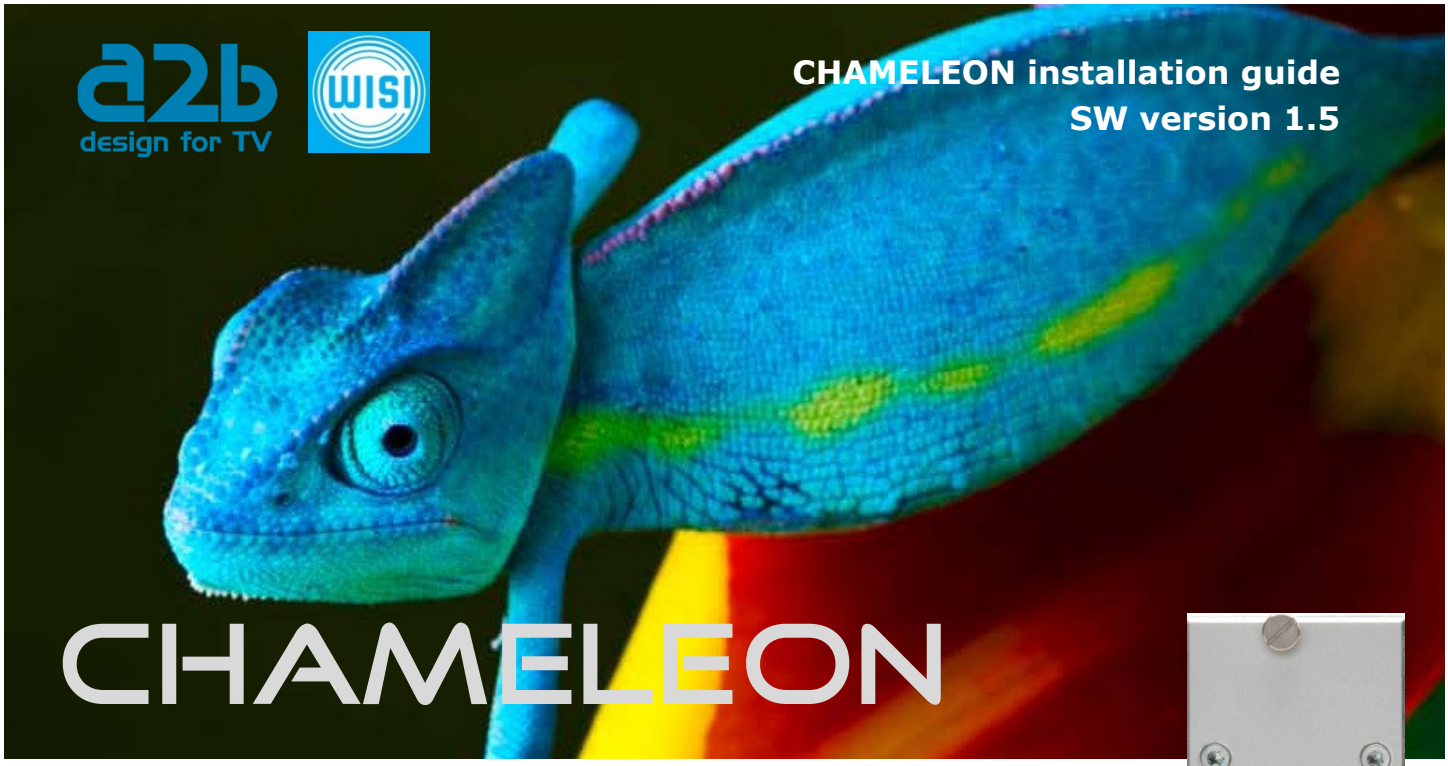


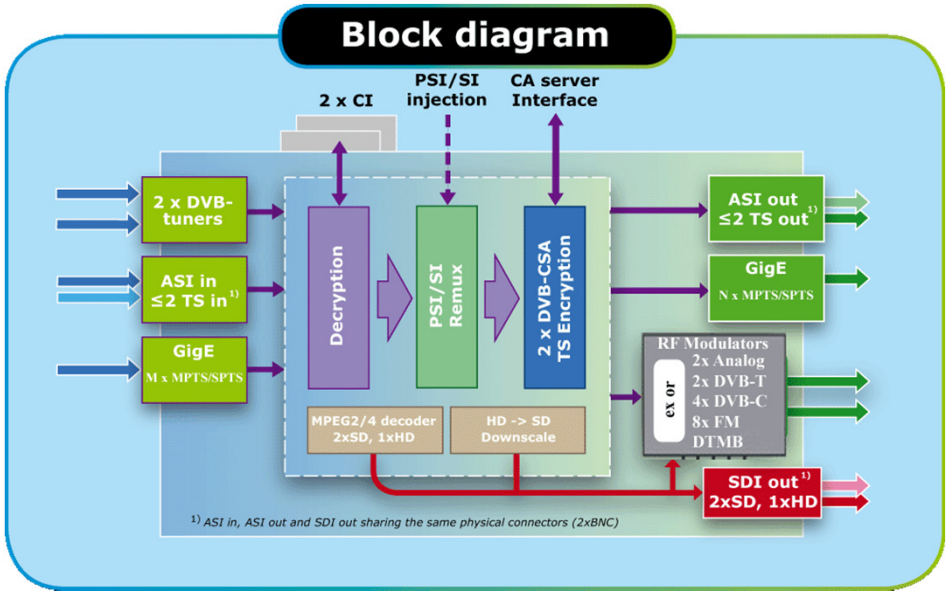
CHAMELEON - SINGLE HARDWARE PRODUCT LINE

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 and AAC HE audio decoding.

The SW options define the different "product realisations" you can implement with the unique HW. For your specific application, you simply buy the SW options you need. When you need further functionality, just purchase additional SW options, and update the installed HW.



CHAMELEON products range from receiver, to edge, to streamer and to scrambler.
Some examples:
Receiver DVB-S/S2/T(T2)/C
Transmodulators
DVB-C, DVB-T modulators
Analog VSB RF-modulators
FM modulator
Edge QAM/COFDM
MPEG2/4 SD/HD decoder
CI multi-decryptions
Remultiplexer multiple TS
DVB_CSA Scrambler
IP streamer
ASI streamer
SDI generator

CHAMELEON

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@chameleonconnect.tv
Telephone:
+46 141 22 91 15
+49 7233 66 621

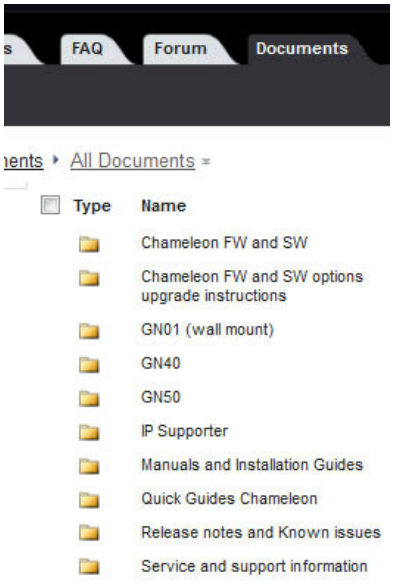
E-mails sent to the above e-mail address will be available to all support staff. The general (Swedish) support telephone number +46 141 22 91 15 will have staff answering both from Sweden and from Germany.

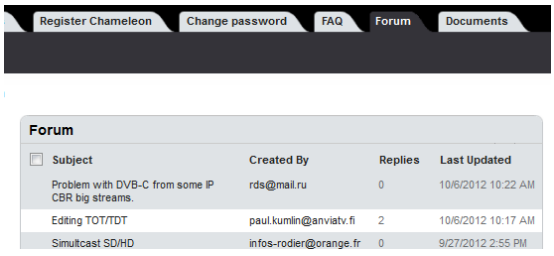
Chameleon installation guide

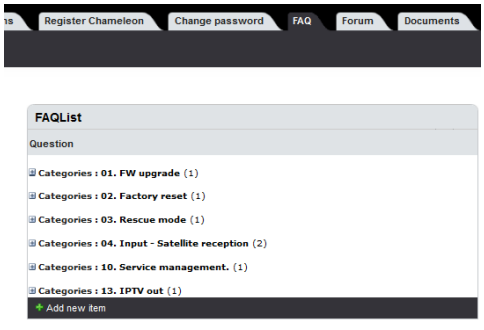
This installation guide is also available at the chameleonconnect.tv portal, under Documents/Chameleon/Installation guides.

Support information available at the chemeleonconnect.tv portal

At the chameleonconnect.tv portal, there is further information and support tools. Here you will find a Forum, a FAQ section and documentation such as Release Notes and Known Issues.





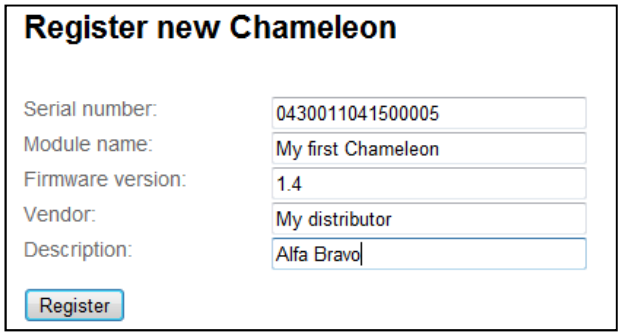


Content

1. Getting started page 4
2. General information and SW options page 5
3. The chameleonconnect.tv portal page 5
4. Registering the Chameleon & downloading SW options page 6
5. Upgrading the Chameleon FW & SW options page 7
6. Connecting to the Chameleon web GUI page 8
7. Select Operation mode page 9
8. Add and configure inputs page 10
8.1 Add ASI and IP inputs page 11
8.2 Add tuner inputs page 12
9. Add and configure outputs page 13
9.1 Add and configure analogue PAL/SECAM outputs page 14
9.2 Add and configure ASI, SDI and FM outputs page 17
9.3 Add and configure DVB-T and DVB-C outputs page 18
9.4 Add and configure IP (SPTS/MPTS) outputs page 19
10. Service selection and remultiplexing page 20
10.1 Adding and removing services to/from Outputs page 21
10.2 Decryption and Common Interface page 22
10.3 Remultiplexing and PSI/SI page 23
10.4 PIDs and PID management page 24
10.5 Outputs TS network settings page 25
10.6 HE system management and DVB Network PSI/SI page 26
10.7 Transmodulation and transparent outputs page 27
11. Encryption – DVB_CSA scrambling page 28
11.1 Add EMM Generator connections *page 29*
11.2 Add EMM connection to the output(s) *page 30*
11.3 Add ECM Generator connections *page 31*
11.4 Add ECM streams to the ECM Generator(s) *page 32*
11.5 Scrambling Control Groups & connect to ECM Streams *page 33*
11.6 Connect the service to be scrambled to an SCG *page 34*
12. Settings: Managing the Chameleon module page 35
12.1 Add and configure Network interfaces *page 36*
12.2 Date and time (NTP server access and Time sources) *page 37*
12.3 Scheduler – commands scripting *page 38*
12.4 SNMP *page 39*
12.5 User management – password protection *page 40*
12.6 Software and SW options (entitlement) upgrade *page 41*
12.7 Module maintenance *page 42*
12.7 Factory reset & Backup / Restore *page 43*
13. Status information page 44
14. SW options page 45

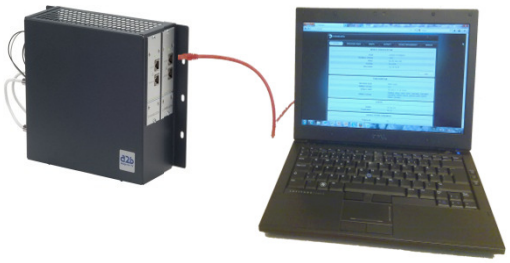
1. Getting started

1. Register your Chameleon at chameleonconnect.tv
After registration and uploading the entitlement file to the Chameleon, your purchased SW options are loaded, and a 30 days trial period for all SW options is initiated.



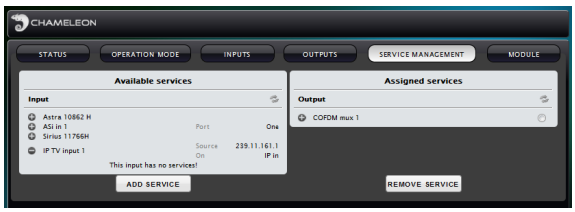
2. Assemble in base unit
Mount your Chameleon in the base unit, and connect the power supply.

3. 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.



4. 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.

5. Configure your Chameleon
Connect and configure inputs and outputs. Select services from your inputs to your outputs.



2. General information and SW options

Delivery without SW options – please register at the portal
The Chameleons are delivered without any SW 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 chameleonconnect.tv portal, see §3.

SW options and 30 days installation period with all SW options
After registering your Chameleon, and uploading the entitlement file to the Chameleon, you have access to the functionalities you have purchased, and a 30 days (uptime) trial period for all currently available SW options is initiated.

3. The chameleonconnect.tv portal

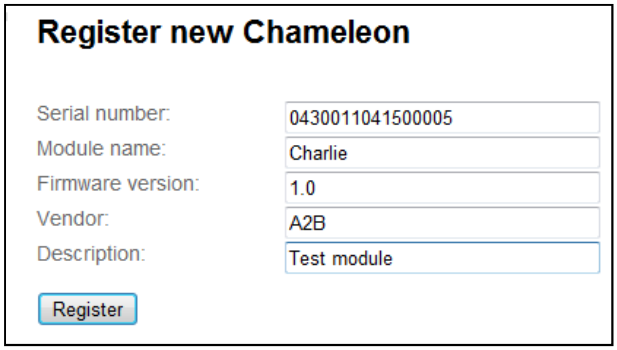
Portal URL: http://chameleonconnect.tv
Connect to the Chameleon portal using the URL: http://chameleonconnect.tv

Login to the chameleonconnect.tv
Enter your e-mail address and password, and click Login. If you have forgotten your password, click the Reset 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.

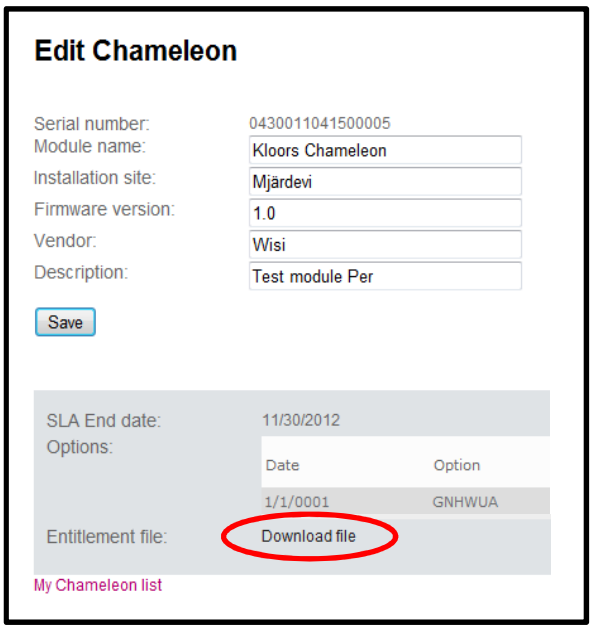
Requesting access to the chameleonconnect.tv portal
If you do not have a password for access to the portal, please click the Request access to Chameleon portal link.

4. Registering the Chameleon & downloading SW options

Registering Chameleons at the chameleonconnect.tv portal
After login, and clicking the **Register Chameleon** tab, enter the serial number of your Chameleon. Optionally, also enter Module name, Vendor, 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 SW options are entered automatically from the information stored in the Unit Data Base.
Click the **Register** button to register the Chameleon.

