





Head-end solutions



ASTRO - System provider for head-end components

With more than 65 years of experience in reception technology ASTRO is your competent partner for head-end and HFC network layout.

ASTRO supports integrators with it's own planning department that delivers software aided network designs. Installers can be sure to be provided with an optimized head-end system, suitable for the required application.

Quality "Made in Germany"

ASTRO Head-end components are "Made in Germany" Each device of the U-, V- and X-series is developed and produced in Bensberg close to Cologne. ASTRO offers a variety of different head-end solutions with signal converters in different levels of signal performance.

• Carrier class signal processing - the U-series

This head-end system is designed for biggest networks, offers best signal parameters and supports various redundancy concepts in terms of hard- and software.

Professional signal processing the V-series

This product line offers signal performance and specifications meeting the requirements of big networks with huge numbers of subscribers.

Universal compact signal processing the X-series

The price competitive X-series is suitable for small and mid-sized cable networks, like residential homes, hospitals, hotels etc.





ASTRO Head-end solutions

Flexible systems with outstanding signal quality

ASTRO's Direct Digital technology makes it possible to reach system parameters, which seemed to be unrealistic in compact head-end technology. Offering additional system resources as well as high-end video and audio parameters, new benchmarks have been created regarding the flexibility of configuration.



Carrier Class signal-processing

The U 100-series

A modular built IP Headend concept

The U 100 Edge series has been developed on the basis of many years of experience gained from the operation of IP head-ends for processing CATV signals from IP data streams.

The series is based on a hardware model which is completely new from the ground up. The experience, gained in major IP / PAL projects, enabled ASTRO to consider operating conditions in large IP backbone networks. Thus, in addition to outstanding transmission parameters, the U 100 series also offers sophisticated redundancy and replacement switching mechanisms to reach the greatest possible signal performance availability. Main features at a glance:

- installation of up to three plug-in modules possible
- PAL, FM, QAM and COFDM converters available
- outstanding signal parameters by Direct Digital ® technology
- user friendly configuration via webbrowser
- every module has redundant network interfaces for network management and data connection
- monitored fans
- output signals via F sockets
- modules can be configured in a way that leads to signal switch-off of the reference level

U 100 equipped with three signal converter modules



U 100-230 base unit signal flow chart





U 100 base unit

The U 100 base unit serves as the chassis for the various signal converters, providing space for three signal converters and two power supply units within a single rack unit. Each slot is equipped with a temperature-controlled fan and the replaceable rear panel offers two management and two data ports as well as the output of the CATV signals via two F sockets.

Status display for slots

L = left

M = middle



U-series signal converters

The ASTRO IP head-end modules handle all output signals distributed in standard CATV networks: QAM, PAL, COFDM and FM. Based on the proven DirectDigital ® system, all the signal converters provide outstanding parameters.

IP frontend included

One special feature of the signal converters is the inclusion of the IP frontend in each slide-in module. Consequently, each module has its own independent IP receiver unit and operates separately from the other modules inside the base unit. In this way, it is possible to limit any failure of an IP frontend to only a single module, meaning that the effects of an error are far less serious compared to a system which has only a single IP interface shared by all the signal converters.

Configuration via web browser

The system is configured by means of a web user interface. System parameters are stored on SD card. If the signal converter must be replaced, the SD card plugged into the old modul can now be inserted in the new module, allowing the previous configuration to be automatically migrated. Thanks to this feature, the spare equipment can be set in operation quickly on site without any need for service staff to reconfigure the system.



Operational controls

Overview of U-series signal converters



U 114

Order no.: 380 114 U 115 Order no.:

380 115

IP to PAL

4-way IP to PAL converter; 4 independent IP receivers; RTP; FEC; IGMPv3; 2 x 2 PAL output channels (channel pairs can span 32 MHz distance); WSS; VPS; Teletext; subtitling; programmable information ticker

U 115 with MPEG4 support



U 124

Order no.: 380 124

IP to FM

16-way IP to FM converter; 4 independent IP receivers; RTP; FEC; IGMPv3; 2 x 8 FM output signals; each program can be set separately in frequency level and RDS configuration (dynamic or static RDS)



U 154

Order no.: 380 154

IP to QAM

4-way IP to QAM converter; 4 independent IP receivers; RTP; FEC; IGMPv3; 2 x 2 QAM output channels (channel pairs can span 32 MHz distance); PID filter; PID remap filter, static NIT processing

(Figure as U 154)

U 158 Order no.: 380 158

IP to QAM

like U 154, but 8 channels per unit separated in 2 x 4 adjacent channels





Order no.: 380 174

IP to COFDM

4-way IP to COFDM converter; 4 independent IP receivers; RTP; FEC; IGMPv3; 2 x 2 COFDM output channels (channel pairs can span 32 MHz distance); PID filter; NIT processing





Order no.: 380 103

Controller

Overall management system for the U 1xx signal converters; managing of complete headend via one IP address; scheduled update; comfortable rack view; channel list; inventory report

U-series application example



IP Head end: 24 x IP/QAM, 24 x IP/PAL, 32 x IP/FM with fully redundant network structure for management and data connections



Future prospects

The U-series is engineered towards the future. Thanks to the modularity, any future application can be realized by keeping the well-established base units, power supplies and management systems. The ASTRO engineers are permanently working on new features for existing modules, but also on brand new signal converters which will make the U-series future-proof and interesting for more and more applications.



