Software version 2.4.3

CHAMELEON
Installation Guide

2015-11-16 JÅ

Chameleon

Single Hardware Headend

THE Chameleon PRODUCT LINE COVERS ALMOST EVERY NEED FOR CABLE-TV AND SMATV DISTRIBUTION WITH ONLY ONE HARDWARE..
The different inputs, processing and outputs are defined by software options, and all software options can be updated at any time.
The Chameleon includes a dual DVB-S/S2/T/T2/C receiver, furthermore it includes decoding of MPEG-2 and MPEG-4 video formats as well

as it supports MPEG, AAC HE and Dolby audio decoding. The Dolby audio decoding requires the latest HW version.
The Software Options define the different "product realisations" you can implement with the unique HW. For your specific application, you simply buy the Software Options you need. When you need further functionality, just purchase additional Software Options, and update the installed HW.

Chameleon Product examples

- Receiver DVB-S/S2/T/T2/C
- Transmodulators
- DVB-C, DVB-T modulators
- QAM J.83 Annex B/C modulators
- DTMB modulator
- ISDB-T modulator
- Analog VSB RF-modulators
- FM modulator
- Edge QAM/COFDM
- Dual MPEG2/4 SD decoder
- Single MPEG2/4 HD decoder
- CI multi-decryptions
- Remultiplexer multiple TS
- DVB_CSA Scrambler
- IP streamer
- ASI streamer
- SDI generator

Visit wisi.de for more info about our products.

Service and support

Support

For support information and help, please contact our support organisations. The support organisation is manned by support staff from both Sweden and Germany.

E-mail: support@wisiconnect.tv

Telephone:
+46 (0)13-21 09 15
+49 723 366 621

E-mails sent to the above e-mail address will be available to all support staff. The general (Swedish) support telephone number +46 13 21 09 15 will have staff answering both from Sweden and from Germany.
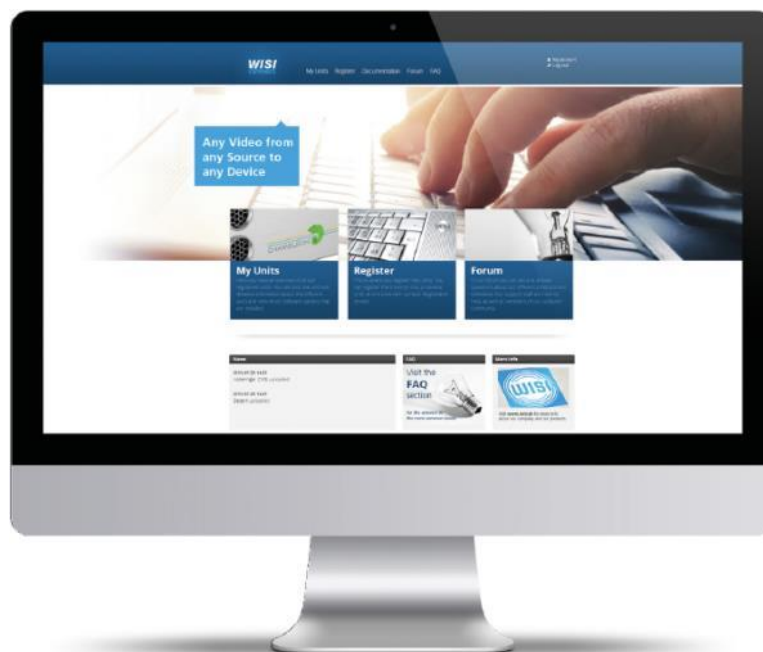
Support tools at wisiconnect.tv

At the wisiconnect.tv portal, you will find the User manual, Release Notes, Known Issues and the software binary for each software release.

Apart from this general information, there is also an FAQ and a Forum. The FAQ will give questions and answers to frequently asked questions, and more information will be added over time.

The Forum is open to all wisiconnect users. Here you can discuss with other Chameleon users, and also get information about how other installations have been implemented. The Forum is also used by the Chameleon Support Team to communicate with Forum users.

This installation guide is also available wisiconnect.tv portal.

Content

1   Getting started

Register your Chameleon at wisiconnect.tv

After registration and uploading the entitlement file to the
Chameleon, your purchased Software Options are loaded, and a 30 days trial
period for all Software Options is initiated.

Assemble in base unit

Mount your Chameleon in the base unit, and connect the power supply.

Connect: 192.168.0.20

Use an IP cable, start your web browser, and connect by entering
192.168.0.20 in the address field of the browser. Make sure your computer or
network adaptor has an IP address in the same IP range.

Change the IP address (optionally)

When using a system of Chameleons, it is recommended to change the default
management address **192.168.0.20** to a system unique IP address.

Configure your Chameleon

Connect and configure inputs and outputs. Select services from your inputs to your outputs.

1   General information about Software options

Delivery without Software options – please register at the portal

The Chameleons are delivered without any Software Options loaded. You can connect to the Chameleon directly using a web browser and the default management IP address **192.168.0.20**.
In a non-registered Chameleon, you have access to the web UI, but no configuration or settings can be done. To enable the normal functionality, the Chameleon has to be registered at the wisiconnect.tv portal, see **§4**.

Software Options and 30 days installation period with all Software Options

After registering your Chameleon, and uploading the entitlement file to the Chameleon, you have access to the functionalities you have purchased. A 30 days (uptime) trial period for all currently available Software Options is initiated. Note that the trial period is terminated automatically if Software Options are added after the initial purchase.

Available software options for the Chameleon modules

INPUT	PROCESSING	OUTPUT	MISCELLANEOUS
DVB-C & QAM J.83 B/C Receivers GNC, GNDC	**Common Interface Decryption** GNCI, GNDCI	**DVB-C & QAM J.83 B/C Modulators** GNCMOD, GNDCMOD, GNTCMOD, GNQCMOD	**MPEG Encoder** GNHWENCW
DVB-S/S2 Receivers GNS2, GNDS2	**Simulcrypt Scrambling** GNSCR	**DVB-T Modulators** GNTMOD, GNDTMOD	**System Management** GNSYSMG
DVB-T/T2 Receivers GNT, GNDT, GNT2, GNDT2	**Pro:Idiom Scrambling** GNQPISCR, GNOPISCR	**DTMB Modulator** GNDMOD	**Service License Agreement** GNM1, GNM3
ISDB-T Receivers GNIST, GNDIST	**Remultiplexing** GNMUX, GNSYMUX	**ISDB-T Modulator** GNISMOD	**All Software Options** GNALL
ASI input & output GNASI, GNDASI	**Redundancy** GNRED	**Analogue Modulators** GNVMOD, GNDVMOD	
IP Streaming input & output GNSTR, GNSTREC	**Dolby AC3** GNDOL	**MTS & SAP (BTSC)** GNBTS	
	T2MI de-encapsulation PLP support GNT2MIDE, GNDT2MIDE GNDT2MIPLP, GNQT2MIPLP GNOT2MIPLP, GNXT2MIPLP	**FM Radio** GNDFM, GNOCTFM	
		SDI & HD-SDI output GNSSDI, GNDSDI, GNHSDI	
		ASI input & output GNASI, GNDASI	
		IP Streaming input & output GNSTR, GNSTREC	

Please note that some functionality, e.g. the N+1 redundancy, is managed by the GT11 embedded switch in the GN50 base unit, and the Software Option GNNRED for N+1 redundancy is purchased for the GN50.

2   Chameleon in GN50

NOTE!

For Chameleon running software 2.4.3 and installed in a GN50, please make sure that the GN50/GT11 is upgraded to SW version 2.3.

Most of the functionality of software 2.4.3 will be possible to access while running earlier SW versions in GN50, but new functionality added in later software versions for Chameleon is only possible to manage via the System UI if the GN50 is upgraded to SW2.3. Functionalities not supported via the System UI can still be managed when connected directly to the management IP address of the Chameleon.

For more information about this SW version for GN50, and for access to the SW2.3 file, please refer to Documents at the wisiconnect.tv portal.

3   The wisiconnect.tv portal

Portal URL: http://wisiconnect.tv

Connect to the Chameleon portal using the URL: **http://wisiconnect.tv**.

Login to the wisiconnect.tv.

Enter your e-mail address and password, and click **Login**. If you have forgotten your password, click the **Forgot password?** link, and an e-mail will be sent to the entered e-mail address. The e-mail contains a hyper-link that you should follow to confirm the request for a new password.

Requesting access to the wisiconnect.tv portal

If you do not have a password for access to the portal, please click the **Register** link and fill in the required fields.
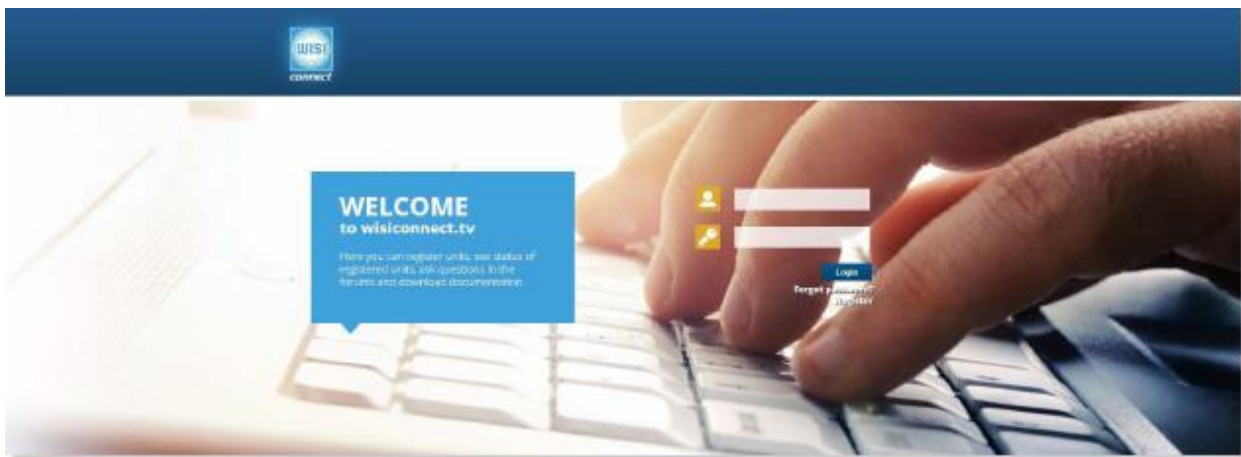
4 Registering the Chameleon & downloading Software Options

Register units at the wisiconnect.tv portal

After login, and clicking the Register tab, enter the serial number of your Chameleon and select your distributor in the drop-down list.
Optionally, also enter Module name, Installation site, and Description (these fields are intended for your own use, to be able to track and maintain your installed base). Information about SLA End date and Software Options are entered automatically.

Click the Register button to register the Chameleon.

Downloading Software Options (entitlement file) to your computer

Go to the tab **My Units**, and click the serial number for the module to download Software Options (entitlement file) for. Click **Download entitlement**. Save the file to your computer.
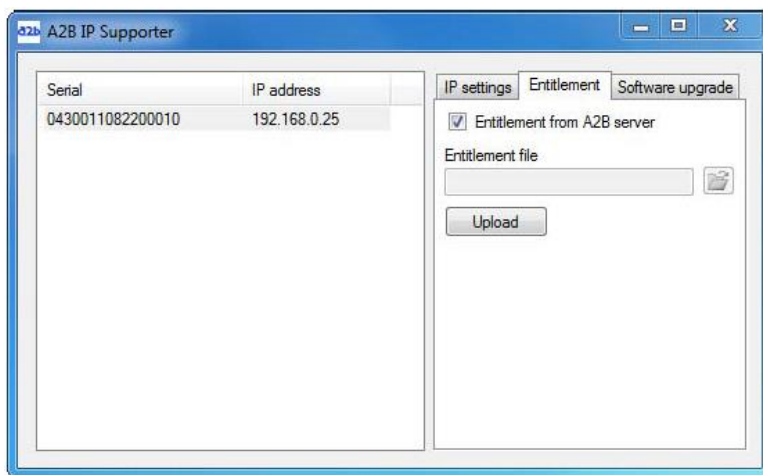
Uploading Software Options (entitlement file) to your Chameleon

<u>Via the Chameleon web UI</u>

Under **Settings / Software and Entitlement Upgrade**, browse for the entitlement file you previously downloaded to your computer. Click **Upload**, and reboot the module when the upload is ready.

<u>Using the IP Supporter</u>

With the Chameleon connected to your computer, and your computer connected to Internet, you can upload the entitlement file directly. Select your Chameleon, and check the box for **Entitlement from A2B server**, and click **Upload**.

5 Upgrading the Chameleon software & Software Options

SOFTWARE AND ENTITLEMENT UPGRADE

Uploading a new software/entitlement can take up to a few minutes to complete. Rebooting the module during an upload can result in faulty operation. After a new software/entitlement version is uploaded the module needs to be rebooted for the upgrade to be complete.
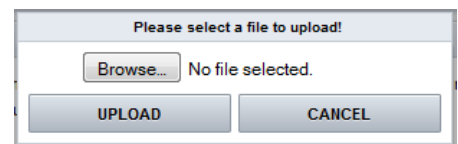
MODULE ▾	CHASSIS	RUNNING SW	UPLOADED SW	
Allan (Chameleon)	N/A	2.1.4	2.1.4	☰▾

UPLOAD

Both software and Software Options (entitlements) are uploaded via the **Software and Entitlement Upgrade** in the **Settings** tab.

Uploading firmware

1. Click on the **Upload** button to browse for the firmware file to be uploaded from your computer

2. Locate the firmware file (.bin file) on your computer, and select it

3. Click **Open** in the browsing window

4. Click the **Upload** button in the Chameleon web UI

5. Wait for the feedback that the upload is OK

6. Reboot the module

Please select a file to upload!
Browse... No file selected.
UPLOAD   CANCEL

Click on the Upload button to browse for the firmware file

Uploading Software Options (.ent file)

1. Click on the **Upload** button to browse for the entitlement file to be uploaded from your computer

2. Locate the software file (<serial number>.ent) on your computer, and select it

3. Click **Open** in the browsing window

4. Click the **Upload** button in the Chameleon web GUI

5. Wait for the feedback that the upload is OK

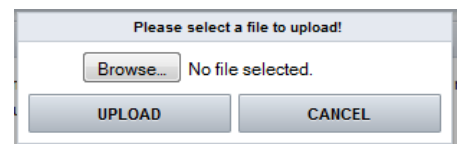6. Reboot the module

Please select a file to upload!
Browse... No file selected.
UPLOAD   CANCEL

**Click on the Upload button to browse for the entitlement file**

6 Connecting to the Chameleon user interface

Default IP address: 192.168.0.20

The default IP address for a Chameleon module is 192.168.0.20. Change the IP address to a unique IP address in your network, in the web UI under **Settings / Networking**, or by using the **IP-Supporter**.

Connecting with web browser

Use a standard web browser on your computer to connect by typing the IP address of the Chameleon in the address field.
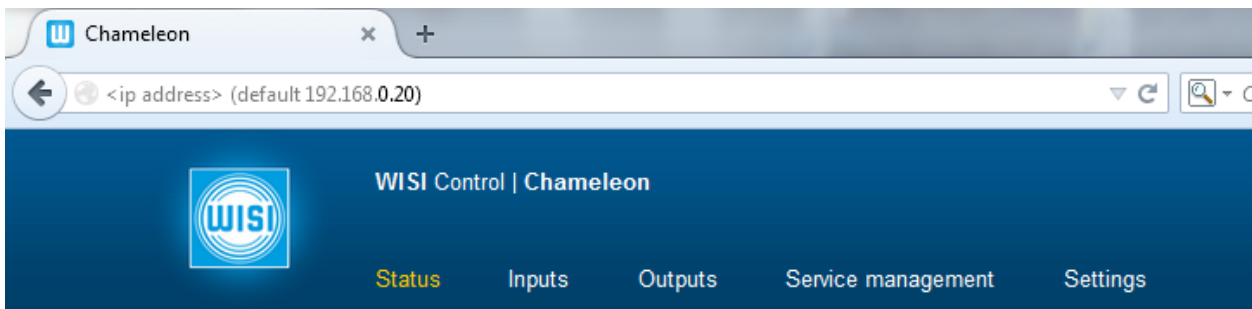
Supported web browsers

The Chameleon web interface is verified for Firefox version 14 and Internet Explorer 9. Other browsers might work, but the functionality cannot be guaranteed.

General information about the web interface structure

The web UI is designed to get a logical structure for the user/installer, and an overview of the module via the top tabs.

Operation mode must be selected before starting to use the Chameleon. The selected Operation mode will have implications on the general functionality of the module, e.g. the possible output standard and the IP streaming capability. The main interface while managing services is the **Service Management**. Here, you will have an overview of the configured inputs and outputs, and you will also manage the service selection, remultiplexing and decryption.

Before you start managing the services, you should add and configure the inputs and the outputs in their respective tabs.
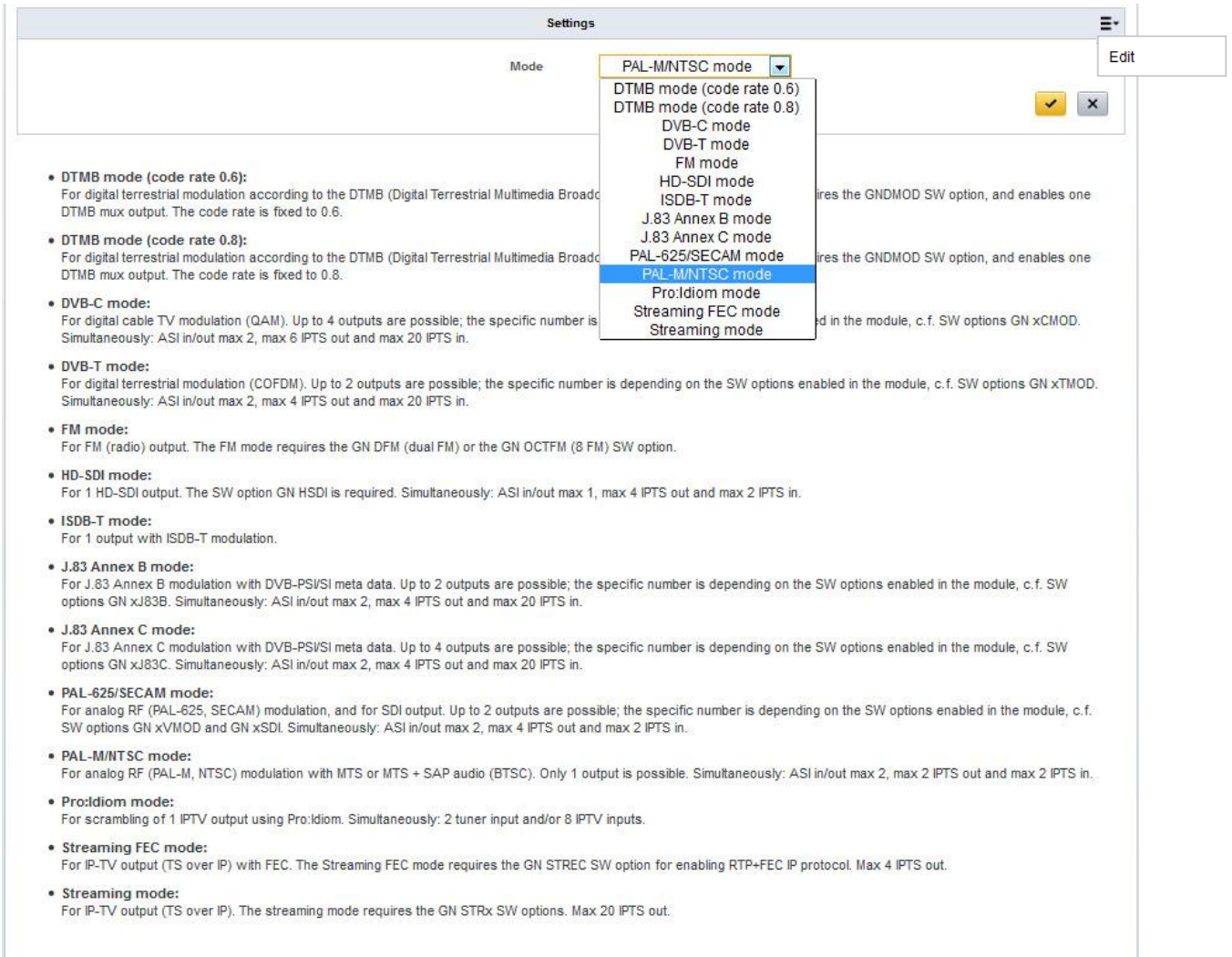

The **Settings** tab contains module settings such as Networking, Headend System Management, Operation Mode, Common Interface, SW and Entitlement Upgrade, Maintenance, and Log. The CAM menu, if available, is also displayed in the Common Interface menu under the Settings tab.

7 Select operation mode

Select Operation Mode

Click **Operation Mode** under the Settings tab. Select the generic operation mode by clicking on the menu icon ☰ at the right of the Settings menu line. Select operation mode from the drop-down list, and click the "yellow tick" ✔ to save the settings.


- **DTMB mode (code rate 0.6):**
  For digital terrestrial modulation according to the DTMB (Digital Terrestrial Multimedia Broadc... ...ires the GNDMOD SW option, and enables one DTMB mux output. The code rate is fixed to 0.6.

- **DTMB mode (code rate 0.8):**
  For digital terrestrial modulation according to the DTMB (Digital Terrestrial Multimedia Broadc... ...ires the GNDMOD SW option, and enables one DTMB mux output. The code rate is fixed to 0.8.

- **DVB-C mode:**
  For digital cable TV modulation (QAM). Up to 4 outputs are possible; the specific number is ...ed in the module, c.f. SW options GN xCMOD. Simultaneously: ASI in/out max 2, max 6 IPTS out and max 20 IPTS in.

- **DVB-T mode:**
  For digital terrestrial modulation (COFDM). Up to 2 outputs are possible; the specific number is depending on the SW options enabled in the module, c.f. SW options GN xTMOD. Simultaneously: ASI in/out max 2, max 4 IPTS out and max 20 IPTS in.

- **FM mode:**
  For FM (radio) output. The FM mode requires the GN DFM (dual FM) or the GN OCTFM (8 FM) SW option.

- **HD-SDI mode:**
  For 1 HD-SDI output. The SW option GN HSDI is required. Simultaneously: ASI in/out max 1, max 4 IPTS out and max 2 IPTS in.

- **ISDB-T mode:**
  For 1 output with ISDB-T modulation.

- **J.83 Annex B mode:**
  For J.83 Annex B modulation with DVB-PSI/SI meta data. Up to 2 outputs are possible; the specific number is depending on the SW options enabled in the module, c.f. SW options GN xJ83B. Simultaneously: ASI in/out max 2, max 4 IPTS out and max 20 IPTS in.

- **J.83 Annex C mode:**
  For J.83 Annex C modulation with DVB-PSI/SI meta data. Up to 4 outputs are possible; the specific number is depending on the SW options enabled in the module, c.f. SW options GN xJ83C. Simultaneously: ASI in/out max 2, max 4 IPTS out and max 20 IPTS in.

- **PAL-625/SECAM mode:**
  For analog RF (PAL-625, SECAM) modulation, and for SDI output. Up to 2 outputs are possible; the specific number is depending on the SW options enabled in the module, c.f. SW options GN xVMOD and GN xSDI. Simultaneously: ASI in/out max 2, max 4 IPTS out and max 2 IPTS in.

- **PAL-M/NTSC mode:**
  For analog RF (PAL-M, NTSC) modulation with MTS or MTS + SAP audio (BTSC). Only 1 output is possible. Simultaneously: ASI in/out max 2, max 2 IPTS out and max 2 IPTS in.

- **Pro:Idiom mode:**
  For scrambling of 1 IPTV output using Pro:Idiom. Simultaneously: 2 tuner input and/or 8 IPTV inputs.

- **Streaming FEC mode:**
  For IP-TV output (TS over IP) with FEC. The Streaming FEC mode requires the GN STREC SW option for enabling RTP+FEC IP protocol. Max 4 IPTS out.

- **Streaming mode:**
  For IP-TV output (TS over IP). The streaming mode requires the GN STRx SW options. Max 20 IPTS out.

Mode selection implications

The selected operation mode will have an impact on the possible selection of output.

- ■ **DTMB mode (code rate 0.6):** for 1 DTMB out with code rate 0.6. Requires GNDMOD.

- ■ **DTMB mode (code rate 0.8):** for 1 DTMB out with code rate 0.8. Requires GNDMOD.

- ■ **DVB-C mode:** for digital cable TV modulation (QAM), 1 to 4 DVB-C multiplexes. Requires GNxCMOD Software Options.

- ■ **DVB-T mode:** for 1 or 2 digital terrestrial modulation (COFDM). Requires GNxTMOD Software Options.

- ■ **FM mode:** for up to 8 FM (radio) outputs. Requires GNDFM or GNOCTFM Software Options.

- ■ **HD-SDI mode:** for 1 HD-SDI output. Requires GNHSDI Software Option.

- ■ **ISDB-T mode:** for 1 ISDB-T output. Requires GNISMOD Software Option.

- ■ **J.83 Annex B mode:** for digital cable TV modulation (J.83 Annex B), 1 or 2 J.83 Annex B multiplexes. Requires GNxCMOD Software Options.