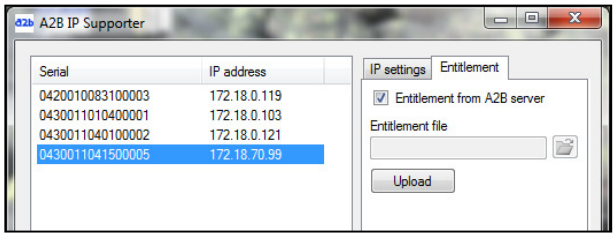


Downloading SW options (entitlement file) to your computer
Go to the tab **My Chameleons**, and click the serial number for the module to download SW options (entitlement file) for. In the Edit Chameleon view, click **Download file**. Save the file to your computer.



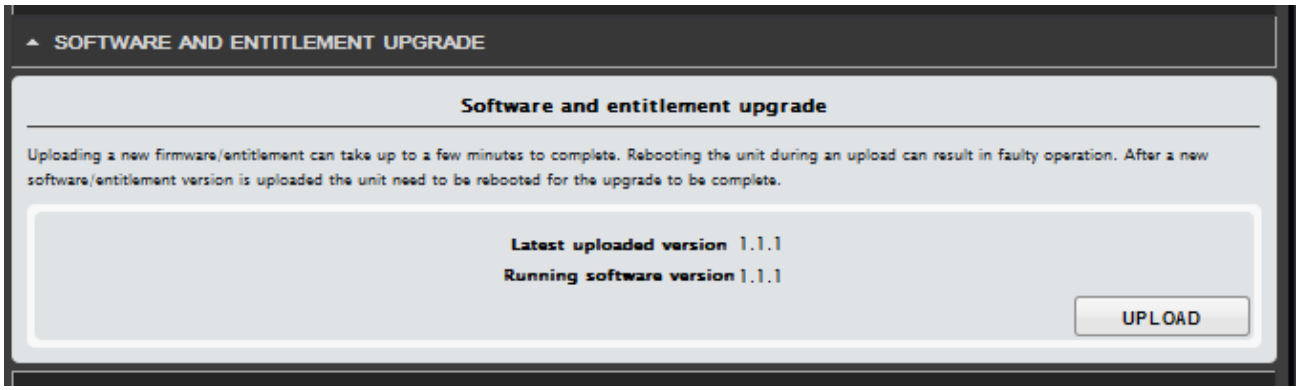
Uploading SW options (entitlement file) to your Chameleon
Via the Chameleon web UI
Under ***SETTINGS / SOFTWARE AND ENTITLEMENT UPGRADE***, browse for the entitlement file you previously downloaded to your computer. Click Upload, and reboot the module when the upload is ready.

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



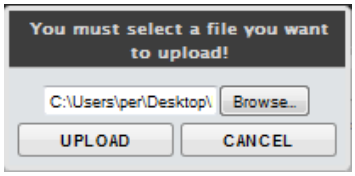
5. Upgrading the Chameleon FW & SW options

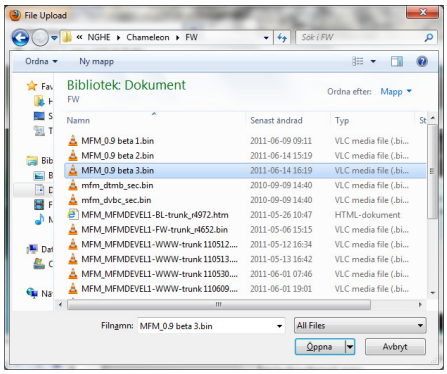
Both FW and SW options (entitlements) are uploaded via the ***SOFTWARE AND ENTITLEMENT UPGRADE*** in the ***SETTINGS*** tab.



Uploading firmware

1. Click on the UPLOAD button to browse for the firmware file to be uploaded from your PC
2. Locate the firmware file (.bin file) on your PC, 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





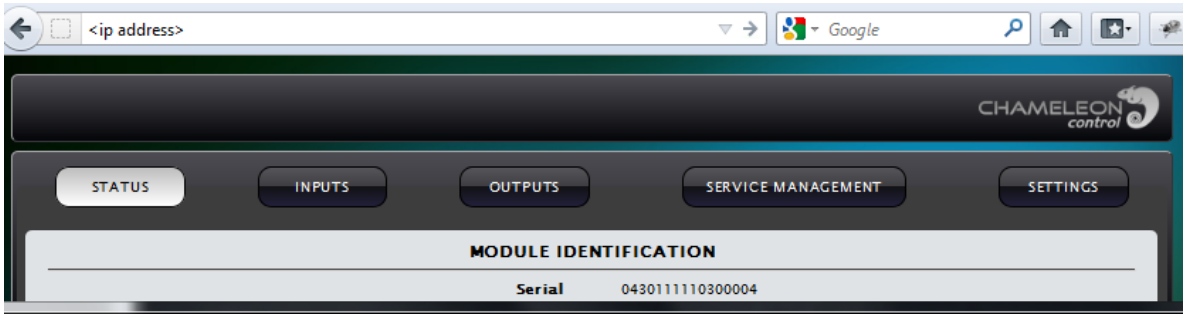
Uploading SW options (.ent file)

1. Click on the UPLOAD button to browse for the entitlement file to be uploaded from your PC
2. Locate the software file (<serial number>.ent) on your PC, 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

6. Connecting to the Chameleon web UI

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.



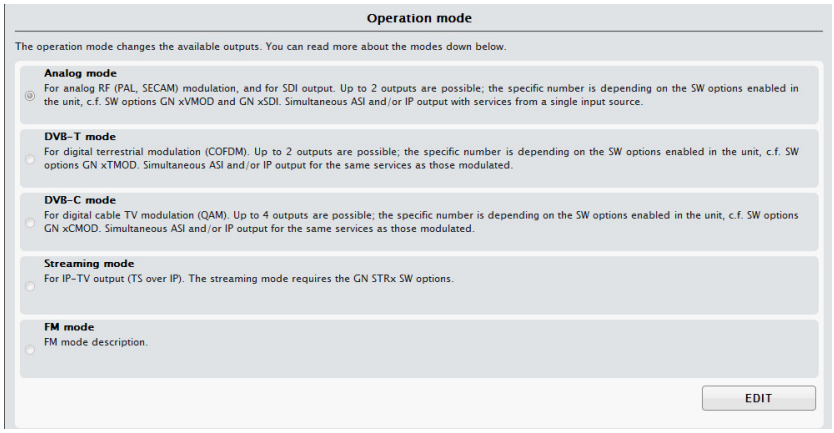
Supported web browsers
The Chameleon web interface is verified for Firefox version 14 and Internet Explorer 9. Other browsers might work, but the functionality cannot be guaranteed.

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 Edit, and selecting operation mode with the radio buttons. Click Save.

Operation modes:
Analogue mode; DVB-T mode; DVB-C mode; Streaming mode, FM mode



Mode selection implications
The selected operation mode will have an impact on the possible selection of output.
Analog mode: for 1 or 2 analog RF and/or SDI output.
***DVB-T mode*:** for 1 or 2 digital terrestrial modulation (COFDM).
DVB-C mode*:* for digital cable TV modulation (QAM), 1 to 4 DVB-C multiplexes.
***Streaming mode*:** for IP-TV output (TS over IP). Up to 20 IPTS out.
FM mode: for up to 8 analog FM outputs.

For all the different operation modes, your Chameleon module must also be equipped with the appropriate SW options, see more details in §13.

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. The different operation modes also have capability for simultaneous IPTS (SPTS and/or MPTS) inputs and outputs. The number of IPTS in different operation modes are given to the right.

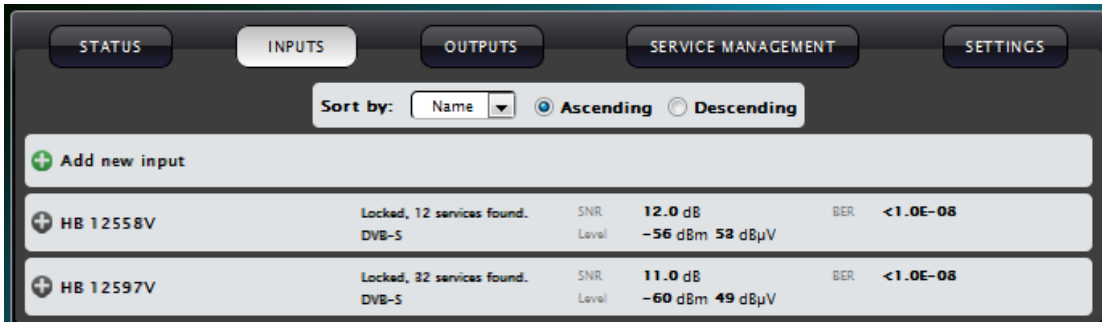
Number of IPTS*) in/out in different operation modes
Analog: 4 IPTS in / 4 IPTS out
FM: 8 IPTS in / 2 IPTS out
DVB-T: 20 IPTS in / 4 IPTS out
DVB-C: 20 IPTS in / 6 IPTS out
Streaming: 4 IPTS in / 20 IPTS out

*) *IPTS = SPTS and/or MPTS*

8. Add and configure inputs

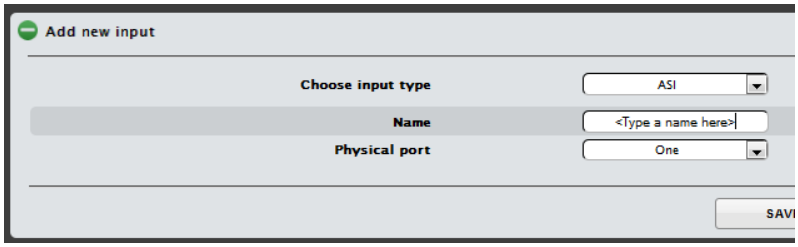
Go to INPUTS
Click on the ***INPUTS*** tab
Depending on the SW options you have for your Chameleon, you can configure inputs from:

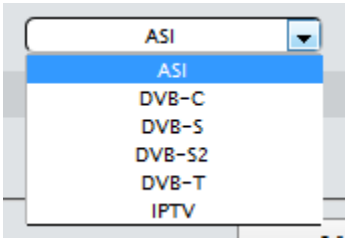
- Tuner (up to 2 tuner inputs)
- ASI (up to 2 ASI inputs)
- IP (up to 20 IPTS inputs, depending on Operation Mode)



Add an input

- Click on “Add new input” or the 
- Select input type in the **Choose input type** drop-down list (*ASI, DVB-C, DVB-S, DVB-S2, DVB-T, DVB-T2, IPTV. Selectable tuner inputs will depend on the tuner installed*).



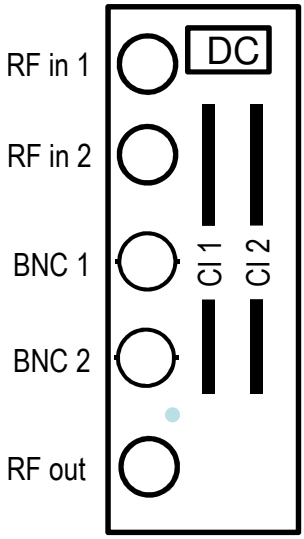


Configure the input
For each type of input, you will get configuration settings in the expanded view.

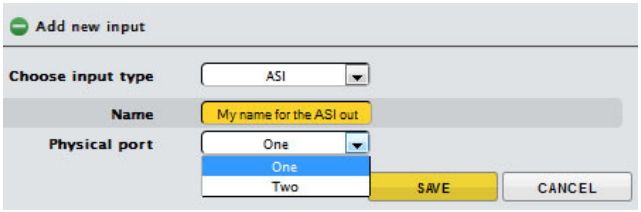
- Type a name for the input. This name will be shown in the overview of the inputs.
- Fill out the required information/parameters and click *SAVE.*

Input status
If your settings were OK, the status will show you services found and additional input type related data.

8.1 Add ASI and IP inputs



Adding ASI inputs
Go to ***INPUTS***, and click on "Add new input" or the
Select ASI in the drop down list for **Choose 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 SAVE
Note: ASI inputs automatically detects the incoming bit rate



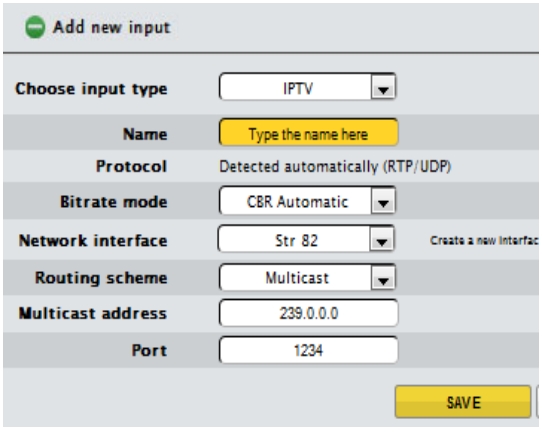
Add IP inputs
Go to ***INPUTS***, click "Add new input" or the
Select IPTV in the **Choose input type** list
Type a name for your new IPTV input
Select **Bitrate mode**

- CBR Automatic (auto-detects the incoming bit rate)
- CBR Manual (manual setting of bit rate in)
- VBR (only available in Analogue Operation mode)

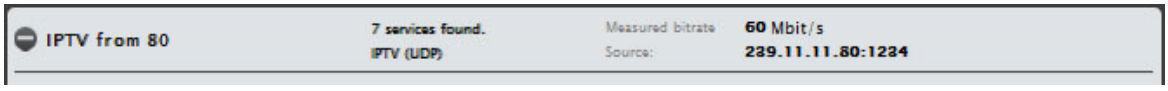
Select **Network interface**. If no network interface is available, you can use the link Create a new interface
Select **Routing scheme**, Multicast or Unicast

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

Click SAVE



Input status
If your settings were OK, the status will show you services found and additional input type related data.



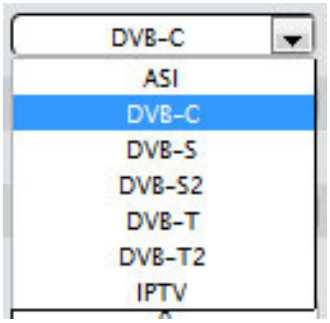
8.2 Add tuner inputs

Adding tuner inputs

Go to ***INPUTS***, and click on “Add new input” or the 

Select the tuner type in the **Choose input type** list

Note: The available tuner input types will depend on the SW options, and on your HW.



Type a name for your input

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 §8.1.

Fill out the required settings and click *SAVE.*

Note: Each input type has its own set of input settings. Below some examples.

Satellite input settings:

Choose input type	DVB-S
Name	Type input name
Physical port	Two
LNB type	Universal
Polarisation	Vertical
Voltage	Auto
22 kHz tone	Auto
FEC	Auto
Symbol rate (kBaud)	27500
Transponder frequency (MHz)	12558
DiSEqC type	None

Terrestrial input settings:

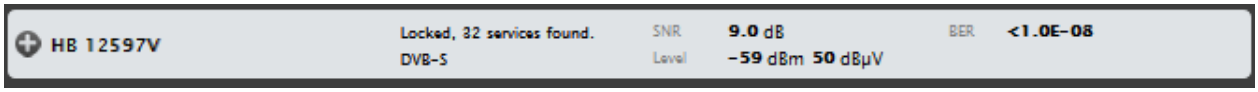
Choose input type	DVB-T
Name	Terrestrial input name
Physical port	Two
Bandwidth	8 MHz
Frequency (MHz)	E36
	594

Cable TV input settings:

Choose input type	DVB-C
Name	QAM input name
Physical port	Two
Symbol rate (kBaud/s)	6875
Frequency (MHz)	E52
	722
Constellation	Auto

Input status

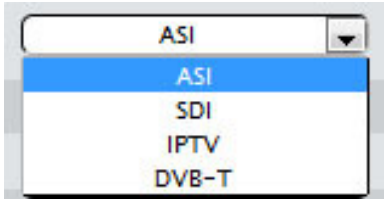
If your settings were OK, the status will show you services found and additional input type related data.