For information on new products please check the ASTRO website: "www.astro-kom.de".

Made in Germany

As mechanical-, electrical-, software-design and production of the devices are all developed and self-made in Germany, highest flexibility is reached. If a feature is missing on the list, customers can speak to ASTRO sales and R&D and solutions will be found.

Highest interoperability

All interfaces are according international standards for highest possible interoperability with other vendor's equipment. This applies to the IP input signals as well as to the RF output signals.

Professional signal-processing

The V-series

A mature concept for professional demands

The continuous development of the approved V-series modules has matured to a complete concept offering solutions for nearly every demand.

The V 16 base unit carries up to 8 signal converters of the V-series and is additionally compatible to all modules of the X-series. The V 16 base unit is available in different hardware versions, but the main features are common: 19" housing, 7 RU, temperature controlled fans, 20 dB test point at the output, LED signalling on the front panel and a lockable cover to prevent unauthorized access to the device.

The plug-in modules of the V-series were developed especially for professional channel processing in combination with the V 16 base unit. These modules feature excellent output parameters after the combining – thanks to the optional output channel filter – and are applicable in biggest networks.

Main features at a glance:

- individual mounting of the base unit with plug-in cards, individually configurable
- configuration via HE programming software or via programming unit KC 3
- different versions of base unit V 16 available (see right page)
- outstanding signal parameters by Direct Digital ® technology
- base unit with 2 temperature controlled fans
- versions with redundant power supply available



You will find further information on the HEsoftware and the KC3 unit in the ASTRO main catalogue.

V 16.4 base unit signal flow chart



V 16 base units

Depending on individual demands, the V 16 can be equipped with redundant power supply, A/V preparation (D-Subinputs) or a programmable satellite splitter.

Different V 16 configurations

•	V 16.1:	single power supply unit Order no.: 380 070
•	V 16.2:	additional redundant power supply uni Order no.: 380 071
•	V 16.3:	Single power supply unit and programmable satellite splitter Order no.: 380 080
•	V 16.4:	Redundant power supply unit and programmable sat splitter Order no.: 380 090

• V 16.23: Redundant power supply unit, prepared for operation of ASI in / out modules Order no.: 380 076

V-series signal converters

The main difference between signal converters of the Xseries and the V-series is the outstanding signal performance even after the combining of several base units.

This is achieved by using channel selective output filters, which can be plugged into each signal converter. Thus the broadband noise caused by any modulator can be filtered from the useful signal. Nevertheless, the modules stay fully tuneable within the whole frequency range.

Band-pass filters

All ASTRO headend modules are equipped with bandpass filters which are chosen depending on the configured output channel. This already leads to a low broadband noise of the ASTRO headend modules. For biggest networks, every dB of S/N is important as the V-series is operated in such networks. This is why ASTRO developed the channel selective output filters for the V-series which lead to best possible parameter values.

Achievable parameter values after the combining:

- PAL: S/N: 60 dB; Residual Carrier Accuracy: 1%
- **QAM:** MER: typ. 45 dB; Shoulder attenuation typ. 58 dB
- FM: Stereo cross talk attenuation: typ. 60 dB; Distortion factor: < 0,05%

These values allow the operation of biggest networks. There is enough buffer in the system parameter values to operate longest optical links or amplifier cascades.



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Further base unit configurations are available. Please check the ASTRO main catalogue.









Overview of V-series signal converters





Further modules are available like DVB-C/PAL, DVB-T/PAL, ASI/PAL, ASI/QAM, DVB-T/QAM, and many more. Please check the ASTRO main catalogue to see the entire V-series product line.

V-series application examples



Standard satellite Head end DVB-S(2) to QAM, DVB-S to PAL and DVB-S/FM, 32 PAL channels (scrambled & FTA), 24 QAM channels, 16 FM stations



Conversion of satellite signals to IP multicast: 16 x DVB-S2 to ASI and 16 x ASI to IP



Universal compact signal-processing

The X-series

A concept for nearly every demand

The X-series is guaranteed future-proof thanks to a flexible modular concept. Its outstanding features are easy servicing and easy expandability. A motherboard holds easily interchangeable plug-in modules allowing a mixed digital/analogue complement. The entire system is enclosed in a compact metal housing.

