Modern Head-End Technology

Systems for future-proof installations

Quality made in Germany

KATHREIN

Digital Systems GmbH

KATHREIN | Digital Systems GmbH

Who we are
and **what** we stand for

We ensure the best possible radio and TV reception

KATHREIN Digital Systems is the market leader for the digital reception of satellite, terrestrial, cable or IP channels, and for signal splitting within buildings and caravans. We are constantly extending our reliable high-quality product portfolio for modern TV and radio reception with innovative solutions in the field of building technology.

Our solutions and systems are absolutely top-class, based on our great expertise in development and unsurpassed quality standards in manufacturing. High-quality satellite reception systems in conjunction with well-designed solutions for signal splitting – be it within a single-family house or a large building complex – bring the best signals in HD quality all the way to the receiving devices. New technologies such as SAT>IP, optical satellite splitters and modular head-end technology for hotel TV close the gap between the classic signal splitting techniques and modern fibre optic and network technologies.

The well-developed solutions from KATHREIN Digital Systems are also the best choice for TV reception in motor homes and caravans.

Find out more about us at **www.kathrein-ds.com**

Our awards:

Head-End Systems from Kathrein

Left: istock.com | zhudifeng; right: @ Siemens AG 2018; ibis Hamburg

Modern cable networks transmit enormous amounts of data and, in addition to fast internet access and telephony, also enable top-quality TV and radio reception. Head-ends from Kathrein enable future-proof feed of TV signals for cable networks of different sizes. Their key features are innovation, flexibility and wide-ranging module combination options. Kathrein head-end systems create the link between conventional coaxial TV signal distribution and IP-based network technology. IP streaming technology enables IPTV reception for many applications, such as hotel TV. Multi-standard head-end modules (DVB-S/S2/T/T2/C) ensure that the cable network can adapt to ongoing changes in broadcasting. They also significantly reduce energy costs.

Kathrein Services

Kathrein offers a wide range of support services for the entire life-cycle of head-end projects. Together with our broad-ranging experience as an innovation and technology driver, and the dedication of our motivated and committed staff, this provides a unique combination. Expert support is provided by the experienced teams at our headquarters in Rosenheim and our service centre in Ulm, as well as by our local field sales staff. Kathrein products are a byword for supreme quality, and that quality also guides how we

Support to initial set-up and for any upgrades, such as adding more head-ends and implementing new technologies. We offer the full range of planning services, from feasibility studies and initial inspections through to detailed material plans.
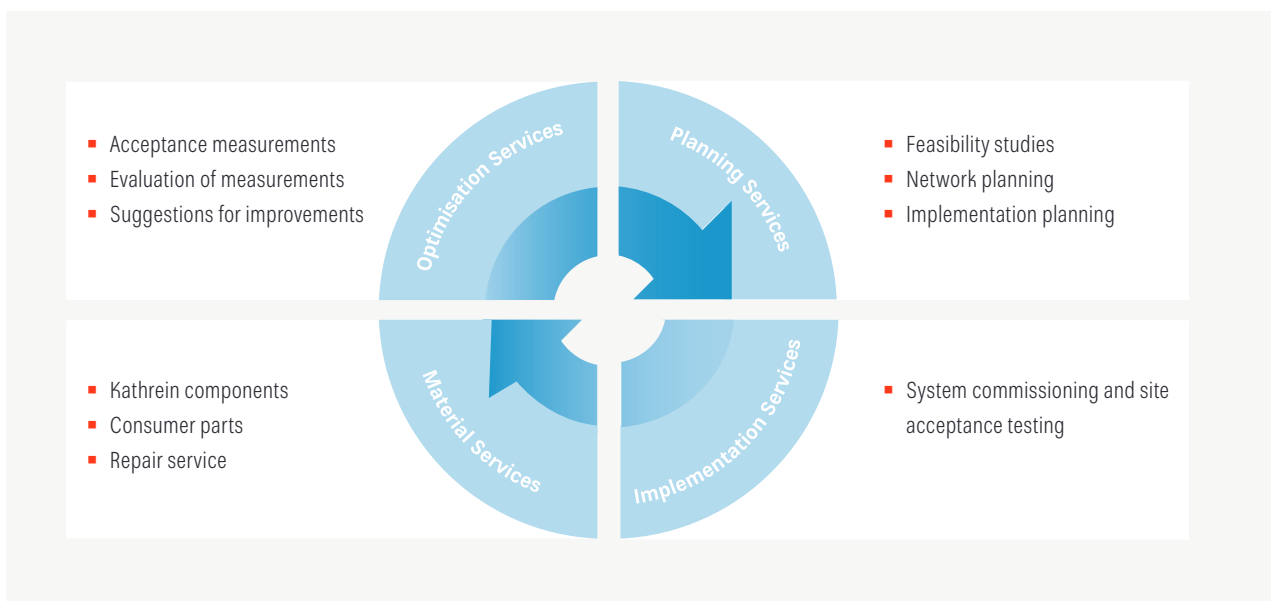
- Implementation services
  Local customer support every step of the way during implementation. We have highly qualified teams within the Kathrein departments as well as local partners who will assist you throughout the entire project life-cycle. Experienced project managers ensure that everything is completed on time.

implement Kathrein services. We help to realise head-end projects delivering the benefits and reliability for which Kathrein is renowned on the market. We focus on the needs of our customers, offering support and assistance with specific jobs as well as on complete projects. We carry out our services so that our customers can concentrate on their core tasks.

We offer the following services:

- Planning

- Material services
  Punctual delivery of all materials. We will handle all the logistics, including managing the parts supply chain.
- Problem-solving
  If any problems occur in the field, we will despatch a local support team to assess the system and eliminate any faults or suggest further steps to remedy the problem.

Optimisation Services
- Acceptance measurements
- Evaluation of measurements
- Suggestions for improvements

Planning Services
- Feasibility studies
- Network planning
- Implementation planning