9. Add and configure outputs

Go to *OUTPUTS*

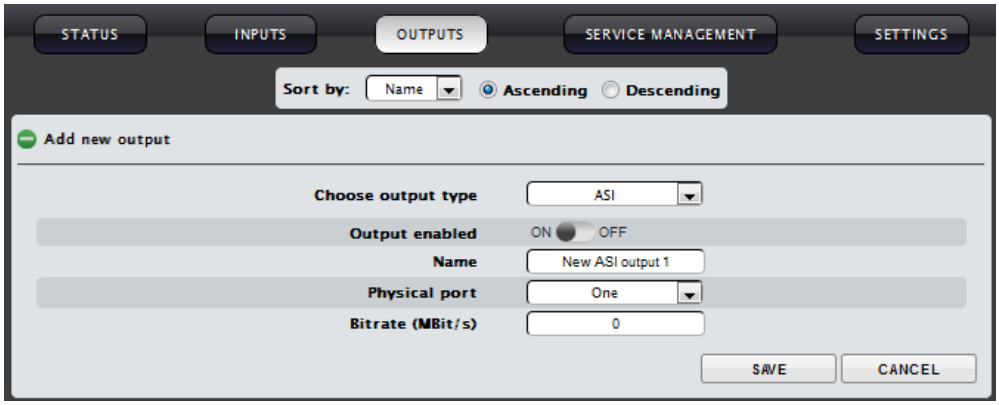
Depending on SW options, and on the Operation mode, you can configure up to:



- 2 Analogue RF out (PAL, SECAM)
- 8 analogue FM radio
- 2 SDI out
- 2 ASI out

Note: ASI in/out and SDI shares the 2 BNC ports. These ports are controlled by SW.

- 2 DVB-T out
- 4 DVB-C out
- 20 IPTS out



Add and configure an output

In the ***OUTPUTS*** tab, click **Add new output**.

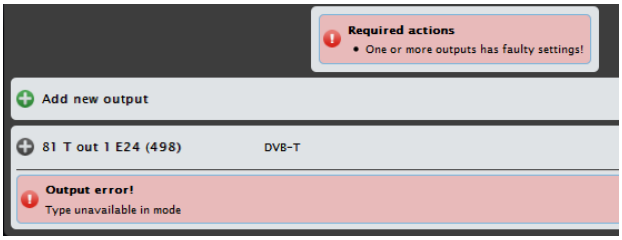
- Select output type (*ASI, SDI, IPTV, DVB-C, DVB-T, ANALOG, FM*) from the drop-down list.

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

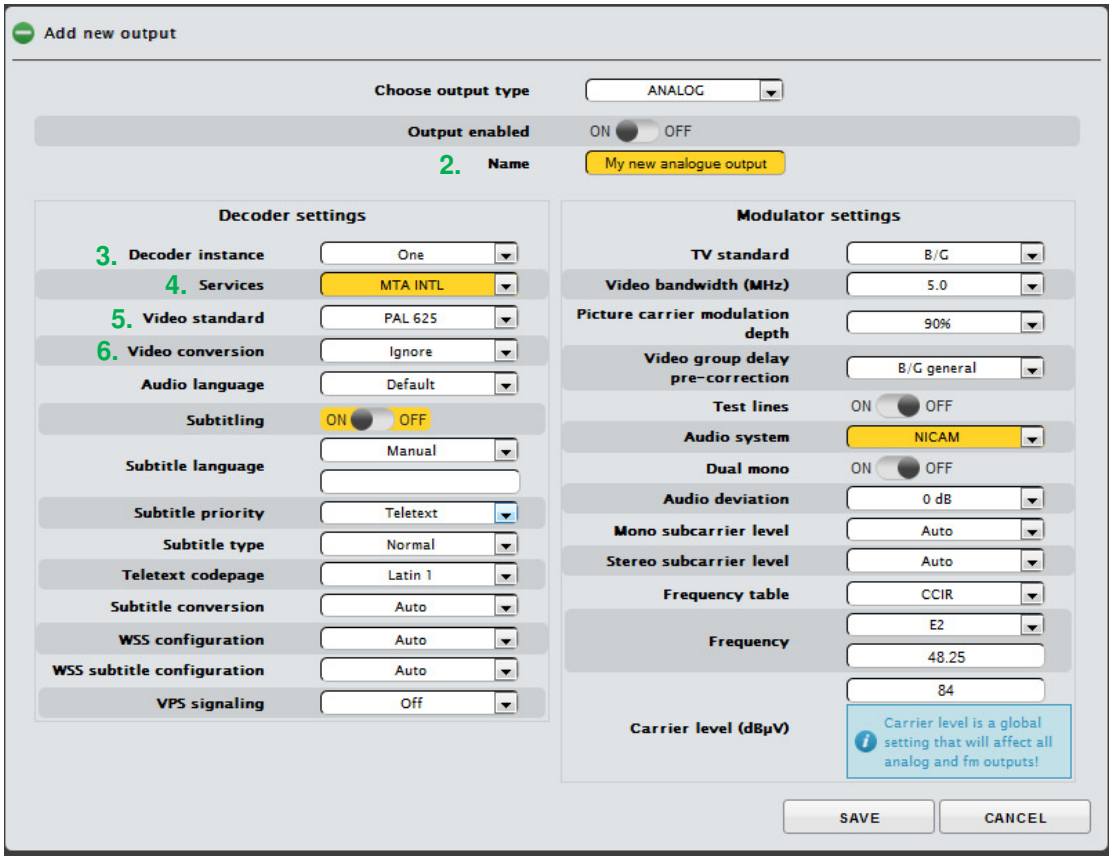
- Fill out the required information/parameters
- Click *SAVE*.

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 an error message displayed.

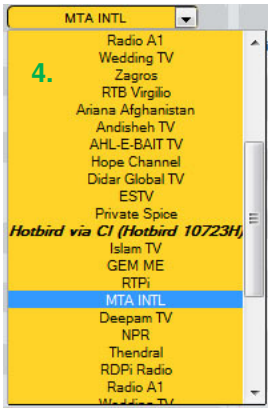


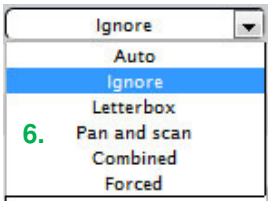
9.1 Add and configure analogue (PAL, SECAM) outputs

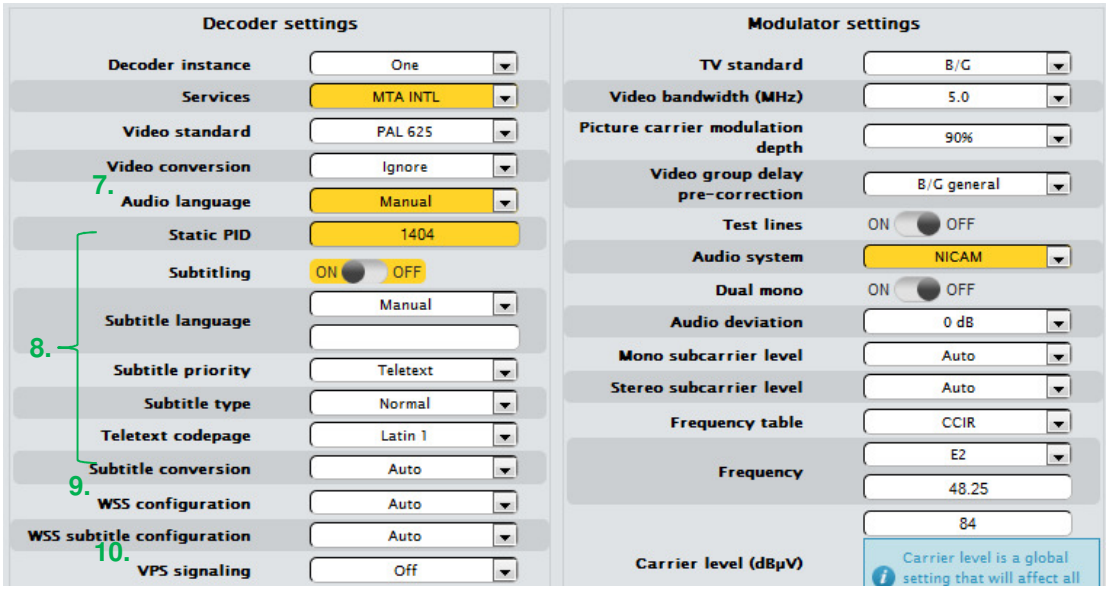


Adding analogue output and Decoder settings

0. Select Analog mode as Operation Mode, see also §7.
1. In the **OUTPUT**, select ANALOG in the **Choose output type** list
2. Type a name for the output
3. Select decoder instance
4. Select the service in the **Services** drop down list. Note: if the incoming service is encrypted, you have to select the input to the CAM in SETTINGS/COMMON INTERFACE, and select to descramble the service in the Service Management. In the **Services** drop down list, make sure to select the decrypted service.
5. Select PAL or SECAM video standard in the **Video standard** drop down list
6. Optional: select video conversion in the drop down list **Video Conversion**

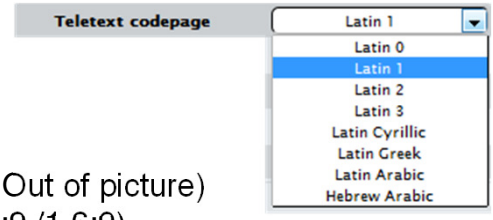






Decoder settings for analogue output (cont.)

7. Optional: Select audio language
8. If subtitling is used, select subtitling "ON", and set the subtitling parameters:
   Subtitling language
   Subtitling priority (DVB or Teletext)
   Subtitle type (Normal or Hearing impaired)
   Teletext codepage
   Subtitle conversion (None, Auto, 14:9, 16:9)
   WSS subtitle configuration (Auto, In picture, Out of picture)

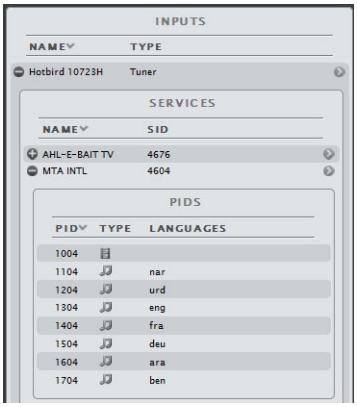


9. Set the WSS parameters (Auto, Off, Forced 4:3 / 14:9 /1 6:9)
10. Optional: for VPS signalling*), select the VPS signalling source (*From Teletext* or *from EIT*), and enter the CNI code.

Language selection for audio language and subtitling

For audio language, you can use default language, select the language from the drop down list, or manually enter the 3 letter language code according to ISO 639-2. When you use the manual settings, you can find the PID number in the Service Management, on the input side, when expanding to service level.

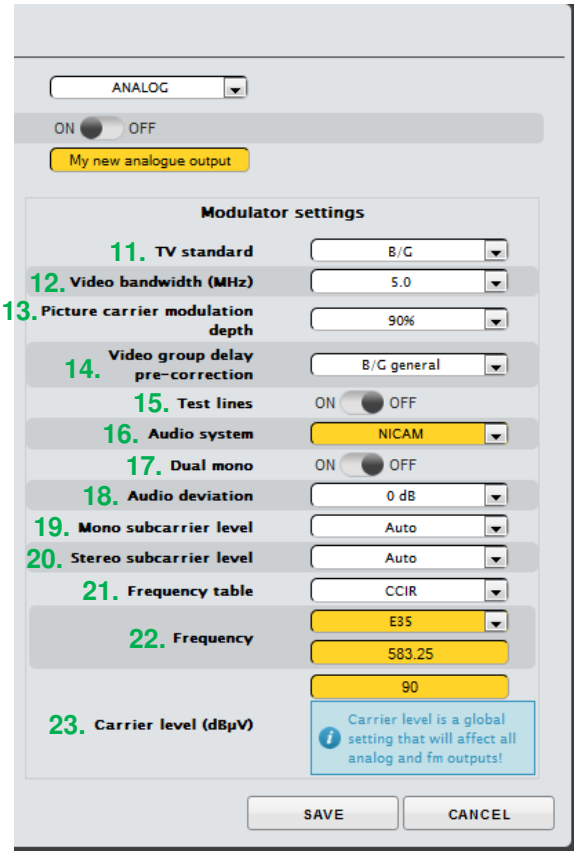
For subtitle language, you can select language from the drop down list, or enter the ISO 639-2 code.



*)*VPS (Video Programming System) is used on terrestrial channels in some European countries (e.g. Czech Republic, Germany) and also on some of the channels on the Astra satellites.*

Modulator settings for analogue output

11. Select the TV standard (B/G, B/H, D/K, I, L, M/N)
12. Select the Video bandwidth (4.2, 5.0, 6.0)
13. Set the Picture carrier modulation depth (from 80% to 90%)
14. Set the Video group delay pre-correction (None, BG general, D/K GOST 20532-75, M FCC)
15. Chose to enable or disable test lines (Test lines ON or OFF)
16. Select audio system (NICAM, A2, A2*, Mono)
17. Use the sliding button for setting of Dual mono ON/OFF
18. Set the Audio deviation (-6dB to 6dB in 1 dB steps)
19. Set the Mono subcarrier level (Auto, Off, -10dBc to -30dBc in 1 dB steps)
20. Set the Stereo subcarrier level (Auto, Off, -10dBc to -30dBc in 1 dB steps)
21. Select frequency table (CCIR, OIRT)
22. Enter the output frequency, as a channel frequency name, or manually in MHz
23. Set output carrier level
24. Click SAVE



Note: many of the settings can be left with the default settings for most applications.

Dual mono output

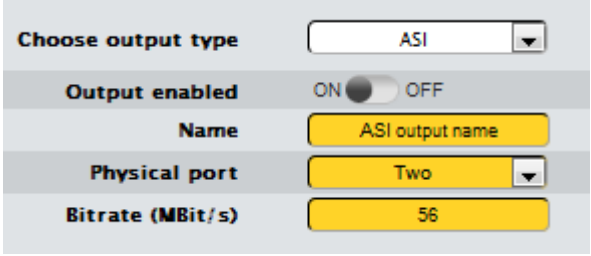
It is possible to set up one analogue output with dual mono sound (different languages in left/right audio channel).

