



**Any Video from  
any Source to  
any Device**

# CHAMELEON

## Single Hardware Headend

As important as it is to have a technically superior platform for your networks, as important is the commercial platform.

The CHAMELEON product line addresses technology changes and increased quality requirements without large investments for hardware and infrastructure.



# CHAMELEON – Investing in Your Future

**Imagine a product where you could go from one distribution method to another, just by the click of your computer mouse – this is CHAMELEON, the transforming headend.**

**The CHAMELEON will enhance the user experience for any Cable-TV or SMATV operator by its simplicity, flexibility and cost efficiency.**

## APPLICATIONS

Applications needed for your network can be purchased at any time depending of your needs. You might want to start with digital reception and analogue distribution. Any time afterwards you may upgrade to digital distribution.

This way of updating existing hardware is cost effective, time saving, environmentally friendly and last but not least it gives you, your subscribers and installers a positive experience of distributed Cable-TV and SMATV.

## CREATE PROGRAM PACKAGES

Create your own program packages, decrypt and/or encrypt with your own selectable encryption system. If you prefer to distribute in IP-format through the embedded IPTV streamer it's just a few mouse clicks away. Distribution in QAM, COFDM, ISDB-T, DTMB or analogue is just as easy.

## MANAGING YOUR HEADEND

You manage your headend through the Web interface and can easily manage, monitor and modify functionality anywhere where you have an IP connection, be it in your smart phone, PC or other devices connected to the Internet.

## PROOF OF CONCEPT

To prove to you as a customer how versatile the product is, we provide each CHAMELEON with a 30 days trial of all released software applications. The trial period of 30 days power up time is started from the date of registra-

tion of the CHAMELEON at the wisiconnect.tv portal, and is valid for each CHAMELEON until permanent software options are ordered and installed. Order the software options you want to keep for permanent use from us or our distributors.

## FUTURE OF CHAMELEON

New functions and software options will be developed over time and software updates will be available to you with our support service at the wisiconnect.tv portal. This service will be offered to all customers.

## LOW ENERGY CONSUMPTION

We design all products to generate as little heat as possible. This has positive effects on our environment as well as on the life time. Apart from the environmental benefits, it also gives a direct cost saving through the lower power consumption.

## ULTRA LONG LIFE

Designing for long life cycle gives advantages for the environment through less scrapping, and repairing a product is worthwhile instead of scrapping if failures occur.

## FUTURE PROOF

A major reason for scrapping equipment is when technology requirements change and the old equipment becomes obsolete. We avoid this through making the products open for software upgrades thus enhancing the products functionality over time.





# CHAMELEON – The Gifted Headend

## ADAPTING TO THE ENVIRONMENT

Just as a chameleon adapts its colours to the changing environment, the CHAMELEON product line can be adapted to any forms of receiving, processing and transmitting TV content.

## SINGLE HARDWARE PRODUCT LINE

The trend has finally reached the point where there is a single hardware that gives you all the opportunities that you can imagine. And despite the versatility of the product, you only have to pay for what you need.

CHAMELEON products are software defined functionalities, all running on the same hardware platform. All the software functionality of CHAMELEON products can be modified and upgraded, at any time, without changing the hardware.

## “ALL ABOARD”

The CHAMELEON product line covers the functionality needs for all types of installations, ranging from small stand-alone or SMATV applications to complex headends in large CATV networks. Installations can easily be extended, in size by adding more units and in functionality by adding software options.

## ADAPTING TO YOUR FUTURE

Our industry is undergoing an accelerating pace of change and development. To facilitate investment decisions we have developed a platform flexible enough to meet all imaginable requirements, and at the same time make it affordable. With the CHAMELEON product line, you can adjust the product to your needs and we can adapt the product to new standards and technologies.

## DISTRIBUTED PROCESSING

The CHAMELEON products are multi-functional products, where each unit is capable of all different kinds of processing. This distributed processing architecture will enable you to create any size of installation, and also to extend an installation incrementally.