- ■ **J.83 Annex C mode:** for digital cable TV modulation (J.83 Annex C), 1 to 4 J.83 Annex C multiplexes. Requires GNxCMOD Software Options.

- ■ **PAL-625/SECAM mode:** for 1 or 2 analogue RF (PAL-625, SECAM) and/or SDI output. Requires GNxVMOD Software Options for the analogue outputs, and GNxSDI for SDI outputs.

- ■ **PAL-M/NTSC mode:** for 1 analogue RF (PAL-M, NTSC) modulation with MTS or MTS + SAP audio (BTSC). Requires GNxVMOD Software Options and GNBTS for MTS + SAP audio.

- ■ **Pro:Idiom mode:** for scrambling of 1 IPTV output using Pro:Idiom. Requires GNxPISCR Software Options.

- ■ **Streaming FEC mode:** for IP-TV output (TS over IP) with FEC. Up to 4 IPTS with FEC out. Requires GNSTREC Software Option.

- ■ **Streaming mode:** for IP-TV output (TS over IP). Up to 20 IPTS out. Requires GNSTR Software Option.
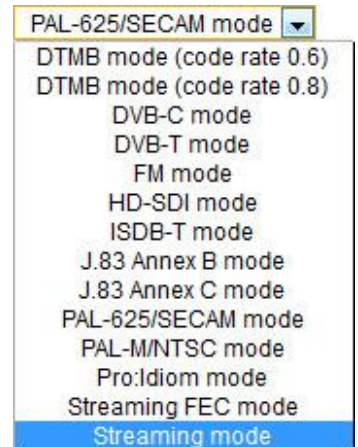
For all the different operation modes, your Chameleon module must also be equipped with the appropriate Software Options, see more details in **§15**.

ASI and IP for all operation modes

In all operation modes, input and/or output via ASI is available simultaneously. The ASI in/out can be used simultaneously with the modulated and IPTS outputs (except for Pro:Idiom operation mode). The different operation modes also have capability for simultaneous IPTS (SPTS and/or MPTS) inputs and outputs. The number of IPTS in and out in the different operation modes is given in the table to the right.

Number of IPTS[1] in/out in different operation modes

- ■ DTMB (0.6 and 0.8): 10 IPTS in / 2 IPTS out
- ■ DVB-C: 20 IPTS in / 6 IPTS out
- ■ DVB-T: 20 IPTS in / 4 IPTS out
- ■ FM: 8 IPTS in / 2 IPTS out
- ■ HD-SDI: 2 IPTS in / 4 IPTS out
- ■ ISDB-T: 4 IPTS in / 2 IPTS out
- ■ J.83 Annex B: 20 IPTS in / 4 IPTS out
- ■ J.83 Annex C: 20 IPTS in / 6 IPTS out
- ■ PAL-625/SECAM: 2 IPTS in / 4 IPTS out
- ■ PAL-M/NTSC: 2 IPTS in / 2 IPTS out
- ■ Pro:Idiom: 8 IPTS in / 1 IPTS out (no ASI)
- ■ Streaming FEC: 4 IPTS in / 4 IPTS out
- ■ Streaming: 4 IPTS in / 20 IPTS out

1) IPTS = SPTS and/or MPTS

8   Add and configure inputs

Go to Inputs

Click on the **Inputs** tab. Depending on the Software Options in your Chameleon, you can configure inputs from:

- Tuner (up to 2 tuner inputs, note that available inputs depends on HW version)
- ASI (up to 2 ASI inputs)
- IP (up to 20 IPTS inputs, depending on Operation Mode)
- SDI (up to 2 SDI inputs)

Add an input

1. Click on **ADD NEW INPUT** to expand the input creation menu.
2. Select Input Type in the drop-down list (ASI, IPTV, TUNER).
3. For tuner inputs, select the type of tuner input in the Configuration drop-down list (selectable tuner inputs will depend on the tuner installed).
4. Enter the settings, and confirm/save by clicking the "yellow tick"
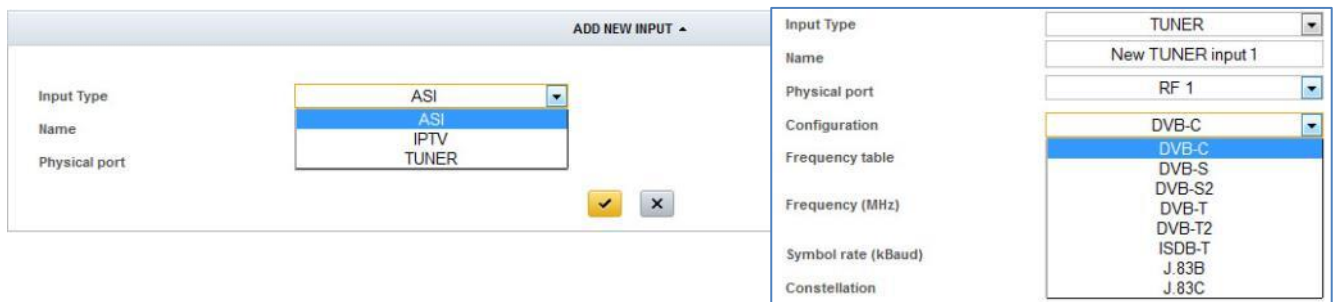
Note: In operation mode SDI to Analog (PAL-625), ASI will appear as SDI in the drop-down list.

Configure the input

For each type of input, you will get configuration settings in the expanded view.

1. Type a name for the input. This name will be shown in the overview of the inputs.

2. Fill out the required information/parameters and confirm/save by clicking the "yellow tick"

Input status

If your settings were OK, the status will show you basic information and no error indication.

NAME ▼	TYPE	SOURCE	STATUS	
▸ Astra 10744H	DVB-S	RF 1: 10744 MHz	Services: 6 SNR: 13.3 dB BER: <1.0E-08 Level: 49 dBµV	≡▾

If your settings were not OK, a red exclamation mark   will indicate an error, and the mouse-over will give indication about the art of the error.

| NAME ▼	TYPE	SOURCE	STATUS		
▸ Astra 10744H	DVB-S	RF 1: 10744 MHz	Services: 0 SNR: N/A dB BER: N/A Level: 46 dBµV	❗	≡▾

❗ Required actions
  • Tuner is unlocked!

8.1   Add ASI and IP inputs

8.1.1   Adding ASI inputs

Go to **Inputs**, and click on **ADD NEW INPUT**. Select **ASI** in the drop down list for Input type.
Type a name for your ASI input. Select the Physical port from the drop down list. Port 1 is the
top BNC 1 connector, port 2 is the lower BNC 2 connector. Click the "yellow tick" ✔ to save
the settings. Note that byte mode (188/204) is auto-detected.
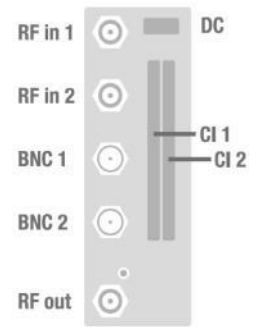
!   **ASI inputs automatically detect the incoming bit rate and packet length.**
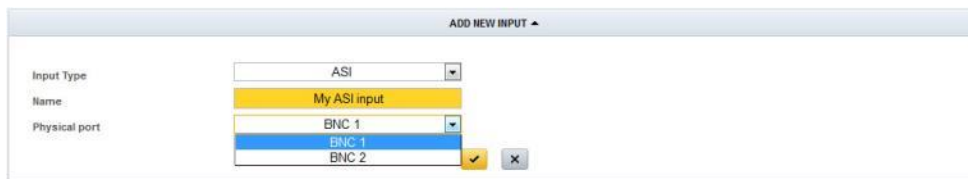
Note: with software 2.4.3 in Chameleon, and SW2.3 in the GT11 in GN50, you can configure streaming between
Chameleons installed in a GN50 without the GNSTR Software Option, see more in §9.8

8.1.2   Add single IPTV input

Go to **Inputs**, click **ADD NEW INPUT**. Select **IPTV** in the drop down list for Input type list. Select Creation mode
Single, type a name for your new IPTV input.

1.   Select Bitrate mode:

   a.   CBR Automatic (auto-detects the incoming constant bit rate)
   b.   CBR Manual (manual setting of constant bit rate in)
   c.   VBR (Variable bit rate in)

2.   Select Network interface. If no network interface is
available, you can use the link **Manage interfaces**. More
information about Network Interfaces are given in **§13.1**
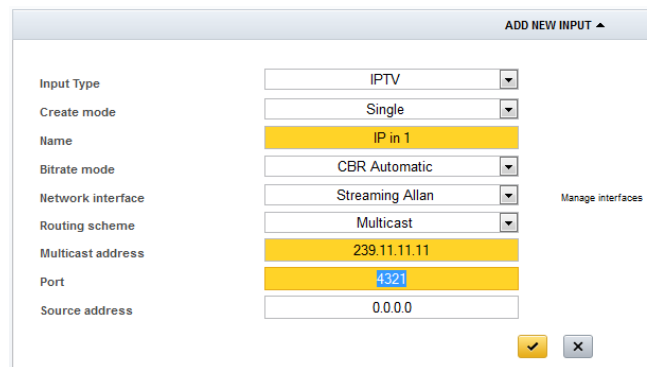
3.   Select Routing scheme, Multicast or Unicast:

   a.   For Multicast; enter the Multicast address and Port
   b.   For Unicast: enter the Port (address will be the same as the IP address of the streaming interface
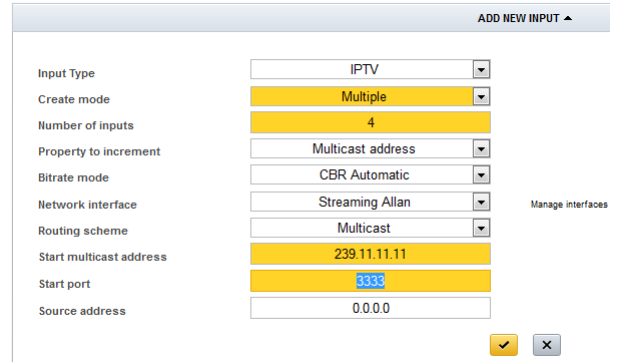selected)

The Source address can be used for differentiating between 2 incoming IP streams with the same Multicast
address. If this differentiation is not needed, leave the Source address at the default 0.0.0.0.

4.   Click the "yellow tick" ✔ to save the settings.

8.1.3   Add multiple IPTV input

Go to **Inputs**, click **ADD NEW INPUT**. Select **IPTV** in the drop down list for Input type list.
Select Creation mode Multiple. The output names will be auto created.

1. Select Property to increment: Multicast address or Port.

2. Select Bitrate mode:

    a. CBR Automatic (auto-detects the incoming constant bit rate)
    b. CBR Manual (manual setting of constant bit rate in)
    c. VBR (Variable bit rate in)

3. Select Network interface. If no network interface is available, you can use the link **Manage interfaces**. More information about Network Interfaces are given in **§13.1**

4. Select Routing scheme, Multicast or Unicast:

    a. For Multicast; enter the Multicast address and Port
    b. For Unicast: enter the Port (address will be the same as the IP address of the streaming interface)

5. Click the "yellow tick" ✔ to save the settings.

NAME ▾	TYPE	SOURCE	STATUS			
▸ New IPTV input 1	IPTV	239.11.11.11:3333	Services: 0	Bitrate: 0 bit/s	Protocol: N/A	☰▾
▸ New IPTV input 2	IPTV	239.11.11.12:3333	Services: 0	Bitrate: 0 bit/s	Protocol: N/A	☰▾
▸ New IPTV input 3	IPTV	239.11.11.13:3333	Services: 0	Bitrate: 0 bit/s	Protocol: N/A	☰▾
▸ New IPTV input 4	IPTV	239.11.11.14:3333	Services: 0	Bitrate: 0 bit/s	Protocol: N/A	☰▾

Input status and edit settings

If your settings were OK, the status will not indicate any error. Expand the input by clicking the ▶ in front of the input name to see further information. Click the ▶ in front of Settings to edit settings.
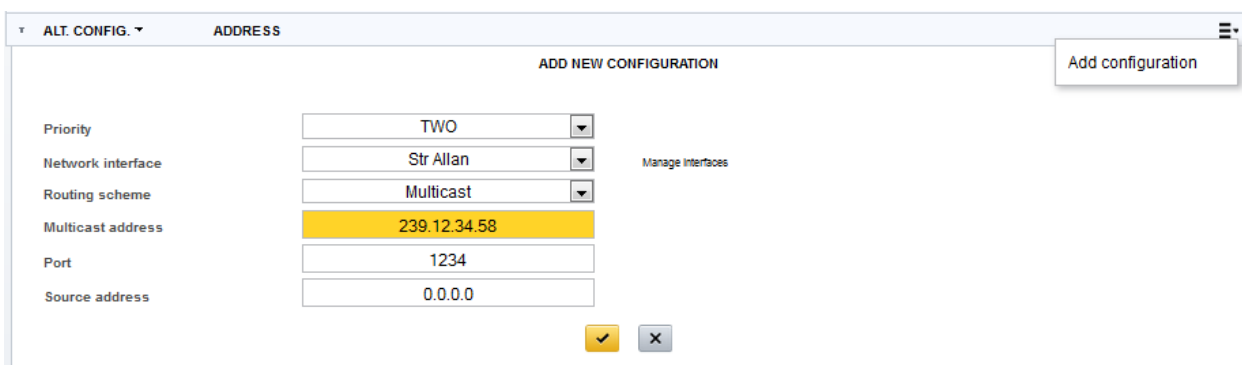
NAME ▾	TYPE	SOURCE	STATUS			
▾ New IPTV input 1	IPTV	239.11.11.11:3333	Services: 0	Bitrate: 0 bit/s	Protocol: N/A	☰▾

Status: No error
Services: 0, TSID: N/A, ONID: N/A
Active configuration: Primary
Detected protocol: N/A

▾ SETTING	VALUE	☰▾
Name	New IPTV input 1	
Bitrate mode	CBR Automatic	
Network interface	Streaming Allan	
Routing scheme	Multicast	
Multicast address	239.11.11.11	
Port	3333	
Source address	0.0.0.0	
Active configuration	Primary	
Redundancy mode	Off	

8.1.4   IP input redundancy – alternative IP input configuration
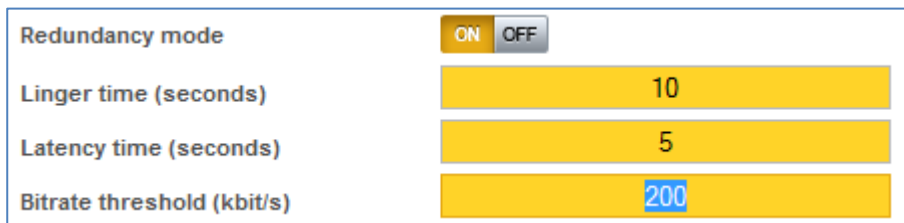
Adding alternative IP inputs

To add alternative IP input configurations, click on the menu icon ≣˙ at the right of the menu line ALT. CONFIG. of an IP input, and select "Add configuration".

1. Select the Priority for the alternative input. If more than one alternative input is used, the alternative inputs must have different priorities.
2. Enter the settings for the alternative IP input. Note that the bitrate mode is inherited by the alternative configurations from the primary configuration.
3. If the alternative IP input has the same Multicast address, you can differentiate the inputs via the Source address.
4. Click the "yellow tick" ✔ to save the settings.

Redundancy trigger and switch-over settings

The IP input redundancy is enabled under the settings for the primary IP input. To be able to enable redundancy, you must first create alternative configuration(s).

1. Select Redundancy mode ON
2. Set the Linger time (in seconds)
3. Set the Latency time (in seconds)
4. Set the Bitrate threshold (in kbit/s)
5. Click the "yellow tick" ✔ to save the settings.

Additional information about triggering, Linger time and Latency
- The trigger for changing to an alternative configuration is when the bit rate for the Active configuration is below the Bitrate threshold
- Linger time is the time an input remains at its current configuration before switching to an alternative configuration, starting from the time the trigger is set, i.e. failure detection time is set by the Linger time.
- Latency time is the time an alternative configuration is tried out for a bit rate. If there is no bit rate within the latency time the next configuration is tried. This is used to allow switches time to get the IGMP message from the Chameleon module and forward the stream.

There is no automatic fall-back, but if an alternative configuration fails, there will be a new search for available configurations starting with the primary configuration.

8.2 Add tuner inputs

Adding tuner inputs

1. Go to **Inputs** and click on **ADD NEW INPUT**.
2. Select TUNER in the **Input type** list.
3. Type a name for your input.
4. Select the Physical port from the drop down list. Port 1 is the top F-connector (RF in 1), port 2 is the lower F-connector (RF in 2), see picture in **§9.1**.
5. Select tuner input type in the Configuration drop-down list.
6. Fill out the required settings and click the "yellow tick"   to save the settings.

Note that each input type has its own set of input settings. Below some examples are given.

> The available tuner input types will depend on the Software Options, and on your HW.

Example of DVB-T input settings
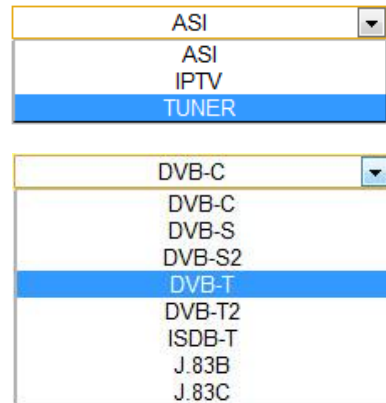
DVB-T and DVB-T2 input settings:
- Name [*type a name*]
- Physical port [RF 1, RF 2]
- Frequency table [CCIR, OIRT]
- Frequency (MHz) [select channel, or enter frequency]
- Bandwidth [6 MHz, 7 MHz, 8 MHz]

For DVB-T2:
- Bandwidth [5 MHz, 6 MHz, 7 MHz, 8 MHz]
- PLP [Automatic, Manual]
  - o   PLP ID [*enter PLP ID*]

Example of DVB-C input settings

DVB-C input settings:
- Name [*type a name*]
- Physical port [RF 1, RF 2]
- Frequency table [CCIR, OIRT]
- Frequency (MHz) [select channel, or enter frequency]
- Symbol rate (kBaud) [*enter the symbol rate*]
- Constellation [Auto, 16QAM, 32QAM, 64QAM, 128QAM, 256QAM]

Example of satellite input settings

DVB-S and DVB-S2 input settings:
- Name [*type a name*]
- Physical port [RF 1, RF 2]
- Transponder frequency (MHz) [*enter tp frequency*]
- Symbol rate (kBaud) [*enter the symbol rate*]
- LNB type [Universal, Fixed, C-band]
- Polarisation [Horizontal, Vertical]
- Switch type [None, DiSEqC switch]
  - o   Switch port [1, 2, 3, 4]

ISDB-T input settings:

- Name [*type a name*]
- Physical port [RF 1, RF 2]
- Frequency table [CCIR, OIRT]
- Frequency (MHz) [select channel, or enter frequency]
- Bandwidth [6 MHz, 7 MHz, 8 MHz]

Example of ISDB-T input settings

	ADD NEW INPUT ▲
Input Type	TUNER
Name	My ISDB-T input
Physical port	RF 1
Configuration	ISDB-T
Frequency table	CCIR
	E26
Frequency (MHz)	514
Bandwidth	6 MHz

QAM J.83 Annex B input settings:

- Name [*type a name*]
- Physical port [RF 1, RF 2]
- Frequency table [CCIR, OIRT]
- Frequency (MHz) [select channel, or enter frequency]
- Constellation [64QAM, 256QAM]

Example of QAM J.83 Annex B input settings

	ADD NEW INPUT ▲
Input Type	TUNER
Name	My J.83 Annex B input
Physical port	RF 1
Configuration	J.83B
Frequency table	CCIR
	E22
Frequency (MHz)	482
Constellation	64QAM

QAM J.83 Annex C input settings:

- Name [*type a name*]
- Physical port [RF 1, RF 2]
- Frequency table [CCIR, OIRT]
- Frequency (MHz) [select channel, or enter frequency]
- Symbol rate (kBaud) [*enter the symbol rate*]
- Constellation [Auto, 64QAM, 256QAM]

Example of QAM J.83 Annex C input settings

	ADD NEW INPUT ▲
Input Type	TUNER
Name	My J.83 Annex C input
Physical port	RF 1
Configuration	J.83C
Frequency table	CCIR
	E46
Frequency (MHz)	674
Symbol rate (kBaud)	5033
Constellation	Auto

## Input status and edit settings

If your settings were OK, the status will not indicate any error. Expand the input by clicking the ▶ in front of the input name to see further information. Click the ▶ in front of Settings to edit settings.

NAME ▼	TYPE	SOURCE	STATUS	
▽ My new satellite input	DVB-S	RF 1: 10744 MHz H	Services: 6 SNR: 13.3 dB BER: <1.0E-08 Level: 62 dBµV	☰▾

Status: No error
Services: 6, TSID: 1051, ONID: 1
SNR: 13.3 dB, BER: <1.0E-08, Level: -47 dBm 62 dBµV
Constellation: QPSK, Code rate: 5/6

▶ **Settings**

8.3   Add SDI inputs

8.3.1   Adding SDI inputs

Go to **Inputs**, and click on **ADD NEW INPUT**. Select **SDI** in the drop down list for Input type. Type a name for your SDI input. Select the Physical port from the drop down list. Port 1 is the top BNC 1 connector, port 2 is the lower BNC 2 connector. Click the "yellow tick"   to save the settings. Note that video and audio formats are auto-detected.
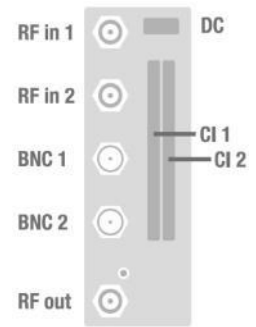
> **!** **ASI inputs automatically detect the incoming bit rate and packet length.**

ADD NEW INPUT ▲	
Input type	SDI ▼
	IPTV
Name	TUNER
Physical port	SDI
	✔ ✕
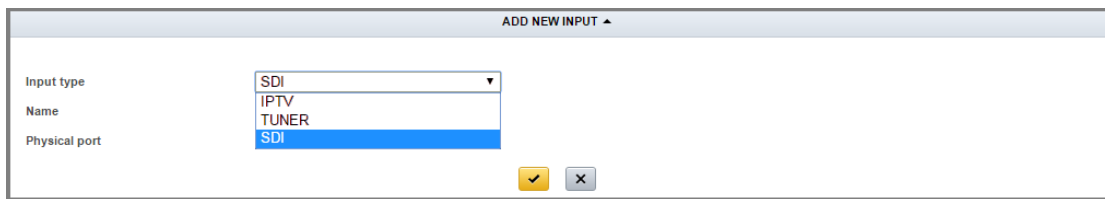
9   Add and configure outputs

Go to OUTPUTS

Depending on Software Options, and Operation mode, you can configure up to:

- 2 Analogue RF (PAL-625, SECAM) out
- 1 Analogue RF (PAL-M, NTSC) with BTSC / SAP out
- 8 analogue FM radio out
- 2 SDI out
- 1 HD-SDI out
- 2 ASI out
- 2 DVB-T out
- 4 DVB-C out
- 2 J.83 Annex B out
- 4 J.83 Annex C out
- 1 DTMB out
- 1 ISDB-T out
- 20 IPTS out

> **!** **ASI in/out and SDI shares the 2 BNC ports. These ports are controlled by software settings.**

Add and configure an output

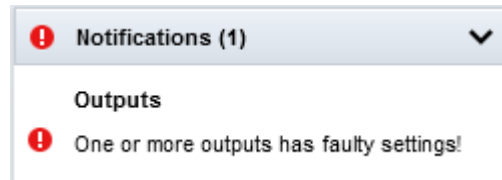| ADD NEW OUTPUT ▲		
Output Type	ASI ▼	Change operation mode
Output enabled	ON OFF	
Name	My ASI output	
Physical port	BNC 1 ▼	
Bitrate (Mbit/s)	45	
Byte mode	188 byte ▼	
	✔ ✕	
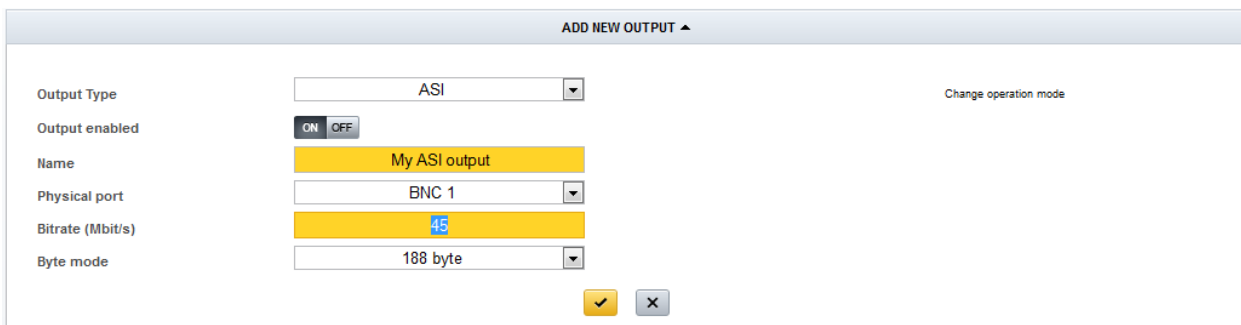
In the **Outputs** tab, click **ADD NEW OUTPUT**.