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

9.2 Add and configure ASI, SDI, and FM outputs

Add ASI outputs

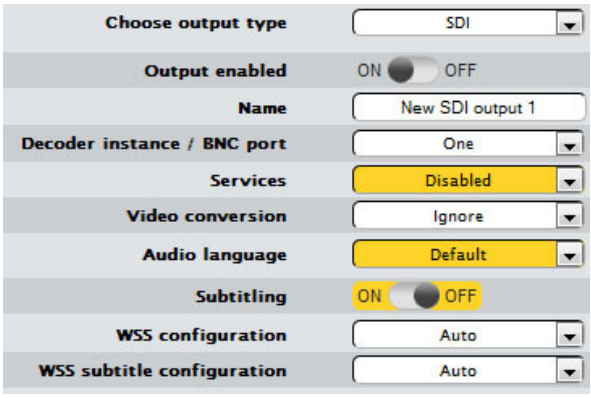
1. In the **OUTPUT**, select ASI in the drop down list for **Choose output type**
2. Enter name, physical port and bitrate
3. Click SAVE

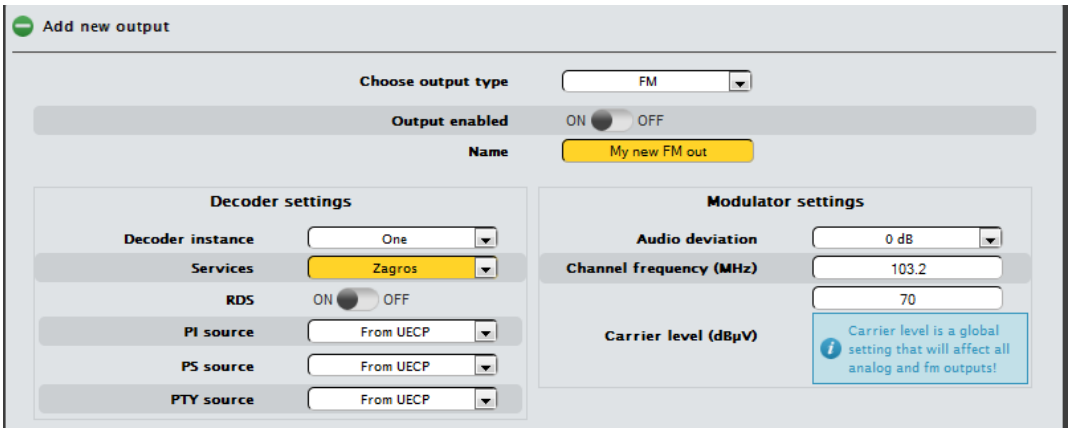


Add and configure SDI outputs

0. Select Analog Operation Mode
1. In the **OUTPUT**, select SDI in the **Choose output type** list
2. Select the service in the **Services** drop down list
3. Set the audio language and subtitle settings
4. Set the WSS configurations
5. Click SAVE

See also §9.1 for more information about these settings.





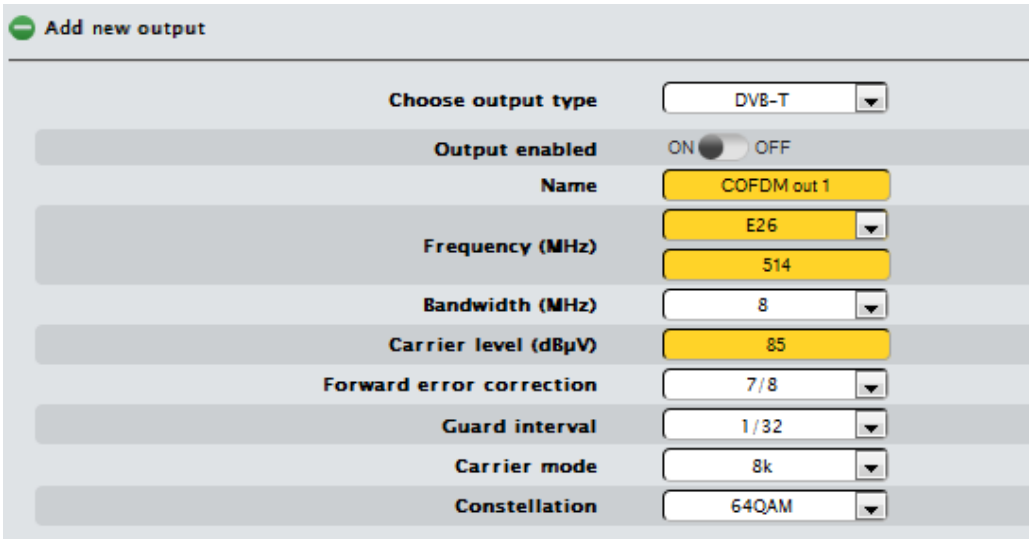
Add FM radio outputs

0. Select FM mode as Operation Mode
1. In the **OUTPUT**, select FM in the drop down list for **Choose output type**
2. Select the service in the **Services** drop down list
3. Enter output frequency and output level
4. Optional: for RDS signalling, select the PI, PS and PTY sources, and enter the values if using manual settings.

9.3 Add and configure DVB-T and DVB-C outputs

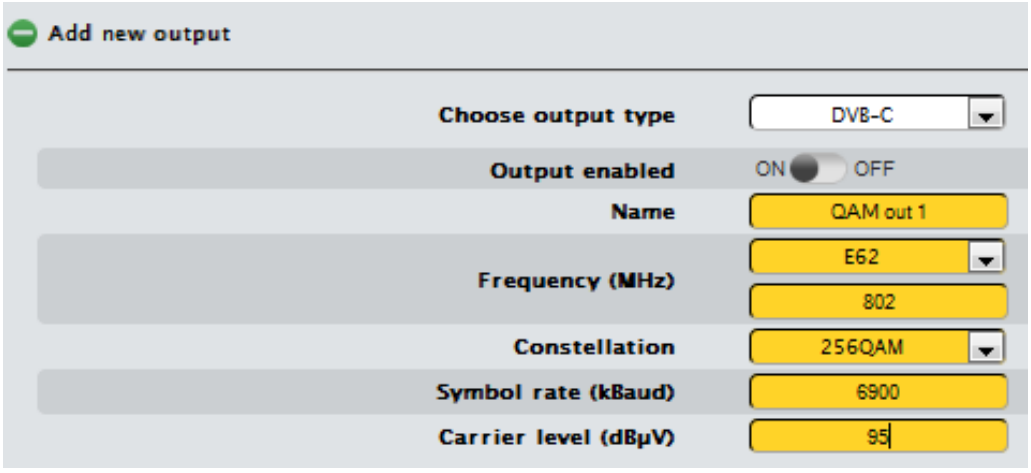
Add DVB-T outputs

1. In the **OUTPUT**, select DVB-T in the drop down list for **Choose output type**
2. Enter the required parameters and settings.
3. Click SAVE



Add DVB-C outputs

1. In the **OUTPUT**, select DVB-C in the drop down list for **Choose output type**
2. Enter the required parameters and settings.
3. Click SAVE



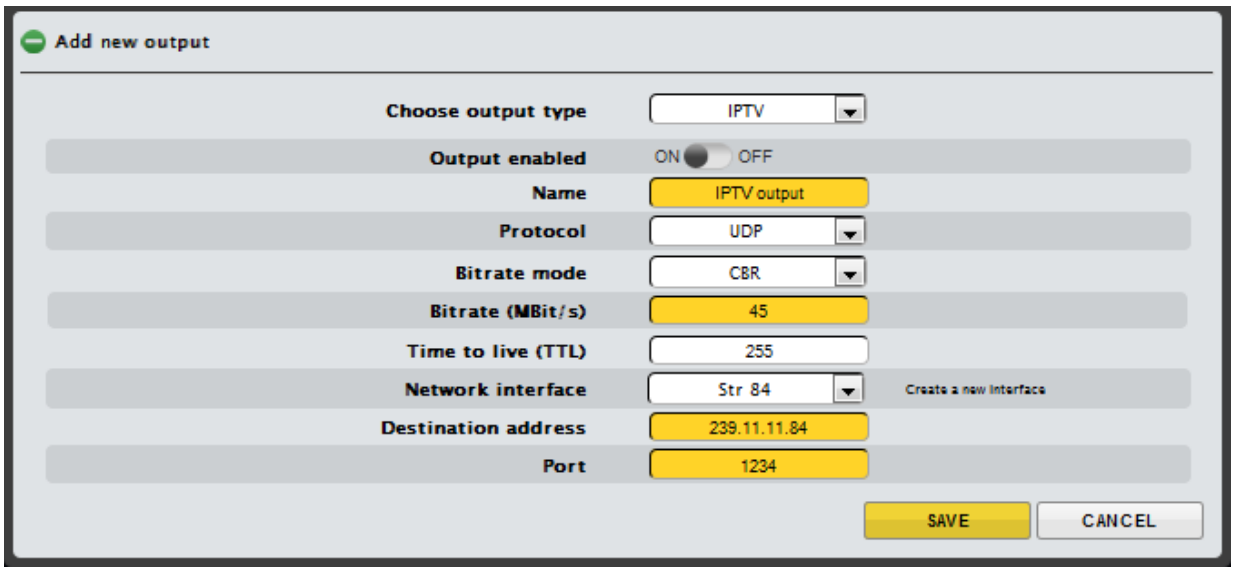
9.4 Add and configure IP (SPTS/MPTS) outputs

Configure a network interface for streaming (see also §11.1)

1. Go to NETWORKING in the ***SETTINGS*** tab, and click Add new 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 SAVE

Add IPTV outputs

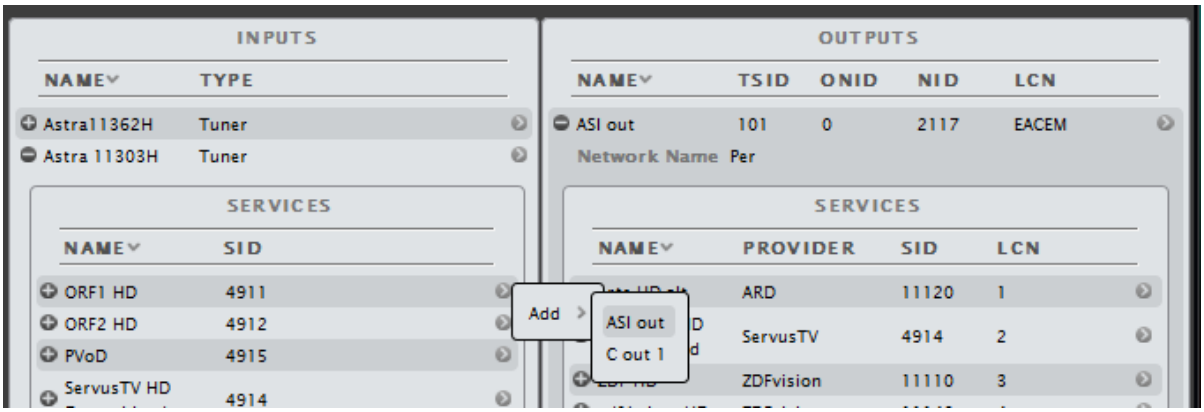
1. In the **OUTPUT**, select IPTV in the drop down list for **Choose output type**
2. Enter the required parameters and settings.
3. Click SAVE.



10. Service selection and remultiplexing

Service management functionality and pre-requisites
The SERVICE MANAGEMENT tab is the main view for handling remultiplexing, service selection, decryption, encryption and PID management. Before starting with the Service management, the inputs and outputs must be defined, see §8 and §9.

Inputs, Outputs, and their available/assigned services
The left part of the SERVICE MANAGEMENT view shows the Inputs with their available services. The right part shows Outputs with the names you have typed while configuring the output. By default, Output have no assigned services, no services has been added.
To see the services in the inputs or in the outputs, expand the input (or output) by clicking the heading plus sign .
The PIDs of each input service can be shown by clicking the to expand the service.



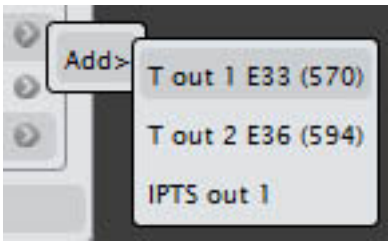
Structure of the available/assigned services under INPUTS and OUTPUTS
Input: Each **Input/service** has 3 (or 4 for a CI module input) columns; **Name** (service names), **SID** (service id), and an “edit arrow” for adding to output or decryption. Decryption (descrambling) is explained in §10.2.
Assigning services from the inputs to the outputs is done by clicking the , and selecting the output to add the service to in the appearing pop-up boxes, details in §10.1

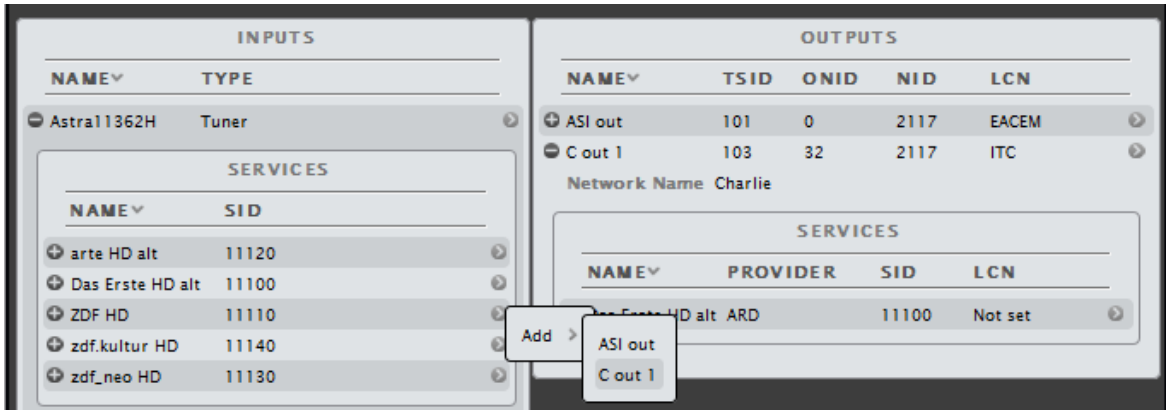
Output: Each **Output** has 6 columns; **Name** (mux names), **TSID** (transport stream id), **ONID** (Original Network id), **NID** (Network id), **LCN** (LCN type) and the “edit arrow” .
Each **Output/service** has 5 columns; **Name** (service name), **Provider** (service provider name), **SID** (service id), **LCN** (service LCN number)) and the “edit arrow” .

10.1 Adding and removing services to/from Outputs

Adding services to the outputs

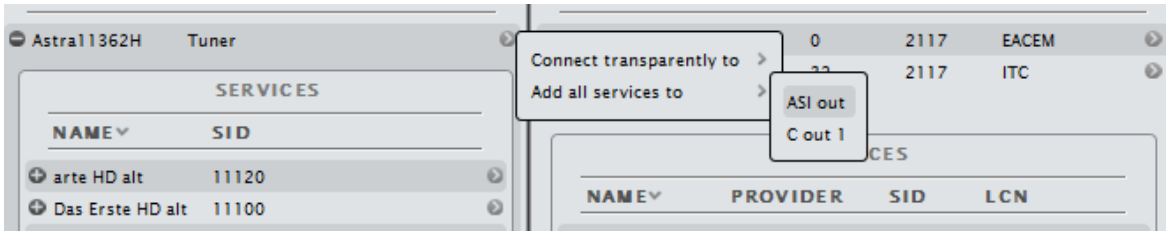
1. Click the edit arrow tailing an input service. When you click the arrow, an “Add” pop-up will appear.
2. Move the mouse pointer to the Add pop-up.
3. Select the **Output** to which you would like to add the service.





Adding all services to the outputs

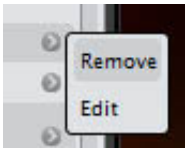
1. Click the edit arrow tailing an input. When you click the arrow, an pop-up will appear with “Connect transparently to” and “Add all services to”.
2. Select “Add all services to”, and select the **Output** to add services to.