Material Services
- Kathrein components
- Consumer parts
- Repair service

Implementation Services
- System commissioning and site acceptance testing

IPTV Network

Please note that in publishing this document Kathrein are simply making a recommendation for the configuration of an IPTV network. Kathrein offers no warranty for the existing network. For a core switch Kathrein recommends the use of a managed layer 2/3 switch with a high data transmission rate and IGMP querier function. For an access switch a layer 2 switch with IGMP snooping function is used. Otherwise the network can be overloaded by the data rate of the channels (streams). The data rate of the network is determined by the number of channels that are fed in (SD channel ~8 Mbps / HD channel ~16 Mbps), the number of participants, the Internet traffic, and so on …
In order to protect fault-free IPTV transmission and avoid interference from other infrastructure systems, the IPTV network should be operated in a network with separate hardware. The configuration must be a star structure. The cabling within the network is dependent on the local conditions. Kathrein always recommends Cat-7A networks. For existing networks and smaller networks, Cat-6E may be sufficient for fault-free IPTV transmission. If on site there is a single network which serves multiple applications, VLANs must always be configured.
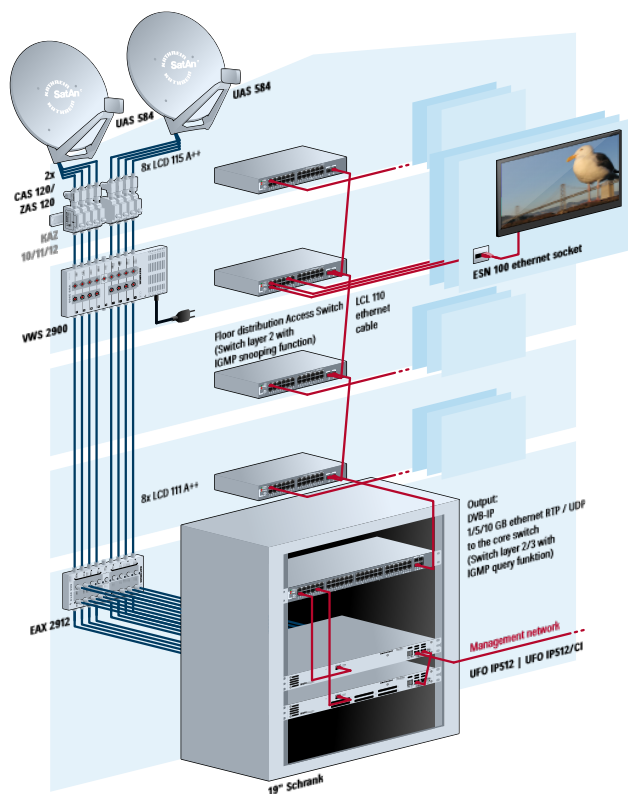
PLEASE NOTE:

- Data transmission rate (backplane/ports for the switches)

- IGMP querier (core switch)

- IGMP snooping (access switch)

- At least IGMP V2

- Switch ports that are linked to each other must have the same SFP data rates

UFO compact plus

UFO 19"-Series

Operating Principle of a Modern Head-End

Monitoring

Software
USW 800

Monitoring with
SNMP

DVB IPTV®

DVB C

**Transcoder/
Transrater**

Bring your own device

Decoding module

**4fach-/8fach-
Transmodulator**

**Multistandard-
Frontends**

DVB S DVB T DVB C
DVB S2 DVB T2

EDGE-QAM

HDMI-Encoder

DVB-IPTV
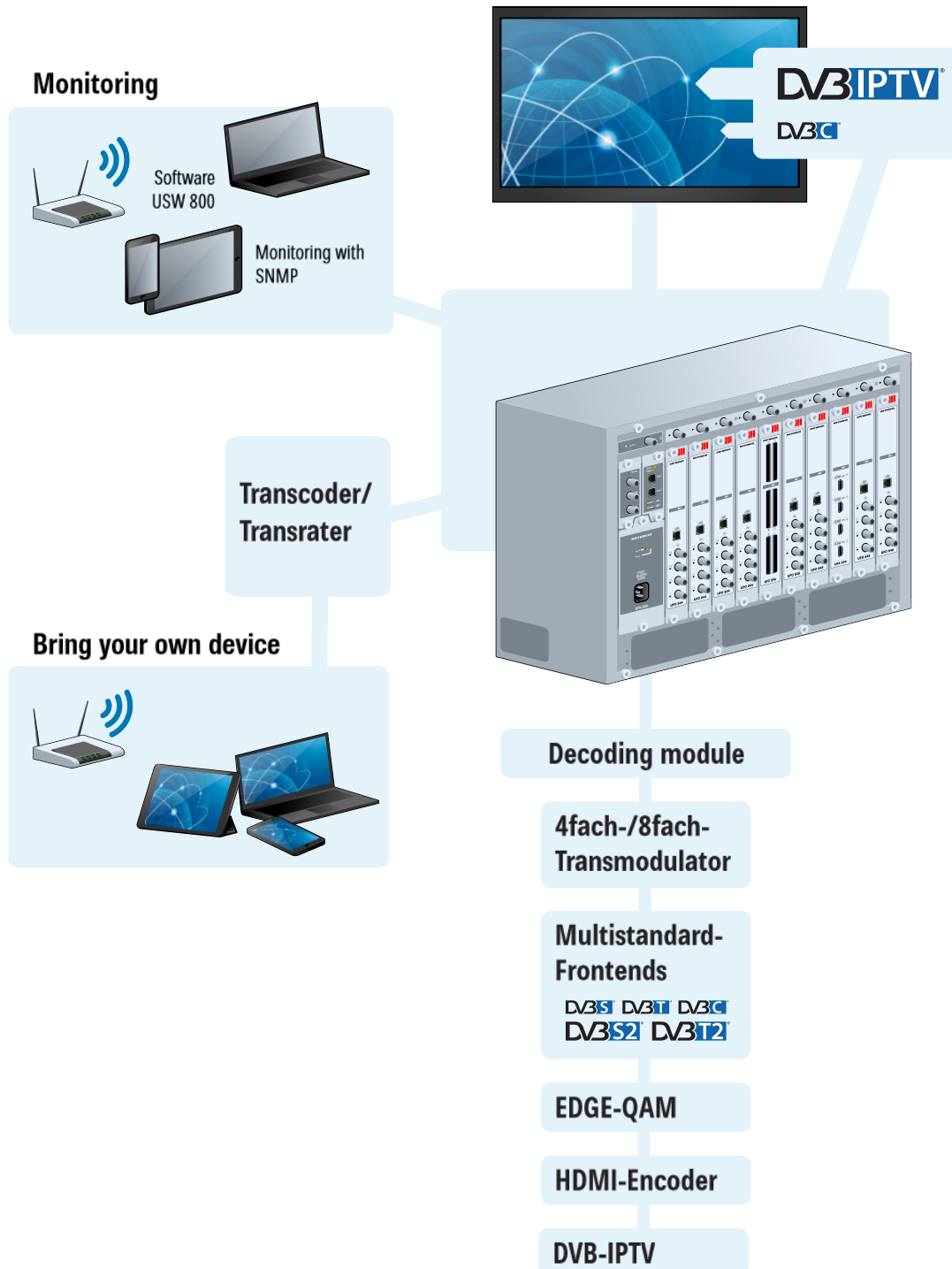
UFO Systems Overview

System features	UFOcompact plus	UFO 19" series	
	Professional, universal, modular device class	Professional 19" device class	
System features	**UFO 8xx**	**UFO 97-x**	**UFO IP 512 x**
Compact/stand-alone unit	✗	✓	✓
Modular overall system	✓	✗	✗
19" rack	✓	✓	✓
Installation height	9 HU	1 HU	1 HU
Integrated fan	✓	✓	✓
Expandability	Unlimited	Unlimited (network) cascading	
Input signals/inputs	Multi-standard/DVB-S(2)/IPTV/HDMI	8× DVB-S(2)/1 × multi-standard	
Output signals	DVB-C DVB-IPTV	18× DVB-C	DVB-IPTV (512x SPTS/18x MPTS)
Channel filter	✓	✓	✓
NIT/LCN support	✓	✓	✓
CI decoding	UFZ 896	UFO 97-18CI	UFO IP512/CI
HDMI/output signals	UFX894	UFO 97-18 HDMI, UFO 97-18 HDMI/CI, 20× DVB-C	
Power supply redundancy	✓*	✓	✓
Control software	USW 800 (NW cable)	USW 800 (NW cable)	USW 800 (NW cable)
Device class	High-end modular device class	High-end professional 19" device class	