## THE DIGITAL SMORGASBORD

The selection of software configurations is extensive and you can pick what you need from our range of software options. To simplify the choice we provide a configuration tool to help you selecting the software options you need. Below you can see some of the “products” that can be realized with the different software options, but remember that there will continuously be new dishes on the CHAMELEON smorgasbord.

## DENSITY MATTERS

Complete 300 programs headend with reception, decoding, decryption, encryption and modulation of 40 multiplexes in 3 U 19 inch.

### CHAMELEON Product Realisation Examples

- Receiver DVB-S/S2, T/T2, C single/double
- Receiver QAM J.83 Annex A/B/C, ISDB-T single/double
- Transmodulator to DVB-T, single/double
- Transmodulator to DVB-C, single/double/triple/quad
- Analogue VSB RF-modulator, single/double
- Edge QAM J.83 Annex A/B/C
- Edge COFDM, single/double
- Edge DTMB, ISDB-T, single
- Edge FM, up to 8 FM out
- MPEG-2/MPEG-4 SD decoder (single/double), HD decoder (single)
- CI decryption, single/double
- Remultiplexer multiple TS
- DVB\_CSA Scrambler
- IP streamer
- ASI streamer

# CHAMELEON Software Options

Software options are license files that enable running the functions defined functionalities. The software options can be bought at the same time as the hardware, or alternatively as a separate order. You can add software options to an existing CHAMELEON at any time, come need for additional functionality. The CHAMELEON Configurator provides an on-line tool for selecting software options. Once an order has been processed, the entitlement file containing licences for the software options is available for download from the wisconnect.tv portal.

## INPUT

### DVB-C & QAM J.83 B/C Receivers

GNC, GNDC

### DVB-S/S2 Receivers

GNS2, GNDS2

### DVB-T/T2 Receivers

GNT, GNDR, GNT2, GNDR2

### ISDB-T Receivers

GNIST, GNDRIST

### ASI input & output

GNASI, GNDRASI

### IP Streaming input & output

GNSTR, GNDRSTR

## PROCESSING

### Common Interface Decryption

GNCI, GNDRCI

### Simulcrypt Scrambling

GNSCR

### Pro:Idiom Scrambling

GNQPISCR, GNDRQPISCR

### Remultiplexing

GNMUX, GNDRMUX, GNDRPSISI

### Redundancy

GNRED

### Dolby AC3

GNDRDOL

### T2-MI de-encapsulation PLP support

GNDR2MIDE, GNDR2MIDE, GNDR2MIPLP, GNDR2MIPLP, GNDR2MIPLP

## OUTPUT

### DVB-C & QAM J.83 B/C Modulators

GNDRCMOD, GNDRDCMOD, GNDRTCMOD, GNDRQCMOD

### DVB-T Modulators

GNDRMOD, GNDRDMOD

### DTMB Modulator

GNDRMOD

### ISDB-T Modulator

GNDRISMOD

### Analogue Modulators

GNDRVMOD, GNDRVDMOD

### MTS & SAP (BTSC)

GNDRBTS

### FM Radio

GNDRDFM, GNDRNOCTFM

### SDI & HD-SDI output

GNDRSSDI, GNDRSDI, GNDRHSDI

### ASI input & output

GNDRASI, GNDRDRASI

### IP Streaming input & output

GNDRSTR, GNDRDRSTR

## MISCELLANEOUS

### System Management

GNDRSYSMG

### Service License Agreement

GNDRNM1, GNDRNM3

### All SW Options

GNDRALL

Any Video from  
any Source to  
any Device

## Functionalities enabled with SW options

- SW options to enable functional blocks
- Customer orders CHAMELEON and SW functionality
- CHAMELEONS delivered as HW without SW options
- Registration and SW options download
- License agreement mandatory for FW upgrades
- Registration on-line or off-line
- Added SW options download via the portal
- The license agreement starting from the date of registration at the wisconnect.tv

# CHAMELEON Subracks

Visit [wisi.de](http://wisi.de) for more info about our products.

CHAMELEON is designed for all current and future applications and suited both for the transition from the analogue to the digital environment, and for the connection between HFC and IP distribution platforms.