1. Select output type (ASI, SDI, HD-SDI, IPTV, DVB-C, J.83 Annex B, J.83 Annex C, DVB-T, ANALOG, FM, DTMB, ISDB-T) from the drop-down list. The available selection depends on Operation mode and Software Options.

For each type, you will get different configuration settings in the expanded view.

2. Fill out the required information/parameters

3. Click the "yellow tick" [✔] to save the settings.

Output status

After saving, the status of the configured outputs is shown. If e.g. too many outputs are configured, or an output that is not supported in the current Operation mode, there will be a Notification with an error message displayed.

9.1   Add and configure analogue outputs

Adding analogue PAL-625/SECAM or PAL-M/NTSC output

Select Operation Mode PAL-625/SECAM, PAL-M/NTSC or SDI to Analog (PAL-625), see also **section 7**.

1. In the **ADD NEW OUTPUT**, select **ANALOG** in the **Output type** list
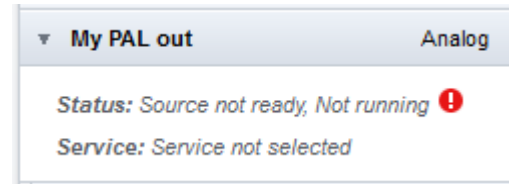2. Type a name for the output

Decoder settings

3. Select decoder instance (there are 2 decoder instances available)
4. For PAL-625/SECAM, select WSS subtitle configuration [Auto, None, In picture, Out of picture]

Modulator settings

5. Select Frequency table [CCIR, OIRT, OI, EIA]
6. Select channel/Frequency (MHz) [select channel, or enter frequency]
7. Set the Carrier level (dBµV) [84-111 dBµV for one output, 81-108 dBµV for two outputs]
8. Select TV system:
   a. For PAL-625 [PAL B/G, PAL B/H, PAL D/K, PAL I, PAL Nc, SECAM B/G, SECAM D/K]
   b. For PAL-M/NTSC [PAL-M, NTSC]
   c. For SDI to Analog (PAL-625) [PAL B/G, PAL B/H, PAL D/K, PAL I, PAL Nc]
9. Select Audio system
   a. For PAL-625 [A2 stereo, NICAM, mono, A2 Dual mono, NICAM Dual mono]
   b. For PAL-M/NTSC [MTS, MTS + SAP, Mono]
   c. For SDI to Analog (PAL-625) [A2 stereo, NICAM, mono, A2 Dual mono, NICAM Dual mono]

Click the "yellow tick" ✔ to save the settings.

Note: For operation modes PAL-625/SECAM and PAL-M/NTSC an output has been created, but no service is selected for this output. This is also indicated by an error message for the output. Adding a service to an analogue output is managed in Service Management.
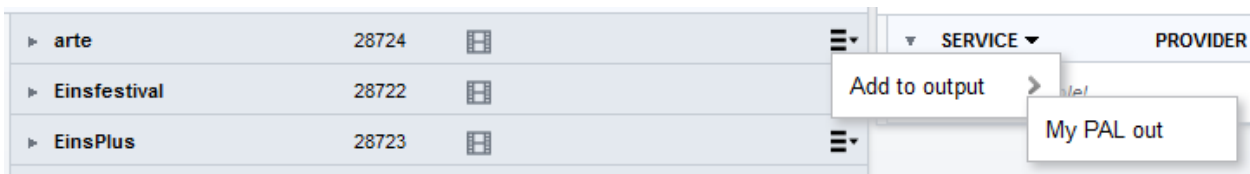
9.2   Add and configure input

For operation mode SDI to Analog (PAL-625) the inputs are fixed. BNC 1 is always connected to the first modulator instance and BNC 2 is always connected to the second modulator instance.
*Therefore this chapter only relates to operation modes PAL-625/SECAM and PAL-M/NTSC.*

Go to Service Management. Click on the menu icon ☰▾ for a service, and select the analogue output you want to add this service to.
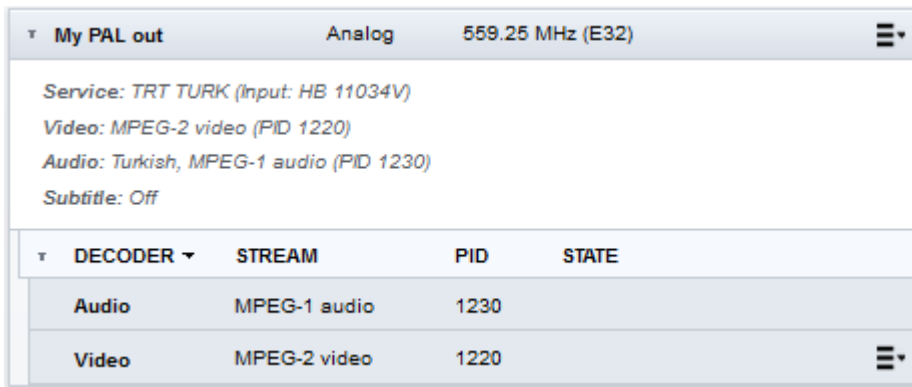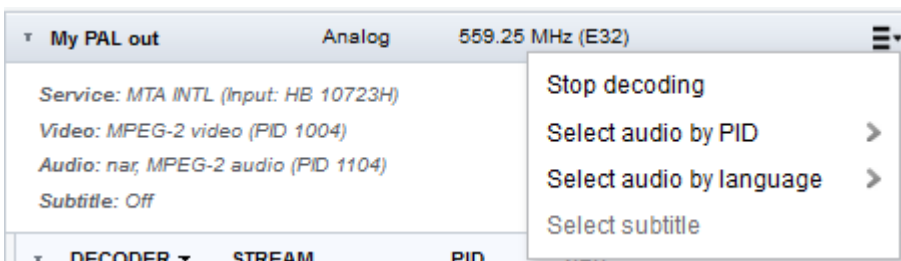
Removing a service from the analogue output

Click the menu icon ☰▾ for the analog output, and select "Stop decoding".

Subtitling settings

Click the menu icon ☰▾ for the analogue output, and "Select subtitle". Select the subtitling from the list, or select subtitling Off.

si.de

Audio language selection

Click the menu icon for the analogue output, and select "Select audio by PID" or "Select audio by language".

9.3   WSS, Video conversion and AFD

This chapter only relates to operation modes PAL-625/SECAM and PAL-M/NTSC.

Widescreen Signalling

Under Advanced settings, the WSS configuration for the internally generated WSS signalling can be set. With WSS configuration Auto (default), the WSS output signalling will depend on the source video Aspect Ratio (AR), the source AFD, and the Video conversion settings.
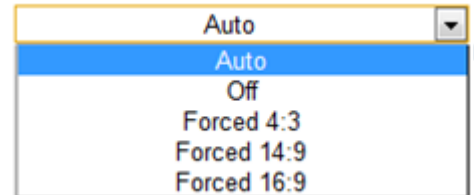
1. In Auto mode WSS aspect ratio is automatically generated
2. Off turns off the WSS signalling altogether
3. The "forced" modes override the implicitly calculated aspect ratio WSS signalling with the static one selected. The picture scaling remains unaffected.

Video conversion (picture transformation)

In the Chameleon, the video conversion for an analogue output is set in the Service Management menu. On the OUTPUT side, expand the analogue output, and expand Decoder. Click on the menu icon and **Video conversion >** to get the list of video conversions.
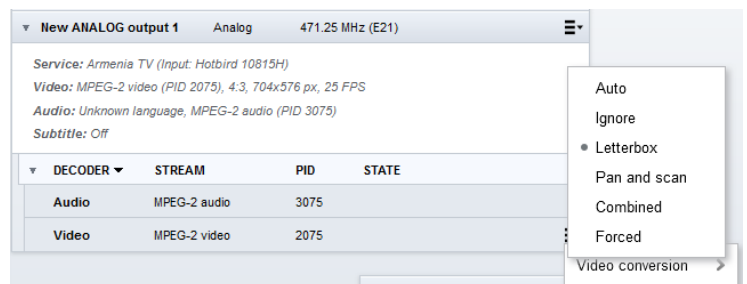
Video conversion settings implications:
- Auto is identical to Letterbox
- Ignore leaves the picture "as is", no transformation
- Letterbox is optimised for 4:3 TV sets. The scaling and aspect ratio changes is done based on incoming video aspect ratio and AFD (Active Format Description) signalling.
- Pan and Scan is also optimized for 4:3 TV sets. A 4:3 cut-out image with full vertical resolution will be selected from the source picture depending on pan-and-scan horizontal coordinate data in the incoming video stream.

- Combined: If source material is 4:3, no change of aspect ratio. If source material is 16:9, convert it to 14:9 by removing horizontal strips of the active picture at the left and right sides. Output as 4:3, proportionally scaled, with narrow black strips on top and bottom.
- Forced: Always perform a 16:9 to 4:3 letterboxing rescaling

AFD (Active Format Description)
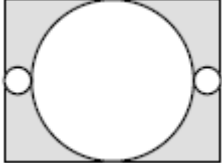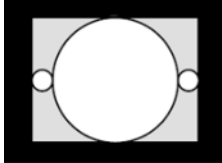
The AFD describes the portion of the coded video frame that is "of interest". It is intended for use in networks that deliver mixed formats to a heterogeneous receiver population. The format descriptions are informative in nature and are provided to assist receiver systems to optimize their presentation of video.

Chameleon handles a sub-set of the AFD codes defined in ETSI TS 101 154;
•   1000 (8) as coded frame
•   1001 (9) 4:3 active picture
•   1010 (10) 16:9 active picture

The received AFD signalling will be used for calculating the outgoing WSS signalling if the WSS configuration is set to Auto, and the Video conversion to Auto or Letterbox. Please note that there is no specific setting in the Chameleon for AFD.

An example of AFD usage is when the source video has aspect ratio 16:9, but the AFD is signalling that the active part of the video frame is "the middle 4:3 part". The resulting calculated WSS signalling allows 4:3 TV sets to display the active part of the video frame over the whole display. If AFD is not taken into account, the 16:9 frame with black left and right bars would be letterboxed to "stamp" size for 4:3 TV sets.

AFD 9, AR 16:9	WSS 4:3 Full	WSS 16:9 Letterbox centre

9.4   HD to SD downscaling and Dual mono

This chapter only relates to operation modes PAL-625/SELAM and PAL-M/NTSC.

Important information about HD to SD downscaling
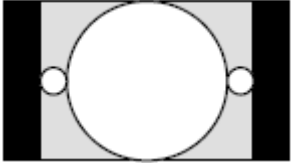
The MPEG decoder can downscale one service from MPEG2/4 HD to SD. When using the MPEG decoder for downscaling, you are limited to 1 analogue output.

Dual mono output

It is possible to set up one analogue output with dual mono sound (different languages in left/right audio channel). The main application for Dual mono out is to provide access to different audio languages for the same video output.

1. Create 2 analogue outputs
2. Set up both decoders with the same service but different audio languages
3. Select Stereo mode: Dual mono
4. Deactivate the second analogue output (Output enabled = OFF)
5. In the Modulator settings, select Audio system A2 Dual mono or NICAM Dual mono
6. Select Dual mono source: Both decoders

The Dual Mono out is generic in the sense that you can select different services for decoder 1 and decoder 2, and get the selected audio stream as "mono 1" and "mono 2" in the receiver.

9.5   Add and configure ASI, SDI, HD-SDI and FM outputs

Add ASI outputs

1. In the **Output**, select **ASI** in the drop down list for **Output Type**
2. Enter **Name**, **Physical port** and **Bitrate**
3. Select **Byte mode** [188 byte, 204 byte]
4. Click the "yellow tick" ✔ to save the settings.
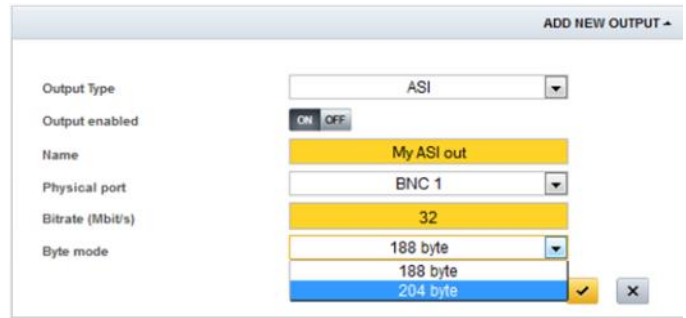
Add and configure SDI outputs

Select PAL-625/SECAM Operation Mode in Settings, then click ADD NEW OUTPUT under Outputs.

1. In the **Output**, select **SDI** in the **Output Type** list
2. Enter **Name** and select **Decoder instance**
3. Select Video standard
4. Click the "yellow tick" ✔ to save the settings.
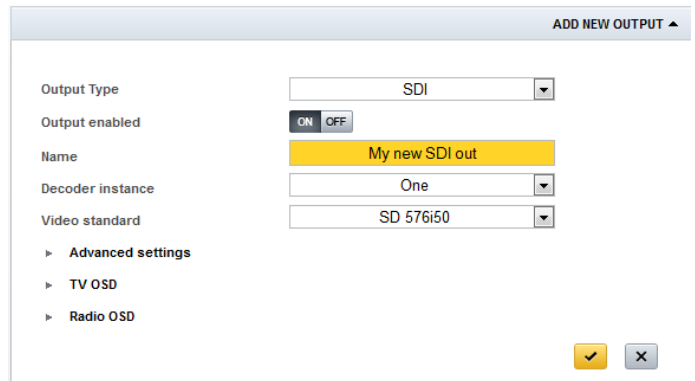
5. Go to Service Management
6. Add a service to the SDI output
7. Settings for audio language and subtitling are the same as for analogue outputs

Note: only DVB subtitling can be added as subtitles
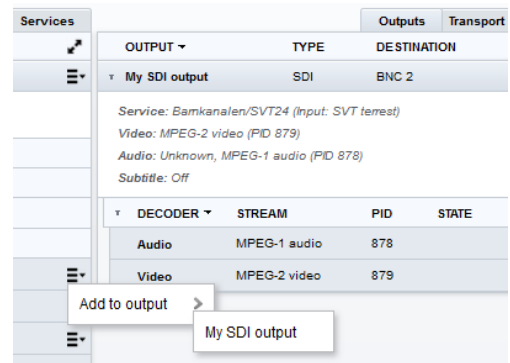
SDI outputs Advanced settings

Under Advanced settings for SDI outputs you can select OSD Test pattern ON/OFF, and SDI out Stereo mode:

- Stereo
- Dual mono
- Dual laft
- Dual right
- Dolby Pro Logic II
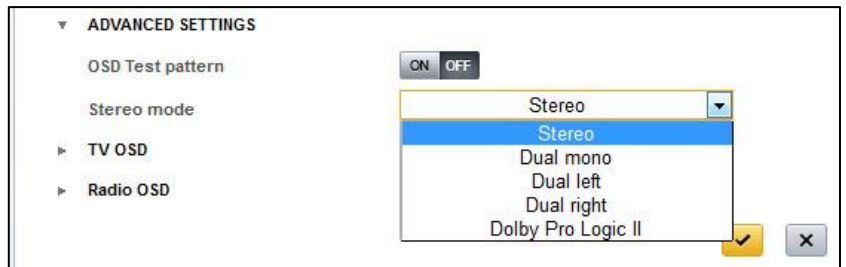
The Dolby Pro Logic II stereo mode includes (if present) information from surround channels to the stereo output.

Add and configure HD-SDI output

Select HD-SDI Operation Mode in Settings, and then click ADD NEW OUTPUT under Outputs.

1. In the **Output**, select HD-SDI in the **Output Type** list
2. Enter a **Name**
3. **Physical port** and **Decoder instance** is fixed
4. Select **Video standard**
5. Click the "yellow tick" [✔] to save the settings.
6. Go to Service Management and add a service to the HD-SDI output
7. Settings for audio language and subtitling are the same as for analogue outputs

|	ADD NEW OUTPUT ▲
Output Type	HD-SDI
Output enabled	ON OFF
Name	My new HD-SDI out
Physical port	BNC 2
Decoder instance	One
Video standard	HD 720p50
	HD 720p50
▶ Advanced settings	HD 720p60
▶ TV OSD	HD 1080i50
▶ Radio OSD	HD 1080i60
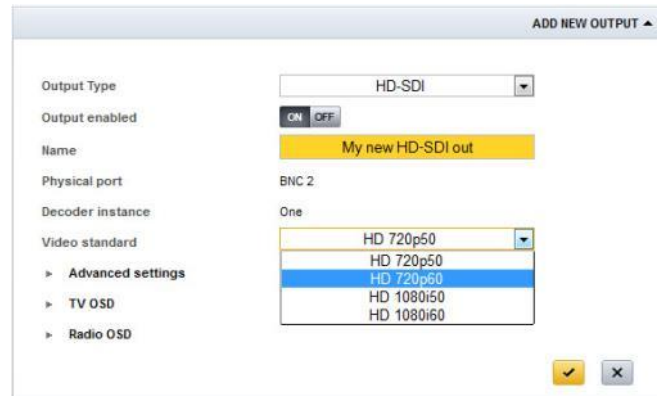
Add FM radio outputs

Select FM Operation Mode in Settings, and then click ADD NEW OUTPUT under Outputs.

	ADD NEW OUTPUT ▲		
Output Type	FM		Change operation mode
Output enabled	ON OFF		
Name	My FM output 1		
	DECODER SETTINGS		**MODULATOR SETTINGS**
Decoder instance	One	Audio deviation	0 dB
RDS	ON OFF	Channel frequency (MHz)	103.2
PI source	From UECP	Carrier level (dBµV)	70
PS source	From UECP		
PTY source	From UECP		
RTC source	From UECP		
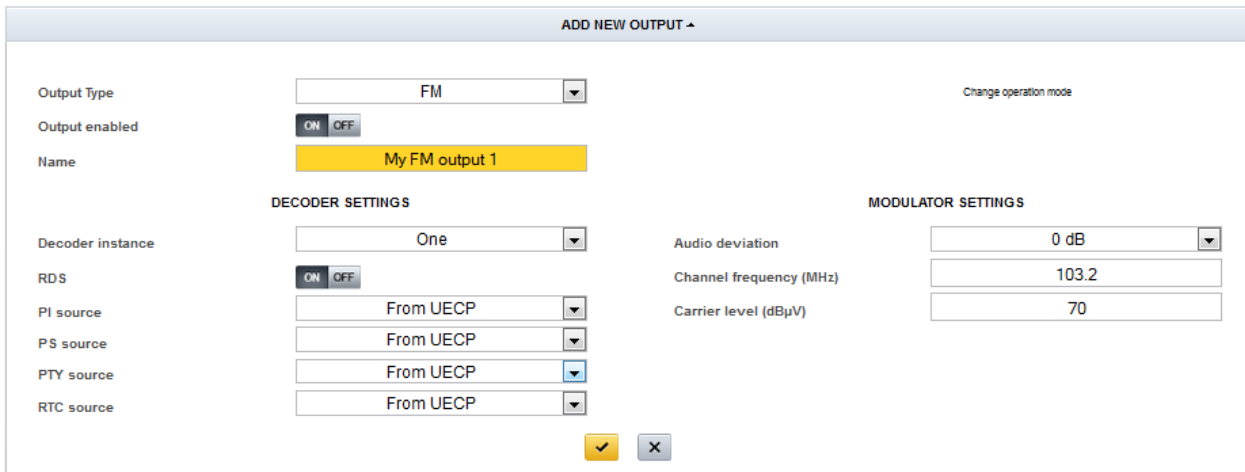
1. In the **Output**, select FM in the **Output Type** list
2. Enter a **Name** and select **Decoder instance**
3. Optional: for RDS signalling, select the PI, PS and PTY sources, and enter the values if using manual settings
4. Enter **Channel frequency** and **Carrier level**
5. Optional: Select **Audio deviation**
6. Click the "yellow tick" [✔] to save the settings.
7. Go to Service Management and add a service to the FM output

▼ My new FM out	FM	RF 1: 103.2 MHz	☰▼

Service: arte (ID: 28724 Input: My new satellite input)

Audio in: German, MPEG-1 audio (PID 402)

▼ DECODER ▼	STREAM	PID	STATE
Audio	MPEG-1 audio	402	

9.6 Add and configure DVB-T, DVB-C, J.83 ANNEX B, J.83 ANNEX C, ISDB-T and DTMB outputs

Add DVB-T outputs

Select Operation mode DVB-T under **Settings**

1. In the **Output**, select **DVB-T** in the **Output Type** list
2. Enter a name for the output
3. Select **Frequency table** [CCIR, OIRT]
4. Select output channel, or set the output frequency manually in MHz
5. Select **Bandwidth (MHz)** [5, 6, 7, 8]
6. Set the **Carrier level (dBµV)**
7. Select the **Forward error correction** [1/2, 2/3, 3/4, 5/6, 7/8]
8. Select the **Guard interval** [1/4, 1/8, 1/16, 1/32]
9. Select the **Carrier mode** [2k, 8k]
10. the **Constellation** from the dropdown lists
11. Click the "yellow tick" ✔ to save the settings.
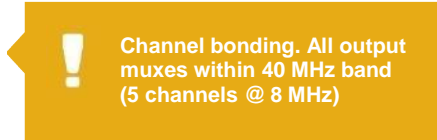
ADD NEW OUTPUT ▲	
Output Type	DVB-T
Output enabled	ON OFF
Name	My DVB-T output
Frequency table	CCIR
	E27
Frequency (MHz)	522
Bandwidth (MHz)	8
Carrier level (dBµV)	75
Forward error correction	7/8
Guard interval	1/32
Carrier mode	8k
Constellation	64QAM

Add additional DVB-T outputs

Repeat the steps above.
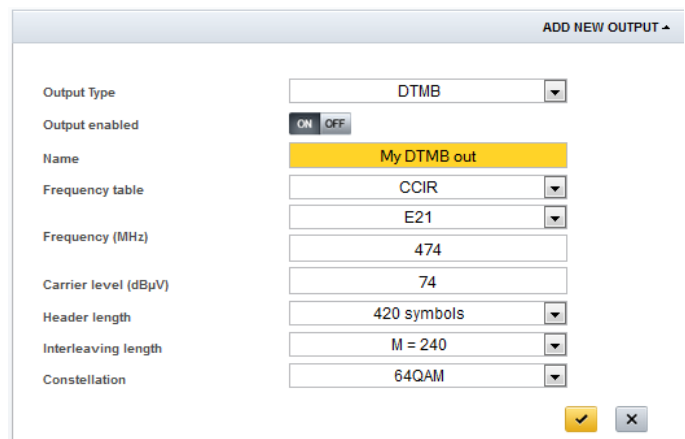
! Channel bonding. All output muxes within 40 MHz band (5 channels @ 8 MHz)

The **Output Enabled ON/OFF** gives you the possibility to configure an output without adding it to your network. With Output enabled set to **OFF**, no signals will be transmitted. Please note that changing an Output to OFF will not affect the shared PSI/SI data (NIT, SDT-other) for other outputs within the same DVB-Network.

Add DTMB output

In OPERATION MODE under **Settings**, select DTMB mode (code rate 0.6) or DTMB mode (code rate 0.8)
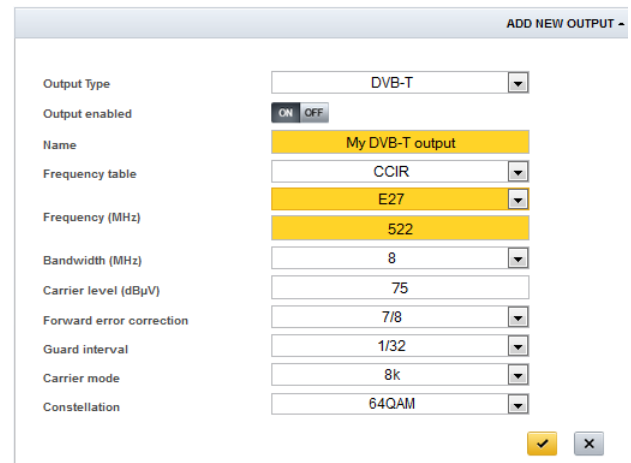
1. In the **Output**, select **DTMB** in the **Output Type** list
2. Enter a name for the output
3. Select **Frequency table** [CCIR, OIRT]
4. Select output channel, or set the output frequency in MHz
5. Set the **Carrier level**
6. Select the **Header length** [945 symbols, 595 symbols, 420 symbols]
7. Select the **Interleaving length** [M=240, M=720]
8. Select the **Constellation** [4QAM, 16QAM, 64QAM]
9. Click the "yellow tick" ✔ to save the settings.
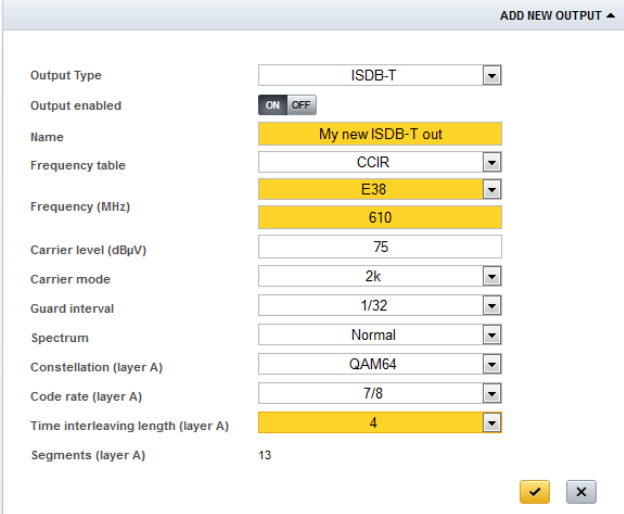
ADD NEW OUTPUT ▲	
Output Type	DTMB
Output enabled	ON OFF
Name	My DTMB out
Frequency table	CCIR
	E21
Frequency (MHz)	474
Carrier level (dBµV)	74
Header length	420 symbols
Interleaving length	M = 240
Constellation	64QAM

Add ISDB-T output

In OPERATION MODE under **Settings**, select ISDB-T mode

1. In the **Output**, select **DTMB** in the **Output Type** list
2. Enter a name for the output
3. Select **Frequency table** [CCIR, OIRT]
4. Select output channel, or set the output frequency in MHz
5. Set the **Carrier level**
6. Select the **Carrier mode** [2k, 4k, 8k]
7. Select the **Guard Interval** [1/4, 1/8, 1/16, 1/32]
8. Select the **Spectrum** [Normal, Inverted]
9. Select the **Constellation (layer A)** [DQPSK, QPSK, QAM 16, QAM64]
10. Select the **Code rate (layer A)** [1/2, 2/3, 3/4, 5/6, 7/8]
11. Select the **Time interleaving length (layer A)** [0, 4, 8, 16]
12. Click the "yellow tick" ✔ to save the settings.