* Second UFG 810 rack and UFZ 810 redundancy cable required
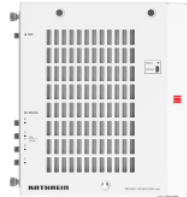
UFOmini	UFOnano
Compact device class	Plug & Play device class
UFO 87 (CI) / UFO 87-18 (CI) / UFO 87-18 HDMI (CI)	**UFO 80**
✓	✓
✗	✗
✗	✗
✗	✗
(USB / UFO link max. 4x)	By additional single-unit installation
4x DVB-S(2) 1× multi-standard / 8× DVB-S(2) 1× multi-standard / 8× DVB-S(2/2X) 1× multi-standard	DVB-S(2)
8× /18× DVB-C	8× DVB-C
✓	✓
✓	✗
UFO 87-x CI	✗
UFO 87-18 HDMI, UFO 87-18 HDMI/CI, 20× DVB-C	
✗	✗
USW 800 (NW cable)	USW 800 (USB)
High-end compact class	Basic compact class

⟩ UFOcompact plus®

UFOcompact plus® is the head-end system combining innovation and tradition in a way that is totally unique. It provides the user with the technological basis for current and future challenges in signal processing.

Functions that were previously completely implemented in special devices can now be mapped efficiently and cost-effectively in the overall system, such as: decoding or recoding of the transport streams of transmodulator modules in combination with the UFZ 896 6-way CI module. The durable aluminium die-cast housings provide excellent thermal properties. All UFOcompact plus® modules are characterised by extremely low energy consumption.

Features

- Modular, expandable, future-proof head-end system
- Simultaneous reception of any DVB standards (DVB-S/-S2/-T/-T2/-C/-IPTV)
- Transmodulation to DVB-C/-IPTV
- IP streamer
- Re-multiplex
- Flexible series or parallel decoding and recoding
- EDGE-QAM
- Monitoring (SNMP)
- NIT generation and adjustments/modification options
- LCN wizard, support for multiple LCN standards (NorDig, IEC 62216 and FRAN SAT PRO)
- High level of energy efficiency
- m3u list wizard for Panasonic TV sets
- Redundancy

UFO compact plus

⟩

Remote configuration via USW 800 PC software

UFO 874/878

UFZ 896

UFX 894

UFO 844/848

UFO 828

UFO 876/MX

Overview of the UFO 19" head-end series

The UFO 19" head-end series enables combined reception of eight DVB-S/-S(2) front-ends and one multi-standard front-end for combined reception of DVB-S(2), -T(2) and -C signals. The stand-alone head-end in 19" design also offers a six-way decoding capability (CI) and flexibly adjustable output channels in DVB-C/DVB-IP.

The UFO 19" series also features a redundant power supply unit, very high energy efficiency, and a remote configuration option. Extensive baseband signal processing with channel filter functionality, NIT, support for different LCN standards and flexible decoding capability ensure various applications.

Features

- All-in-one solution
- Simultaneous reception of any DVB standards (DVB-S/-S2/-T/-T2/-C)
- Completely flexible input, output and baseband configuration
- Hot-swappable power supply unit and fan
- Remote feeding for LNBs and active DVB-T/-T2 antennas
- NIT generation
- 6 CI slots for flexible individual or serial decoding
- HDMI encoder (4 inputs)
- High level of energy efficiency
- Remote configuration via USW 800 PC software
- LCN wizard, support for multiple LCN standards
  (NorDig, IEC 62216 and FRAN SAT PRO)

III UFO 19"-Series

UFO 97-18 HDMI

UFO 97-18 HDMI-CI

UFO IP512 HDMI

UFO IP512 HDMI/CI

UFO 19" variants:

- UFO 97-18 –18 output channels in DVB-C
- UFO 97-18/CI –18 output channels in DVB-C with six CI slots
- UFO 97-18 HDMI –20 output channels in DVB-C
- UFO 97-18 HDMI/CI –20 output channels in DVB-C with six CI slots
- UFO IP512 – 512 SPTS/18 MPTS streams in DVB-IP
- UFO IP512/CI – 512 SPTS/18 MPTS streams in DVB-IP with six CI slots
- UFO IP512 HDMI – 512 SPTS/18 MPTS streams in DVB-IP
- UFO IP512 HDMI/CI – 512 SPTS/18 MPTS streams in DVB-IP with six CI slots

⟩ UFOmini
UFO 87, UFO 87/CI, UFO 87-18, UFO 87-18/CI, UFO 87-18 HDMI, UFO 87-18 HDMI/CI

⫴UFOmini

The UFOmini head-end enables combined reception of DVB-S/-S2/-T/-T2/-C signals. The stand-alone head-end in a compact design also offers a 6-way decoding option (CI) and flexibly adjustable output channels in DVB-C.

UFOmini also features a very high level of energy efficiency and a remote configuration option. Extensive baseband signal processing with channel filter functionality, NIT, support for different LCN standards and flexible decoding capability ensure various applications.

UFOmini variants:

- UFO 87:
  Eight output channels in DVB-C
- UFO 87-18
  18 output channels in DVB-C
- UFO 87-18/CI
  18 output channels in DVB-C with six CI slots
- UFO 87-18 HDMI
  20 output channels in DVB-C
- UFO 87-18 HDMI/CI
  20 output channels in DVB-C with six CI slots

Features

- All-in-one solution
- Simultaneous reception of any DVB standards (DVB-S/-S2/-T/-T2/-C)
- Completely flexible input, output and baseband configuration
- Fanless design (no noise)
- Remote feeding for LNBs and active DVB-T/-T2 antennas
- NIT generation
- Six CI slots for flexible individual or serial decoding

- HDMI encoder (2 inputs)
- High level of energy efficiency (34 - 46 watts)
- Remote configuration via USW 800 PC software
- LCN wizard, support for multiple LCN standards (NorDig, IEC 62216 and FRAN SAT PRO)

⟩ UFOnano

UFO 80

IIIUFOnano

The third system is the inexpensive, yet fully technically developed, UFOnano stand-alone head-end, which offers a number of advantages specifically when modernising existing properties. Really simple programming thanks to channel packages and a pre-set station list mean that installation and commissioning are complete in the blink of an eye. UFOnano allows transmodulation (FTA) of 8 x DVB-S(2) to 8 x QAM. With a typical power consumption of 20-28 watts, the head-end with a built-in power supply unit is extremely energy-efficient. The head-end is delivered pre-programmed, which allows operation without further configuration. After installation and connection, the most important German-language TV and radio channels are immediately available over Astra 19.2° east. The head-end is primarily used in smaller hotels and guest houses.

Features

- All-in-one solution
- Unbeatable price-performance ratio
- Ideal for when modernising existing properties (replacement for PAL)
- Very low power consumption

- Fanless design (no noise,
  maintenance-free)
- Pre-programming of TV channels
- Simple programming thanks to channel packages

The UFOcompact plus® Signal Processing System

UFOcompact plus is ideal for medium to large sized building complexes such as hotels, hospitals or housing blocks.