CHAMELEON modules can be mounted in four different subracks. In high profile professional applications, the GN50 with redundant power supply and integrated GigE switch is recommended. For standard applications in 19" rack mounting, the GN 40 chassis is recommended. The GN20 B/R allows you to install one or two CHAMELEON in a 1 HU, 19" chassis. GN20 R includes dual redundant power supplies. For wall mount of one or two CHAMELEON modules, the GN01 can be used.

## GN01



### Features

Wall mount subrack for 1 or 2 CHAMELEONS

Embedded PSU and fan

## GN20 B/R



### Features

1 HU 19 inch subrack for 1 or 2 CHAMELEONS

Embedded PSU and fan

Dual redundant PSU (GN20 R)

## GN40



### Features

3 HU 19 inch subrack for up to 10 CHAMELEON modules

1 HU 19 inch PSU and fan unit

## GN50



### Features

3 HU 19 inch subrack with embedded GigE switch

Fitting up to 10 CHAMELEON modules

Embedded fans and PSU, optional redundant PSU

N+1 redundancy (SW option GNNRED)

# CHAMELEON Support



**WISICONNECT.TV**

At the start page of the portal, you can request access, or if you already have an account, you can log in. The main functionality of the portal is to provide you with a repository for information about your CHAMELEONS. All your registered CHAMELEONS will be listed, and you can add textual information such as installation site or the function for each CHAMELEON. For each CHAMELEON, you also have information about the purchased software options, and you can download the entitlement file (the license file enabling the software options).

Product documentation such as User Manuals, Release Notes etc. are available for download from the portal. All released firmware versions are also available for download. The FAQ and Forum gives additional help, and allows you to share questions and information with other CHAMELEON users.



**THE WEB UI**

The CHAMELEON is configured and managed via a web UI. Each CHAMELEON contains an embedded web server, and no propriety control software is needed. To connect to the UI of a CHAMELEON, simply start a browser on your computer and type the IP address of the CHAMELEON in the address field.

The web UI of CHAMELEON is structured to simplify configuration and management. Following the different parts of the UI in order, Inputs, Outputs, Service Management, will take you through all basic settings you need to do to set up a working configuration.



**SUPPORT AND SLA**

The CHAMELEON product platform is continuously enhanced and new functionality both in terms of new software options and as new firmware versions are released. To allow our CHAMELEON users to upgrade for added functionality, a Service Licence Agreement (SLA) is included in each purchase of a CHAMELEON.

The validity period of the SLA included is one year, and the SLA can be extended at any time. As long as a CHAMELEON has a valid SLA, new firmware versions can be uploaded, hence giving the user access to enhancements.

# CHAMELEON Technical Specifications

<b>Power Supply:</b>	12 VDC nom. (9-14 VDC)
<b>Power consumption</b>	Typical 15 W, max 18 W
<b>Dimensions:</b>	230x105x40 mm (excl. connectors)
<b>Weight:</b>	Approx. 640g
<b>Controller:</b>	Embedded web server, SNMP, CLI
<b>Op. temperature:</b>	5°C to 45°C
<b>Nominal temp. range:</b>	15°C to 35°C



- ✓ Graphical User Interface for easy set up of complex systems. Simple handling of service remultiplexing and automatic PSI/SI regeneration.
- ✓ Each CHAMELEON contains an embedded web server for management and control. Standard web browsers (Explorer, Mozilla etc.) are supported.
- ✓ Remultiplexer with multiple inputs from tuners, IP and ASI. Multiple TS outputs to modulators, IP and ASI.
- ✓ PSI/SI analysis and regeneration. PID dropping and PID remapping.



## CONNECTORS

Dual RF tuner F-connectors, dual BNC connectors for ASI in/out and SDI out. RF out F-connector. Dual PCMCIA CI slots. RJ45 IP management connector (10/100) RJ45 GigE IP streaming connector.



## INPUTS

The CHAMELEON has dual independent universal tuners (DVB-S/S2/T/ T2/C, QAM J.83 Annex B and C, ISDB-T), GigE IP inputs and ASI inputs.



## PROCESSING

CI decryption, remultiplexing, PSI/SI regeneration, encryption and MPEG decoding.