	ADD NEW OUTPUT ▲
Output Type	ISDB-T
Output enabled	ON OFF
Name	My new ISDB-T out
Frequency table	CCIR
	E38
Frequency (MHz)	610
Carrier level (dBµV)	75
Carrier mode	2k
Guard interval	1/32
Spectrum	Normal
Constellation (layer A)	QAM64
Code rate (layer A)	7/8
Time interleaving length (layer A)	4
Segments (layer A)	13

Add DVB-C outputs

Select Operation mode DVB-C under **Settings**

1. In the **Output,** select **DVB-C** in the drop down list for Output Type
2. Enter a name for the output
3. Select **Frequency table** [CCIR, OIRT]
4. Select output channel, or set the output frequency in MHz
5. Select **Constellation** [16QAM, 32QAM, 64QAM, 128QAM, 256QAM]
6. Select **QAM spectrum** [Normal, Inverted]
7. Set the **Symbol rate (kBaud)**
8. Set the output **Carrier level (dBµV)**
9. Click the "yellow tick" ✔ to save the settings.

	ADD NEW OUTPUT ▲
Output Type	DVB-C
Output enabled	ON OFF
Name	DVB-C out 1
Frequency table	CCIR
	E53
Frequency (MHz)	730
Constellation	64QAM
QAM spectrum	Normal
Symbol rate (kBaud)	6900
Carrier level (dBµV)	78

ⓘ • Symbol rate is a setting that will affect all outputs on the same RF port!

Channel bonding. All output muxes within 40 MHz band (5 channels @ 8 MHz)

Add QAM J.83 Annex B outputs

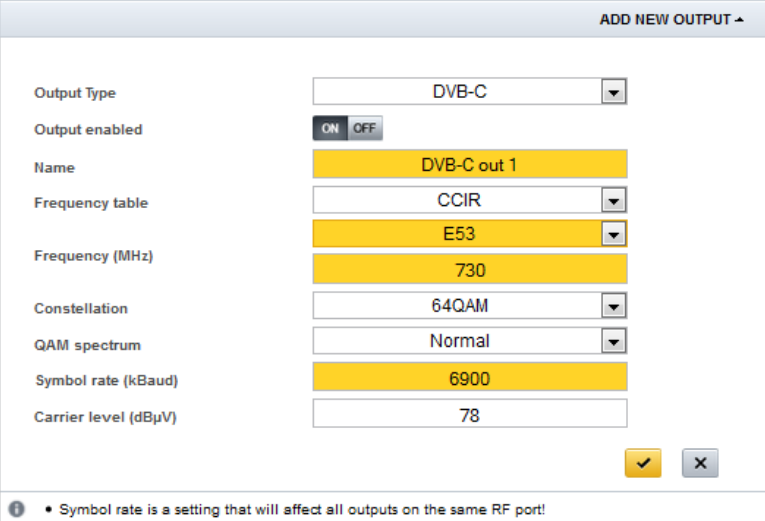Select Operation mode J.83 Annex B under **Settings**

1. In the **Output**, select **J.83 Annex B** in the Output Type list
2. Enter a name for the output
3. Select **Frequency table** [CCIR, OIRT]
4. Select the output channel, or set the output frequency in MHz
5. Select **Constellation** [64QAM, 256QAM]
6. Select **Interleaving mode** in the drop-down list
7. Select **QAM spectrum** [Normal, Inverted]
8. Set the output carrier level
9. Click the "yellow tick" ✔ to save the settings.

	ADD NEW OUTPUT ▲
Output Type	J.83 B
Output enabled	ON OFF
Name	QAM J.83 B out
Frequency table	CCIR
Frequency (MHz)	E41
	634
Constellation	64QAM
Interleaving mode	I = 128, J = 1
QAM spectrum	Normal
Carrier level (dBμV)	78
	✔ ✖

Channel bonding. All output muxes within 40 MHz band (5 channels @ 8 MHz)

Add QAM J.83 Annex C outputs

Select Operation mode J.83 Annex C under **Settings**

1. In the **Output**, select **J.83 Annex C** in the Output Type list
2. Enter a name for the output
3. Select **Frequency table** [CCIR, OIRT]
4. Select output channel, or set the output frequency in MHz
5. Select **Constellation** [64QAM, 256QAM]
6. Select **QAM spectrum** [Normal, Inverted]
7. Set the **Symbol rate (kBaud)**
8. Set the output **Carrier level (dBμV)**
9. Click the "yellow tick" ✔ to save the settings.

	ADD NEW OUTPUT ▲
Output Type	J.83 C
Output enabled	ON OFF
Name	QAM J.83 C out
Frequency table	CCIR
Frequency (MHz)	E38
	610
Constellation	64QAM
QAM spectrum	Normal
Symbol rate (kBaud)	6875
Carrier level (dBμV)	78
	✔ ✖

ⓘ • Symbol rate is a setting that will affect all outputs on the same RF port!

Channel bonding. All output muxes within 40 MHz band (5 channels @ 8 MHz)

Add additional DVB-C, J.83 Annex B or J.83 Annex C outputs

Repeat the steps above.

9.7   Add and configure IP (SPTS/MPTS) outputs

Configure a network interface for streaming (see also §12.1)

1. Go to **Networking** in the **Settings** tab, and select Add **interface**.

> – For GN01 or GN40 mounting, add a new network interface for the streaming port.

> – For GN50 mounting, add a new network interface to the backplane port.

2. Enter name for the interface, and IP parameters
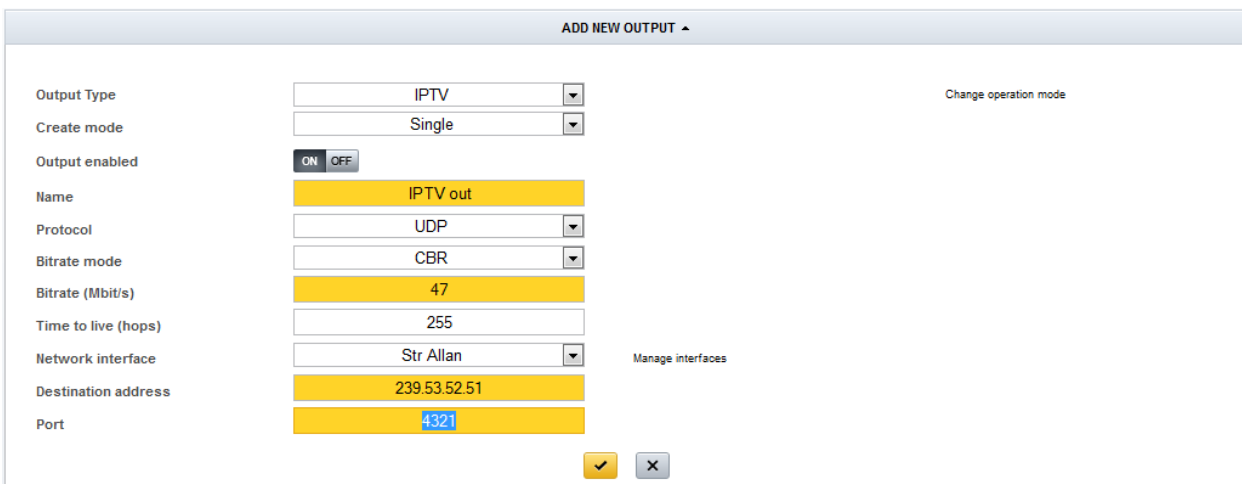
3. Select **Streaming ON**, and click the "yellow tick" [✔] to save the settings

Note: with software 2.4.3 in Chameleon, and SW2.3 in the GT11 in GN50, you can configure streaming between Chameleons installed in a GN50 without the GNSTR Software Option, see more in §9.8.

9.7.1   Add single IPTV output

In the **Output**, select **IPTV** in the drop down list for **Output type** and Single as **Create mode**

1.   Enter a name for the output
2.   Select **Protocol** [UDP, RTP]
3.   Select the **Bitrate mode** [CBR, VBR]
4.   For CBR, set the output **Bitrate (Mbit/s)**
5.   Set the TTL **Time to live (hops)**. The default TTL=255 => no limit for the lifespan of data.
6.   Select **Network interface** in the drop-down list.
7.   Set the **Destination address**. For Multicast, use an address in the Multicast range. For Unicast, enter the IP address of the receiving host.
8.   Set the **Port**
9.   Click the "yellow tick" [✔] to save the settings

ADD NEW OUTPUT ▲		
Output Type	IPTV ▾	Change operation mode
Create mode	Single ▾	
Output enabled	ON OFF	
Name	IPTV out	
Protocol	UDP ▾	
Bitrate mode	CBR ▾	
Bitrate (Mbit/s)	47	
Time to live (hops)	255	
Network interface	Str Allan ▾	Manage interfaces
Destination address	239.53.52.51	
Port	4321	
	✔ ✕	

Multicast vs. Unicast

Multicast or Unicast transmission is selected automatically by the address range used. In IPv4, addresses **224.0.0.0** through **239.255.255.255** are designated as multicast addresses. To stream Unicast, enter the IP address of the receiving host.

9.7.2   Add multiple IPTV outputs

In the **Output**, select **IPTV** in the drop down list for **Output type** and Multiple as **Create mode**

1. Enter a name for the output
2. Enter the **Number of outputs**
3. Select the **Property to increment** [Destination address, Port]
4. Select **Protocol** [UDP, RTP]
5. Select the **Bitrate mode** [CBR, VBR]
6. For CBR, set the output **Bitrate (Mbit/s)**
7. Set the TTL **Time to live (hops)**. The default TTL=255 => no limit for the lifespan of data.
8. Select **Network interface** in the drop-down list.
9. Set the **Start Destination address**.
10. Set the **Start Port**
11. Click the "yellow tick" ✔ to save the settings

ADD NEW OUTPUT ▲	
Output Type	IPTV ▼
Create mode	Multiple ▼
Number of outputs	4
Property to increment	Destination address ▼
Outputs enabled	ON OFF
Protocol	UDP ▼
Bitrate mode	CBR ▼
Bitrate (Mbit/s)	21
Time to live (hops)	255
Network interface	Str Allan ▼
Start destination address	239.1.1.1
Start port	1234

Change operation mode

Manage interfaces

In the example below, 4 IP outputs were created with incremented Destination address:

NAME ▼	TYPE	DESTINATION	INFORMATION	
▸ New IPTV output 1	IPTV	239.1.1.1:1234	Bitrate: 21 Mbit/s Network interface: Str Allan	≡▼
▸ New IPTV output 2	IPTV	239.1.1.2:1234	Bitrate: 21 Mbit/s Network interface: Str Allan	≡▼
▸ New IPTV output 3	IPTV	239.1.1.3:1234	Bitrate: 21 Mbit/s Network interface: Str Allan	≡▼
▸ New IPTV output 4	IPTV	239.1.1.4:1234	Bitrate: 21 Mbit/s Network interface: Str Allan	≡▼

The properties of the auto-created IP outputs, e.g. the names, can be edited by clicking the arrow ▶ in front of the output name, enter the Settings and change the parameters.

NAME ▼	TYPE	DESTINATION	INFORMATION	
▾ New IPTV output 1	IPTV	239.1.1.1:1234	Bitrate: 21 Mbit/s Network interface: Str Allan	≡▼

Status: No error

SETTING	VALUE	
Output enabled	ON OFF	
Name	Changed name	
Protocol	UDP ▼	
Bitrate mode	VBR ▼	
Time to live (hops)	255	
Network interface	Str Allan ▼	Manage interfaces
Destination address	239.1.1.1	
Port	1234	

9.8   Add and configure IP FEC outputs

IP FEC out requires Software Option GNSTREC, and is available only in Operation Mode **Streaming FEC mode**.

Configure a network interface for streaming (see also §12.1)

1. Go to **Networking** in the **Settings** tab, and select Add **interface**.
   – For GN01 or GN40 mounting, add a new network interface for the streaming port.
   – For GN50 mounting, add a new network interface to the backplane port.

2. Enter name for the interface, and IP parameters

3. Select **Streaming ON**, and click the "yellow tick" ✔ to save the settings

Add RTP + FEC IP output

1. Select operation mode Streaming FEC mode under SETTINGS
2. In the Output, select IPTV in the drop down list for Choose output type
3. Select **Create mode** [Singel, Multiple]
4. Enter a name for the output
5. Select **Protocol** RTP+FEC
6. Select **FEC L dimension** (column) and **FEC D dimension** (row)
7. For protocol RTP+FEC, only bit rate mode CBR is available
8. Set the output **Bitrate (Mbit/s)**
9. Set the **Time to live (hops)**. The default TTL=255 => no limit for the lifespan of data.
10. Select **Network interface**
11. Set the **Destination address** and **Port**.
12. Click the "yellow tick" ✔ to save the settings

ADD NEW OUTPUT ▲	
Output Type	IPTV
Create mode	Single
Output enabled	ON OFF
Name	My IP FEC out
Protocol	RTP+FEC
FEC L dimension	7
FEC D dimension	5
Bitrate mode	CBR
Bitrate (Mbit/s)	0
Time to live (hops)	255
Network interface	Str Beowulf Manage interfaces
Destination address	239.0.0.0
Port	1234
	✔ ✕

9.9 Streaming between Chameleons installed in GN50

Streaming between Chameleons installed in a GN50 does not require any Software Option if the Chameleons run software 2.4.3, and the GT11 in the GN50 runs SW2.3. In this case, you should create streaming network interfaces for VLAN ID 16 in the Chameleons. The restriction is that this VLAN cannot be connected to any external streaming port in the GT11, see more in the user manual for SW2.3 for GN50/GT11.

9.9.1 Using streaming between Chameleons to "remux before CI"

A CI slot in a Chameleon can be connected to an incoming transport stream. However, it is not possible to remux services in a single Chameleon before connecting the transport stream to a CI slot.
To enable descrambling of services from different input sources (e.g. from different satellite transponders), you can create a new transport stream (with the services you want to descramble with the same CAM), and use e.g. streaming between Chameleons to receive this "compiled" transport stream, and route it to a CI slot:

1. Create an IPTV output
2. Add the services you want to descramble in the same CAM to this output
3. Set up an input in another Chameleon to receive this "compiled" transport stream containing all services that you want to descramble
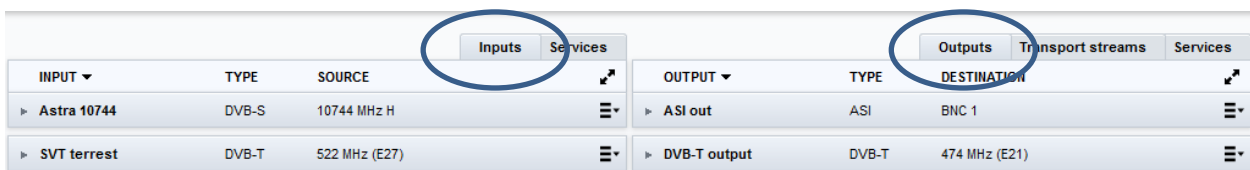4. Connect this input to a CI slot

As in any descrambling, the normal restrictions apply in terms of the number of PIDs a CAM can descramble, the authorisation of the SmartCard etc.
Note: You can also use the ASI input and output to perform the same task.

10 SERVICE MANAGEMENT, service & PID management

Service Management functionality and pre-requisites

The **Service Management** tab is the main view for handling remultiplexing, service selection, decryption, encryption and PID/stream management. Before using the Service Management, the inputs and outputs of the Chameleon module must be configured, see **§8** and **§9**.

INPUT ▼	TYPE	SOURCE		OUTPUT ▼	TYPE	DESTINATION	
▶ Astra 10744	DVB-S	10744 MHz H	☰▾	▶ ASI out	ASI	BNC 1	☰▾
▶ SVT terrest	DVB-T	522 MHz (E27)	☰▾	▶ DVB-T output	DVB-T	474 MHz (E21)	☰▾

(Tabs: Inputs / Services — left view; Outputs / Transport streams / Services — right view)

Service Management - left part for Inputs, right part for Outputs

> Note that the Input and Output parts of Service Management can be collapsed/expanded by clicking on the expand/collapse icon at the top right:

The Service Management menu has two main parts. In the left part, information about inputs (Inputs, Services) is shown. The right part contains information about the outputs (Outputs, Transport streams, Services). You can select to show information about Inputs/Outputs or Services by clicking the tabs at the top of the 2 main views.

■ In the **Inputs view**, the listing is based on the configured inputs in the Chameleon.

■ In the **Outputs view**, the listing is based on the configured outputs in the Chameleon.

■ In the **Transport stream** view, the listing is based on the configured output transport streams in the Chameleon.

■ The **Services** views list all incoming/outgoing services.

Information about inputs/outputs, services and PIDs can be accessed in any view, and the view you select to work with will depend on what you want to check or configure.

Service Management navigation

To navigate (expand/collapse) menu entries, the arrows in front of a menu is used:
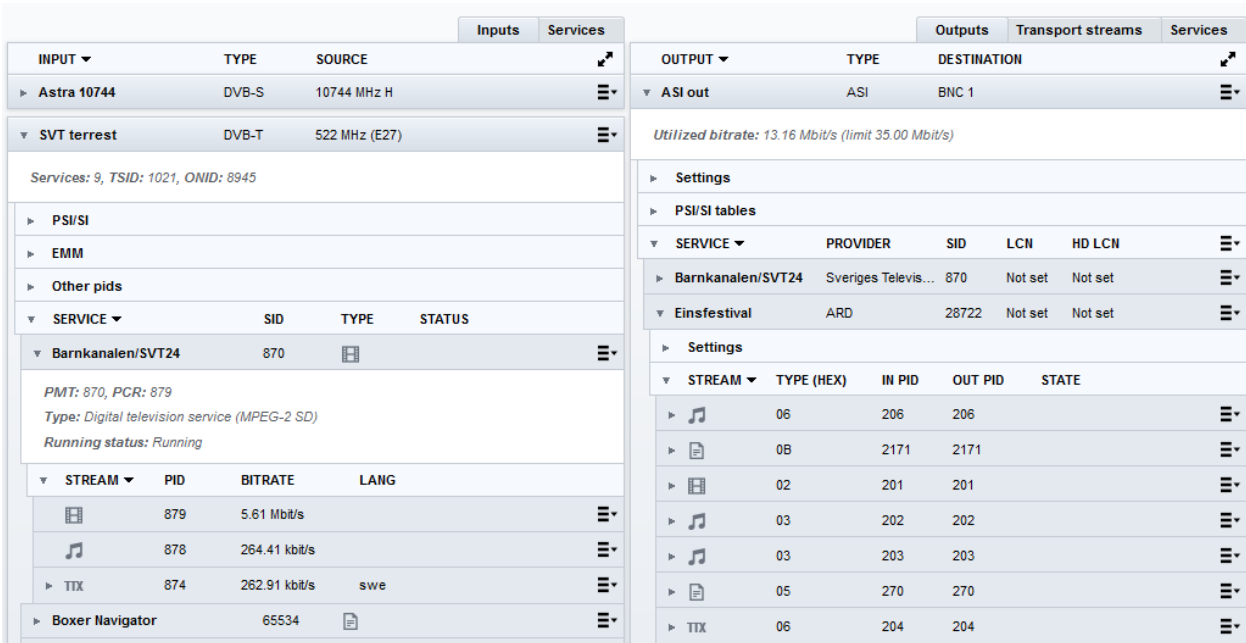
■ Click the ▶ icon to expand a menu and show the sub-menus

■ Click the ▼ icon to collapse a menu and hide the sub-menus

Menu list sorting
All listings can be sorted according to any column name. Click a column name to sort the list entries by this column ▼ . Click again to sort in reversed order ▲ .

10.1 Navigating the Inputs and Outputs views in Service Management

In the **Inputs** and **Outputs** views in **Service Management**, all inputs and outputs for the Chameleon is listed. The top entries in the navigation trees are the physical inputs and outputs configured. To navigate in the menus, use the ▶ and ▼ arrows to expand/collapse.

Note that each entry in the lists has additional information via "mouse over" or hover that is displayed when you place the mouse pointer over an entry. The hover pop-up gives you information about the input or output name, and which module that the input or output is configured in.

From module: Chameleon 1 (Chameleon)

To add a service to an output, navigate to the Service level, click the menu icon ☰▾ and select the output to add the service to. More information about the managing services and PIDs in the System Management is given in **§11.4** and **§11.5**.

10.2 Navigating in the Services view in Service Management

In the **Services** views in **Service Management**, all services in and out for the Chameleon are listed. The top entries in the navigation trees are the services from the configured inputs and outputs. To navigate in the menus, use the ▶ and ▼ arrows to expand/collapse.

Each entry in the lists of services has additional hover information when you place the mouse pointer over an entry. The hover pop-up states which module the service is coming from, the name of the input/output and (for output) the name of the input.

Inputs hover:

From module: Romeo, input: Satellite input example

Outputs hover:

From module: Romeo, output: T out E45, input: Satellite input example.

To add a service to an output, navigate to the Service level, click the menu icon ≡▾ and select the output to add the service to. More information about the managing services and PIDs in the System Management is given in **§10.3** and **§10.4**.

10.3 Managing services and PIDs in the Inputs part of Service Management

Management of services, PIDs etc. in the Service Management is handled via pop-up menus.

The presence of a pop-up menu is indicated by the menu icon, ☰▾ , at the end of an entry line.
For the input services, the menus are used to select services to the outputs. For inputs from CI, descrambling of services or PIDs are also managed, see **§10.5**.

Managing services, PIDs and descrambling in Inputs in Service Management

Selection of services from inputs to outputs and descrambling of services or PIDs is managed via the pop-up menus indicated by the menu icon, ☰▾ , tailing the different menu line entries. If no menu icon is present, the information is read-only.

Input level pop-up menu

The pop-up menu at **Input** level allows you to add all services of an input to an output, or to connect an input transparently to an output. The **Character encoding** menu allows you select the encoding standard for the service names and for the provider names, see **§10.4.3**.
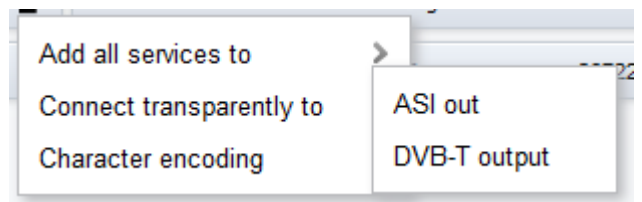
Add all services to

Click on **Add all services to**, and select the output to add the services to.

This will result in the same as adding all services one by one on the Service level, and the automatic remultiplexing including creating correct PSI/SI will be done.

Connect transparently to

When you select **Connect transparently to**, all services of an input will be added to the selected output, and no change is done in the PSI/SI information. An output that is connected transparently to an input is marked with the 🔗 icon.