⟩ System description

UFOcompact plus® is the Kathrein head-end system that provides the user with a sound technical foundation for meeting current and future signal processing challenges. With its completely flexible input and output channel configuration, this system is really well suited to medium and large sized cable networks. Digital signal processing and transmodulation of the transport streams are realised with the very latest FPGA technology. Transport stream routing is carried out via the backplane, making it possible to use common functions from module to module. The USW 800 software provides a user-friendly interface; programming is either performed locally on site or by remote access over a TCP/IP connection via an existing LAN/WAN infrastructure.

UFG 810 base unit

The central element is the UFG 810 base unit. Not only is power supplied via the passive data/control backplane, but this unit also enables the modules to communicate with one another. UFG 810 offers a total of 13 slots, 10 of which are intended to accommodate any head-end modules the user wants. The output coupler is specified as up to 1 GHz and allows for simple, aesthetically pleasing cabling. At the same time, the backplane facilitates the transmission of DVB transport streams between all the inserted modules. The UFX 800 central control module and the UFN 800 power supply unit are included with the UFG 810. The UVO 830 line amplifier can also be used as an option, making additional amplifiers superfluous. A lockable housing cover protects the base unit from unauthorised access. A durable, low-noise fan assembly, continuously monitored by a central system, ensures a long service life for the complex electronic assemblies.

UFX 800 central control module

UFX 800 is the control interface for the inserted modules. It features two Fast Ethernet ports for managing and cascading several installations without an external switch. The high-performance control bus ensures fast communication with the system components. This enables quick and easy system

configuration, even when multiple UFG 810s are cascaded. The built-in LED acts as a status indicator. The software of the modules can be updated via remote configuration or two USB ports.

UVO 830 output amplifier

The optional UVO 830 features four adjustable pre-emphases. Even if many channels are assigned, it still impresses with its outstanding dynamic range. All output channels can be measured without interruption at the test socket on the front. The amplifier is set up via the UFX 800 control module, using the USW 800 software.

UFN 800 power supply unit

The UFN 800 is characterised by a high degree of efficiency of over 92%. A status LED provides information on the condition of the power supply unit if an automatic overtemperature switch-off occurs. It is easy to replace, since it is installed at the front.

UFZ 896 decoding module

The UFZ 896 features six slots for CA modules, which are flexibly supplied with transport streams by means of baseband data exchange with neighbouring modules. What's more, the CA modules can be connected in parallel and series. With parallel decoding, two CA modules can be operated redundantly. In this configuration, if one CA module malfunctions, the system switches to the other (redundant) CA module automatically and corrects the error automatically too. With serial decoding, transport streams can be decoded piece by piece by three CI modules connected one after the other. The flexible CAM connection technique increases decoding capacity, which reduces the number of front-ends required in the transmodulators too.

USW 800 software

USW 800 is used to configure UFOcompact plus® installations. It provides user-friendly transponder and channel search functions based on built-in satellite channel lists. A central and high-performance software update function for all components keeps the modules up to date at all times. Cross-module system functions (e.g. CI or MUX) have been designed flexibly and clearly. USW 800 offers special functions for efficiently managing large systems with many installations, such as favourite lists, offline configuration and the use of configuration templates.

Routing of all RF levels into the input matrix

Each front-end can be flexibly supplied from all physical inputs
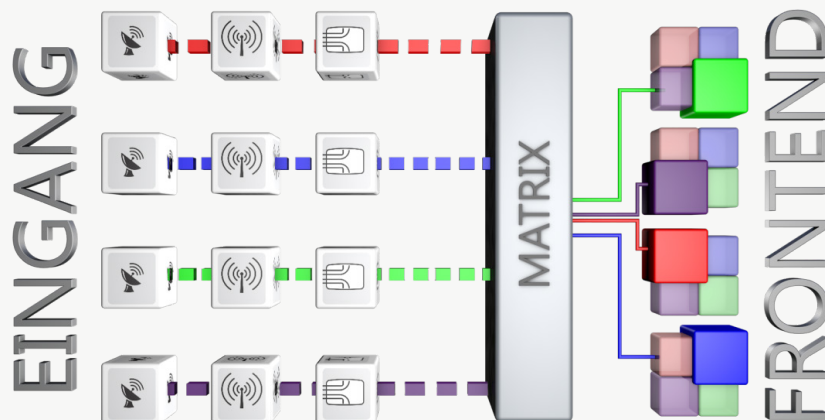
Multiplexing
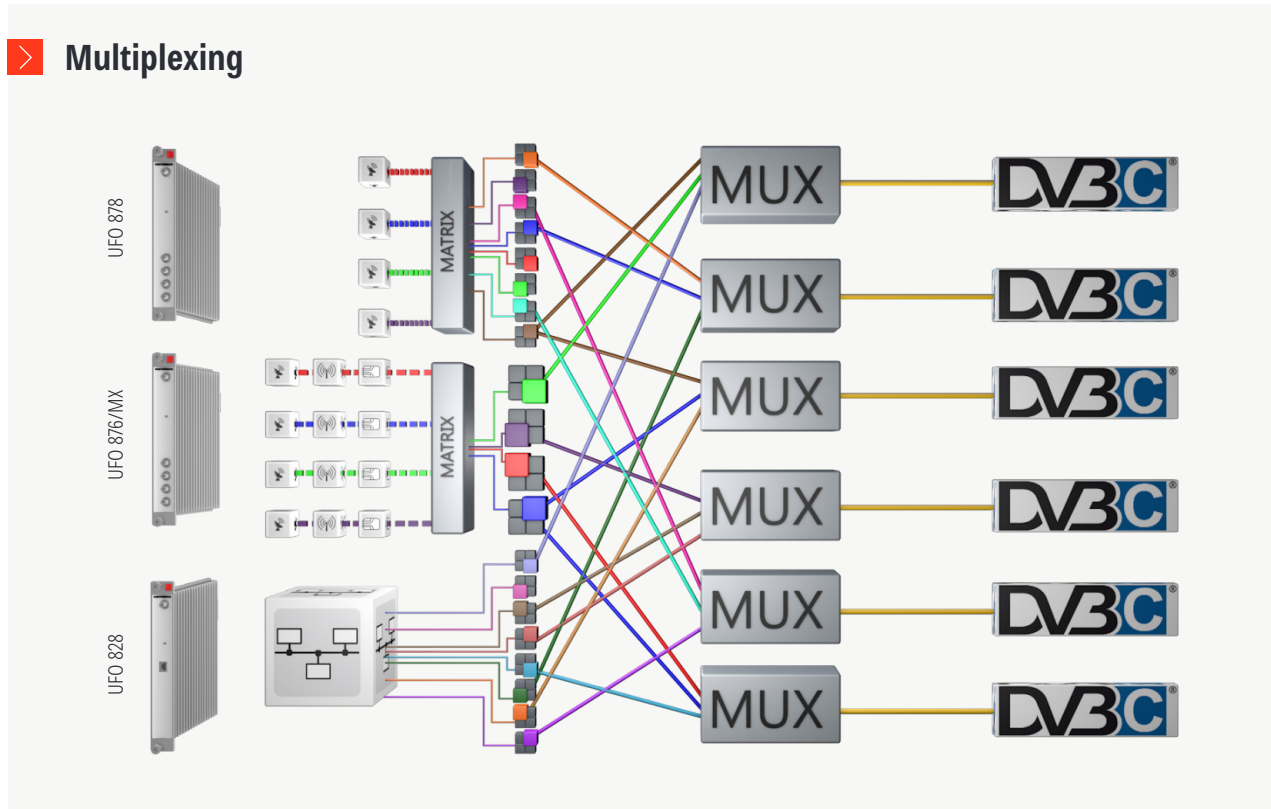
Modules with multi-standard front-ends
Multi-standard front-ends give users the option of receiving a range of different DVB standards (DVB-S(2)/-C/-T and -T2) combined.