Removing services from the outputs

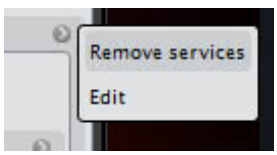
Removing a single service from an output

1. Click the edit arrow of an output service.
2. Click “Remove” in the pop-up window.

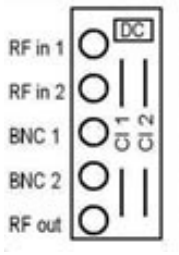


Removing all services from an output

1. Click the edit arrow of an output.
2. Click “Remove services” in the pop-up window.



10.2 Decryption and Common Interface



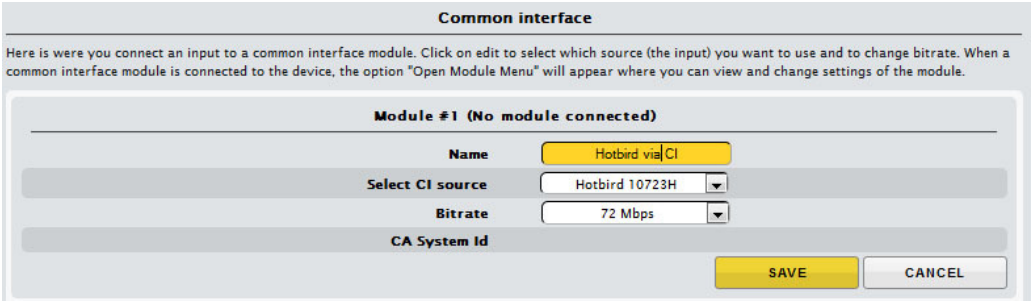
Insert the CAM and smart card in the CI slot

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.

NOTE! Make sure that CAM is inserted with text side to the right

Select CI source

Go to the ***SETTINGS*** top tab, and click **COMMON INTERFACE**. The name as it will appear in the Service Management can be edited. In the drop-down list of Select CI source, select the input source for 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.

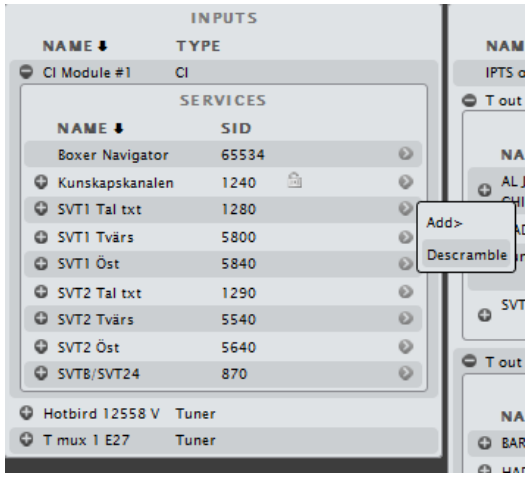


Select the services to be decrypted

After having selected the CI source, a new “input” with the name you have entered will be displayed in the Service Management Inputs menu. Click the edit arrow of the service you want to decrypt, and select “descramble”.

The descrambled services are indicated by an open padlock.

To output a decrypted service, select the decrypted service from the CI input to an output (see §10.1)



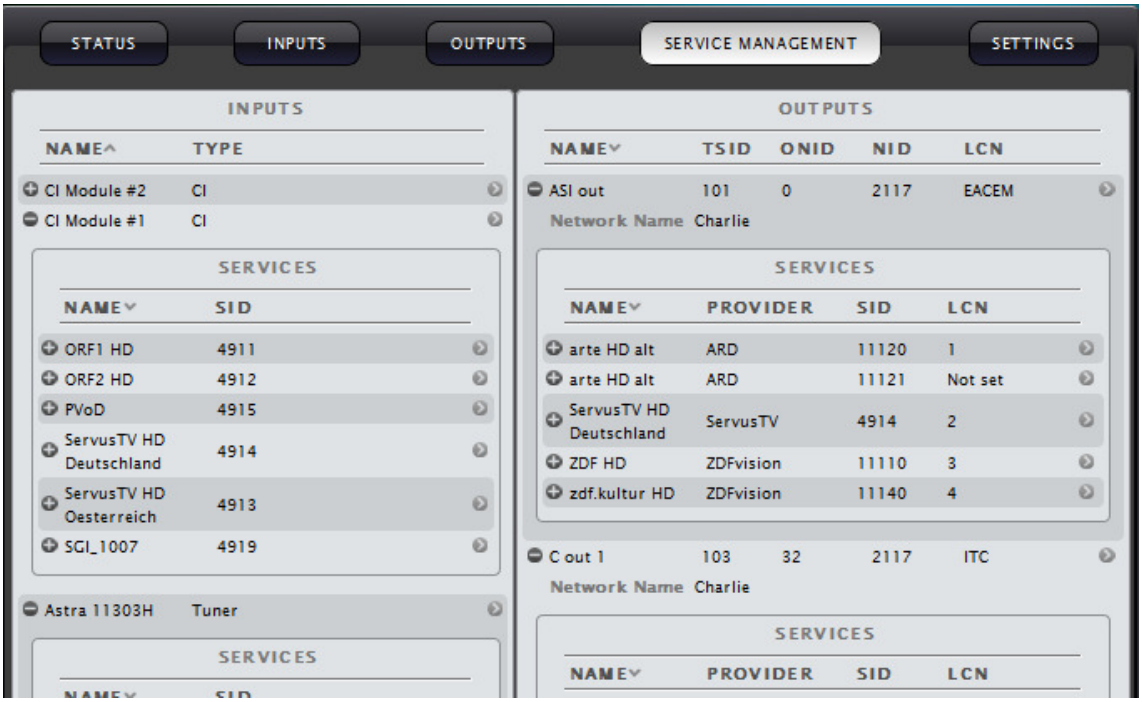
Notes: Decryption in analog mode

In Analog mode you have to use the SERVICE MANAGEMENT for handling the decryption. The analog output service selection is made in the output menu, and when a CI source has been set, the list of available services for analogue output will include the services routed via the CAM.

10.3 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 of the outputs are automatically generated as services are assigned to the outputs. Selecting services from a single input, or selecting services from several inputs both result in the updating of the PSI/SI tables of the outputs.

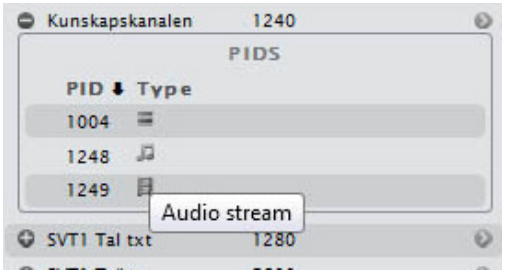


DVB-Network PSI/SI management
To create a DVB-network-wide correct PSI/SI structure, all Chameleons in the same DVB network must be able to share PSI/SI information. The interconnection between the Chameleons is enabled by the HEADEND SYSTEM MANAGEMENT functionality, see §10.6.
Further, the GNSYMUX SW option must be active to allow the interchange.

10.4 PIDs and PID management

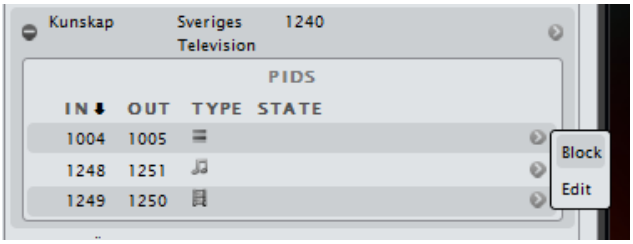
PIDs, PID listing and PID types

The PIDs of an input or output service can be displayed by clicking the ⊕. PID or stream types are indicated with icons, and the PID type is displayed in a pop-up if the mouse pointer is left over the icon.



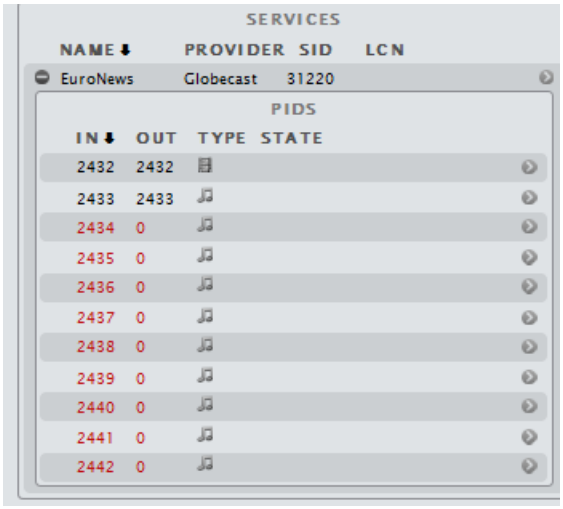
In the example to the right, the service “Kunskapskanalen”, with service_id 1240 contains 3 PIDs: PID 1004 (Subtitle stream), PID 1248 (Audio stream) and PID 1249 (Video stream).

For outputs, the incoming as well as the outgoing PID number is listed in the columns IN and OUT. Often the outgoing PID number is the same as the incoming PID number, but if the PID number already exist 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.



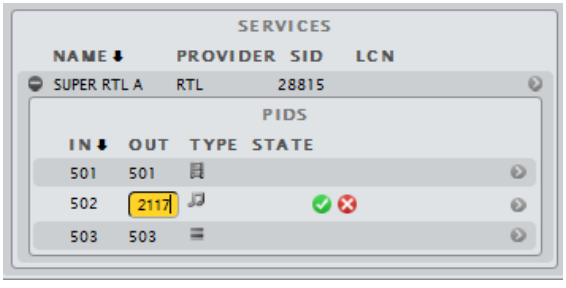
PID dropping (blocking)

The PIDs in the outputs can be blocked (PID dropping) by clicking the edit arrow ◉ and selecting “Block”. A blocked PID is marked with red text, and the PID number becomes 0. In the example to the right, all audio PIDs except PID 2433 is blocked, and in the output there will only be one audio stream.



PID editing (remapping)

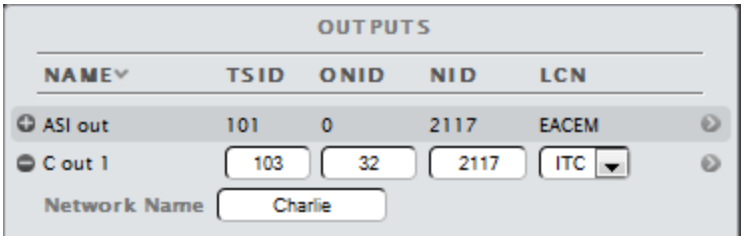
Clicking the edit arrow ◉ of an output service, and selecting Edit, allows you to manually set the PID number for the outgoing PID. Click the green confirm button ✔ to save the changes.



10.5 Outputs TS network settings

TSID, ONID, NID, LCN type and Network Name

Each outgoing 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. These identifiers are listed for all outputs. All identifiers can be edited by clicking the edit arrow .



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 has been transferred to another delivery system than the delivery system where it originated.

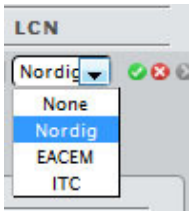
Network Name

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

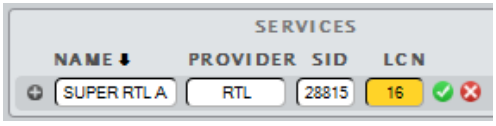
LCN type

The LCN type specifies which LCN implementation to use. For a DVB-Network, the LCN type should be the same for all outgoing muxes. Available LCN types are Nordig, EACEM and ITC (Independent Television).



LCN number

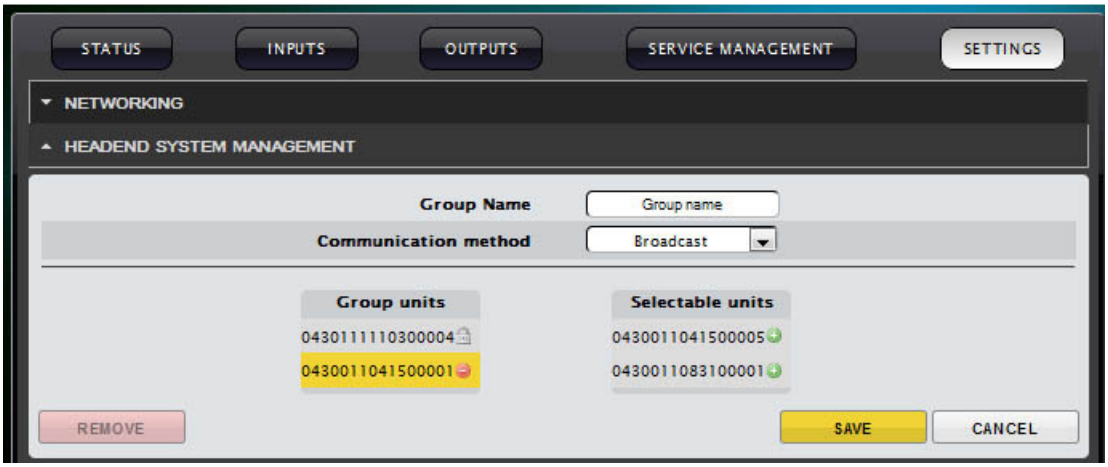
The LCN number, which will be used by a receiver to make a channel list, is edited for each service in each outgoing mux. For correct functionality, the LCN number must be unique for each service within a DVB network.



10.6 HE system management and DVB Network PSI/SI

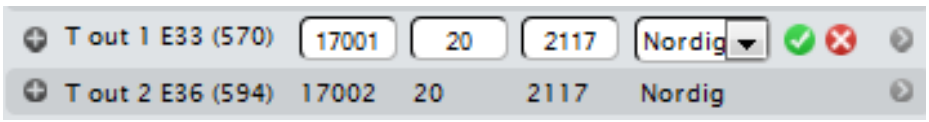
For creation of a network-wide correct PSI/SI structure in a DVB Network, information about PSI/SI has to be shared between the Chameleon modules in the same network. The basis for such a sharing is that the Chameleons are connected via a switch, and that a communication is set up between the Chameleons.

Headend system management
Under SETTINGS, in the HEADEND SYSTEM MANAGEMENT menu, you can select Chameleons in the same IP network to be members in the same group.



When clicking EDIT, all Chameleon in the IP network will be listed by their serial number. To add a Chameleon to a DVB network, click the green ⊕ in the list of Selectable units. 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 select 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 §10.5.