PSI/SI, EMM and Other PIDs pop-up menu

The pop-up menu for the entries under PSI/SI, EMM and Other PIDs can be used to add the PID/stream to an output or to a service in an output. This can be used e.g. when PSI/SI information is to be passed transparently to the output, without being updated by the embedded remultiplexing, see §10.4.2.
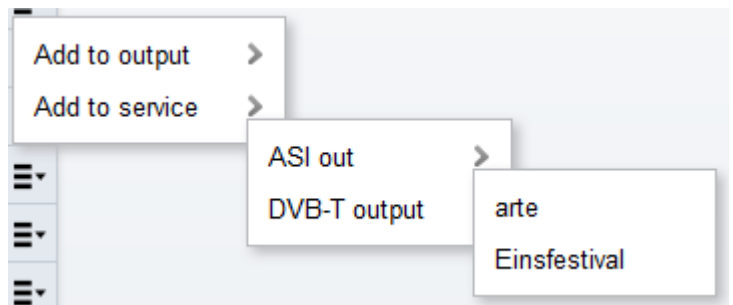
Service level pop-up menu

The pop-up menu at Service level allows you to add services one by one to an output by clicking **Add** and selecting the output in the new pop-up menu.
The **Descramble** command sets all PIDs to be descrambled. This command is only available for CI inputs. For more information about descrambling, see **§10.5**.
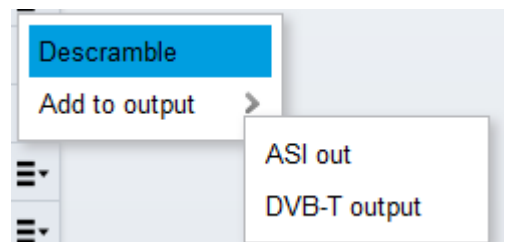
Stream level pop-up menu

The pop-up menu at Stream level allows you to descramble individual PIDs of a service. This menu is only available for CI inputs. The Descramble command on Stream level is activated only if the service is descrambled on Service level.

The Add to output and Add to service commands are covered in §10.4.2.
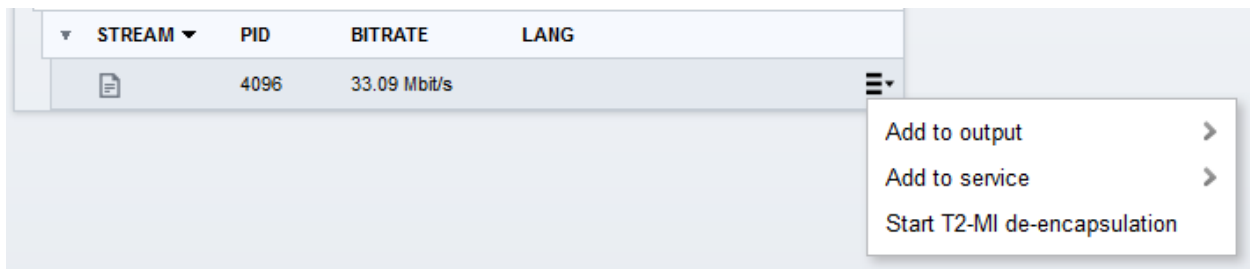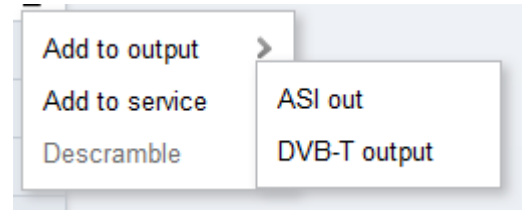
The Start T2-MI de-encapsulation is assuming that the stream is a T2-MI stream, see §10.3.2.

When selecting to descramble a PID, all other PIDs will become not selected for descrambling. Hence, if you need to descramble on PID level, make sure that you select descramble for all PIDs that you want to descramble.

10.3.1 Advanced management of tables and streams in Inputs

The Service Management includes advanced management of tables (PSI/SI tables) and streams (ranging from EMM and ECM streams to elementary streams such as audio streams or video streams). This enables a wide range of advanced applications, where the user is assumed to have thorough knowledge of how to manage the tables and streams.

Please note that using this functionality also adds the possibility to create configurations that will not be according to standard application, and hence potentially can create problems in a network. It is advised to contact Support if there are any doubts about correct settings or applications.

> Please contact Support if you are unsure about how to use the Advanced settings.
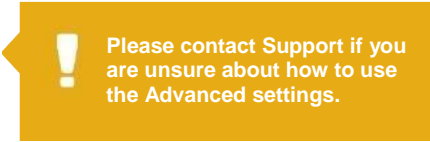
Pop-up menus for advanced applications

All menu entries below Service level at the Inputs part of Service Management have pop-up menus allowing you to add the entry to an output, or to a service of an output.

Add to output	>
Add to service	>

ASI out	>
DVB-T output	

arte
Einsfestival
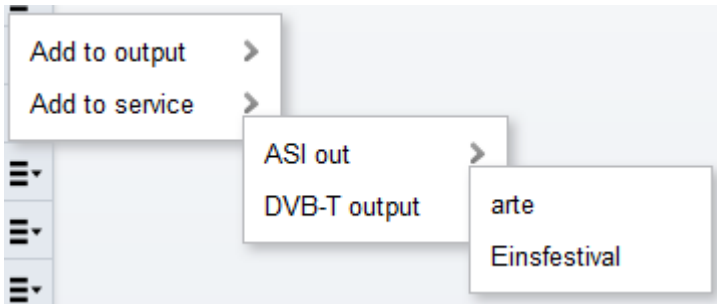
The presence of a pop-up menu is indicated by a menu icon, , at the end of an entry line.

Advanced application example

This user manual will not cover all settings and applications for the advanced settings. As one example of possible usage of the advanced settings, you can add incoming unreferenced streams ("PIDs") to an output, or to a service in an output. This can be used e.g. for adding OTA data or EPG (EIT) from external sources.

For specific use cases, please contact Support for help or further documentation.

Inputs	Services

INPUT ▾	TYPE	SOURCE	
▸ Astra 10744	DVB-S	10744 MHz H	≡▾
▾ SVT terrest	DVB-T	522 MHz (E27)	≡▾

Services: 9, TSID: 1021, ONID: 5945

TYPE ▾	PSI/SI PID	BITRATE	
CAT	1	15.02 kbit/s	≡▾
EIT	18	449.23 kbit/s	≡▾
NIT	16	600 bit/s	≡▾
PAT	0	15.02 kbit/s	≡▾
PMT	870	15.02 kbit/s	≡▾
PMT	1240	15.02 kbit/s	≡▾
PMT	1280	15.02 kbit/s	≡▾
PMT	1290	15.02 kbit/s	≡▾
PMT	5540	15.02 kbit/s	≡▾
PMT	5640	15.02 kbit/s	≡▾
PMT	5800	15.02 kbit/s	≡▾
PMT	5840	15.02 kbit/s	≡▾
PMT	1810	15.02 kbit/s	≡▾
SDT	17	4.51 kbit/s	≡▾
TDT	20	282 bit/s	≡▾
TOT	20	282 bit/s	≡▾

CA ID ▾			
▸ 0x0500			

TYPE ▾	OTHER PID	BITRATE	
MIP	21	2.87 kbit/s	≡▾

SERVICE ▾	SID	TYPE	STATUS	
▸ Barnkanalen/SVT24	870	▯		≡▾
▸ Boxer Navigator	65534	▯		≡▾
▾ Kunskapskanalen	1240	▯		≡▾

PMT: 1240, PCR: 1249
Type: Digital television service (MPEG-2 SD)
Running status: Running

STREAM ▾	PID	BITRATE	LANG	
▯	1249	6.15 Mbit/s		≡▾
♫	1248	264.43 kbit/s		≡▾
TTX	1244	262.93 kbit/s	swe	≡▾

TYPE ▾	LANGUAGE	
≡	swe	≡▾
≡	swe	≡▾

▸ SVT1 Tel Txt	1280	▯	≡▾
▸ SVT1 Tvärs	5800	▯	≡▾
▸ SVT1 Öst	5840	▯	≡▾
▸ SVT2 Tel Txt	1290	▯	≡▾
▸ SVT2 Tvärs	5540	▯	≡▾
▸ SVT2 Öst	5640	▯	≡▾

10.3.2 T2-MI de-encapsulation

The T2-MI de-encapsulation functionality allows an incoming T2-MI stream to be de-encapsulated to access the services included in the stream. Please note that T2-MI de-encapsulation requires Software Options for T2-MI de-encapsulation and PLP handling.
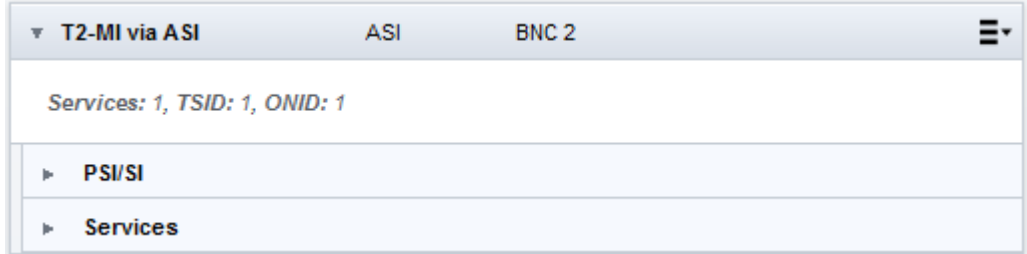
De-encapsulate a T2-MI stream
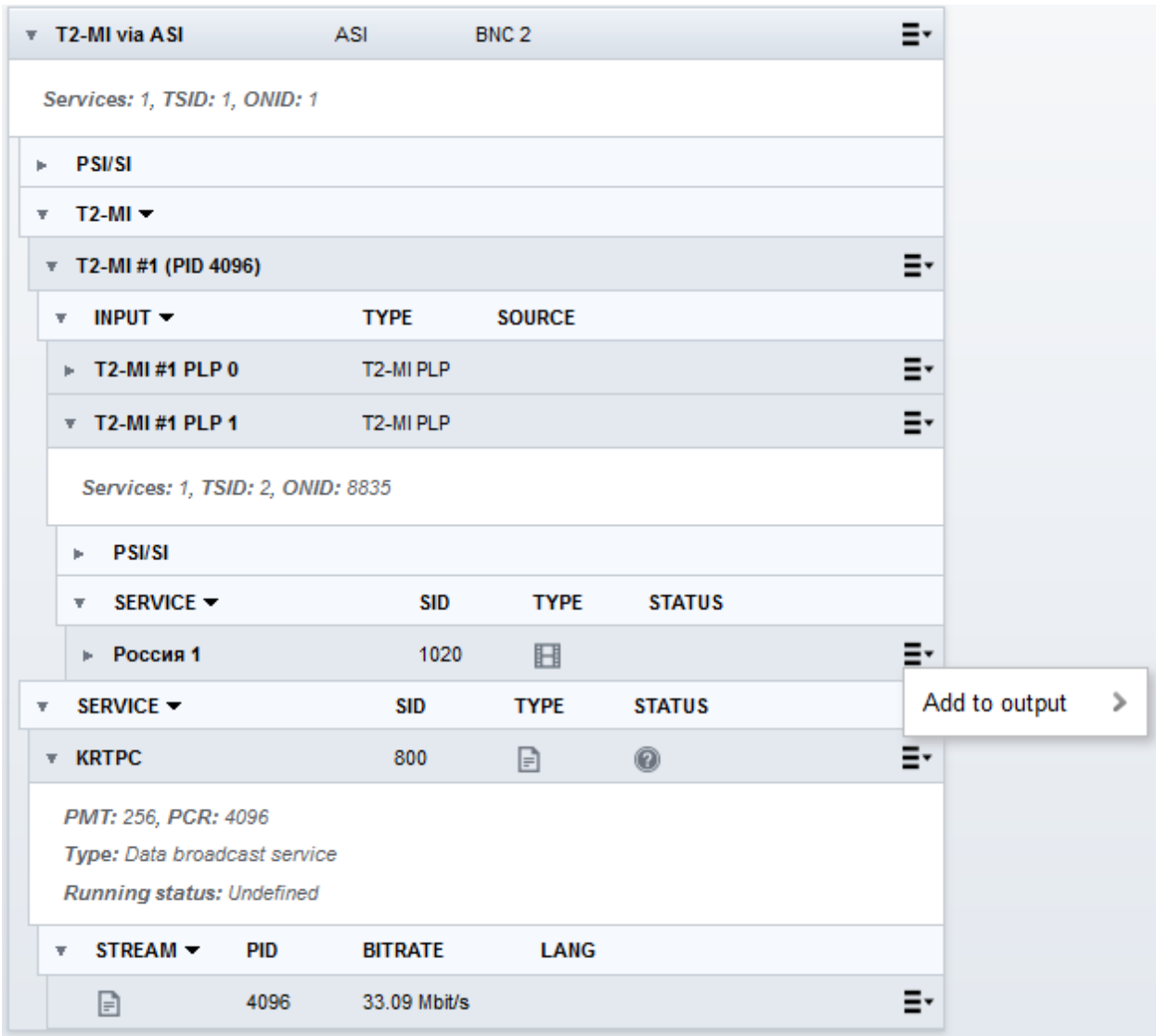
Go to Service Management.
In the **Input** carrying the incoming T2-MI stream, expand **Services**, expand the service with the T2-MI, and expand the **Streams** of this service.
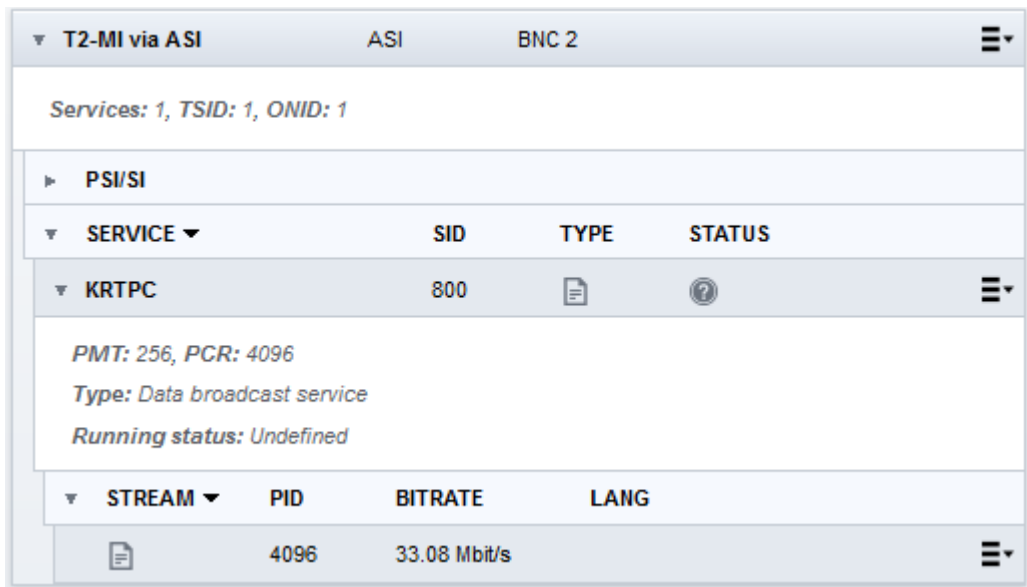
Click the menu icon, , and select Start T2-MI de-encapsulation.
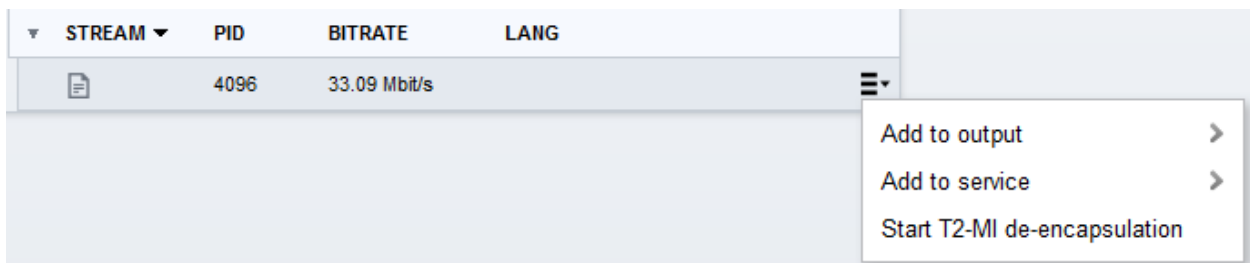
A new T2-MI entry will be available for the same Input. Expand the T2-MI and the PLPs by clicking the ▶ . The services in each PLP are listed, and can be used in the same way as other services by adding them to an output etc.

Stop T2-MI de-encapsulation

For a T2-MI entry, click the menu icon, ☰▾ , and select Stop T2-MI de-encapsulation.

10.4 Settings and management of Outputs in Service Management

For the Outputs part of Service Management there are pop-up menus and context menus where you type parameters. **Edit** in pop-up menus can open a context menu.

For the transport streams (TS) in the outgoing multiplexes, there are DVB Network related settings (TSID, ONID, Network ID, Network name, LCN type). There is also bitrate information for each output (utilized bitrate and configured (limit) bitrate).

For the services in the outputs, there are settings for service name, service provider name, SID (Service ID), LCN number and HD LCN number.

LCN types, multiple LCN types, LCN and HD-LCN numbers

For an output TS, you can select to include several LCN types. By doing this, descriptors for the different LCN types will be added to the output, and the LCN number settings for a service will be included for all selected LCN types.

"HD-LCN" in general is intended to allow receivers to decide the placement of a service in a channel list depending on the receiver capability. For Nordig, this functionality is achieved by setting the same LCN number for an SD service and an HD service with the same content. For EAECM, the HD-LCN number setting is used.

Outputs	Transport streams	Services

OUTPUT ▾	TSID	ONID	NID	LCN 1	
▾ ASI out	0	0	No id	Nordig	☰▾

Utilized bitrate: 11.13 Mbit/s (limit 35.00 Mbit/s)

▾ SETTING	VALUE	☰▾
TSID	0	
ONID	0	
Network ID	No id	
Network name	Not set	
LCN 1	Nordig	
LCN 2	None	
LCN 3	None	

▸ PSI/SI tables		

▾ SERVICE ▾	PROVIDER	SID	LCN	HD LCN	☰▾
▾ arte	ARD	28724	Not set	Not set	☰▾

▾ SETTING	VALUE	☰▾
Name	arte	
Provider	ARD	
SID	28724	
LCN	Not set	
HD LCN	Not set	
PMT PID	4148	
PCR PID	401	
Type	Digital television service (MPEG-2 SD)	
Running status	Running	

▸ Streams		

Please note that when several LCN types are used, the "HD-LCN" functionality is incompatible.

10.4.1 Managing output TS settings, PSI/SI, service and streams/PIDs settings

The Outputs side of Service Management contains information and settings for the output TS, the PSI/SI tables, the EMMs, the services and the streams in the services:

- TS (output): Removing services, edit output TS settings (TSID, ONID, Network ID, Network name, LCN type)
- PSI/SI: Manage PSI/SI tables (enable ON/OFF and table repetition rates) and manage PSI/SI descriptors (block/unblock, and add/block descriptors)
- EMM: EMM out PID, block/unblock
- Services: Edit service settings (service name, service provider name, SID, LCN and HD LCN number, PMT PID, Service type, running status)
- Streams: Edit stream settings (set stream type, OUT PID number, block/unblock)

Connecting outputs to EMMg and services to SCG is managed in the Outputs of Service Management. Elementary stream level scrambling is also managed in these menus. The scrambling related settings is covered in **§11**.

Output (TS) settings (remuxed)

The transport stream (TS) DVB Network settings can be accessed by selecting Edit in the pop up menu, or by clicking the ▶ in front of Settings at the output level. TSID, ONID, Network ID, Network name and LCN types can be edited. More information about the DVB Network settings in **§10.9**.
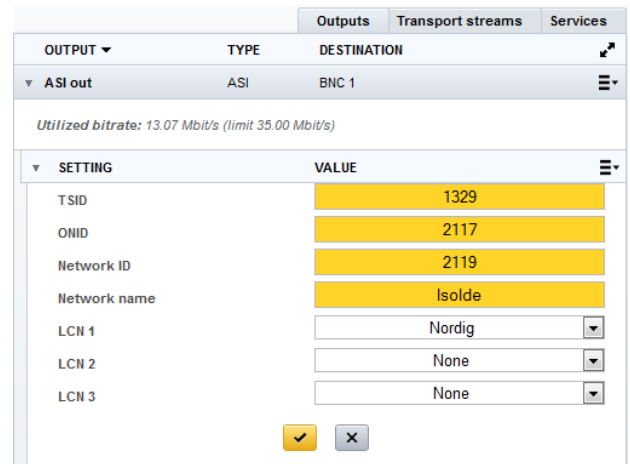
The pop-up menu at **Outputs** or **Transport streams** level allows you to edit the TS DVB Network settings (see above), remove all services from an output, add an EMM connection (see **§11**), and set the Character encoding (see **§10.4.3**).
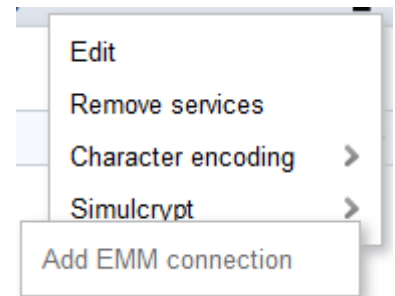
Output level pop-up menu (transparently connected)

The pop-up menu at **Outputs** or **Transport streams** level of an output that is transparently connected from an input allows you to disconnect the transparent connection or edit the Network ID (NID). Note that editing the NID is possible only if you have selected **Share NIT** to **ON** under **Setting**.
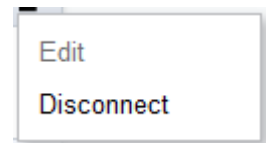
Note: there are 2 different ways to edit the DVB Network settings for an output:

■ Select **Edit** in the **Output** level pop-up menu

■ Navigate to the **Settings** under an output, and select **Edit** for this menu, see the following page

These 2 menus have different layout, but contain the same information, except that the Network name entry is not available from the Output level pop-up Edit.
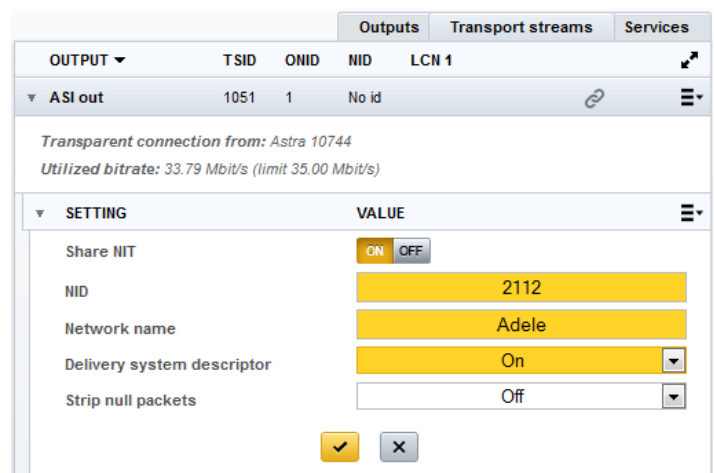
Output / PSI/SI tables settings

Expanding the PSI/SI tables entry by clicking the leading ▶ lists the PSI/SI tables. For each table or sub-table there is a pop-up menu allowing you to Edit or Reset.

- Edit will allow you to Enable/Disable the PSI/SI table, and configure the table repetition rate
- Reset will reset the settings to the default values

Output / PSI/SI descriptors

For the PSI/SI tables that contain descriptors, you can block incoming descriptors and create new descriptors.

The PSI/SI tables settings, and the PSI/SI descriptor settings are generally intended for advanced settings, and will be covered in §10.4.2.

▼ ASI out	0	0	No id	None	≡▾
Utilized bitrate: 11.93 Mbit/s (limit 35.00 Mbit/s)					

▶	Settings				
▼	PSISI TABLE ▾	TABLE ID	ENABLED	REP. RATE (ms)	
▶	AITs	0x74	On	2000	≡▾
▶	CAT	0x01	On	200	≡▾
	EIT PF actual	0x4E	On	2000	≡▾
	EIT PF other	0x4F	Off	10000	≡▾
▶	NIT actual	0x40	On	3000	≡▾
	PAT	0x00	On	100	≡▾
▶	PMTs	0x02	On	100	≡▾
▼	SDT actual	0x42	On	2000	≡▾

▼	SID ▾	SERVICE	
▼	28724	arte	

▼	SETTING	VALUE	≡▾
	Block incoming descriptors	Off	

▼ SDT DESCRIPTOR (HEX) ▾	≡▾
No descriptors available!	Create SDT descriptor

▶	28725	PHOENIX

Output / Service settings

The Service settings can be accessed by selecting Edit in the pop up menu for a service, or by clicking the ▶ in front of a service menu line.
For each service you can set:

- Service name
- Service Provider name
- SID (Service ID)
- LCN (Logical Channel Number)
- HD LCN (only for HD LCN for France)
- PMT PID
- PCR PID
- Service type
- Running status

▼	SERVICE ▾	PROVIDER	SID	LCN	HD LCN	≡▾
▼	arte	ARD	28724	Not set	Not set	≡▾

▼	SETTING	VALUE	≡▾
	Name	arte	
	Provider	ARD	
	SID	28724	
	LCN	3	
	HD LCN	53	
	PMT PID	4148	
	PCR PID	401	
	Type	Digital television service (MPEG-2 SD▾)	
	Running status	Running ▾	

✔ ✕

The pop-up in the header of Service level allows you to create a new service. A created service contains no streams, and streams has to be added manually, see §10.4.2 Advanced settings.