Transport stream routing
Data volumes can be processed at a speed of up to 10 Gbps on the backplane. Depending on the incoming transponder, transport stream routing enables encoded channels to be decoded by the UFZ 896 neighbouring module (serial or parallel decoding) and sent back to the original module. Another advantage of transport stream routing is that input data streams of all types (DVB-S/-S2/-C/-T/-T2 and/or IPTV) from up to three neighbouring modules can be combined, processed (multiplexing) and output to the cable network together in DVB-C or DVB-T.

Multiplexing
Multiplexer modules feature six MUX blocks, each of which multiplexes three different input transport streams into one output MUX. The input transport streams can be obtained flexibly from the multiplexer module and from the neighbouring modules. This enables services from different transport stream sources (DVB-S/-S2/-C/-T/-T2 and -IPTV) to be combined, filtered and fed into the cable network.

Monitoring with SNMP (in the pipeline)
All available head-end parameters can be monitored in real time using the UFX 800. Operators maintain a comprehensive overview of functions at all times and are well informed about the overall status of the head-end.

⟩ Central management program
USW 800

The USW 800 software program is required to operate UFOcompact plus®, UFO 19" series, UFOmini and UFOnano signal processing systems, and is available to download free of charge for Windows and Linux.

SPECIAL FEATURES

- **Easy remote access via TCP/IP connection**
- **Supports central software update for modules**
- **Offline configuration and favourite lists for managing large systems efficiently (e.g. in the hospitality sector)**
- **Pre-programmed transponder/channel lists**

Features

- For central control and high-performance setting of all parameters of the UFOcompact plus® and UFO® modules used in the UFOcompact plus® signal processing system
- User-friendly interface for easy set-up of the installation by means of wizards (e.g. NIT/LCN) and tool tips
- Simplified programming of channel units thanks to the use of channel lists and configuration templates that can be updated
- Transfer of saved configurations and channel lists into other installations
- Online update
  - Control program
  - Channel lists
  - Transponder lists
  - Module software

› Base unit
UFG 810

Base unit with 10 slots

Includes a power supply unit (UFN 800), backplane, central control module (UFX 800), fan unit, passive output coupler and cover.

Features

- Ten hot-plug slots for UFOcompact plus® modules
- Three dedicated hot-plug system slots for the power supply unit (UFN 800), control module (UFX 800) and add-ons (UVO 830 etc.)
- UFO®compact series modules can be installed and operated via the UFZ 800 adapter
- Module power supply and communication via high speed backplane
- Safe heat dissipation is ensured thanks to two energy-saving, monitored fans and optimised air ducting over the modules' cooling elements
- Ample free space at the bottom of the base unit for laying the cables of the external leads and the adapter

SPECIAL FEATURES

- **Installation height: Nine HUs for wall mounting or 19" rack**
- **Completely pre-assembled with power supply unit (UFN 800), output coupler and control module (UFX 800)**

❯ Power supply unit for UFOcompact plus® base units
UFN 800

Features

- Power supply unit for use in UFOcompact plus®base units (supplied with the UFG 810 base unit, BN 20610122)
- Easily exchangeable thanks to frontal insertion into UFOcompact plus® base units
- Automatic overtemperature switch-off
- Low peak inrush current < 20 A

- High degree of efficiency: > 92 %
- Redundancy-capable
- Front LED status display

❯ Connection cable for UFOcompact plus® base units
UFZ 810

- Cable for connecting two base units
- Power supply redundancy
- Seamless switch-over in event of fault

❯ Central control module
UFX 800

Features

- Central control module for controlling all channel u[...] in the UFOcompact plus® signal processing system[...] conjunction with the USW 800 software (supplied w[...] UFG 810 base unit, BN 20610122)
- Two Fast Ethernet ports for managing and cascading s[...] eral installations without an external switch
- Management interface with a high level of performance thanks to parallel communication; also the interface to the inserted UFOcompact® modules
- Power ON reset for UFOcompact plus® series modules

- Flexible IP configuration (IPV 4/IPV 6, DHCP, zeroconf)
- Two USB ports (e.g. for software updates)
- Remote software update for modules

Transmodulators overview

UFO compact plus

UFOcompact plus® enables a wide range of TV signals to be processed in a very small space. The transmodulators feature four RF inputs, followed by a broadband RF matrix with DiSEqC™ capability for internally splitting the signals in a completely flexible way. Powerful channel and PID filters, combined with the available multiplex function, ensure maximum flexibility. All modules are characterised by a particularly low level of power consumption. They are of push-pull design, and are hot-pluggable. They also have voltage and temperature sensors. A status LED informs the user of the modules' operating condition at a glance.

UFO 874
Four-way transmodulator
DVB-S(2) – DVB-C (J.83A)
Page 22

UFO 878
8-way transmodulator
DVB-S(2) – DVB-C (J.83A)
Page 22

UFO 876/MX
6-way multi-standard
transmodulator/
multiplexer
DVB-S2/-T2/-C –
DVB-C (J.83A)
Page 23

UFZ 896
6-way CI module
Page 26

UFO 828
8-way transmodulator
DVB-IPTV – DVB-C (J.83A)
Page 25

UFX 894
HDMI encoder
Page 26

UFO 844
4 x IP streamer
Multi-DVB – DVB-IPTV
Page 24

UFO 848
8 x IP streamer
Multi-DVB – DVB-IPTV
Page 24

UFZ 800
Channel unit adapter
Page 27

⟩ 4-way/8-way transmodulator DVB-S(2) – DVB-C (J.83A)
UFO 874, UFO 878

Features

- 8-way (UFO 878) or 4-way (UFO 874) transmodulator DVB-S (2) - DVB-C (QPSK/8PSK - QAM)
- Flexible baseband data exchange with neighbouring modules, e.g. UFZ 896 for decoding
- Excellent technical data (MER ≥ 45 dB) with direct implementation as FPGA solution
- Four sat IF inputs with DiSEqC™1.0 functionality for sat multi-switches, flexibly distributable across four/eight front-ends

SPECIAL FEATURES

- Extensive baseband signal processing e.g. with extended channel filter functionality

- Four/eight DVB-C-compliant output channels (J.83A)