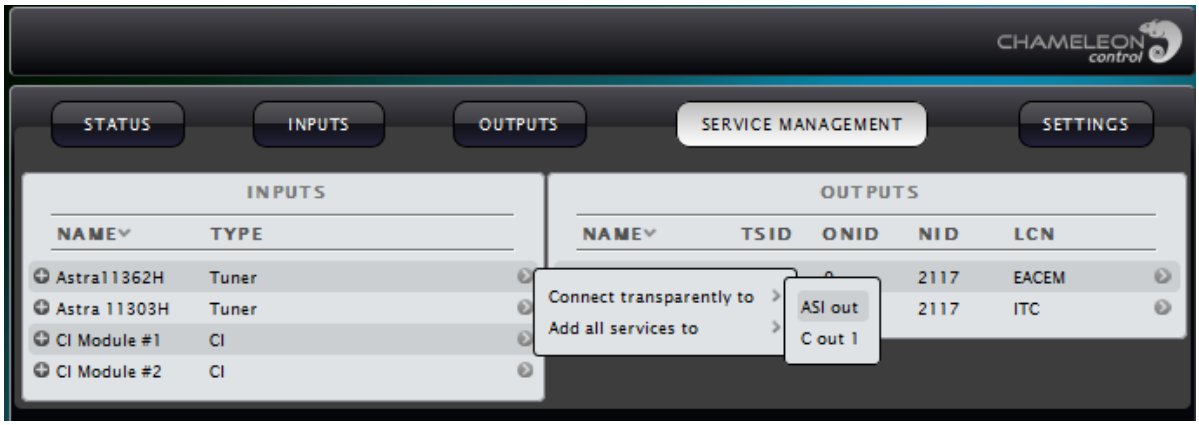


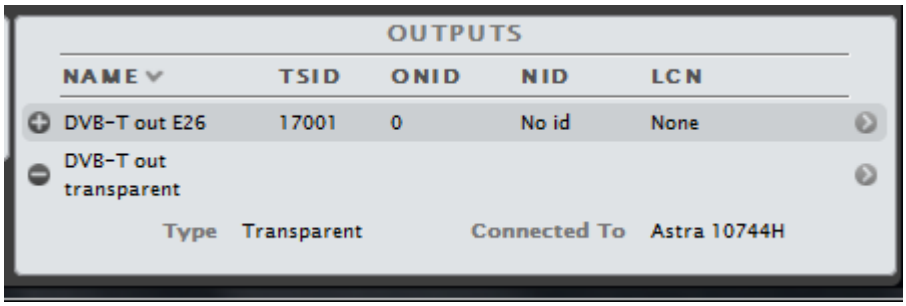
10.7 Transmodulation and transparent outputs

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, 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

The transparent/transmodulation mode can be used e.g. when a complete MPTS for QAM modulation is created for a transport via IP to another Headend.



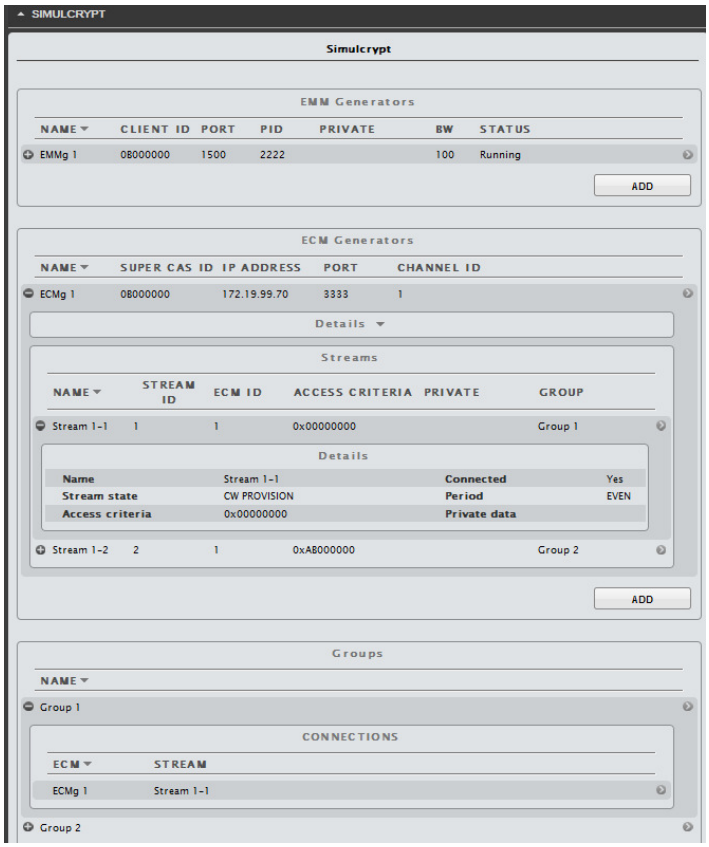


11. Encryption - DVB_CSA scrambling and SimulCrypt

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.

Setting up encryption in Chameleon includes the following steps:
- Create your outputs, and add the services you want to have in your outputs
- (Set up your CAS for EMM and ECM generation)
- Add EMM Generator connections to the Chameleon SimulCrypt interface
- Add EMM connection to the output(s)
- Add ECM Generator(s) to the Chameleon SimulCrypt interface
- Add “ECM streams” to the ECM Generator(s)
- Create Scrambling Control Groups (SCG) and connect SCG to ECM Streams
- Connect the service(s) to be scrambled to an Scrambling Control Group (SCG)

Notes
- In the FW version 1.5, you can encrypt DVB-C, DVB-T and ASI outputs.
- The maximum number of PIDs that can be encrypted is 64 PIDs per output
- The maximum number of encryption keys is 64.
- Each SCG (see §11.5) can only be connected to one output. Create separate SCGs for each output.

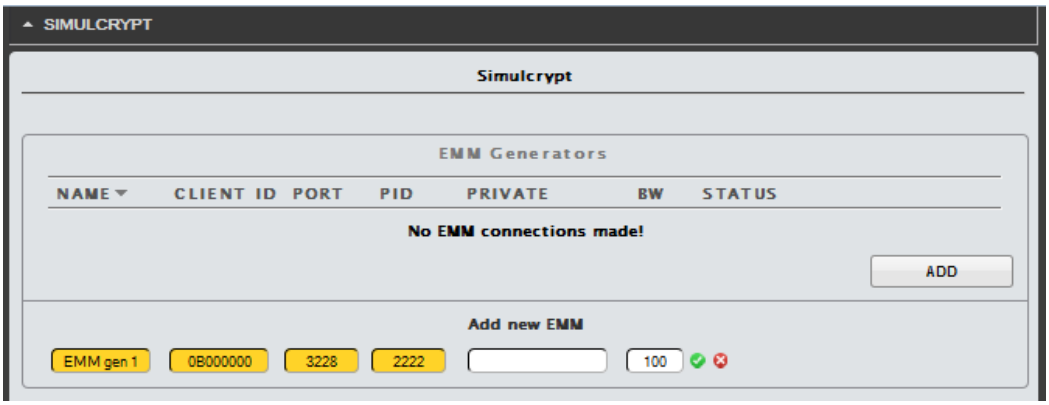


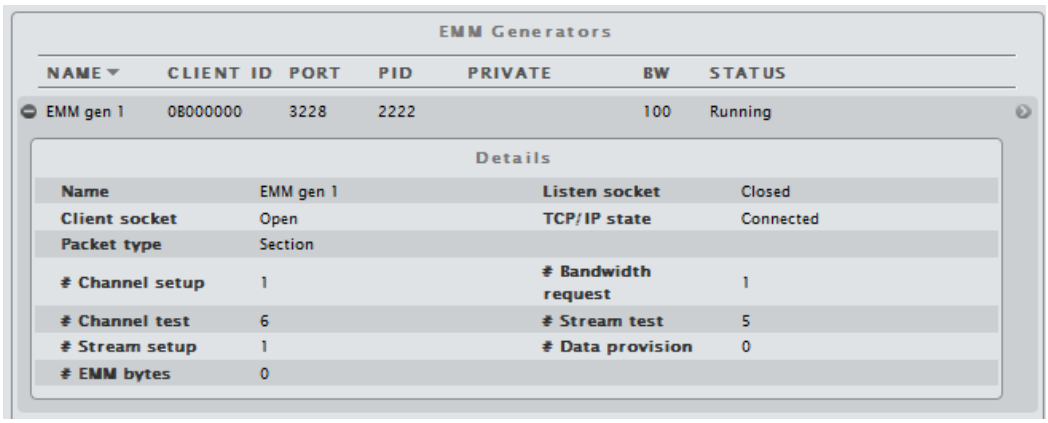
11.1 Add EMM Generator connections

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 management IP address of the Chameleon or the IP address of the streaming port of the Chameleon.

Adding an EMM Generator connection
In the SimulCrypt menu under SETTINGS, click ADD in the EMM Generators box.

1. Enter a name for the EMM generator connection
2. Enter the Client ID and port *(info from CAS supplier)*
3. If required, enter Private Data *(info from CAS supplier)*
4. Enter the maximum EMM bandwidth (BW) (kbit/s)
5. Click the green confirmation symbol , or press enter

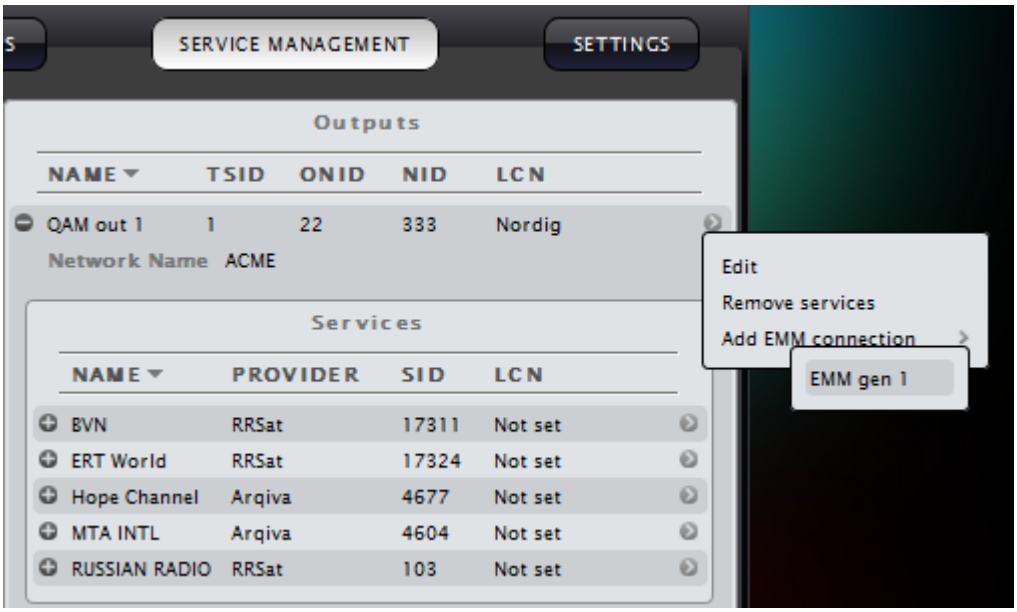


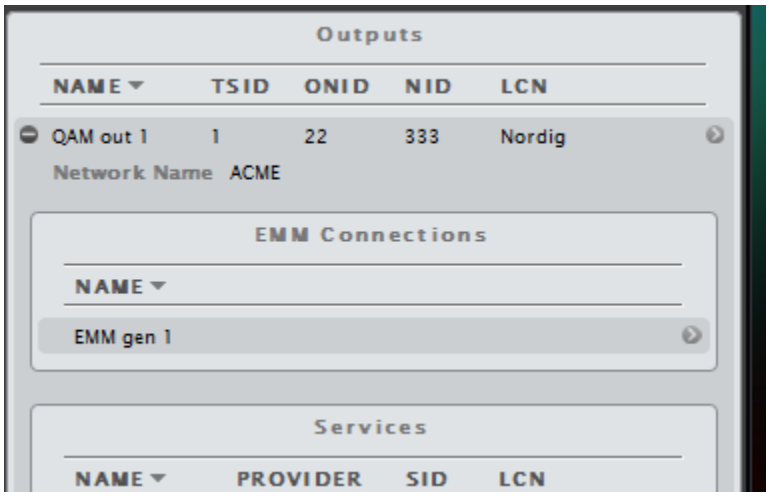


Adding another EMM Generator connection
Repeat the steps above.

11.2 Add EMM connection to the output(s)

Connecting an EMM Generator to an output
In SERVICE MANAGEMENT, for an output, click the grey arrow to the right of an output.
In the pop-up menu, select “Add EMM connection”
Select the EMM generator you want to use for this output.



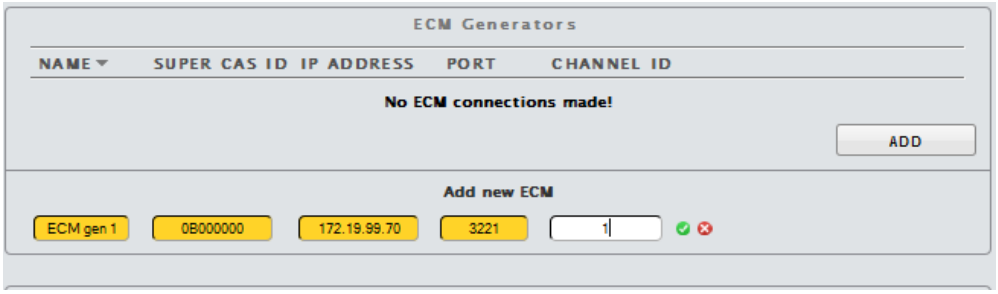


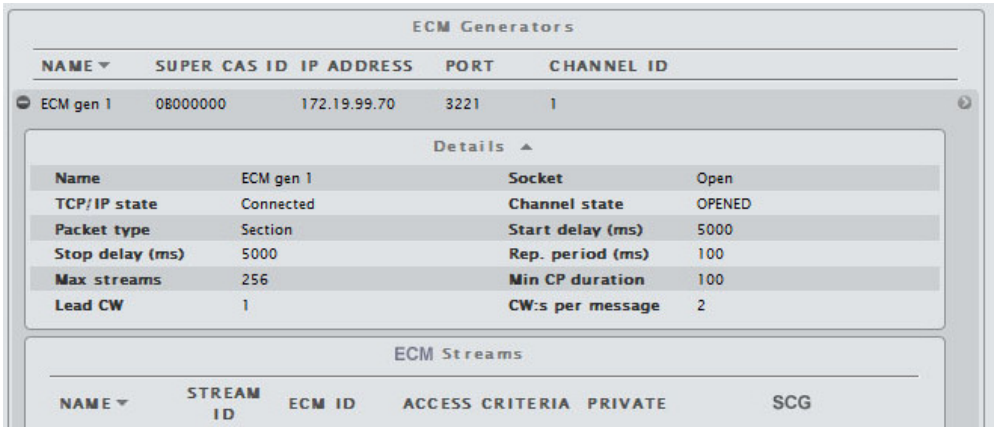
11.3 Add ECM Generator connections

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 in the ECM Generators box.

1. Enter a name for the ECM generator connection
2. Enter the Super CAS ID *(info from CAS supplier)*
3. Enter the IP address of the CA Server *(info from CAS supplier)*
4. Enter the ECM port *(info from CAS supplier)*
5. Enter the Channel ID
6. Click the green confirmation symbol , or press enter



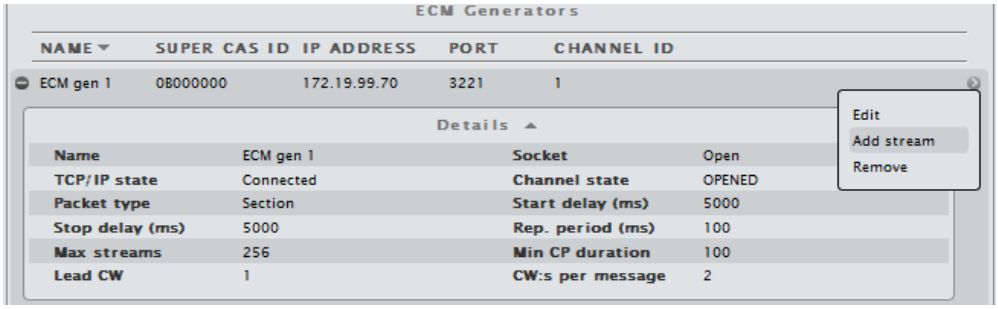


Adding another ECM Generator connection
Repeat the steps above.