## OUTPUTS

Digital RF modulation in DVB-T, DVB-C, QAM J.83 Annex B/C, ISDB-T and DTMB. Analogue RF in PAL, SECAM and NTSC, GigE IP outputs, ASI outputs and SDI outputs.



DVB-S/S2 Satellite Receivers	
Input frequency	950 – 2150 MHz
Input level	35 to 90 dBμV, -74 to -19 dBm
Symbol rates	1.0-45 Mbaud (max 100 Mbit/s)
Spectral inversion	Yes, automatically
LNB voltage	Auto, Off or 13/18V, programmable
22kHz to LNB	Auto, On or Off, programmable
DiSEqC	Supporting control of up to 4 sat sources
Compliance	DVB-S (EN 300 421) DVB-S2 (EN 302 307)

DVB-C , QAM J.83 Annex A/B/C Cable Receivers	
Input frequency	47- 862 MHz
Input level	45 to 90 dBμV, -64 to -19 dBm <sup>1)2)</sup>
Bandwidth (DVB-C)	6 or 8 MHz
Bandwidth (QAM J.83 annex B, C)	6 MHz
Symbol rate (DVB-C)	1-7.2 Mbaud
Symbol rate (QAM J.83 Annex B)	QAM64 = 5.057 Mbaud; QAM256 = 5.361 Mbaud
Symbol rate (QAM J.83 Annex C)	1-5.3097 Mbaud
Compliance	EN 300 429 / ITU J.38 Annex A, B, C

<sup>1)</sup> QEF reception, test signal: 256QAM, C/N 26dB (DVB-C)

<sup>2)</sup> QEF reception, test signal: 64 QAM, C/N 26dB (QAM J.83 Annex B,C)

IPTV Input / Output	
Input bit rate	Max 110 Mbit/s per IPTS, max 200 Mbit/s total
Output bit rate	Max 100 Mbit/s per IPTS, max 200 Mbit/s total
Connectors	RJ45, or backplane GigE connector in GN50
Input/output protocol	UDP/RTP Multicast/Unicast
IPTS input/output format/capacity	CBR/VBR, max 20 MPTS or SPTS <sup>1)</sup>
IP FEC (MPEG COP#3) out	Yes
IGMP	Supporting IGMP version 1, 2, 3
SAP (Session Announcement Protocol)	Yes, selectable for IP SPTS output
Time stamp & de-jitter	Yes

<sup>1)</sup> Number of IPTS (i.e. SPTS and/or MPTS) will depend on Operation Mode

ISDB-T Receivers	
Input frequency	47- 862 MHz
Input level	38 to 90 dBμV, -71 to -19 dBm <sup>1)</sup>
ISDB-T mode	Supporting mode 1, 2, or 3 (hierarchical) layers
Number of OFDM segments	Full 13-segment
Bandwidth	6/7/8 MHz
Compliance	ARIB STD-B31 standard compliant

<sup>1)</sup> Layer A - Constellation: 64QAM, Code rate: 7/8, Segments: 7

Layer B - Constellation: QPSK, Code rate: 3/4, Segments: 3

Layer C - Constellation: 16QAM, Code rate: 5/6, Segments: 3

DVB-T/T2 Terrestrial Receivers	
Input frequency	47– 862 MHz
Input level (DVB-T)	35 to 90 dBμV, -74 to -19 dBm <sup>1)</sup>
Input level (DVB-T2)	38 to 90 dBμV, -71 to -19 dBm <sup>2)</sup>
Bandwidth (DVB-T)	6/7/8 MHz
Bandwidth (DVB-T2)	1.7/5/6/7/8 MHz
Compliance	DVB-T (EN 300 744) DVB-T2 (ETSI EN 302 755)

<sup>1)</sup> QEF reception, test signal: 8K, 64QAM, 1/4 guard interval, 2/3 FEC

<sup>2)</sup> QEF reception, test signal: 32K, 64QAM, 1/28 guard interval, 64k lpdcc, code rate 2/3, BW-8MHz