- High energy efficiency, power consumption: Typical 14/24 W at 12 V

UFO 874

UFO 878

6-way transmodulator/multiplexer DVB-S(2)/-T(2)/-C – DVB-C (J.83A)
UFO 876/MX

Features

- 6-way transmodulator/multiplexer DVB-S(2)/-T(2)/-C – DVB-C (J.83A)/ DVB-T
- Transmodulator with 4-way multi-standard front-end and max. six DVB-compliant output channels in DVB-C (J.83A)
- 3-in-1 MUX per output channel:
  - Enables for each output channel multiplexing of three freely selectable input transport streams (front-end or neighbouring modules)
  - PSI/SI MUX provides completely new structure of the PAT, SDT, EIT etc.
- Flexible baseband data exchange with neighbouring modules, e.g. UFZ 896 for decoding
- Four sat IF/terr./cable inputs with DiSEqC™1.0 functionality for sat multi-switches, flexibly distributable across four front-ends
- Manually editable SID enables:
  - The generation of a channel list (for receivers without LCN)
  - Replacement of channels without a new channel search in the receivers

UFO 876/MX

SPECIAL FEATURES

- Excellent technical data (MER ≥ 45 dB) with direct implementation as FPGA solution

- Comprehensive baseband signal processing e.g. with extended channel filter functionality

- High energy efficiency, power consumption: Typical 19 W an 12 V

4-way/8-way IP streamer multi-DVB – DVB-IPTV
UFO 844/UFO 848

Features

- 4-way IP streamer multi-DVB/8-way DVB-S(2) -DVB-IPTV
- IP streamer with 4-way multi-standard front-end DVB-S(2)/-T(2)/-C/8-way DVB-S(2) front-end
- Converts input signals into 4×/8× MPTS or 32×/64× SPTS
- Four Sat-IF/terr./cable inputs/four Sat-IF inputs with DiSEqC™ 1.0 functionality for Sat multi-switches; can be flexibly switched to any of the four/eight front-ends

UFO 844

UFO 848

SPECIAL FEATURES

- Flexible baseband data exchange with neighbouring modules, e.g. UFZ 896 for decoding

- Extensive baseband signal processing e.g. with extended channel filter functionality

- High energy efficiency, power consumption: Typical 10/18 W at 12 V

8 x transmodulator DVB-IPTV – DVB-C
UFO 828

Features

- 8 x transmodulator DVB-IPTV – DVB-C (J.83A)
- Converts DVB-IPTV input signals into eight output channels DVB-C EDGE-QAM (eight output channels in DVB-C (J.83A))
- Input: 1 GB Ethernet, 8 × MPTS or SPTS
- Excellent technical data (MER ≥ 45 dB) with direct implementation as FPGA solution
- Manually editable SID

UFO 828

SPECIAL FEATURES

- Flexible baseband data exchange with neighbouring modules, e.g. UFZ 896 for decoding

- Extensive baseband signal processing e.g. with extended channel filter functionality

- High energy efficiency, power consumption: Typical 16/18 W at 12 V

❯ 6-way CI module
UFZ 896

Features

- Flexible serial connection of up to three CAMs and assignment to input transport streams in order to increase decoding capacity
- Flexible parallel operation of up to three CAMs with automatic switching if one CAM should develop an error in order to increase decoding reliability (redundancy)
- Each CAM fitted can be individually reset and restarted (power ON reset) or permanently enabled/disabled

SPECIAL FEATURES

- Six CI slots, each intended to accommodate one CAM
- Flexible baseband data exchange with neighbouring modules, e.g. UFO 878
- Monitoring of the decoding status and automatic reconfiguration in the event of an error

❯ HDMI encoder
UFX 894

Features

- Four independent HDMI inputs
- Supported video formats: SD = 576i50, HD = 720p50, 1080i50 and 1080p50
- Two integrated multiplexers generate max. 2 transport streams with 1-4 of the encoded TV channels
- Transmission of the generated TV channels to transmodulator, IP streamer and encoding modules via backplane
- Exceptional image quality and guaranteed future thanks to a FPGA-based encoder solution

SPECIAL FEATURES

- 4 HDMI inputs
- High energy efficiency, power consumption: Typical 14.5 W an 12 V

Amplifier for UFOcompact plus®
UVO 830

Features

- Amplifier can be inserted into the UFG 810 base unit (BN 20610122) directly
- Set-up via the UFX 800 central control module in conjunction with the USW 800 software
- Level and slope range can be set in combination (four suitable pre-emphases)
- Test socket for the uninterrupted measurement of the output channels at the UFOcompact plus® base unit
- Lightning protection (1.2/50 µs 2 kV) on the output side
- Excellent dynamic range under high channel assignment

Channel unit adapter for UFOcompact plus®
UFZ 800

Features

- Channel unit adapter to enable use of UFO® compact modules in the UFOcompact plus® signal processing systems:
  - Power supplied and control functions performed via the backplane
  - Central controlling via UFX 800 and USW 800 allows all previous functions to be used
  - The perfect means to continue using existing material and initiate installation conversions
- Adapter is delivered including the required connection leads for UFO® compact plus modules as well as fixing material and RF connection cable for the output coupler

UFO 19" Series

⟩ Head-end 18-way DVB-S(2)/-T(2)/-C – DVB-C
UFO 97-18, UFO 97-18 CI, UFO 97-18 HDMI, UFO 97-18 HDMI/CI

The UFO 19" series allows the combined reception of DVB-S(2)/DVB-T(2)/-C signals using the latest triple-tuner technology. The stand-alone head-end in 19" design also offers a flexible 6-way decoding option (CI) and up to 20 flexibly adjustable output channels in DVB-C.

Features

- Stand-alone 19" head-end (1HU) with 16x DVB-S(2) as well as two multi-standard front-ends DVB-S(2)/-T(2)/-C, 6-way decoding (CI) and up to 20 DVB-compliant output channels (flexibly adjustable):
- UFO 97-18: 18 output channels in DVB-C
- UFO 97-18/CI: 18 output channels in DVB-C with six CI slots
- UFO 97-18 HDMI: 20 output channels in DVB-C
- UFO 97-18 HDMI/CI: 20 output channels in DVB-C with six CI slots
- Eight Sat IF inputs with DiSEqC™ 1.0 functionality for Sat multi-switches and one DVB-S(2)/-T/-C input flexibly distributable to two multi-standard front-ends
- All transmission parameters can be set using the USW 800 management program
- Extensive baseband signal processing e.g.with channel filter functionality, NIT, LCN
- Unlimited cascading via UFO link
- Hot swap capability for the power supply unit and fan

UFO 97-18 HDMI

UFO 97-18 HDMI-CI

SPECIAL FEATURES

- Outstanding output values thanks to direct implementation as FPGA solution
- High level of energy efficiency
- Remote maintenance and configuration
- Power supply redundancy

Head-end 18-way DVB-S(2)/-T(2)/-C – DVB-IPTV
UFO IP512, UFO IP512 CI, UFO IP512 HDMI, UFO IP512 HDMI/CI

The UFO 19″ series allows the combined reception of DVB-S(2)/DVB-T(2)/-C signals using the latest triple-tuner technology. The stand-alone head-end in a compact design also offers a flexible 6-way decoding option (CI) and 512 SPTS or 18 MPTS streams.