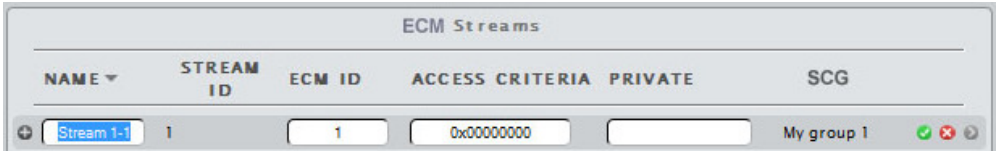
11.4 Add ECM streams to the ECM Generator(s)

The concept of “ECM streams” is used to enable connection of the ECM generators to the Scrambling Control Groups (SCG), and this is where you enter the access criteria giving smart cards rights to descramble services.

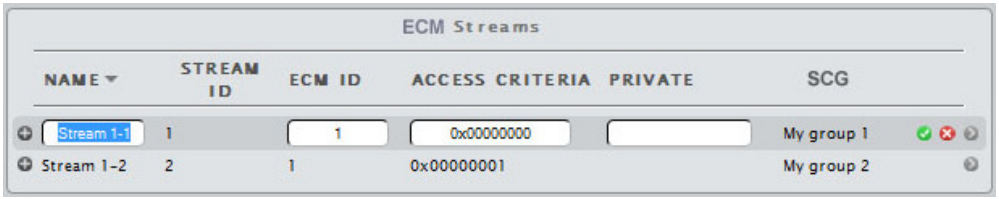
Adding an ECM stream to the ECM Generator
In the SimulCrypt menu under SETTINGS, click the grey arrow to the right of an ECM generator. Select “Add stream”.



1. Enter a name for the ECM stream
2. Enter the STREAM ID and ECM ID *(local identifiers)*
3. Enter the access criteria *(info from CAS supplier)*
4. If required, enter Private Data *(info from CAS supplier)*
5. Click the green confirmation symbol , or press enter



Adding another ECM stream to an ECM Generator
Repeat the steps above.



11.5 Scrambling Control Groups & connect to ECM Streams

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

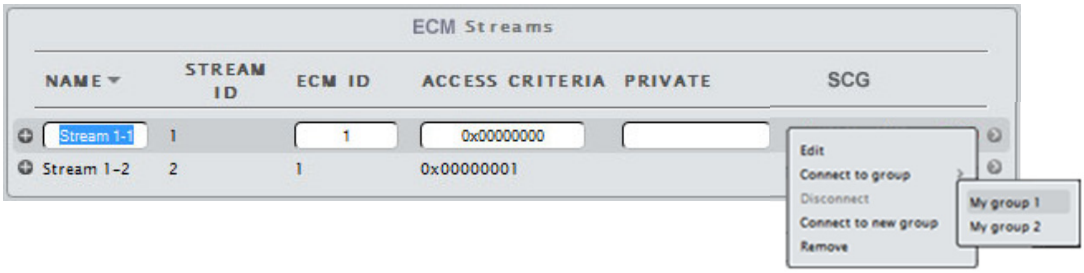
Adding a Scrambling Control Group (SCG)

In the SimulCrypt menu under SETTINGS, click ADD in the SimulCrypt Control Groups box.

1. Enter a group name
2. Click the green confirmation symbol , or press enter

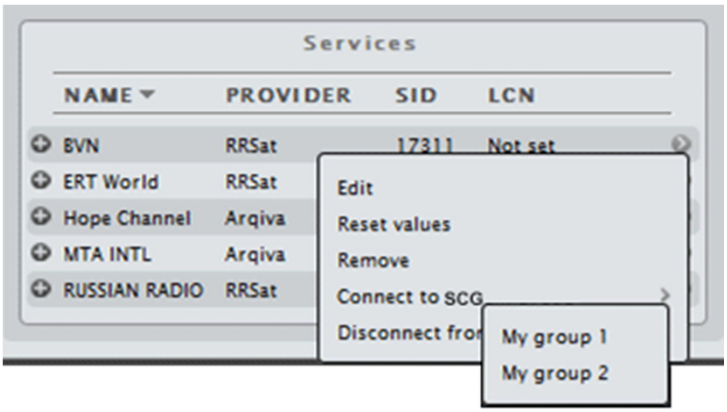
Connecting ECM Streams to Scrambling Control Groups

In the SimulCrypt menu under SETTINGS, click the grey arrow to the right of an ECM stream. In the pop-up menu, select “Connect to group”, and select the scrambling control group (SCG) to connect to.



11.6 Connect the service to be scrambled to an SCG

Connecting a service to a Scrambling Control Group (SCG)
In SERVICE MANAGEMENT, Outputs, click the grey arrow 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 it is connected to is displayed below the service name.

Services that are scrambled are indicated with a padlock .

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

12. Settings: Managing the Chameleon module

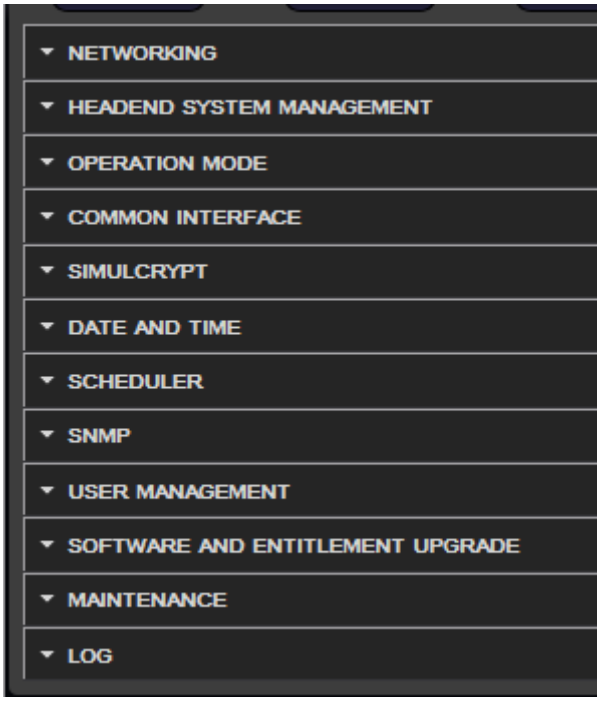
Under ***SETTINGS***, all module specific setting are managed.

NETWORKING: Networking settings IP interfaces, see §12.1.

HEADEND SYSTEM MANAGEMENT: for Chameleon interconnection, see §10.6

OPERATION MODE: selection of output mode, see §7

COMMON INTERFACE: In the COMMON INTERFACE menu, you select the input source for the CI, and you have access to the menu from the inserted CAM or CAMs. See § 10.2



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.

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

SCHEDULER: Task scheduling for scripts, see § 12.3

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

USER MANAGEMENT: password protection for UI access, see § 12.5

SOFTWARE AND ENTITLEMENT UPGRADE: Software upgrade, used both for uploading new FW and for uploading SW options (entitlement files), see §12.6

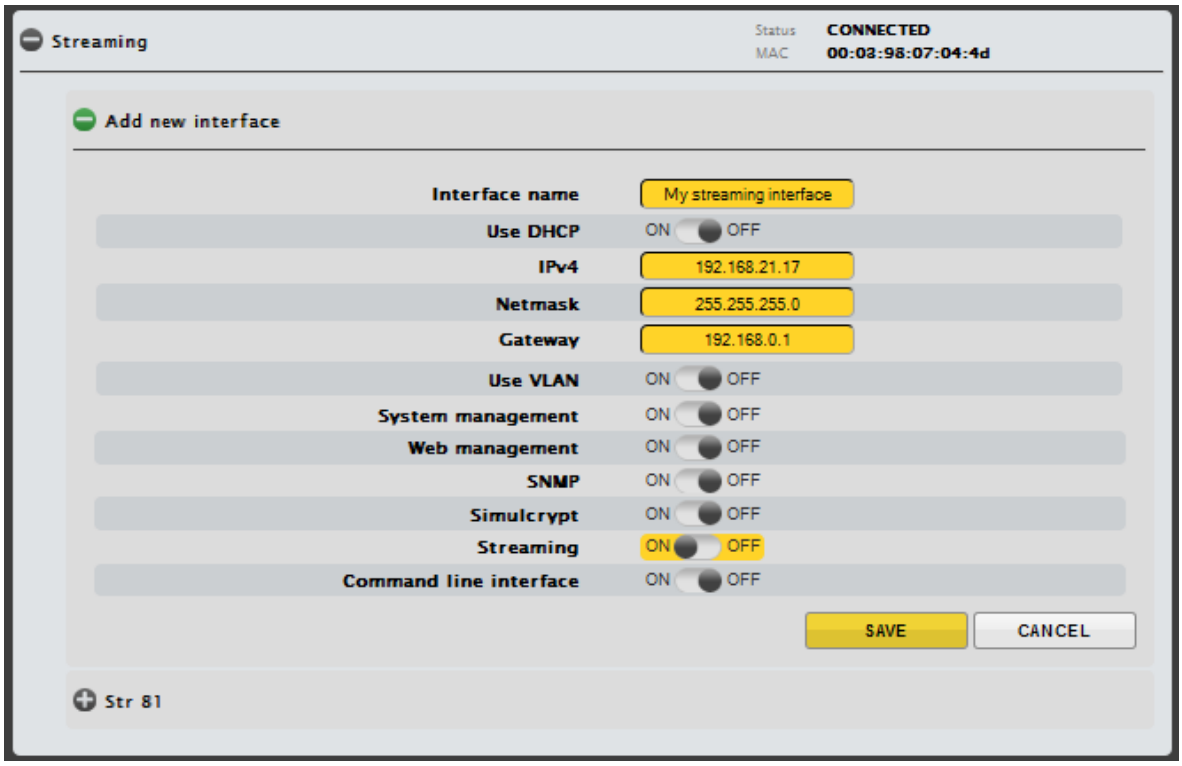
MAINTENANCE: For software reboot, reboot in rescue mode, factory reset and configuration backup and restore, see § 12.7 and §12.8

LOG, for displaying logged data.

12.1 Add and configure Network interfaces

Adding network interface for streaming

1. Click on NETWORKING in the ***SETTINGS*** tab
2. Click Add new interface
3. Type a name for the interface
4. Enter the IPv4 address, the Netmask and the Gateway
5. Select the capabilities needed for the interface (e.g. Streaming)
6. Click SAVE



Note: Chameleon has 2 IP ports, a 10/100 Ethernet management port, and a GigE port for streaming. As 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.

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

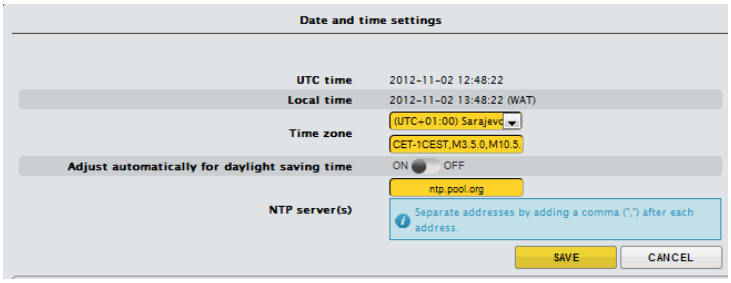
The DATE AND TIME menu allows you to connect the Chameleon to an NTP server for establishing a valid UTC time reference. The time reference can be used as a time source for the creation of the TDT table. The TDT and TOT is used to enable receivers to detect correct time, and is also the time basis for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

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

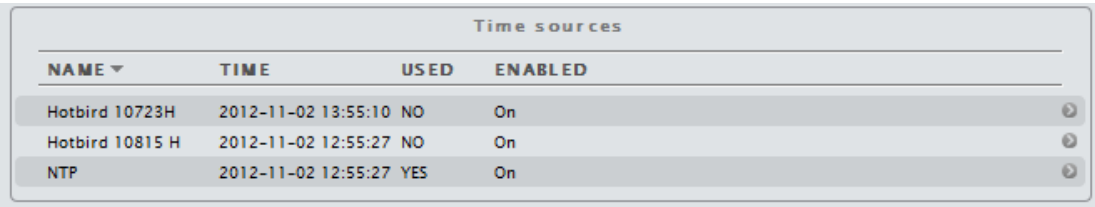
NTP server connection for UTC time reference

In the DATE AND TIME menu under SETTINGS, click Edit

- Select your Time zone in the drop down list
- Select daylight saving time ON/OFF
- Enter a valid URL to an NTP server (e.g. ntp.pool.org)
- Click 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.



Selecting Tome source for the TDT manually

- Click the grey edit arrow to the right of the Time source that is indicated as YES under USED
- Select OFF in the drop-down list under ENABLAD
- Click the green confirmation symbol, or click enter

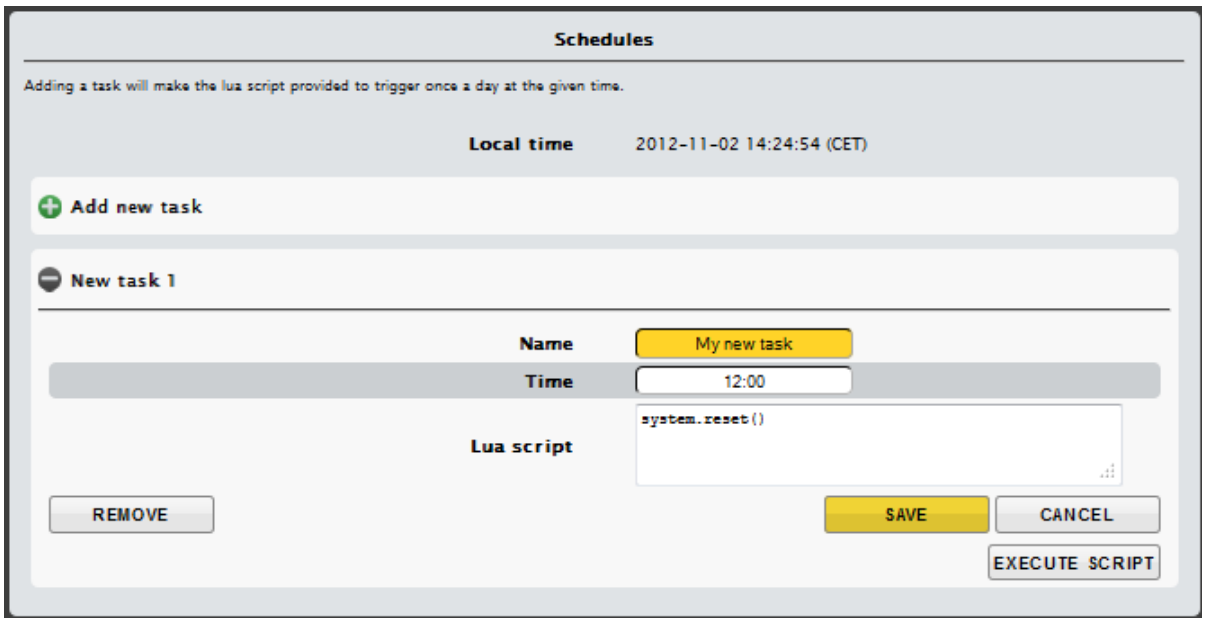
The Time reference will automatically switch to another Timer source.

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) are based on local time (hour and minute), with the time source in DATE AND TIME as reference.