ASI Input / Output	
Number of ports	2 BNC ports, configurable for in/out via UI
Max payload bitrate IN	Typical 200 Mbit/s
Max payload bitrate OUT	Typical 200 Mbit/s
PCR restamping	Yes
Packet size	188/204 byte
Compliance	EN 50083-9:2002, ASI-C

Analogue Modulator PAL-625/SECAM	
Number of modulators	Up to 2 analogue modulators
Standards	PAL B/G, D/K, I, SECAM D/K, B/G, L
Group delay pre-correction	B/G general, D/K GOST20532-75, M FCC, none
Sound	Mono, NICAM stereo, A2 stereo
Modulation video	VSB AM, neg. or pos.
Video bandwidth	4.2, 5.0, 6.0 MHz
Modulation mono audio	Audio FM or AM
Output frequency	48 – 855 MHz
Output level	Max 111 dB $\mu$ V (1 channel) Max 108 dB $\mu$ V (2 channels)
Video S/N (weighted)	> 65 dB
C/N, broadband	> 70 dB (65 dB typical at adjacent channel)
NICAM standards	NICAM 728 (EN 300 163)
Spurious suppression	> 60 dBc

Analogue Modulator PAL-M/NTSC	
Number of modulators	1 modulator
Standards	PAL M, NTSC
Group delay pre-correction	FCC, none
Sound	Mono, MTS, MTS + SAP audio
Modulation video	VSB AM, neg.
Video bandwidth	4.2 MHz
Modulation mono audio	FM
Output frequency	48 – 855 MHz
Output level	Max 111 dB $\mu$ V
Video S/N (weighted)	> 65 dB
C/N, broadband	> 70 dB (65 dB typical at adjacent channel)
Spurious suppression	> 60 dBc
MTS, SAP compliance	BTSC

MPEG Decoder – Audio / Video	
Supported formats video	MPEG-2 MP@ML, MPEG-2 MP@HL, up to MPEG-4 H.264 AVC, HiP, level 4
Supported formats audio	MPEG-1 layer II, HE-AAC Dolby Digital AC-3 (requires specific HW)
Aspect Ratio	Letterbox, Pan/Scan, or conversion combined (14:9) programmable, WSS
Teletext	Teletext or DVB subtitling

DTMB Modulation	
Number of modulators	1 DTMB mux
Code rate	0.6, 0.8
Carrier mode	C = 3780 (multi-carrier)
Header length	PN420 / PN945 symbols
Interleaving length	M = 240, M = 720
MER	>38 dB
Modulation	4QAM, 16QAM, 64QAM
Output frequency	40 – 860 MHz
Output level	Max 101 dB $\mu$ V
Spurious suppression	> 60 dBc
Compliance	GB 20600-2006

ISDB-T Modulation	
Number of modulators	1 ISDB-T mux
Carrier mode	Mode 1 (2k), Mode 2 (4k), Mode 3 (8k)
Guard interval	1/4, 1/8, 1/16, 1/32
Constellation	DQPSK, QPSK, QAM16, QAM64
Code rate	1/2, 2/3, 3/4, 5/6, 7/8
Time interleaving length	Mode 1: 0, 4, 8, 16 Mode 2: 0, 2, 4, 8 Mode 3: 0, 1, 2, 4
Segments	13
MER	> 38 dB
Max output bit rate	23.23 Mbit/s (QAM64, CR 7/8, GI 1/32)
Output frequency	40 – 860 MHz
Output level	Max 102 dB $\mu$ V
Spurious suppression	> 60 dBc
Compliance	ARIB_STD-B31 layer A, no SFN

CI & Decryption	
Number of CI slots	2 CI slots (accessible from rear)
Supported bit rates	55 / 62 / 72 Mbit/s
Multi decryption / Singel decryption	Yes/Yes
Service level decryption	Yes
PID level decryption	Yes
Compliance	EN 50221