The main field of application for the X-series are conversion or expansion of small to mediumsized community installations and design of new distribution networks. Main features at a glance:

- analogue, digital, quad, twin and single plug-in cards available
- outstanding signal parameters by Direct Digital ® technology
- integrated input distribution matrix and output combiner to simplify cabling
- adjustment via the HE-programming software or via programming unit KC 3



You will find further information on the HE programming software and the KC3 unit in the ASTRO main catalogue.

X-8 twin base unit signal flow chart





X-8 base unit

The X-8 twin base unit carries all signal converters of the Xseries like transcoders (DVB-x to PAL or FM), transmodulators (DVB-x to QAM or COFDM) and terrestrial converters for FM and DVB-T. It is suitable for 19" rack mounting and wall mounting. For temperature regulation the base unit is equipped with temperature-controlled fans.

Order no.: 380 010



Further base units of the X-series are available. Please check the ASTRO main catalogue

HE programming software

With the HE programming software, up to 20 bus-compatible X-8 or V 16 base units can be saved in a configuration file. Current programme satellite assignments are stored in their own "SAT program files". These files can be updated and changed by the user. ASTRO offers updating of programme assignments of the most common satellites via the internet.

Order no.: 330 360

					Programmieren				
insteckkaten									
V512	•	Kanal A	Kanal B	K 2 / 50,5 MHz V	K 3 / 57,5 MHz V	? ?	Deta		
QAM DUO 7 S2	•		-	K 4 / 64,5 MHz 💌	D 73 / 73,0 MHz •	212	Deta		
unbekannt	•				-		Deta		
unbekannt	-		¥		*		Deta		
j, unbekannt	-	•	¥	•	¥		Deta		
unbekannt	•	•	Y		•		Deta		
unbekannt			v		•		Deta		
unbekannt	-	-	*	-	•		Deta		

X-series signal converters

The plug-in cards of the X-series offer approved technology and flexible mounting of the base units with plug-in modules. Digital (DVB-C / -S / -T) as well as analogue input signals can be processed and converted into cable-suitable DVB-C, PAL or FM signals.

Band-pass filters

The X-series is equipped with band-pass filters which are chosen depending on the configured output channel. This leads to a low broadband noise of the ASTRO headend modules.



Inputs

Multi-pin connector for power supply and programming data

Achievable parameter values after the combining:

- PAL: S/N: 58 dB; Residual Carrier Accuracy: 1%
- **QAM:** MER: typ. 43 dB; Shoulder attenuation typ. 58 dB
- **FM:** Stereo cross talk attenuation: typ. 60 dB; Distortion factor: < 0,05%

Overview of X-series signal converters



X-COFDM duo S2 CI DVB-S2 to COFDM

Order no.: 330 484

2 independent DVB-S2 input signals will be converted to 2 COFDM channels; services are chosen by online Pass or Drop PID filter; CAM with Multiservice-Descrambling; FTA version is also available



X-DVB-S/PAL twin DD CI

DVB-S to PAL

Order no.: 330 677

2 independent DVB-S input signals will be converted to 2 standard PAL adjacent channels; features like WSS, DVB and TTX subtitles are implemented; FTA version is also available



X-PAL quad-4

Order no.: 380 331

DVB-S to PAL

4 independent DVB-S input signals will be converted to 2 pairs of adjacent standard PAL channels; in addition to WSS, DVB and TTX subtitles, the module features a freely programmable information ticker; integrated signal switch to minimize cabling



X-QAM duo 7 S2 CI

Order no.: 330 482

DVB-S2 to QAM

2 independent DVB-S2 input signals will be converted to 2 QAM channels; services are chosen by online Pass or Drop PID filter, NIT, LCN, CAM with Multiservice-Descrambling; FTA version is also available



X-QAM quad

Order no.: 380 325

DVB-S2 to QAM

4 independent DVB-S2 input signals will be converted to 2 pairs of adjacent QAM channels; services are chosen by online Pass or Drop PID filter; NIT and LCN support; integrated signal switch to minimize cabling



X-DVB-S/FM octopus DVB-S to FM

Order no.: 330 645

2 independent DVB-S input signals will be converted to 8 independent FM radio programs; each program can be configured separately in terms of frequency, level, dynamic or static RDS



X-FMC quad

Order no.: 380 328

FM to FM

4 independent FM radio stations can be shifted to different output frequencies



Further modules are available like DVB-C/PAL, DVB-T/PAL, DVB-T/QAM, FM amplifier and many more. Please check the ASTRO main catalogue to see the entire X-series product line.

X-series application examples



Standard satellite Head end DVB-S(2) to QAM, DVB-S to PAL, 32 PAL channels (FTA), 32 QAM channels, passive combining



Standard satellite Head end DVB-S(2) to COFDM, 16 COFDM channels (scrambled or FTA), receivable for any DVB-T Set-Top-Box or TV set with integrated DVB-T tuner





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