▼	SERVICE ▾	PROVIDER	SID	LCN	HD LCN	≡▾
		ADD NEW SERVICE				

Create service
Remove services
Revert all service changes
Reset all LCN
Reset all HD LCN

Name		
Provider		
SID		
LCN	Not set	
HD LCN	Not set	
PMT PID	1234	
Type	User defined ▾	
Running status	Running ▾	

✔ ✕

The pop-up for a service allows you to edit the service settings, see above. The **Revert changes** will reset all service settings to the original values. **Remove** will remove this service from the output. Simulcrypt allows you to **Connect to / Disconnect from SCG.** Scrambling is described in **§11**. The **Character encoding** menu allows you select the encoding standard for the service names and for the provider names, see **§10.4.3**.
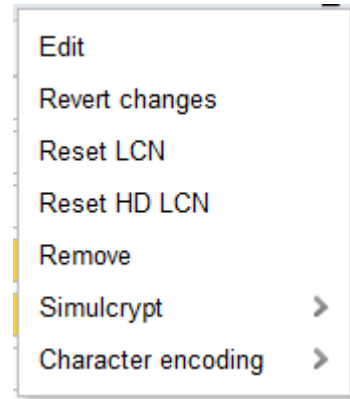
Output / Service / Streams settings

For each service in an output (TS), you can edit the settings for the streams (PIDs) in the service. Streams settings can be accessed by selecting Edit in the pop up menu for a stream, or by expanding the stream menu and clicking the ▶ in front of Settings.

Stream type (in HEX), and output PID can be edited. A textual description of the stream type will be indicated in a pop-up when entering a (HEX) stream type, if the stream type is according to the DVB specification.

The pop-up at stream level allows you to edit the Out PID value, and block (or unblock) the stream in the output TS. You can also select to scramble the stream. Scrambling is described in **§11.**
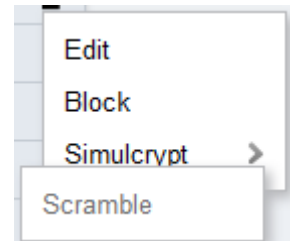
10.4.2 Advanced management of tables and streams in Outputs

The Service Management includes advanced management of tables (PSI/SI tables) and streams (ranging from EMM and ECM streams to elementary streams such as audio streams or video streams). This enables a wide range of advanced applications, where the user is assumed to have thorough knowledge of how to manage the tables and streams.

Please note that using this functionality also adds the possibility to create configurations that will not be according to standard application, and hence potentially can create problems in a network. It is advised to contact Support if there are any doubts about correct settings or applications.

> **!** Please contact Support if you are unsure about how to use the Advanced settings.

Advanced application example

This user manual will not cover all settings and applications for the advanced settings. As one example of possible usage of the advanced settings, you can create a service in an output without adding a service from the Input part of Service Management.

▼ SERVICE ▼	PROVIDER	SID	LCN	HD LCN	☰▼

ADD NEW SERVICE		
		Create service
		Remove services
Name		Revert all service changes
Provider		Reset all LCN
SID		Reset all HD LCN
LCN	Not set	
HD LCN	Not set	
PMT PID	1234	
Type	User defined	
Running status	Running	

For specific use cases, please contact Support for help or further documentation.

PSI/SI table management

All PSI/SI tables are listed under the PSI/SI table entry, and can be displayed by clicking the arrow ▶ in front of the entry line. The general pop-up menu is allows you to edit the table settings (enabled On / OFF, table repetition rate), or reset to the default values. For most tables, you can also create descriptors and/or block incoming descriptors.

As an example of PSI/SI table management, all the EIT Actual Schedule and EIT Other Schedule tables can be enabled or disabled, allowing you to modify the "EPG" data transmitted.

For specific use cases, please contact Support for help or further documentation.

▼ PSISI TABLE ▼	TABLE ID	ENABLED	REP. RATE (ms)	
▶ AITs	0x74	On	2000	☰▼
▶ CAT	0x01	On	200	☰▼
EIT PF actual	0x4E	On	2000	☰▼
EIT PF other	0x4F	Off	10000	☰▼
▶ NIT actual	0x40	On	3000	☰▼
PAT	0x00	On	100	☰▼
▶ PMTs	0x02	On	100	☰▼
▶ SDT actual	0x42	On	2000	☰▼
SDT other	0x46	On	10000	Edit
TDT	0x70	On	20000	Reset
▶ TOT	0x73	On	20000	☰▼
▶ TSDT	0x03	On	10000	☰▼
▼ EIT ACTUAL SCH ▼	TABLE ID	ENABLED	REP. RATE (ms)	
0-3 days	0x50	On	10000	☰▼
4-7 days	0x51	Off	10000	☰▼
8-11 days	0x52	Off	30000	☰▼
12-15 days	0x53	Off	30000	☰▼
16-19 days	0x54	Off	30000	☰▼
20-23 days	0x55	Off	30000	☰▼
24-27 days	0x56	Off	30000	☰▼
28-31 days	0x57	Off	30000	☰▼
32-35 days	0x58	Off	30000	☰▼
36-39 days	0x59	Off	30000	☰▼
40-43 days	0x5A	Off	30000	☰▼
44-47 days	0x5B	Off	30000	☰▼

10.4.3 Character encoding

DVB specifies a number of standard encodings of text strings, e.g. Service Names and Service Provider Names. These include ISO 8859-1 ISO 8859-15, GB-2312, BIG5, and UTF8. To indicate the encoding used, there is a flag in the SDT. If there is no flag, the name decoding should use ISO 6937.

Some transmissions omit the flag, but choose not to encode in ISO 6937. You may also want to use an encoding that is not defined by DVB.

Character encoding settings for inputs
On the input side of Service Management, there are settings for text encoding for the Service Name and the Service Provider Name. These settings can be used if there is no encoding flag in the incoming SDT.

> **!** This setting only has effect if the input service does NOT have a flag for character encoding.

Character encoding settings for outputs
At the output side of Service Management, there are encoding settings at output level as well as at service level. A service will inherit the encoding of the output unless you have set a specific encoding setting for the service.

For input services:

■ Selecting a character encoding only has effect if the incoming SDT is without character encoding flag

For output services:

■ For a not changed service name, and the output encoding set to Automatic (default), the service name is copied directly from the inputs

■ For a not changed service, and the output encoding set to anything other than Automatic, the service name is decoded (according to the setting/flag for inputs), and encoded with the selected output encoding

■ For a changed service/service provider name, and the output encoding set to Automatic, the Chameleon tries to encode the configured service name in an encoding that fits the text, e.g. "abcd" is encoded with ISO 6937 while "åäö" encoded with ISO 8859-9

■ If the service/service provider name is changed and the output encoding is set to anything other than Automatic, the name will be encoded with the set encoding.

In all cases except the first, for "No DVB signalling" the encoding used is removed.

- Inherited (Automatic)
- Automatic
- Big5-HKSCS
- CP1251 (Windows-1251)
- GB-2312
- ISO-8859-15
- ISO-8859-14
- ISO-8859-13
- ISO-8859-11
- ISO-8859-10
- ISO-8859-9
- ISO-8859-8
- ISO-8859-7
- ISO-8859-6
- ISO-8859-5
- ISO-8859-4
- ISO-8859-3
- ISO-8859-2
- ISO-8859-1
- UTF-16 (Unicode)
- UTF-8 (Unicode)
- No DVB signaling

10.5 Descrambling and Common Interface

10.5.1 Common Interface and CAM/smart card

Descrambling requires a CAM to be inserted in one of the CI slots, and a smart card with the rights for descrambling the services. Note that multi-descrambling using professional CAMs is supported. CI settings are managed in the **COMMON INTERFACE** menu under **SETTINGS**.

### Insert the CAM and smart card in the CI slot

Insert the CAM and smart card into the correct CI slot. From a rear view,
CI slot 1 is to the left, CI slot 2 to the right.

Make sure that CAM is inserted with text side to the right
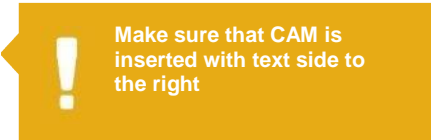
Select CI source – set which input to be connected to the CI slot

In the **COMMON INTERFACE** menu, Click **Edit**. Type a name for the CI. This name will appear in the Service Management as a input with type CI.
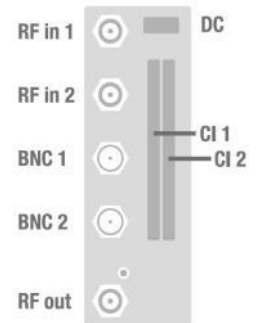
In the drop-down list of Select CI source, select the input to be connected to this common interface slot. The Bitrate selection in the drop-down list (72 Mbps, 62 Mbps, 55 Mbps) can normally be left at the default value 72 Mbps for all modern CAMs.

10.5.2 Descrambling – Service level & PID level

After selecting CI source in the COMMON INTERFACE menu, a new "input" of type CI will be displayed in the Inputs part of Service Management.

Select the services to be descrambled

Click the menu icon, , of the service you want to descramble, and select **Descramble** in the popup menu. To output a descrambled service, add the service from CI input to an output (see **§10.3**).

Descrambling status indication icons

Scrambled (service or PID)

Descrambled (complete service or individual PID)

Partly descrambled service (some of the services PIDs are descrambled)

Unsucessful descrambling (complete service or individual PID)

Unsucessful partly descrambled service

PID level descrambling

At the PID level in the Inputs of Service Management, click the edit arrow of the PID you want to descramble, and select **Descramble** in the popup menu.

NOTE: When selecting to descramble a PID, all other PIDs will by default be selected not to be descrambled. Hence, if you descramble on PID level, make sure that you select to descramble all PIDS that you want to descramble.
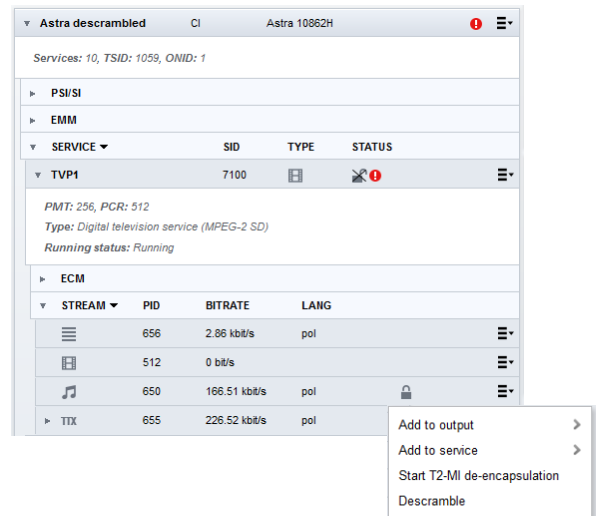
10.5.3 CAM reset and Common Interface Watchdog

The CAM can be reset (power toggled) by selecting Reset CAM in the pop-up menu.
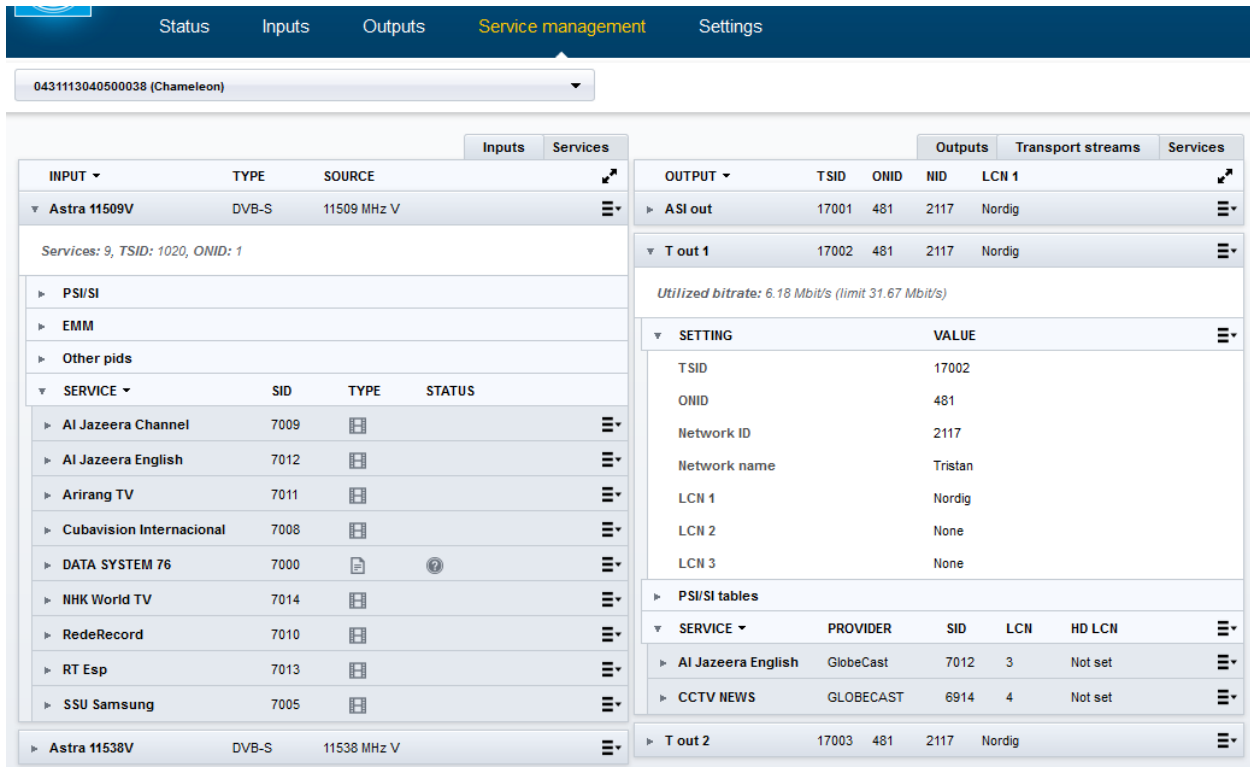
The CI Watchdog will, when enabled, monitor the TS header information from the CAM to detect if the stream is descrambled or not. For the CI watchdog to trigger, the service must first be descrambled correctly.

When the CI watchdog is triggered, the CAM is reset (power toggle), and you will see "No module connected" in the Common Interface menu during the CAM reset.
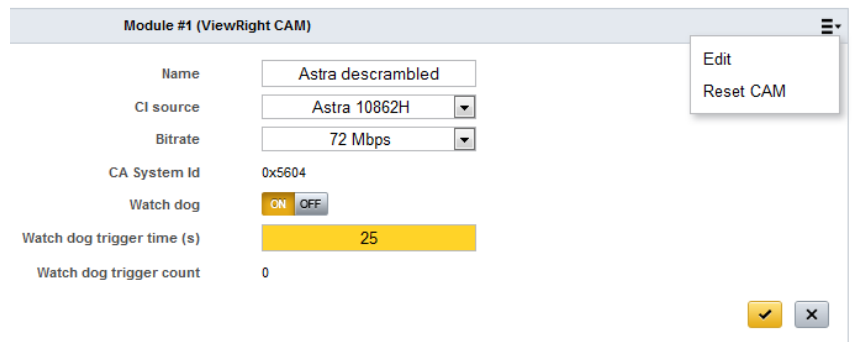
The Watch dog trigger time is the delay from detection of a service not being descrambled to the reset of the CAM.

10.6 Remultiplexing and PSI/SI

Remultiplexing

In a Chameleon, remultiplexing is automatically done as services are selected from the inputs to the outputs. As such, all remultiplexing is managed in **SERVICE MANAGEMENT.**

PSI/SI Management

The PSI/SI tables of the outputs are automatically updated as services are assigned to the outputs.

> Note that the SW option GNMUX is required for selecting services from several input sources to one output, and that the SW option GNSYMUX is required for sharing PSI/SI information between Chameleons.

DVB-Network PSI/SI Management

To create a DVB-network-wide correct PSI/SI structure, all Chameleons with outputs in the same DVB network must be able to share PSI/SI information. The interconnection between the Chameleons is enabled by the **HEADEND SYSTEM MANAGEMENT** functionality, see **§10.11**. For the PSI/SI sharing between Chameleons, the GNSYMUX Software Option must be active, and the Chameleons must be interconnected via IP.

10.7 Service listings and service types

Input service listings

The services of an input transport stream (TS) or an output TS can be listed by navigating to the service level, see **§10.1**.

In the Inputs view of Service Management, expand an input, and expand Services to get a list of all services from this input.

To view a list of input services from all configured inputs, click on the Services tab to the right of the input side of Service Management.

	SERVICE	SID ▾	TYPE	STATUS	
▸	DATA SYSTEM 76	7000			
▸	SSU Samsung	7005			
▸	Cubavision Internacional	7008			
▸	Al Jazeera Channel	7009			
▸	RedeRecord	7010			
▸	Arirang TV	7011			
▸	Al Jazeera English	7012			
▸	RT Esp	7013			
▸	NHK World TV	7014			
▸	MELODY	8501			
▸	NUMERO 23	8502			
▸	PLANETE+ THALASSA	8504			
▸	DISCOVERY	8505			
▸		8506			
▸	CANAL SAT RADIOS	8507			
▸	MCS BIEN ETRE	8508			
▸		8509			
▸	RADIOS 2	8510			
▸	RADIOS 3	8511			
▸	CANAL SAT RADIOS	8514			
▸	OM TV	8516			
▸	OL TV	8517			
▸	RF	8518			
▸	FRANCE MUSIQUE	8519			
▸	FIP	8520			
▸	FRANCE INFO	8521			
▸	FRANCE INTER	8522			
▸	FRANCE BLEU	8523			
▸	RFI INTERNAT	8524			

Service listing information and types

The services in the input service listings have information columns SERVICE (service name), SID (service_id), TYPE (service type) and STATUS (indicating e.g. scrambling status or running status).

The TYPE is indicated by icons (and also has mouse-over textual information):

Radio service 🎵

TV service 🎞

"Private data" (user defined) 👤

Data broadcast service 📄

Output service listings

The services of an input transport stream (TS) or an output TS can be listed by navigating to the service level, see **§10.1**.

In the Outputs view of Service Management, expand an output, and expand Services to get a list of all services from this output.

To view a list of output services from all configured outputs, click on the Services tab to the right of the output side of Service Management.

	SERVICE ▾	PROVIDER	SID	LCN	HD LCN	
▸	Al Jazeera English	GlobeCast	7012	3	Not set	
▸	Arirang TV	GLOBECAST	7011	5	Not set	
▸	DISCOVERY	CSAT	8505	2	Not set	
▸	JAZZ RADIO	CSAT	8535	14	Not set	
▸	NHK World TV	GLOBECAST	7014	11	Not set	
▸	PLANETE+ THALASSA	CSAT	8504	7	Not set	
▸	RT Esp	GlobeCast	7013	9	Not set	

Output service listing and information

The services in the output service listings have information columns SERVICE (service name), PROVIDER (service provider name), SID (service_id), LCN (logical channel number) and HD LCD.

10.8 Streams (PIDs) and Streams/PIDs listings

Streams and PIDs and listings and types

The Streams/PIDs of an input transport stream (TS) or an output TS can be listed by navigating to the stream or PID level. All streams and PIDs including PSI/SI PIDs, EMM PIDs, Other (unreferenced) PIDs, and elementary streams of services are listed.
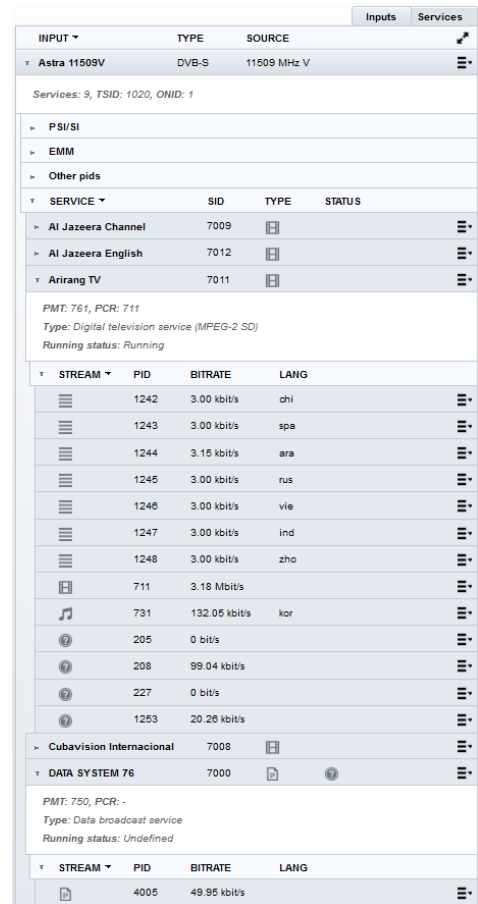
In the Services views of the Service Management, the service streams (audio streams, video streams, subtitling streams, data streams and unknown streams) are listed.

Stream types and information

All listings have (at least) 3 columns:

- Type/Stream

- PID

- Bitrate

- (Lang)

PSI/SI PID types are given as table acronyms such as PAT, CAT NIT.

Service stream types are indicated with icons:

Audio streams:	♫	**Subtitling streams:**	≡
Video streams:		**Data streams:**	
Teletext streams:	TTX	**Unknown streams:**	?

For outputs, the stream type (in hex) is listed, as well as the incoming and the outgoing PID number. Often the outgoing PID number is the same as the incoming PID number, but if the PID number already exists in the system, there is an automatic PID remapping to avoid PID clashes. Just as for the PIDs of the input services, the stream (PID) types are indicated with icons.

The STATE column shows if a stream is e.g. blocked or scrambled.

10.9 Outputs TS DVB Network settings

TSID, ONID, NID, LCN type and Network Name

Each outgoing Transport stream (TS) has a set of identifiers: TSID (transport stream ID), ONID (original network ID), NID (network ID), LCN (logical channel numbering type) and Network Name. All identifiers can be edited by clicking menu icon, [icon] , and select **Edit**.

TSID
The transport_stream_id (TSID) is a 16-bit field which serves as a label for identification of this TS from any other multiplex within the delivery system. Hence, the TSID has to be unique within a DVB Network.

ONID and NID
The SI uses two labels related to the concept of a delivery system, namely the network_id (NID) and the original_network_id (ONID). The latter is intended to support the unique identification of a service, contained in a TS, even if that TS have been transferred to another delivery system than the delivery system where it originated.

> **!** If no network_id (NID) is set, the outputs will not contain any NIT.

Network Name
A string of characters that specify the name of the delivery system about which the NIT informs.
A change of the Network Name is propagated to all TS with the same NID.

LCN (LCN type)
The LCN type specifies which LCN implementation to use. For a DVB Network, the LCN type should be the same for all outgoing muxes. Please note that you can add several LCN types for each transport stream out without any conflict in the descriptors in the PSI/SI structure, but you still have to check that the receivers in the network can handle input signals with several LCN types.
Available LCN types are Nordig, EACEM and ITC (Independent Television).

> **!** The LCN number is edited in the settings for each service.

10.10 Outputs services settings

Service name, service provider name, service ID, LCN number, HD-LCN, PMT PID, PCR PID, Type and Running status

Each service in an outgoing transport stream has a set of identifiers: service name (**Name**), service provider name (**Provider**), service ID (**SID**), LCN number (**LCN**) and HD-LCN. These identifiers are listed for all output services. All identifiers can be edited by clicking menu icon, [icon] , and select **Edit**. **PMT PID**, **PCR PID**, service type (**Type**), and Running status can be set or selected.

SID

The service ID is a 16-bit field which serves as a label to identify this service from any other service within a transport stream (TS). Hence, the service ID is a unique identifier of a service within a transport stream.

Service name and service provider name

The service name and the service provider name is textual information used by the receivers to display information about the services.

LCN (LCN number) and HD LCN number

The LCN number, which will be used by a receiver to make a channel list, is edited for each service in each outgoing mux. For correct functionality, the LCN number must be unique for each service within a DVB network. For managing automatic reconfiguration of channel lists depending on receiver capability, the HD LCN can be used.

Type (service_type)

The service_type field is used to specify the type of a service. The intention of this field is to allow the service provider to describe the nature of the service. For example, information provided by the service_type field about the nature of a service can be used to group services into dedicated service lists, e.g. separate television and radio lists. The service_type field is not meant to override information provided at lower levels within SI or within PSI, such as the assignment of stream_type for a component within the PMT or the actual coding within the component itself, particularly with respect to the decoding and presentation of components of a service.

Running status

The running_status field indicates the status of the service as undefined, not running, starts in a few seconds, pausing, running or service off-air.

10.11 The System management and DVB Network PSI/SI

For creation of a network-wide correct PSI/SI structure in a DVB Network, information about PSI/ SI has to be shared between the Chameleon modules in the same network. The basis for such a sharing is that the Chameleons are connected via a switch, and that a communication is set up between the Chameleons. Additionally, all Chameleons that are to share PSI/SI information must have the Software Option GNSYMUX.

Headend System management

Under **SETTINGS**, in the **HEADEND SYSTEM MANAGEMENT** menu, you can select Chameleons in the same local (layer 2) network to be members in the same group, a HE Group.

When clicking menu icon, ☰▾ , and selecting Edit, all Chameleon in the local IP network will be listed. The list gives the name (the **Name** entered under Module Identification in the Status menu), the serial number, chassis name or serial number, group membership column and a warning ⓘ if the module is member of another group.

To add a Chameleon, or Chameleons, mark their respective tic boxes, ☑ , in the MEMBER column, and save the settings by clicking the yellow tick ✔ .

Please note that the settings done in one Chameleon will automatically update the headend System Management settings also for all Chameleons in the same group.

DVB network and PSI/SI sharing – network settings

When setting up a system where PSI/SI information is shared, you must also set the network settings for all outgoing transport streams. The network_id (NID) must be identical for all outgoing transport streams, and all the transport streams must have different Transport Stream ID (TSID), see also **§10.9**.