Features

- Stand-alone head-end with 16x DVB-S(2) as well as two multi-standard front-ends DVB-S(2)/-T(2)/-C, 6-way decoding (CI) conversion to DVB-IPTV
- Simultaneous service pool with 494 SPTS and 18 MPTS or 512 SPTS
- Supports SAP (Session Announcement Protocol) and M3U
- Two redundant wideband power supply units with automatic redundancy and fan monitoring
- Eight Sat IF inputs with DiSEqC™ 1.0 functionality for Sat multi-switches, flexibly distributable to 2 × 8 front-ends plus one input (non-switchable DVB-S(2)) for the two multi-standard front-ends
- Power supply for two LNBs and one active antenna
- All transmission parameters can be set using the USW 800 configuration software
- Unlimited cascading via IP network or the internal switch (system network). Joint administration and configuration of system network
- 6-way decoding function (serial or parallel decoding)
- Hot swap capability for the power supply unit and fan

UFO IP512 HDMI

UFO IP512 HDMI/CI

Solutions for Hotels and Guesthouses

❯ IPTV head-end combined with external middleware server

- Welcome screen
- Overview board
- Live TV
- EPG
- Bring your own Device
- Hotel info channel
- Weather information
- Useful hotel information
- Locality information

Kathrein's IPTV head-end systems can be transformed into a sustainable, digital and intelligent IPTV system through the strategic deployment of an external middleware server. We provide the hotel/guesthouse and guests with the latest technology solutions, always making sure to offer them the best tools available. These include support for hospitality TVs and TV management solutions. We work closely with our partners to ensure that we keep pace with the technology of today and tomorrow. For more information contact our field sales team. They will help you plan and implement your project.
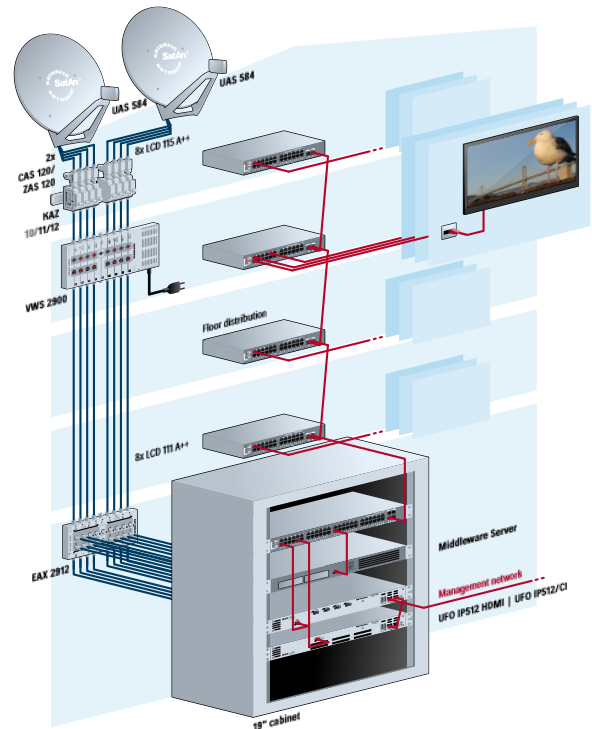
The UFOmini Systems

III UFOmini

> Overview of the UFOmini head-end family

The UFOmini head-end family features eight multi-standard front-ends for the combined reception of DVB-S(2), -T(2) and -C signals. The stand-alone head-end in a compact design also offers a flexible 6-way decoding option (CI) and eight flexibly adjustable output channels in DVB-C. Further features of the UFOmini include very high energy efficiency and remote configuration. Additional baseband signal processing with a channel filter, NIT, support for various LCN standards and the flexible decoding option all add up to a product with a very wide field of application. The combinable components of the UFOmini are:

- UFO 87 – eight output channels in DVB-C
- UFO 87/CI – eight output channels in DVB-C with six CI slots
- UFO 87-18 – 18 output channels in DVB-C
- UFO 87-18/CI – 18 output channels in DVB-C with six CI slots
- UFO 87/18 HDMI – 20 output channels in DVB-C
- UFO 87/18 HDMI/CI – 20 output channels in DVB-C with six CI slots

> **Head-end 8-way DVB-S(2)/-T(2)/-C – DVB-C**
UFO 87, UFO 87/CI

The UFOmini head-end family enables combined reception of DVB-S(2)/-T(2)/-C via the latest triple-tuner technology. The stand-alone head-end in a compact design also offers a flexible 6-way decoding option (CI) and eight flexibly adjustable output channels in DVB-C.

Features

- Stand-alone head-end with 8-way multi-standard front-end DVB-S(2)/-T(2)/-C, 6-way decoding (CI) and eight DVB-compliant output channels (flexibly adjustable):
  - UFO 87: Eight output channels in DVB-C
  - UFO 87/CI: Eight output channels in DVB-C with six CI slots
- Four sat IF inputs with DiSEqC™1.0 functionality for sat multi-switches and one terr./cable input, flexibly distributable across eight multi-standard front-ends
- All transmission parameters can be set using the USW 800 management program
- Extensive baseband signal processing e.g.with channel filter functionality, NIT, LCN
- Cascadable (16-way multi-standard front-end, 12-way decoding (CI) and 16 × QAM/COFDM via UFO link)

UFO 87, UFO 87/CI

Head-end 18-way DVB-S(2)/-T(2)/-C – DVB-C
UFO 87-18, UFO 87-18/CI, UFO 87/18 HDMI, UFO 87/18 HDMI-CI

The UFOmini head-end family enables combined reception of DVB-S(2)/-T(2)/-C via the latest triple-tuner technology. The stand-alone head-end in a compact design also offers a flexible 6-way decoding option (CI) and 18 flexibly adjustable output channels in DVB-C.

Features

- Stand-alone head-end with 16-way DVB-S(2) and two multi-standard DVB-S(2)/-T(2)/-C front-ends, 6-way decoding (CI) and 18 DVB-compliant output channels (flexibly adjustable):
- UFO 87-18: 18 output channels in DVB-C
- UFO 87-18/CI: 18 output channels in DVB-C with six CI slots
- UFO 87-18 HDMI: 20 output channels in DVB-C
- UFO 87-18 HDMI/C: 20 output channels in DVB-C with six CI slots
- Eight Sat IF inputs with DiSEqC™ 1.0 functionality for Sat multi-switches and one DVB-S(2)/-T/-C input flexibly distributable to two multi-standard front-ends
- All transmission parameters can be set using the USW 800 management program
- Extensive baseband signal processing e.g.with channel filter functionality, NIT, LCN
- Up to four UFOmini cascadable via UFO link

UFO 87-18, UFO 87-18/CI

UFO 87/18 HDMI, UFO 87/18 HDMI-CI

⟩ Connection example for UFOmini with DiSEqC™ control

2x
UAS
584 (585)

EBC 10

KAZ 10/11/12*

EXR 2908

EXR 2908

UFO 87-18

EBC 04/G

EBC 02/G

⟩

The CI versions offer the possibility to decode encoded signals directly in the head-end.