Adding a new task

- Click the green plus , or Add new task.
- Enter a name for the task
- Set the time the task should be run (hh:mm)
- Enter the LUA commands in the Lua script window
- Click SAVE



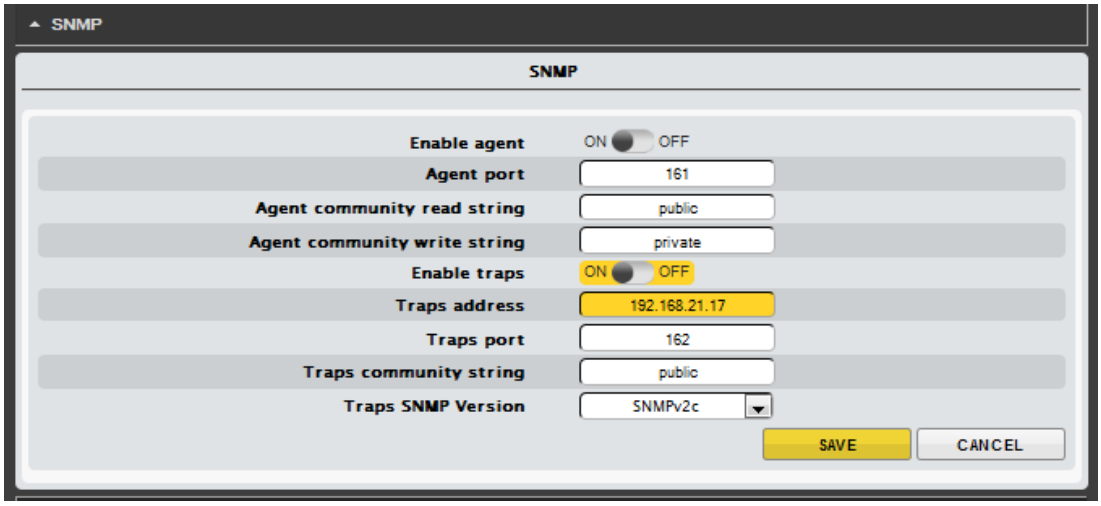
Running (testing) a task

You can test a task / the LUA commands manually by clicking EXECUTE SCRIPT

LUA commands for scripting

For information about available LUA commands, please contact Support.

12.4 SNMP

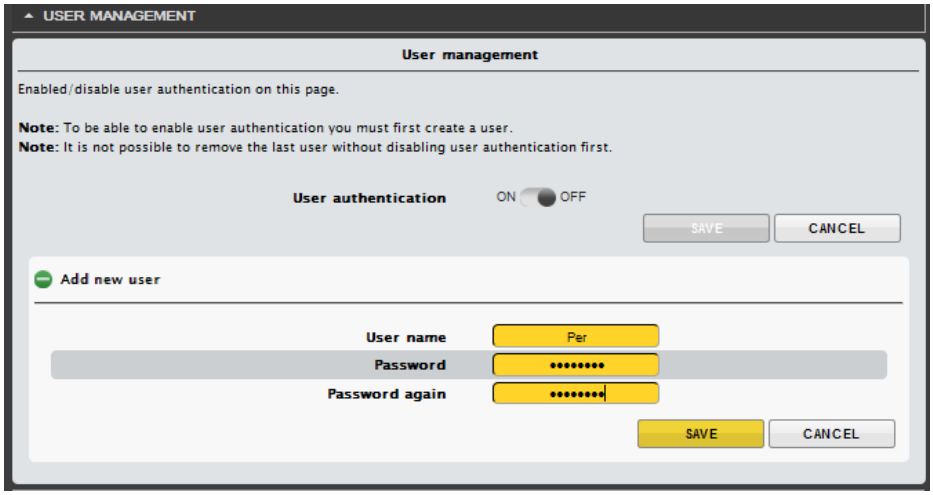


SNMP, Simple Network Management Protocol
SNMP can be used for alarms (traps/notifications) or to read (Get) or write (Set) information from/to a Chameleon.
To use SNMP, you need an NMS (Network Management System) that is connected to the Chameleon.

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 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 functionality
- Traps address: destination address of the NMS receiving the traps
- Destination port: destination port of the NMS receiving the traps
- Traps Community string: a “password”. Should be stated in the NMS. Default standard: “public”

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

12.5 User management – password protection



The USER MANAGEMENT allows settings of password for the UI. You can add users, and create passwords for each user.

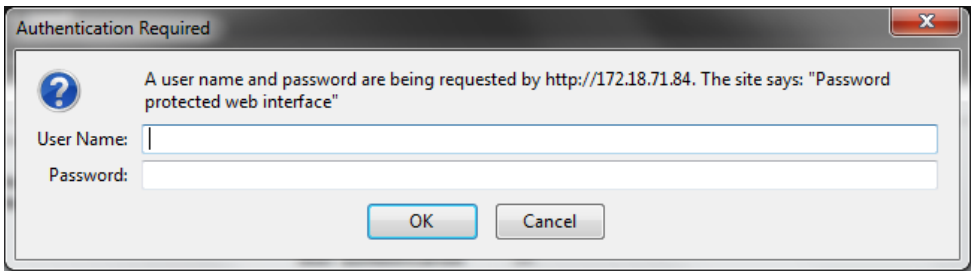
Adding a user and password

- Click Add new user, or the green plus
- Enter a user name
- Enter a password
- Confirm the password by entering it again
- Click SAVE

Enabling password control

- Select User authentication ON
- Click SAVE

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



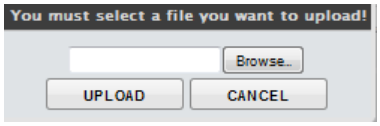
Note: make sure to remember your user names and passwords!

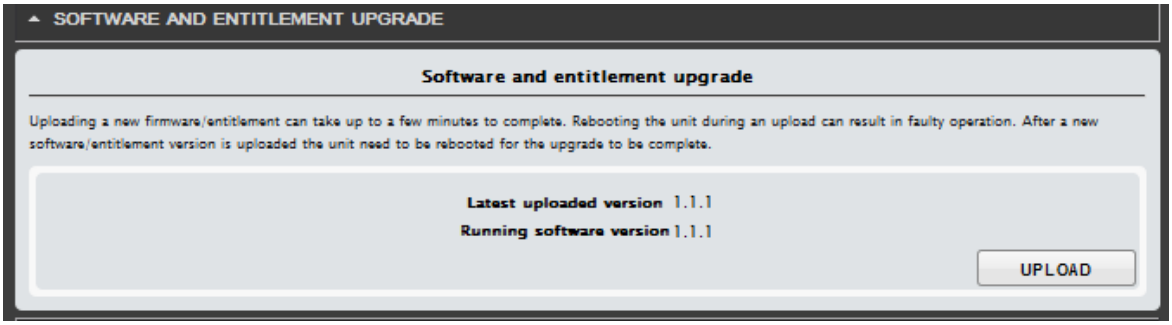
12.6 Software and SW options (entitlement) upgrade

Both FW and SW 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 PC
2. Click the Upload button
3. After upload complete message, reboot the module





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

Note: The SW options file will have the format <serial number>.ent. If you need to, you can download the entitlement file from the chameleonconnect.tv portal, see §4.

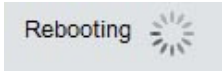
2. Locate the software options file on your PC, and select it
3. Click the Upload button
4. Reboot the module

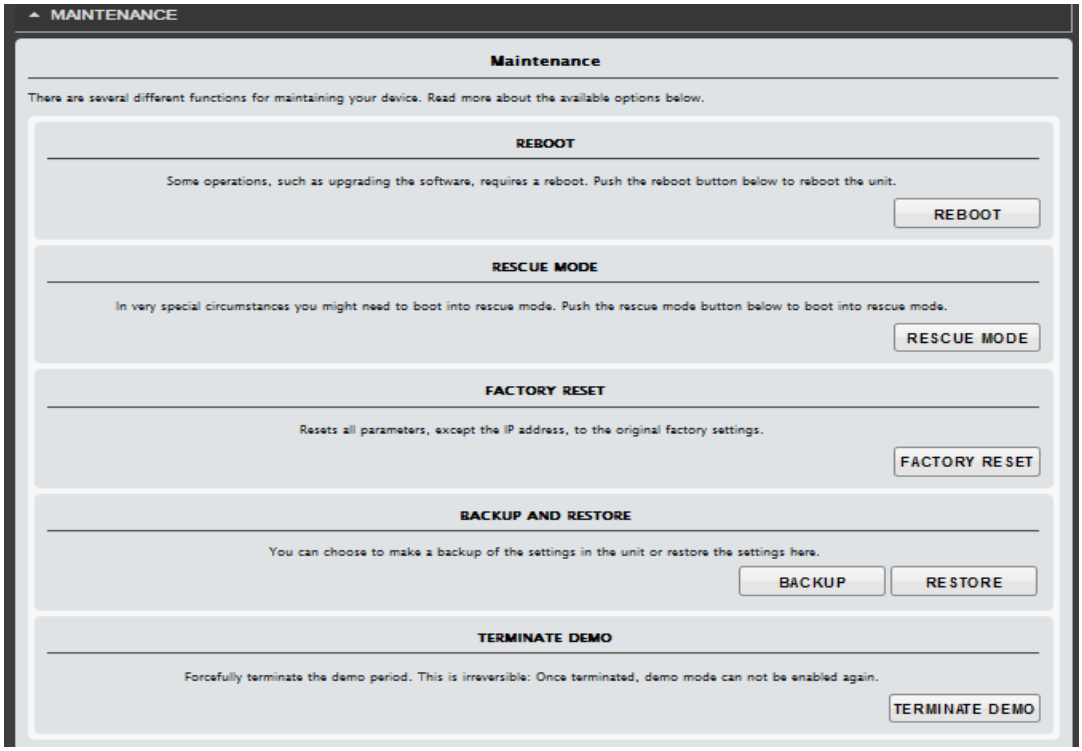
12.7 Module maintenance

Reboot

Some operations, such as upgrading the software, requires a reboot. Click the **Reboot** button to reboot the unit.

During the rebooting process, Rebooting will be shown.

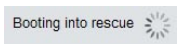




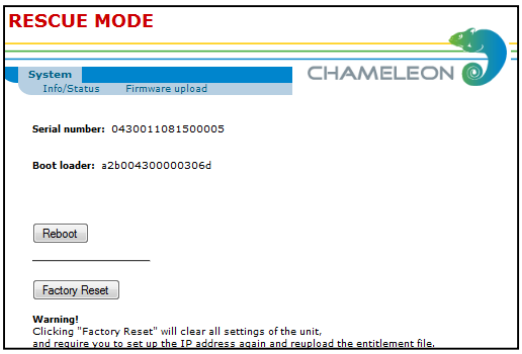
Rescue mode

In very special circumstances you might need to boot into rescue mode. Push the **Rescue mode** button to boot into rescue mode.

During the rebooting process, Booting into rescue will be shown.



In the rescue more, you can access basic functionality, and upload new software and software options.



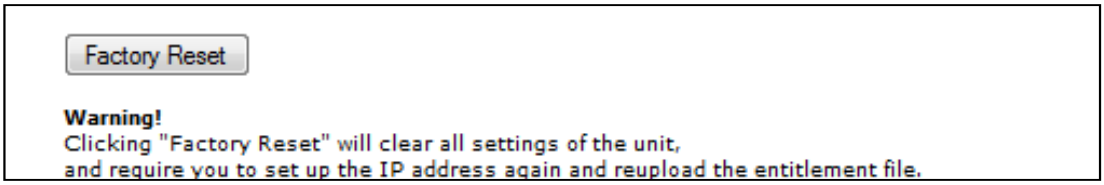
Returning to normal mode

Click the **Reboot** button in the rescue mode to return to normal mode. *Note*: re-enter the IP address of your Chameleon in the address field of you browser to access the normal mode web GUI.

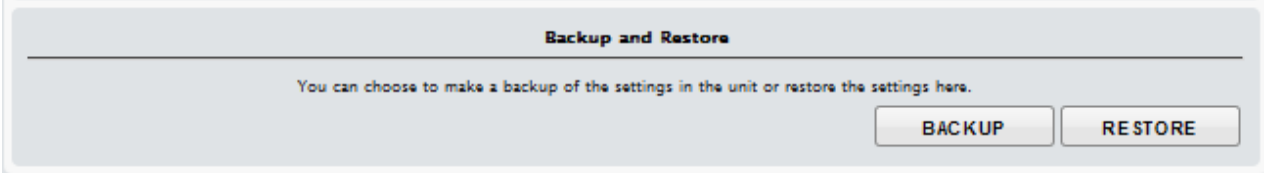
12.8 Factory reset & Backup / Restore

Factory reset
The Chameleon module can be reset to the same status as when delivered from the factory, apart from the SW 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 from the rescue interface
There is a factory reset button in the rescue mode UI.
WARNING! Factory reset from the rescue mode will remove all settings, remove the entitlement file enabling the SW options, and will reset the IP address to the default 192.168.0.20.



Backup and restore (saving configuration)
The backup and restore functionality gives you the possibility to save the complete configuration of a Chameleon to your PC. 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 purposes, since it gives the support team a possibility to set up an identical installation.



13. Status information

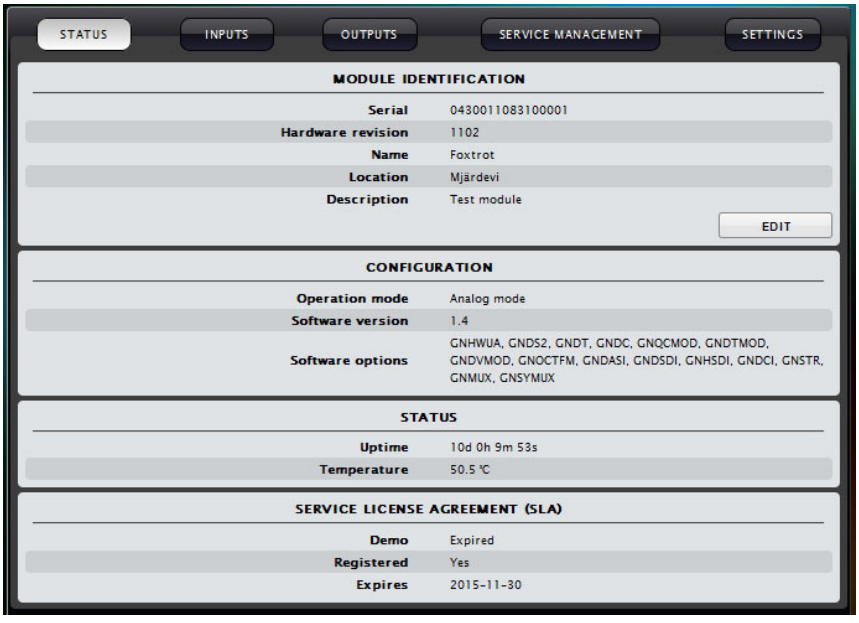
The ***STATUS*** tab gives a general overview over the Chameleon module. This page is also the starting page for the web GUI.

MODULE IDENTIFICATION
Serial number and the HW version is shown. Further, there are 3 editable fields; Name, Location and Description. Clicking **EDIT** below the box enables you to save your own selected information about this Chameleon module.

CONFIGURATION
The configuration box shows you the Operation mode, the Software version, and the enabled SW options. A warning will be shown if no operation mode is selected.

STATUS
Uptime (from last reboot), and current module temperature.

SERVICE LICENCE AGREEMENT
Shows if the Chameleon is registered at the chameleonconnect.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 Expired will be show.



14. SW options

Chameleon “products” range from receiver, to edge, to streamer and to scrambler. The different “products” realisations are controlled by the SW options enabled in any specific Chameleon module.

To get an overview of all different SW options currently available, please contact your sales representative at A2B or Wisi, or contact the Chameleon Support, see §14.

List of uploaded SW options
Under the Status tab, all enabled SW options are listed.
NOTE! During DEMO trial period all SW options are enabled. Don't forget to order SW options needed for the actual installation.

How to get and upload additional SW options
Please contact your sales representative at A2B or Wisi to get information.

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