OUTPUT ▾	TSID	ONID	NID	LCN 1			
▸ ASI out	17001	481	2117	Nordig			☰▾
▸ T out 1	17002	481	2117	Nordig ▾	✔	✕	☰▾
▸ T out 2	17003	481	2117	Nordig			☰▾

(Outputs | Transport streams | Services)

10.12 Transmodulation and transparent outputs

Connect input to output transparently

An input can be sent transparently to an output by selecting **"Connect transparently to"**. When an input is **"connected"** to an output, as default there is no change of the content of the transport stream from input to output:

■ All services, with all PIDs are sent from the input to the output

■ The PSI/SI tables are sent from input to output without any change or modification

Settings for transparent outputs

As an alternative to the default setting (no change of content or signalling) there are settings available for sharing NIT, Network ID (NID), Network name and Delivery system descriptor. You can also select to remove null packets from the output.

To edit these settings, click the menu icon, ☰▾ , and select Edit.

OUTPUT ▼	TSID	ONID	NID	LCN 1	⤢
▾ ASI out	1020	1	No id		🔗 ☰▾

Transparent connection from: Astra 11509V
Utilized bitrate: 33.79 Mbit/s (limit 45.00 Mbit/s)

▾ SETTING	VALUE	☰▾
		Edit
Share NIT	ON OFF	
NID	N/A	
Network name	Not set	
Delivery system descriptor	Off ▼	
Strip null packets	Off ▼	

✔ ✕

11 Encryption – DVB-CSA scrambling and Simulcrypt

Conditional Access System (CAS) general information

A conditional access system generally consists of two main subsystems:

■ A scrambling subsystem that a) scrambles the signal to prevent non-subscribers from receiving it and b) descrambles the signal at the subscribers' receivers.

■ An access control subsystem that processes access control messages to determine whether descrambling is to be performed.

A Chameleon used in this context contains a Control Word Generator (CWG) generating Control Words (CW) for the scrambling (DVB-CSA). To enable de-scrambling at the receiver side, the CW is transmitted in encrypted format as ECMs. The ECMs are created by the CAS, based on the CW, and an Access Criteria (AC) supplied by the CAS.

The access control system is handled by EMMs. EMMs are received from the CAS, and included in the outgoing transport streams.
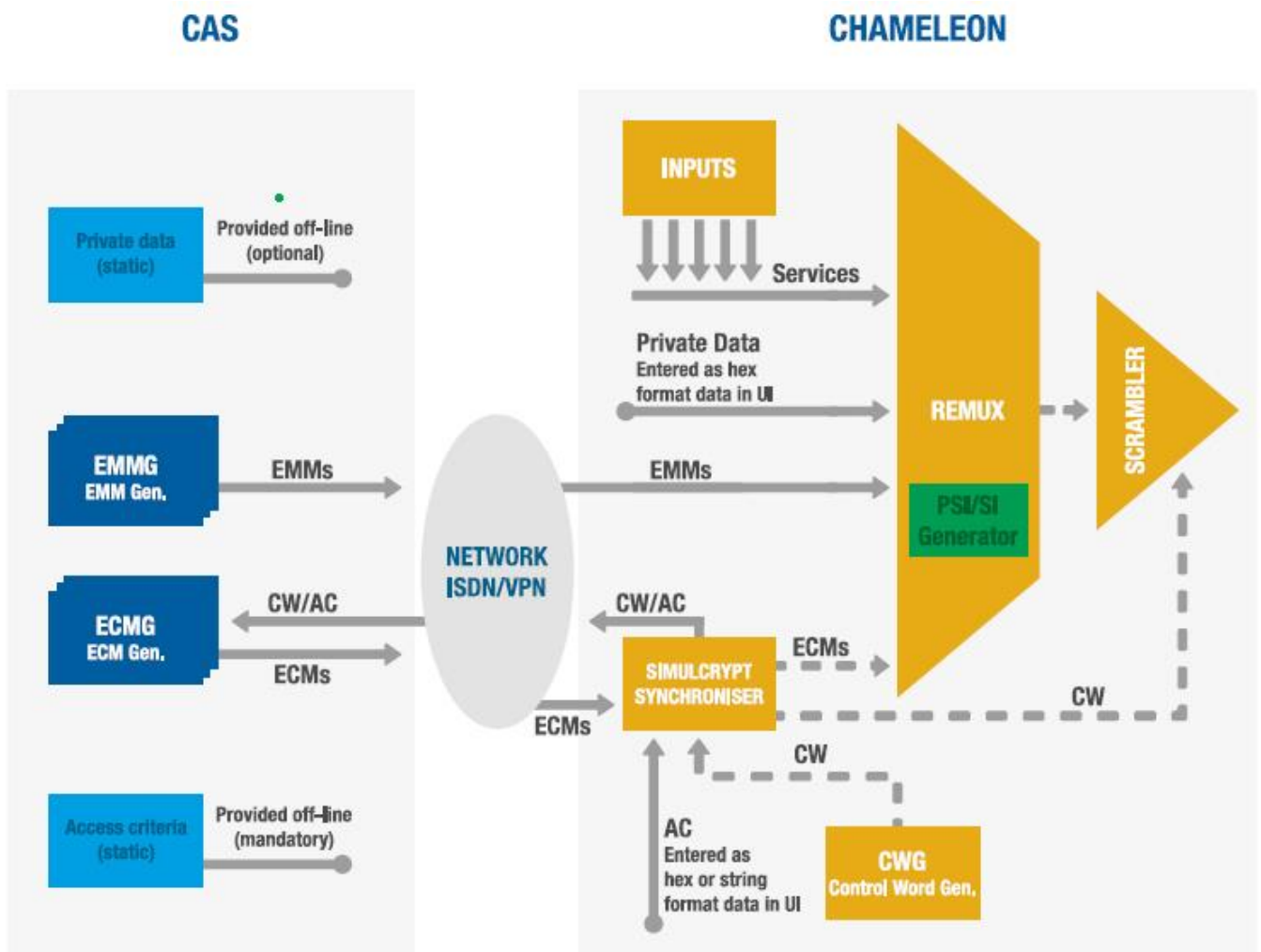
CAS vs. Chameleon interface structure

When setting up a Chameleon for scrambling, there are 2 main interconnections between the Chameleon and the CAS to be established:

■ The connection for receiving EMMs from the CAS

■ The connection for transmitting CW/AC to the CAS, and receiving the ECMs

Apart from this, there are some parameters/identifiers that have to be set internally in the Chameleon.

EMM communication req's

■ Chameleon IP address for the IP interface used for Simulcrypt, and port for receiving the EMMs (EMM port) has to be given to the CAS.

■ The Client ID has to be provided by the CAS, and entered in the Chameleon UI when setting up the connection.

The internal identifier that has to be set in the Chameleon UI is the EMMg name. The EMM PID will be automatically assigned by the Chameleon, and can be changed in Service Management.

ECM communication req's

■ The CAS IP address to be entered in the Chameleon UI.

■ The SuperCAS ID, specified by the CAS, has to be entered in the Chameleon UI.

■ The ECM port, the port that Chameleon should connect to for the ECMs, must be supplied.

■ The Access Criteria has to be given by the CAS.

The internal identifiers that has to be set in the Chameleon UI is the ECMg name.
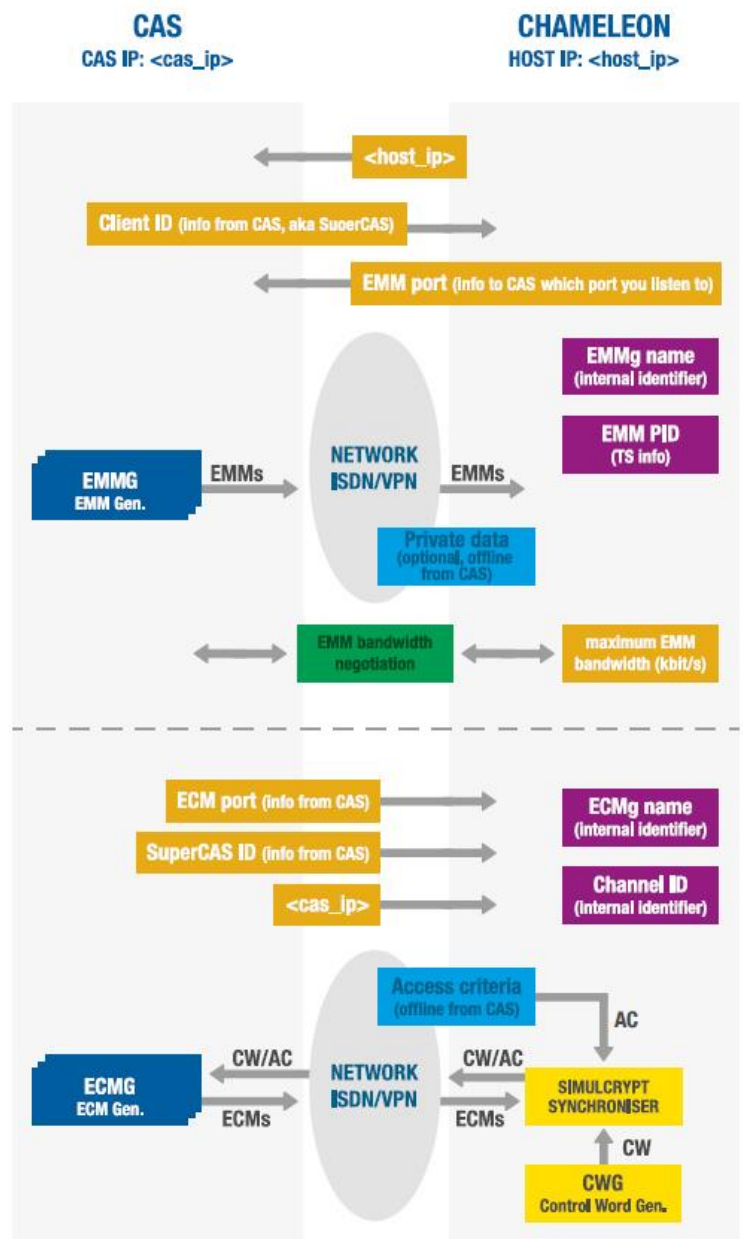
11.1 Encryption - scrambling overview

Encryption overview

Scrambling of services, or PIDs in services, requires a connection to a CA Server (CAS). Chameleon can connect to the CAS via the management IP interface or via the streaming interface. For setting up, or changing a network interface, for scrambling, set Simulcrypt to "On". For details about network interfaces, please refer to §12.1.

Setting up encryption in Chameleon includes the following steps:

1. Create your outputs, and add the services you want to have in your outputs

2. (Set up your CAS for EMM and ECM generation)

3. Add EMM Generator connections to the Chameleon Simulcrypt interface

4. Add EMM connection to the output(s)

5. Add ECM Generator(s) to the Chameleon Simulcrypt interface

6. Create Scrambling Control Groups (SCG) and set up connections to the ECMg

7. Connect the service(s) to be scrambled to a Scrambling Control Group (SCG)

Notes

■ In software version 2.4.3, you can encrypt DVB-C, DVB-T, DTMB, J.83 Annex B, J.83 Annex B and ASI outputs.

■ The maximum number of PIDs that can be encrypted is 64 PIDs per output

■ The maximum number of encryption keys (SCG) is 64.

■ The maximum bit rate for a scrambled output is 55 Mbit/s.

11.2 Add EMM Generator connections

The CA Server set-up for EMM and ECM generation is not covered by this manual. Please contact your CAS supplier for information.

The IP address to be entered in the CAS is the IP address of the Chameleon network interface used for Simulcrypt communication.

Adding an EMM Generator connection

In the **Simulcrypt** menu under **SETTINGS**, click **ADD EMM** under the EMM Generators box.

1. Enter a name for the EMMg

2. Enter the Client ID (info from CAS supplier, often same as the superCAS). The Client ID should be entered as a hex number, but without the 0x prefix. As an example, if the Client ID is given as 0x320011ac, you should enter 320011ac in the UI. The Client ID should always be 8 hex digits.

3. Select the Network interface you are using. Select a Simulcrypt enabled interface in the drop-down list, or remain with Auto. If Auto, the Chameleon will scan all Simulcrypt enabled interfaces and check if a connection can be established based on port and Client ID.

4. Enter the PORT (as the port stated by the CAS)

5. Optionally, enter private data

6. Set the EMM bandwidth (check with your CAS provider)

7. Click the "yellow tick" ✔

EMM ▾	CLIENT ID	INTERFACE	PORT	PRIVATE	BW	STATUS	
No content available!							
My EMMg	0B000000	Auto ▾	2161		100		✔ ✕
		Auto					
		Default management					
		Allan scrambling				ADD EMM	

Adding another EMM Generator connection

Repeat the steps above.

EMM Generator connection status during initialisation

After configuring the EMMg, the Chameleon will start listening for a connection to the CA server. If the connection is established correctly, the STATUS of the EMMg is "Client connected".

EMM ▾	CLIENT ID	INTERFACE	PORT	PRIVATE	BW	STATUS	
▾ My EMMg	0B000000	Allan scrambling	2161		100	Client connected	☰▾
Error state: No error							
Client socket: Client connected							
Packet type: Section							
Emm bytes: 756							

11.3 Add EMM connection to the output(s)

Connecting an EMM Generator to an output

In **SERVICE MANAGEMENT**, for an output, click the menu
icon, [icon], and under Simulcrypt >, select the EMMG to
connect the output to.
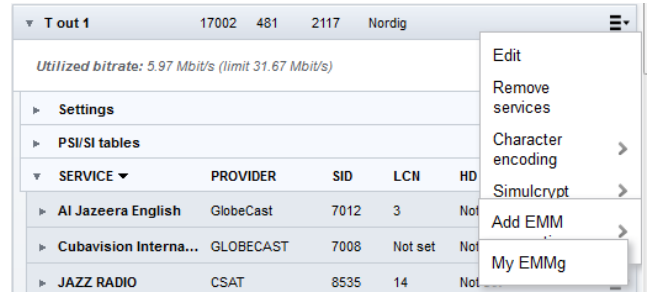
EMM information and EMMg removal

An output connected to an EMMg will have a Simulcrypt entry
under **Settings**. To remove an EMMg,connection, click the
menu icon, [icon], and select **Remove.**

11.4 Add ECM Generator connections

The CA Server set-up for EMM and ECM generation is not covered by this manual. Please contact your CAS supplier
for information.

Adding an ECM Generator connection

In the Simulcrypt menu under **SETTINGS**, click **ADD ECM** under the ECM Generators box.

1. Enter a name for the ECMg (internal name/identifier, default name ECMg 1 is OK)

2. Enter the Super CAS ID (info from CAS supplier). The Super CAS ID should be entered as a hex number, but
without the 0x prefix. As an example, if the Super CAS ID is given as 0x320011ac, you should enter 320011ac in the
UI.

3. Enter the HOST ADDRESS, the IP address for the CAS (information from your CAS supplier)

4. Enter the PORT (information from your CAS supplier)

5. For Interface, select a Simulcrypt enabled interface in the drop-down list, or use Auto. If you use Auto, the
Chameleon will try to connect using one interface at the time, and connection will be based on CAS IP address and
port.

6. Click the "yellow tick" [icon] .

ECM ▼	SUPER CAS ID	HOST ADDRESS	PORT	INTERFACE	STATUS	
No content available!						
My ECMg	0B000000	172.18.5.70	2117	Auto ▼		✔ ✕

ADD ECM
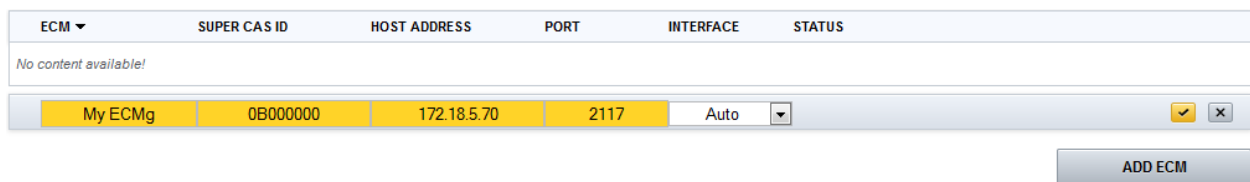
When the communication between the Chameleon and the CAS is established: STATUS is **Open**

ECM ▾	SUPER CAS ID	HOST ADDRESS	PORT	INTERFACE	STATUS	
▾ My ECMg	0B000000	172.18.5.70	2117	Auto	Opened	☰▾

Status: Opened
Channel ID: 0
Max streams: 256
Packet type: Section
Messages: 6
Start delay (ms): 5000, Stop delay (ms): 5000, Rep. period (ms): 100
Min CP duration: 10000
Lead CW: 1, CW:s per message: 2

11.5 Add SCG (Scrambling Control Group)

In the SIMULCRYPT menu, under SCG, click ADD to add a Group.

1. Enter e name for the SCG

2. Set the Crypto Period duration (CP Duration). This must be set to a duration higher than the minimum allowed CP duration set in the CAS.

3. Select Scrambling Policy in the drop-down list:

Never (never scramble)

All ECMgs connected (scramble only if all ECMgs are connected)

Any ECMg connected (scramble as soon as there is, or as long as there remains, a connection to any ECMg)

Always (scramble always, i.e. the outgoing service will always be scrambled with the created CW, even if there is no possibility for the CAS to create an ECM. If all connections to the CAS for ECM are lost nobody will be able to descramble)

SCG ▾	CP DURATION	SCRAMBLING POLICY	SCRAMBLING POLICY FALLBACK	STATUS	
No content available!					
▾ Group A	10000	Any ECMG connected ▾	Revert to clear ▾		✔ ✖
▾ ECM ▾	ENABLED	Never / All ECMGs connected / Any ECMG connected / Always	RIA	PRIVATE DATA	
My ECMg	Off				☰▾

ADD GROUP

4. Select Scrambling fall-back policy in the drop-down list:

Revert to clear (if connection to CAS lost for ECM, go to not scrambling)

Keep last CW (if connection to CAS lost for ECM, keep scrambling, but keep using the last used Control Word (CW), and the last received ECM. This means that even if the connection is lost, the Chameleon will continue scrambling using the last CW that will correspond to the last received ECM from the CAS, and receivers can continue descrambling.

▾ Group A	10000	Any ECMG connected ▾	Revert to clear ▾		✔ ✖
▾ ECM ▾	ENABLED	ECM ID	ACCESS CRITER / Revert to clear / Keep using last CW		
My ECMg	Off		HEX (0x) ▾		☰▾

11.6 Edit Group in SCG (set up connection to ECMg)

Scrambling Control Group (SCG) (ETSI TS 103 197 V1.5.1): data structure gathering together in one same logical set the list of A/V streams scrambled at the same time with the same control word and the list of ECMs that are going to be generated with the identifier of their CA system and with their respective Access Criteria

After adding an SCG, edit the group to set up connection to an EMMg.
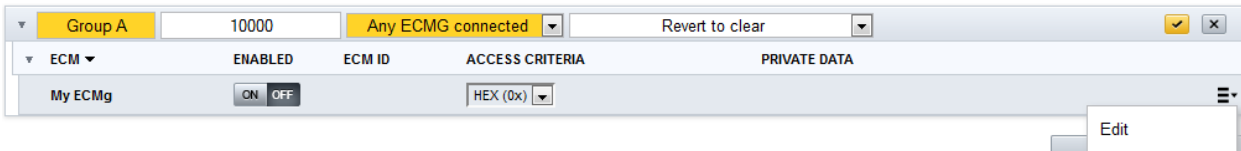
1. Set ENABLED to ON

2. Enter an ECM ID (You can select any numerical value, but commonly a CAS will require that the ECM ID is the same for all (scrambled) outputs in your DVB network.)

3. Select how to enter the ACCESS CRITERIA: HEX or ASCII

4. Enter the ACCESS CRITERIA (info from CAS supplier)

5. Optionally: enter private data

6. Click the "yellow tick"
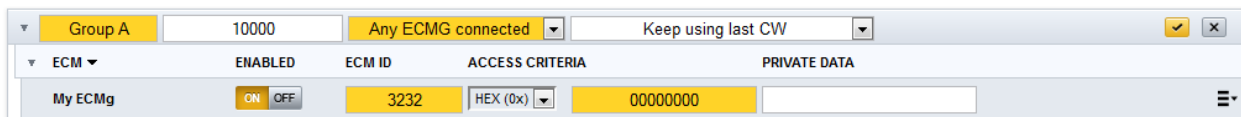
Status at this stage (before any service is connected to the Group in Service Management)

In the Group header: "No services connected"

Under the Group:

- Status   No services connected

- Scrambling status   Scrambling

- Current crypto period   235 (increasing with new CW being created)

SCG ▾	CP DURATION	SCRAMBLING POLICY	SCRAMBLING POLICY FALLBACK	STATUS	
▾ Group A	10000	Any ECMG connected	Keep using last CW	No services connected	≡▾

Status: No services connected
Scrambling status: Scrambling
Current crypto period: 6

ECM ▾	ENABLED	ECM ID	ACCESS CRITERIA	PRIVATE DATA	
▾ My ECMg	On	3232	HEX (0x) ▾ 00000000		≡▾

ECMG connected: Yes
Stream state: Opened
CW state: ECM recieved
Error state: No error

11.7 Connect output services to an SCG (to a group)

Connecting a service to a Scrambling Control Group (SCG)

In **SERVICE MANAGEMENT** under **Outputs**, click the menu icon, ☰▾ , to the right of a service.

In the pop-up menu, select **Connect to SCG**, and select the Scrambling Control Group you want to connect to.
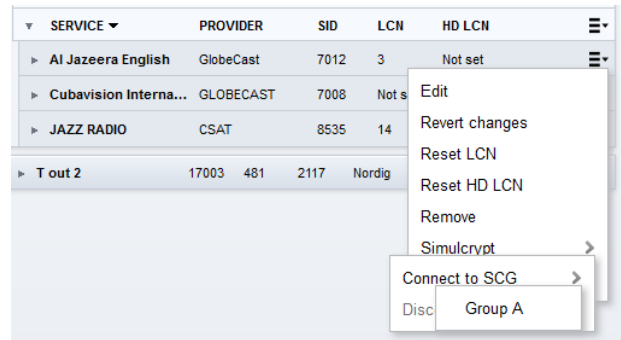
When an output service connected to a Scrambling Control Group is expanded (clicking the leading ▶), the SCG and ECMg it is connected to is listed in the ECM connections menu.
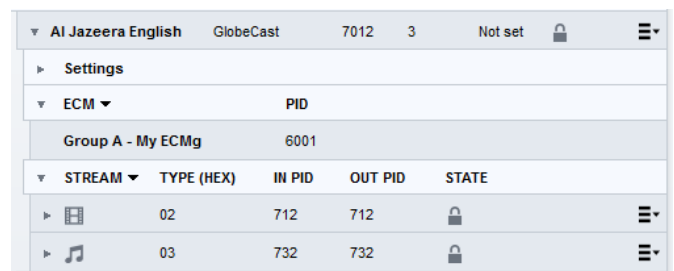
Services that are scrambled are indicated with a padlock 🔒

For the services connected to an SCG, all video and audio PIDs will be scrambled.

Scrambling (or not) on PID level

In the PID listing of a scrambled service, you can select which PIDs you want to scramble or not.

Click the menu icon, ☰▾ , to the right of a PID, and select Simulcrypt > Scramble > and then Scramble or Do not scramble.
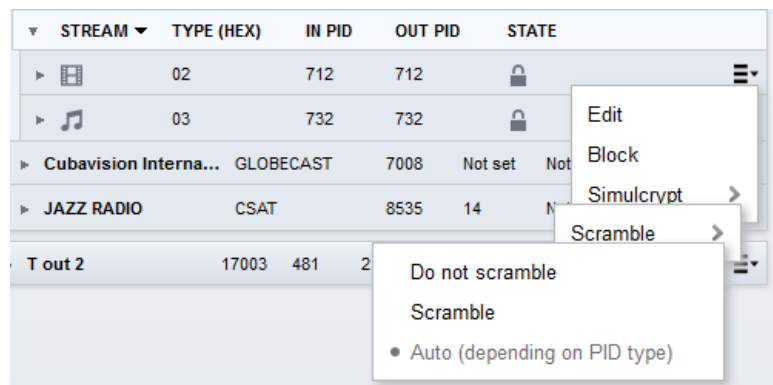
11.8 Simulcrypt menu for a correct set-up

EMM ▼	CLIENT ID	INTERFACE	PORT	PRIVATE	BW	STATUS	
▼ My EMMg	0B000000	Allan scrambling	2161		100	Client connected	≡▾

Error state: No error
Client socket: Client connected
Packet type: Section
Emm bytes: 34776

ADD EMM

ECM ▼	SUPER CAS ID	HOST ADDRESS	PORT	INTERFACE	STATUS	
▼ My ECMg	0B000000	172.18.5.70	2117	Auto	Opened	≡▾

Status: Opened
Channel ID: 0
Max streams: 256
Packet type: Section
Messages: 161
Start delay (ms): 5000, Stop delay (ms): 5000, Rep. period (ms): 100
Min CP duration: 10000
Lead CW: 1, CW:s per message: 2

ADD ECM

SCG ▼	CP DURATION	SCRAMBLING POLICY	SCRAMBLING POLICY FALLBACK	STATUS	
▼ Group A	10000	Any ECMG connected	Keep using last CW	Scrambling	≡▾

Status: Scrambling
Scrambling status: Scrambling
Current crypto period: 92

ECM ▼	ENABLED	ECM ID	ACCESS CRITERIA	PRIVATE DATA	
▼ My ECMg	On	3232	HEX (0x) ▼ 00000000		≡▾

ECMG connected: Yes
Stream state: Opened
CW state: ECM recieved
Error state: No error

Status information for OK set-up:

■ **EMM Status:** Client connected

■ **ECM Status:** Opened

■ **SCG Status in Group header(s):** Scrambling (this will be the case if a service is connected to an SCG in Service Management)

Under Details in each group under SCG:

■ **Status:** Scrambling

■ **Scrambling status:** Scrambling

■ **Current crypto period:** xyz (increasing with new CW being created)

Group Status (Connections under SCG):

■ **Enabled:** ON

■ **ECM ID:** existing and unique

■ **Access criteria:** entered (as HEX or ASCII)

12 Settings: Managing the Chameleon module

Under **SETTINGS**, all module specific settings are managed.