FM Modulation	
Number of modulators	Up to 8 FM modulators
Audio decoder	MPEG-1 Layer III
Sound	Mono, stereo, joint stereo
Modulation	FM, ref ITU-R BS.450-3
FM deviation limiter	Yes
RDS insertion (dynamic & static)	Yes. Ref EN50067
Output frequency	87.5-108 MHz, 100 kHz step size
Output level per FM ch	Max 92 dB $\mu$ V
S/N	> 60 dB (mono) > 55 dB (stereo)
C/N, broadband	Typical 65 dB
Spurious suppression	Typical 60 dBc (FM band 87.5-108 MHz) > 50 dBc (outside FM band)

DVB-C and J.83 Annex A/B/C Modulation	
Number of modulators	DVB-C, J.83 Annex C: max 4 output muxes J.83 Annex B: max 2 output muxes
QAM modes	DVB-C: 16, 32, 64, 128 and 256 QAM J.83 Annex B/C: 64QAM, 256QAM
Symbol rate	DVB-C, J.83 Annex C: 2.4 – 13.6 Mbaud J.83 Annex B: 5,06/5,36 Msymb/s (64/256 QAM)
MER (at RF out)	> 43 dB for 256-QAM
Output frequency	40 - 860 MHz
Output level	105 dB $\mu$ V (1 channel) 102 dB $\mu$ V (2 channels) 99 dB $\mu$ V (3 channels, DVB-C and J.83 Annex C) 96 dB $\mu$ V (4 channels, DVB-C and J.83 Annex C)
Spurious suppression	> 60 dBc
Compliance	DVB-C (EN 300 429) , J.83 Annex B Level 2 for 6 MHz channel BW, J.83 Annex C

DVB-CSA / Scrambling	
Interface	IP
Number of encrypted PIDs	64 PIDs per output
Number of SCG	64 SCG per output (64 CWG per output)
Scrambleable outputs	DVB-C, DVB-T, ASI, (IP)
Interface protocol version support	ECMG <=> SCG: V2 and V3 EMMG/PDG <=> MUX: V2 and V3
Compliance	DVB-SimulCrypt (ETSI TS 103 197)

SDI/HD-SDI Outputs	
Number of outputs	Max 2 (SDI), 1 (HD-SDI)
Video formats (SDI)	720x576i@50 fields/s 720x576i@50 fields/s
Video formats (HD-SDI)	1920x1080i@50/60 fields/s 1280x720p@50/60 frames/s
Audio formats	2 channel Linear PCM (AES3)
Audio sampling frequency	32, 44.1 and 48 kHz
Connectors	BNC
Compliance (SDI)	SMPTE 259M-C, SMPTE 272M-DEF
Compliance (HD-SDI)	SMPTE 292M, SMPTE 299M, SMPTE 291

DVB-T Modulation	
Number of modulators	Up to 2 DVB-T muxes
COFDM mode	2k, 8k
Guard interval	1/4, 1/8, 1/16, 1/32
FEC	1/2, 2/3, 3/4, 5/6, 7/8
MER (at RF out)	>38 dB
Modulation	QPSK, 16QAM, 64QAM
Max output bit rate	31,7 Mbit/s (64-QAM, FEC 7/8, GI 1/32)
Output frequency	40 – 860 MHz
Output level max	102 dB $\mu$ V, 1 channel, 99 dB $\mu$ V, 2 channels
Spurious suppression	> 60 dBc
Compliance	DVB-T (EN 300 744)

PSI/SI & Remultiplexing	
<b>Remultiplexer with multiple inputs from tuners, IP and ASI. Multiple TS outputs to modulators, IP and ASI.</b>	
<b>PSI/SI analysis and regeneration. PID dropping and PID remapping.</b>	
Service remultiplexing	Yes
PID filtering and PID remapping	Yes
PID/SID auto anti-clash	Yes
PCR restamping and de-jitter	Yes
Dynamic PSI/SI processing	Yes
Advanced PSI/SI regeneration	Yes
Supported tables	PAT, CAT, PMT, TSDT NIT, SDT, EIT, TDT, TOT
Compliance	ETSI EN 300 468

Any Video from  
any Source to  
any Device



ELPAS INTERNATIONAL d.o.o.  
Ciril-Metodova 3  
SI-9250 Gornja Radgona  
T: +386 2 564 80 40  
F: +386 2 564 80 41  
E: info@elpas.si  
W: www.elpas.si

