 Mbps in burst mode, 1 ... 98 Mbps in continuous mode adjustable in 1 Kbps steps
Channels	1 ... 4 encoder channels per individual device

Transport Stream input port (input in the case of a multi-device configuration)

Protocol	DVB-ASI, burst or continuous mode, 188/ 204 Byte (self adapting)
Connection	BNC, 75 ohms, 800 mV$_{pp}$
Bit rate	98/ 214 Mbps max. (continuous/ burst mode, respectively)

AV input ports

Video IN	analogue: 1 V$_{pp}$, digital: 800 mV$_{pp}$, Audio embedded (AES/ EBU, 48 kHz) adjustment range: +/- 6 dB (SDI with analogue audio, feed via „Audio IN" see below)
Audio IN	4 x sockets according EN 50083-5 annex B (without control functions) [3] 600 ohms/ 10 kilo-ohms (selectable), symmetrical, (mono, stereo, dual) adjustment range: +6 dB ... -20 dB , 0.5 dB steps

Remote control

Settings, data	Ethernet interface, UDP/ IP

Extensions

Cascade system	Up to 14 devices can be combined into a cascaded system to form a DVB transport stream using the ASI interface. A maximum of 8 cascades per network (i.e. per head end) is possible.

Extra functions

Teletext, VPS, WSS	Transparent feed of teletext signals, conversion and onward transmission of VPS und WSS signals

Options

Teletext	200 pages (generated in the device)
Optional	1,000 additional pages (extended memory)
SNMP	Coming soon
Editable service ID and PID	Coming soon

4.2 Accessories

4.2.1 Accessories as standard

1 x device connection cable
1 x 19" installation set (4 bolts; 4 washers; 4 cage nuts)
2 x replacement T fuses 1A/ 250V
1 x null modem cable; 3 m; 9 poles (2 sub D sockets)
1 x patch cable; cross-linked; 3 m; 8 poles (2 RJ45 plugs)
1 x BNC connecting cable; 0.34 m
4 x DIN plug connectors, 5 poles
1 x guarantee certificate
3 x copies of serial number with 5 digits (in the storage pocket of the device manual)
1 x operating manual (this document)

4.2.2 Optional accessories

The optional accessories can be ordered individually as required.

Purpose	Plug connection	Length	Type	Item nº.
Video and ASI connector cable	BNC-BNC	0.34 m	VVK 526	8025.26
		1 m	VVK 540	8025.40
		2 m	VVK 541	8025.41
		3 m	VVK 542	8025.42
		... m*	VVK 543	8025.43
Video adapter cable	BNC-Cinch	1 m	VAK 537	8025.37
		2 m	VAK 538	8025.38
		3 m	VAK 539	8025.39
		... m*	VAK 560	8025.60
Audio connector and control cable	DIN 8 pole-DIN 8 pole	1 m	ASK 545	8025.45
		2 m	ASK 546	8025.46
		3 m	ASK 547	8025.47
		... m*	ASK 548	8025.48
Audio adapter cable	DIN 5 pole-2 x XLR sockets	0.2 m	AAK 536	8025.36
	DIN 5 pole-2 x Cinch	1 m	AAK 564	8025.64
		2 m	AAK 535	8025.35
		3 m	AAK 566	8025.66
		... m*	AAK 567	8025.67
Cable to connect apparatus to mains	C13 (standard connector cable) - CEE7/7 (Schuko-type angle plug)	2 m	NKW 200	0144
Audio plugs (for cable diameter 6 mm)	DIN plug, 5 poles		SV 050	0143
	DIN plug, 8 poles		SV 081	0141

* ... length as specified by customer

Further accessories are to be found in the BLANKOM Antennentechnik main catalogue.