NETWORKING: Networking settings for IP interfaces, see **§12.1**.

HEADEND SYSTEM MANAGEMENT: for Chameleon interconnection, see **§10.11**

OPERATION MODE: selection of output mode, see **§7**

COMMON INTERFACE: In the COMMON INTERFACE menu, you select the input source for the CI, manage the CI watchdog, and you have access to the menu from the inserted CAM or CAMs. See **§10.5**.

SIMULCRYPT: for setting up EMM and ECM connections to a CA Server, and connecting ECM streams to Scrambling Control Groups, see **§11** and sub-paragraphs.

PRO:IDIOM: Pro:Idiom scrambling key management

DATE AND TIME: Settings for TDT source, and connection to NTP server. See **§12.2**

TASK SCHEDULER: Task scheduling for scripts, see **§12.3**

SNMP: settings for SNMP, traps etc., see **§12.4**

SAP: settings for Session Announcement Protocol, see **§12.5**

USER MANAGEMENT: password protection for UI access, see **§12.6**

SOFTWARE AND ENTITLEMENT UPGRADE: Software upgrade, used both for uploading new software and for uploading Software Options (entitlement files), see **§12.7**

MAINTENANCE: For software reboot, factory reset and configuration backup and restore, see **§12.8** and **§12.9**

LOG: For displaying logged data, see **§12.10**
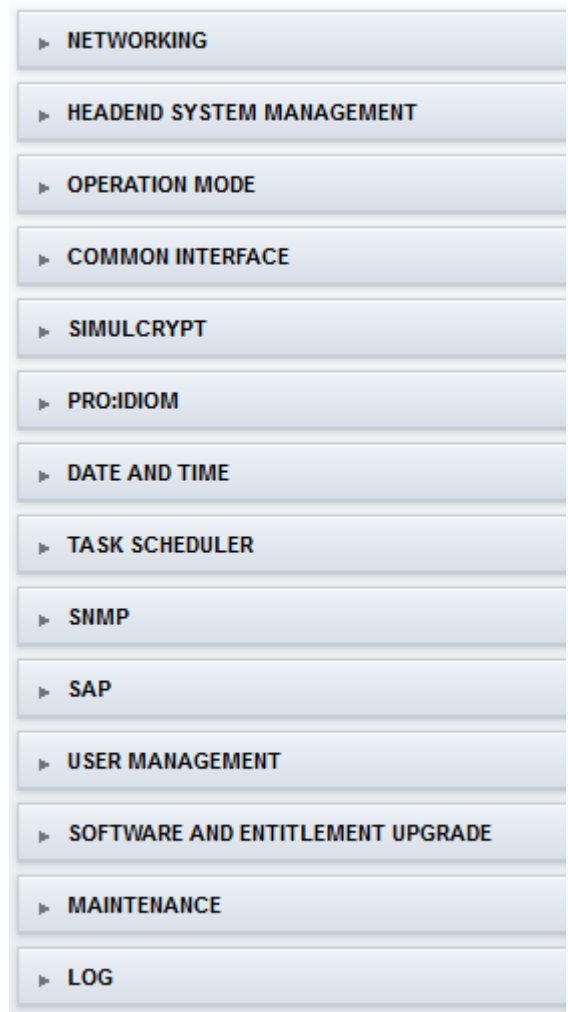
12.1 Add and configure Network interfaces

Adding network interface for streaming

1. Click on **NETWORKING** in the **SETTINGS** tab
2. Expand **Streaming** (or **Management**), and expand **Interfaces**
3. Click the menu icon, ☰▾ , to the right on the **INTERFACE** menu line, and select **Add interface**
4. Type a name for the interface
5. Enter the IPv4 address, the Netmask and the Gateway
6. Select IGMP version
7. Select the capabilities needed for the interface (e.g. Streaming)
8. Click the "yellow tick" ✔ to save

> **!** Chameleon has 2 IP ports in the front, a 10/100 Ethernet management port, and a GigE port for streaming. By default, there are no IP interfaces defined for the streaming port. When connecting a PC to the streaming port, the Ethernet port of the PC must have GigE capability. Chameleons installed in a GN50 base unit use the backplane connector for both management and streaming interfaces.

PORT ▼	MAC	STATUS
▸ Management	00:03:98:07:3c:90	CONNECTED
▾ Streaming	00:03:98:07:3c:91	CONNECTED

▾ INTERFACE ▼			☰▾

Add interface

ADD NEW INTERFACE

Name	My added streaming interface
Use DHCP	ON OFF
IPv4	192.168.0.25
Netmask	255.255.255.0
Gateway	192.168.0.1
IGMP	IGMPv2
Use VLAN	ON OFF
Web management	ON OFF
SNMP	ON OFF
Simulcrypt	ON OFF
Streaming	ON OFF
Command line interface	ON OFF

✔ ✕

Creating a new streaming interface

12.2 Date and time (NTP server access and Time sources)

The **DATE AND TIME** menu allows you to connect the Chameleon to an NTP server for establishing a valid UTC time reference. The time reference can be used as a time source for the creation of the TDT table. The TDT and TOT are used to enable receivers to detect correct time, and is also the time basis for the EPG (EIT).

The connection to an NTP server requires Internet connection to the Chameleon.

As an alternative, TDT information from incoming streams from the input sources can be used as a time source.

▾ DATE AND TIME

NTP server access and time sources
The date and time settings allows you to connect the module to an NTP server for establishing a valid UTC time reference. The time reference can be used as a time source for the creation of the TDT table. The TDT and TOT is used to enable receivers to detect correct time, and is also the time basis for the EPG (EIT). The connection to an NTP server requires an Internet connection to the module. As an alternative, TDT information from incoming streams from the input sources can be used as a time source.

Settings		☰▾
UTC time	2014-11-24 10:22:09	
Local time	2014-11-24 10:22:09 (UTC)	
Time zone	(UTC+01:00) Sarajevo, Sk ▾	
	CET-1CEST,M3.5.0,M10.5.0/	
Adjust automatically for daylight saving time	ON OFF	
NTP server(s)	ntp.pool.org	

ⓘ Separate addresses by adding a comma (",") after each address.

✔ ✕

| SOURCE ▼	TIME	USED	ENABLED	
Astra 11509V	2014-11-24 10:22:09	YES	On	☰▾
Astra 11538V	2014-11-24 10:22:08	NO	On	☰▾

NTP server connection for UTC time reference

In the **DATE AND TIME** menu under **SETTINGS**, click the menu icon, ☰▾ , and select Edit.

1. Select your Time zone in the drop down list
2. Select daylight saving time **ON/OFF**
3. Enter a valid URL to an NTP server (e.g. ntp.pool.org)
4. Click the "yellow tick" ✔ to save

The added NTP server will be shown under Time sources. The UTC time from the NTP server is displayed, and if there are other valid time sources, their times will also be displayed.

As default, the NTP time reference is used for the TDT.

SOURCE ▾	TIME	USED	ENABLED		
Astra 11509V	2014-11-24 10:29:26	NO	Off		☰▾
Astra 11538V	2014-11-24 10:29:26	NO	Off		☰▾
NTP	2014-11-24 10:29:27	YES	ON OFF	✔ ✕	☰▾

Selecting Time source for the TDT manually

1. Click the menu icon, ☰▾ , to the right of the Time source that is indicated as **YES** under USED, and select Edit.
2. Select **OFF** under ENABLED
3. Click the "yellow tick" ✔ , or click enter

The Time reference will automatically switch to another Time source.

12.3 Scheduler – commands scripting

The **Scheduler** is a task scheduler that can be used to run LUA commands from the UI of the Chameleon. The triggering of the tasks (set of commands) is based on local time date and time, with the time source in **Date and Time** as reference.

ADD NEW TASK ▲

Name	My task
Enable	ON OFF
Schedule	Weekly ▾
Weekday	Monday ▾
Time	12:00
Lua script	system.reset()

✔ ✕

The Scheduler can be set up to run tasks daily, weekly, monthly, yearly or once. The Enable ON/OFF gives you the possibility to save tasks without executing them.

Weekly ▾
Daily
Weekly
Monthly
Yearly
Once

Adding a new task

1. Click **Add new task**

2. Enter a name for the task

3. Set Enable to OFF if you want to save but not execute the task

4. Select the schedule periodicity (daily, weekly, monthly, yearly or once)

5. Set the date, day, time parameters for the task

6. Enter the LUA commands in the Lua script window

7. Click the "yellow tick" ✔ , or click enter

Running (testing) a task

You can test a task / the LUA commands manually by clicking the menu icon, ☰▾ , to the right of a task, and selecting **Execute Script** in the pop-up menu.

TASK ▾	ENABLED	SCHEDULE	
▾ **My task**	On	Weekly every Monday at 12:00	☰▾
▾ SETTING	VALUE		Execute script
Name	My task		Remove

12.4 SNMP

▾ SNMP

Simple Network Management Protocol
SNMP can be used for alarms (traps/notifications) or to read (Get) or write (Set) information from/to a module. To use SNMP, you need an NMS (Network Management System) that is connected to the module.

Read more about setting up SNMP by clicking on the question mark to the right.

Settings	☰▾
Enable agent	ON OFF
Agent port	161
Agent security level	Authentication, no encrypt ▾
Enable traps	ON OFF
Traps SNMP Version	Version 2c ▾
Traps community string	public
Traps PDU	Trap ▾
	✔ ✕

ADD NEW TRAP DESTINATION ▾

DEST. ADDRESS ▾	DEST. PORT	
192.168.21.17	162	✔ ✕ ☰▾

SNMP, Simple Network Management Protocol

SNMP can be used for alarms (traps/notifications) or to read (Get) or write (Set) information from/ to a Chameleon. To use SNMP, you need an **NMS** (Network Management System) that is connected to the Chameleon.

SNMP versions supported

In the current implementation, SNMP version 1, SNMP version 2c and SNMP version 3 is supported.
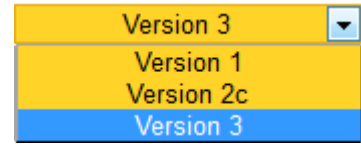
SNMP settings

- **Enable agent:** for turning the SNMP agent in Chameleon ON/OFF

- **Agent port:** UDP listen port (161 is the standard port used)

- **Agent security level:** controlling authentication and encryption.

    When "No authentication or encryption" is selected:

    - **Agent community read string:** a "password" that has to be set in the NMS. The standard default string is "public".
    - **Agent community write string:** a "password" that has to be set in the NMS. The standard default string is "private".

- **Enable traps:** for turning ON/OFF the alarm (traps) functionality

- **Traps SNMP version:** selection of used SNMP version

- **Traps community read string:** a "password" that has to be set in the NMS. The standard default string is "public".

- **Traps PDU:** selection of SNMP Protocol Data Units (PDU); Trap / Inform

For the TRAP DESTINATIONS

- **Dest. address:** destination address of the NMS receiving the trap

- **Dest. port:** destination port of the NMS receiving the traps

> **Please contact Support for information about the MIB, MIB structure and NMS integration.**

Supported traps and SNMP read/write in software 2.4.3

SNMP traps

- Tuner locked status change
- Loss of IP input bit rate (IP input bit rate = 0)
- IP input changed alternative input (for input redundancy)
- Chameleon temperature exceeding 65 °C
- Video decoder not running
- FM decoder running / not running
- PAT on input timed out
- Simulcrypt EMMg connected/disconnected
- Simulcrypt ECMg connected disconnected
…

SNMP read/write

- Tuner input status
- Tuner input configuration
- IP input status
- IP input configuration
- Chameleon module temp. (read only)
- Chameleon module name (read only)
- Chameleon module description (read only)
- GN50 slot number (read only)
…

A complete description of all SNMP traps and read/write is listed in a separate document. Please contact Support for more information.

12.5 SAP

Session Announcement Protocol (SAP) is a protocol for broadcasting multicast session information (corresponding to SDT and NIT for DVB transmissions). The information transferred over the SAP transport is formatted in compliance with the Description Protocol (SDP) format defined in RFC 2327. Under SAP, senders periodically broadcast SDP descriptions to a well-known multicast address and port (224.2.127.254:9875). A SAP listening application can listen to the SAP multicasts and construct a guide of all advertised multicast sessions.

In Chameleon, when IP SPTS is used as output, the SAP can be enabled, and the Announcement interval can be set.

▼ SAP

Session Announcement Protocol

SAP is a protocol for broadcasting multicast session information (corresponding to SDT and NIT for DVB transmissions). The information transferred over the SAP transport is formatted in compliance with the Description Protocol (SDP) format defined in RFC 2327. Under SAP, senders periodically broadcast SDP descriptions to a well-known multicast address and port (224.2.127.254:9875). A SAP listening application can listen to the SAP multicasts and construct a guide of all advertised multicast sessions. When IP SPTS is used as output, the SAP can be enabled, and the Announcement interval can be set.

Settings	☰▾
Enable	ON OFF
Announcement interval	10

✔ ✕

12.6 User management – password protection

The **User Management** allows settings of password for the UI. You can add users, and create passwords for each user.

▼ USER MANAGEMENT

Manage the users used for authentication.

Note: To enable user interface authentication you must first create a user.
Note: It is not possible to remove the last user without disabling user interface authentication first.

Settings	☰▾
User interface authentication	ON OFF

✔ ✕

ADD NEW USER ▲

User name	Beta
Password	●●●●
Password again	●●●●

✔ ✕

USER ▾

▼ Alfa ☰▾

| SETTING	VALUE	☰▾
User name	Alfa	
Password	******	
Password again	******	

Adding a user and password

1. Click **Add new user**

2. Enter a user name

3. Enter a password

4. Confirm the password by entering it again

5. Click the "yellow tick" ✔ to save
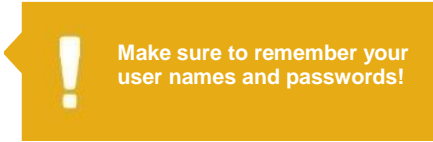
Enabling password control

1. Select **User authentication ON**

2. Click the "yellow tick" ✔ to save

> ! **Make sure to remember your user names and passwords!**

The web UI will respond with a "Authentication Required" where you should enter the user name and password.
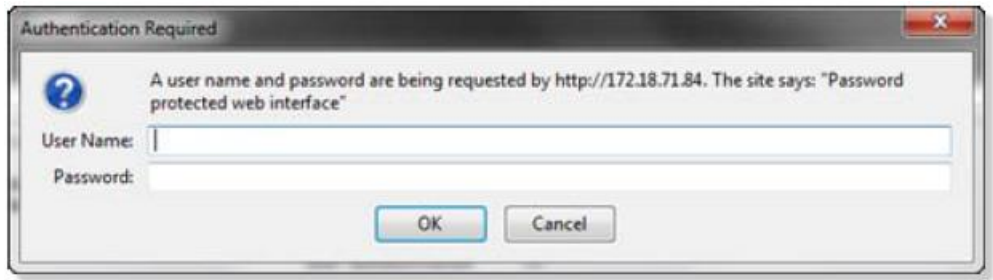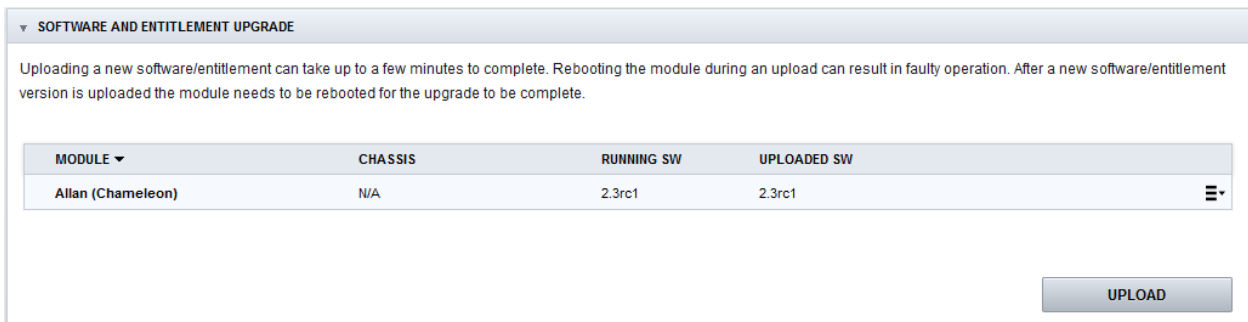

12.7 Software and Software Options (entitlement) upgrade

Both software and Software Options are uploaded via the **Software and Entitlement Upgrade** in the **Settings** tab. Additionally, there is status information about the running software version, and, if a new software is uploaded, also about the latest (not running) software version.

Uploading Firmware

1. Click **Upload**. Click Browse... in the pop-up, and select the software file (*.bin file) to be uploaded from your computer

2. Click the **Upload** button

3. After upload complete message, reboot the module

▼ SOFTWARE AND ENTITLEMENT UPGRADE

Uploading a new software/entitlement can take up to a few minutes to complete. Rebooting the module during an upload can result in faulty operation. After a new software/entitlement version is uploaded the module needs to be rebooted for the upgrade to be complete.

MODULE ▼	CHASSIS	RUNNING SW	UPLOADED SW	
Allan (Chameleon)	N/A	2.3rc1	2.3rc1	☰▾

UPLOAD

Uploading software options

1. Click **Upload**. Click **Browse**… in the pop-up to browse for the software options file (*.ent) for this specific Chameleon module

2. Locate the software options file on your computer, and select it

3. Click the **Upload** button

4. Reboot the module

The SW options file will have the format <serial number>.ent. If you need to, you can download the en-titlement file from the wisiconnect.tv portal, see §4.

12.8 Module maintenance

There are several different functions for maintaining your Chameleon module in the MAINTENANCE menu.

Reboot

Some operations, such as upgrading the software, require a reboot. Click the **REBOOT** button to reboot the unit. During the rebooting process, Rebooting will be shown.

Reboot from Rescue mode

In very special circumstances the Chameleon can enter the Rescue mode. Click the **Reboot** button in the rescue mode to return to normal mode. Make sure to re-enter the IP address of your Chameleon in the address field of your browser to access the normal mode web GUI. In the rescue more, you can access basic functionality, and upload new software and software options.

Factory reset

The Chameleon module can be reset to the same status as when delivered from the factory, apart from the Software Option that will remain as before factory reset, and the management IP address that will be kept. Go to the **Settings** tab, and **Maintenance**. Click on **Factory Reset**.

FACTORY RESET
Resets all parameters, except the IP address, to the original factory settings.
FACTORY RESET

Backup and restore (saving and uploading configuration)

The backup and restore functionality gives you the possibility to save the complete configuration of a Chameleon to your computer. The stored file is in xml format.

The backup file can be used for e.g. copying configurations between different installations, or keeping a possibility to upload the original configuration to a Chameleon if you have tested a different configuration.

Additionally, the backup file is useful for support.

BACKUP AND RESTORE
You can choose to make a backup of the settings in the module or restore the settings here.
BACKUP   RESTORE

Diagnostic file

The diagnostic file is a file containing additional information about the Chameleon module. If you are having problems with your module, download the diagnostic file and send it together with a description of the problem to our Support Team (support@wisiconnect.tv).

FACTORY RESET
Resets all parameters, except the IP address, to the original factory settings.
FACTORY RESET

Terminate Demo

During the trial (Demo) period, all functionality enabled by Software Options are available. If you want to confirm that the permanent Software Options will support the functionality you are using for your installation, you can disable the Demo by clicking Terminate Demo.

Please note that the Terminate Demo is irreversible. Demo cannot be activated once it has been terminated.

| TERMINATE DEMO |
|---|
| Forcefully terminate the demo period. This is irreversible: Once terminated, demo mode can not be enabled again. |
| TERMINATE DEMO |

12.9 Log

The Log contains information about rebooting and failures/exceptions. You can also enable Syslog for logging more information. If the Chameleon has access to a time reference, the log entries are time stamped.

▼ LOG

The Log contains information about rebooting and failures/exceptions. You can also enable Syslog for logging more information.
If the module has access to a time reference, the log entries are time stamped, if not, the time since the last reboot (uptime) will show. The latter is indicated by a "*" in the date column.

The log is sorted in descending order.

Settings		☰▾
Syslog	Off	

Log filter

Priority All ▾
Date All ▾

APPLY CLEAR

DATE	TIME	PRIORITY	MESSAGE
2015-03-09	13:19:10	INFO	Unit booting
2015-03-09	13:19:08	INFO	Automatic reboot after Operation mode change
2015-03-09	13:11:17	INFO	Unit booting

The Log information can be filtered to show entries with specific priority, of entries from specific dates.

13 Status information

The **Status** tab gives a general overview over the Chameleon module. This page is also the starting page for the web UI.

MODULE IDENTIFICATION

The serial number, the hardware version, and the tuner version are shown. Further, there are 3 editable fields; Name, Location and Description. Click the menu icon,   , to the right, and select **Edit** to change the information about this Chameleon module. Click the "yellow tick"   to save the changes.

CONFIGURATION

The Configuration fields show you the Operation mode, the Software version, and the enabled Software Options. A warning will be shown if no operation mode is selected.

STATUS

The Status fields shows Uptime (uptime from last reboot), and current module temperature.

SERVICE LICENCE AGREEMENT

Shows if the Chameleon is registered at the wisiconnect.tv portal, and the expiry date of the service level agreement. If the demo/trial period is still on, the remaining demo uptime is displayed.
If not, **Demo Terminated** will be shown.

14 Software options

Chameleon "products" range from receiver, to edge, to streamer and to scrambler. The different "products" realisations are controlled by the Software Options enabled in any specific Chameleon module.

To get an overview of all different Software Options currently available, please contact your sales representative or contact the Chameleon Support.

List of uploaded Software Options

Under the **Status** tab, all enabled Software Options are listed.

> **!** During DEMO trial period all Software Options are enabled. Don't forget to order Software Options needed for the actual installation.

How to get and upload additional Software Options

Please contact your sales representative at WISI to get information

Available software options for the Chameleon modules

INPUT	PROCESSING	OUTPUT	MISCELLANEOUS
DVB-C & QAM J.83 B/C Receivers GNC, GNDC	**Common Interface Decryption** GNCI, GNDCI	**DVB-C & QAM J.83 B/C Modulators** GNCMOD, GNDCMOD, GNTCMOD, GNQCMOD	**MPEG Encoder** GNHWENCW
DVB-S/S2 Receivers GNS2, GNDS2	**Simulcrypt Scrambling** GNSCR	**DVB-T Modulators** GNTMOD, GNDTMOD	**System Management** GNSYSMG
DVB-T/T2 Receivers GNT, GNDT, GNT2, GNDT2	**Pro:Idiom Scrambling** GNQPISCR, GNOPISCR	**DTMB Modulator** GNDMOD	**Service License Agreement** GNM1, GNM3
ISDB-T Receivers GNIST, GNDIST	**Remultiplexing** GNMUX, GNSYMUX	**ISDB-T Modulator** GNISMOD	**All Software Options** GNALL
ASI input & output GNASI, GNDASI	**Redundancy** GNRED	**Analogue Modulators** GNVMOD, GNDVMOD	
IP Streaming input & output GNSTR, GNSTREC	**Dolby AC3** GNDOL	**MTS & SAP (BTSC)** GNBTS	
	T2MI de-encapsulation PLP support GNT2MIDE, GNDT2MIDE GNDT2MIPLP, GNQT2MIPLP GNOT2MIPLP, GNXT2MIPLP	**FM Radio** GNDFM, GNOCTFM	
		SDI & HD-SDI output GNSSDI, GNDSDI, GNHSDI	
		ASI input & output GNASI, GNDASI	
		IP Streaming input & output GNSTR, GNSTREC	

Please note that some functionality, e.g. the N+1 redundancy, is managed by the GT11 embedded switch in the GN50 base unit, and the Software Option GNNRED for N+1 redundancy is purchased for the GN50.

Any Video from any Source to any Device

WISI Communications GmbH & Co. KG

Empfangs- und Verteiltechnik
Wilhelm-Sihn-Straße 5–7
75223 Niefern - Oeschelbronn, Germany

Inland: +49 72 33 66 -0, fax -320
Export: +49 72 33 66 -280, fax -350
E-mail: info@wisi.de