4.3 Glossary and abbreviations

Term	Meaning	Notes
ASI	**A**synchron **S**erial **I**nterface	Interface for DVB transport stream BNC connection, 75 ohms
Audio bit rate	Digital bandwidth for audio transmission, element of the system bit rate	The higher the value the better the transmission quality, but it may (slightly) limit the video bit rate.
Audio mode	Options for the audio channels to be transmitted. The options are: stereo, joint stereo, mono, dual channel, Use VPS.	The relevant option is entered (unchangeably) into the EMA 207 coding. It will be transmitted with the additional DVB information.
Burst mode	ASI TS mode: either 188 or 204 data bytes are sent as a bundle with no intervals between them, then "sync words" follow.	Identical with the mode: contiguous, packed, packed space, packed timing, data packed, packed burst
Continuous mode	ASI TS mode: data bytes are continuously transmitted alternately with sync words at equal intervals.	Identical with the mode: interleave, distributed, spread out, byte-space, byteburst, byte timing, equality, data byte
DHCP	**D**ynamic **H**ost **C**onfiguration **P**rotocol: enables networked devices to receive IP addresses automatically	If there is no DHCP service available or DHCP is switched off, the (default) IP address which has been set will be used.
Input channel	Audio or video signal input	Analogue (video and audio separately),SDI (video with audio embedded or separate)
IP address	Network address for access to data and configuration (in case there is no DHCP service)	Factory setting: 192.168.2.86
IP subnet mask	Mask for detailed identification of the address in the network	Factory setting 255.255.255.0
Kbps	Bit rate	**K**ilo **b**it **p**er **s**econd (where Kilo=1024)
Load	Reads out the parameter settings of the EMA 207 and shows them in the settings masks.	The parameters can be viewed and altered. "Save" saves the edited parameters
Mbps	Bit rate	**M**ega **b**it **p**er **s**econd
MIB	**M**anagement **I**nformation **B**ase	The device-specific file (ME.mib) to serve the system via SNMP
Network ID	Network identification: this ID gives the unique identification for the link between DVB transport streams (TSs) and a particular (cable) network Within the network this ID is the same for all TSs.	This is an element of the NIT and is usually overwritten by the succeeding modulator component.
NIT	**N**etwork **I**nformation **T**able this is an important table for the transmission of channel parameters. The NIT supports, for example, the "seek" function in the DVB receivers so that a broadcaster is found.	The EMA 207 is capable of setting up this table. A succeeding modulator component can add to it or overwrite it.
Password	Access to configuration via the IP network is password-protected	The password on delivery is set to: neu
Programme language	This shows the programme language; the abbreviations to be used are those in ISO 639-2 [4] code, (i.e. "deu" for German)	The details will be displayed in the receiver for the information of the watcher.
Programme name	This is the name of the newly generated DVB programme. Every A/V channel should be given a name.	The name of the programme will be presented for selection in the table of broadcasters by the DVB receiver.
RDS	**R**adio **D**ata **S**ystem	Additional digital information concerning analogue radio programmes, e.g. name of broadcaster, short details, special announcements.
Save	Saves the configuration values which have been set for the EMA 207	These parameters are read using "Load" and stored using "Save"
SDI	Serial Digital Interface for digital, uncompressed video signals	270 MBit/s, transmission via BNC cables, audio data can be embedded
SDT	**S**ervice **D**escription **T**able	This contains the programmes offered and relevant details of broadcaster
Serial number	The 5-digit device serial number	This serial number is on the rear of the device (it will be needed for "login")
SNMP	**S**imple **N**etwork **M**anagement **P**rotocol	An interface protocol allowing data exchange and device control via the network

Term	Meaning	Notes
System bit rate	The digital bandwidth available for an A/V channel.	The system bit rate for a channel is composed of the video and audio shares combined.
TS	**T**ransport **s**tream (a data signal in packeted form)	The whole of the information necessary to enable transmission of digital signals. One transport stream can contain more than one programme, with audio, video, teletext and details.
TS ID	**T**ransport **s**tream **id**entifikation (unique designation of the transport stream)	When devices are linked up in series for a shared transport stream, they must all use the same TS ID.
TS out bit rate	Output data bit rate of the transport stream = digital bandwidth	This rate must be adequate to the quantity of data.
TTX processing	**T**ele**tex**t processing and onward transmission	Conversion of the teletext signal contained in the analogue signal into digital transport packets which are then transmitted in the DVB signal.
Video format Video system	Standards applying to the analogue video input signals which require conversion	Factory setting: PAL/ SECAM (50 Hz); alternatively, NTSC (60 Hz) or OFF (Digital Radio) can be selected
VPS/ WSS	VPS (**v**ideo **p**rogramming **s**ystem): this is the recording control for the video recorder. WSS (**wi**de **s**creen **si**gnalling): format control for the TV itself	Both these signal components are contained in the analogue TV signal. WSS = ON and VPS = ON: here the signal components are converted and transmitted in the DVB signal.

5. Bibliography

[1] EN 60728-11: Cable networks for television signals, sound signals and interactive services Part 11: Safety (IEC 60728-11:2005); German version EN 60728-11:2005

[2] EN 50083-2: Cabled distribution systems for television and sound signals. Electromagnetic compatibility for equipment; EN 50083-2:2001

[3] EN 50083-5: Cabled distribution systems for television and sound signals. Headend equipment, German version EN 0083-5:2001

[4] ISO 639-2:1998 − Codes for the representation of names of languages − Part 2: Alpha-3 code

[5] ISO13818-1: 2000 - Information technology - Generic coding of moving pictures and associated audio information: Systems

6. Document history

Version	Date	Modification	Author
1.00	28.08.2008	basic document	K.-H. Möller/ N.Poch
1.01	28.11.2008	revision	N. Poch
2.00	18.02.2009	revision/ additions	N.Poch
2.01	18.05.2010	revision/ additions	J Häußer

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

$C\epsilon$ Declaration of Conformity

The Manufacturer

BLANKOM Antennentechnik GmbH · Hermann-Petersilge-Str. 1 · 07422 Bad Blankenburg · Germany

herewith declares the conformity of the product group

Product name:	MPEG-2 Encoder/ Multiplexer
Type:	EMA 207
Product number:	9172.x1

according to the following regulations

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

and additional device-specific regulations, enclosed above, which these products are subjected to.

Date: 28.08.2008

Signature:

Piero Kirchner
(Managing Director)