⟩ UFOlink connection example
UFO 87-18 and UFO 87 system network

USB Type A
OUT
UFOmini Master

Input 1-8
UFO 87-18/CI
Output

Type A
OUT
UFOmini Slave

Type B IN

Input 1-4
USB 2.0 UFO Link
Output
UFO 87

USB Type B
IN
UFOmini Slave

Input 1-8
UFO 87-18/CI
Output

Type A
OUT
UFOmini Slave

Type B IN

Input 1-4
USB 2.0 UFO Link
Output
UFO 87

USB 2.0 UFO Link

EBC 04/G

The UFOnano Systems

III UFOnano

> The all-in-one solutions

The third system is the inexpensive, yet fully technically developed, UFOnano stand-alone head-end, which offers a number of advantages specifically when modernising existing properties. Really simple programming thanks to channel packages and a pre-set station list mean that installation and commissioning are complete in the blink of an eye. UFOnano allows transmodulation (FTA) of 8 x DVB-S(2) to 8 x QAM. With a typical power consumption of 20-28 watts, the head-ends with built-in power supply units are extremely energy-efficient. The head-end is delivered pre-programmed, which allows operation without further configuration. After installation and connection, the most important German-language TV and radio channels are immediately available over Astra 19.2° east. The head-end is primarily used in smaller hotels and guest houses.

> Connection example for UFOnano installation
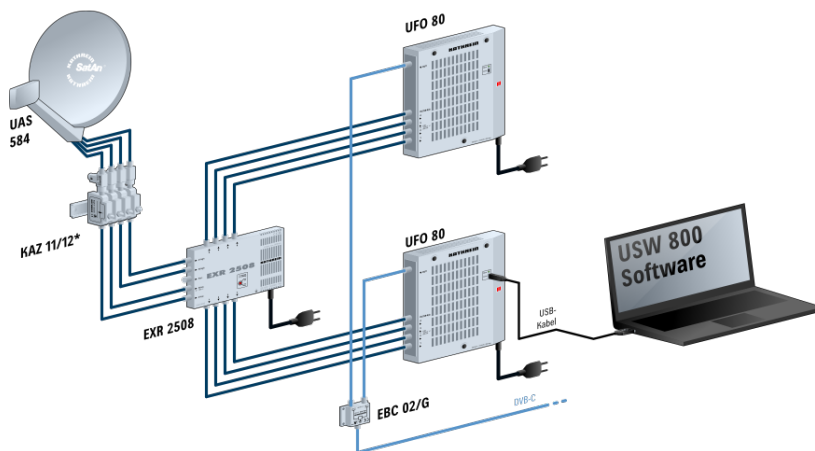
⟩ Head-end 8-way DVB-S(2) – DVB-C (J.83A)
UFO 80

Features

- Converts eight QPSK/8PSK modulated DVB-S2 signals into eight QAM-modulated DVB-C output signals
- TV and radio channels pre-programmed
- Four Sat IF inputs A/B/C/D configurable
- All the transmission parameters can be set using the USW 800 management program
- To change the standard configuration, a USB-A connector/mini-USB cable is additionally required (supplied)
- MPEG transport stream processor:
- To set a constant output data rate (stuffing) with PCR correction
- With channel filter to remove individual TV and radio channels
- Fanless design for wall mounting (no noise)
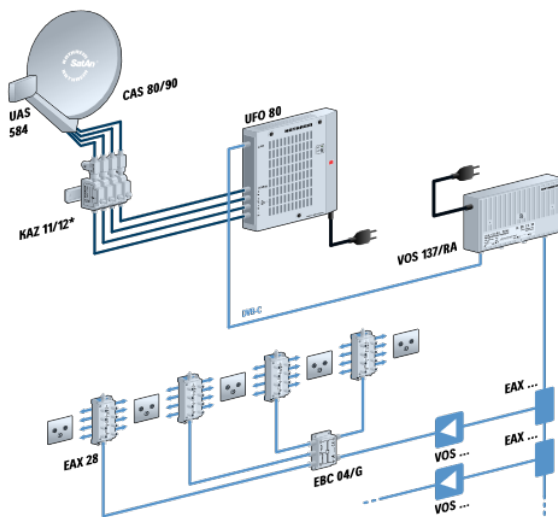
SPECIAL FEATURES

- Stand-alone head-end with built-in power supply unit
- Outstanding data through direct implementation as an FPGA solution
- High energy efficiency, power consumption: Typical 28 W

⟩ UFOnano tuning instructions

The plug-and-play condition on delivery allows operation of the UFOnano head-end without any further configuration. After installation and connection, 78 TV and 9 radio channels are immediately available over Astra 19.2° east (see table below). The default configuration can be changed using the USW 800 control program.

For programming, the UFO 80 head-end must be connected by a USB cable (supplied) to a PC with a USB port.

Channel unit	1	2	3	4	5	6	7	8
Input	A	A	A	A	A	A	B	B
Transponder/ Channel	Das Erste, BR, HR, SWR, WDR	ZDF, 3sat, KIKA, ZDFinfo, ZDFkultur, ZDF neo	MDR, NDR, RBB, SWR	RTL, N-TV, RTL2, RTL Living, RTLnitro, Vox	Pro Sieben, Sat1, Kabel eins, N24 ...	Anixe, Das Vierte, 1-2-3 TV, TLC Germany, Sixx Deutschland	VIVA, Nickelodeon ...	Sport1, DMAX, HSE24, SonnenklarTV, Astro TV ...
SD/HD	SD							
Band	High							
Polarisation	Horizontal						Vertical	
Transp. frequency [MHz]	11836	11954	12110	12188	12545	12460	11973	12480
Sat-IF [MHz]	1236	1354	1510	1588	1945	1860	1373	1880
SR	27500				22000		27500	
Standard	DVB-S							
CR	3/4				5/6		3/4	
Output channel	S21	S22	S23	S24	S25	S26	S27	S28
Symbol rate	6.9							
Output level	-2							
QAM	64							

Delivery status UFO 80, transponder Astra 19.2° east and output channel assignment

The settings and numerical values shown are examples that do not necessarily correspond to the delivery status. For the operation of two UFOnano units or reception of other satellites, more pre-set configurations are available. These can be downloaded free of charge from the Kathrein website at www.kathrein-ds.com. When operating two UFOnano units, make sure that the respective output channel blocks do not overlap. The output signals of the two head-end units can then be combined with distributors of the EBC series (reverse operation). The power supply to the LNB (remote feed) is provided directly by the UFO 80.

Optional HDMI Encoder

> **HDMI encoder MPEG-4/H.264 HD/SD**
> UFX 10

Features

- HDMI encoder MPEG-4 AVC/H.264 HD/SD (4k loop through)
- Input: HDMI
- RF output: DVB-C/-T
- Output: HDMI (4k loop through)
- Setting options: Direct device operation by buttons on front
- Implementation of different signal sources, e.g. set-top boxes, cameras, DVD players, Blu-ray players
- Integration into an existing LCN possible

SPECIAL FEATURES

- HDMI encoder
- RF output: DVB-C/-T

Technical Appendix

Type	UFG 810
Order no.	20610122
Type of mounting	Installation in 19" rack and wall mounting
Number of slots	Ten modules, one power supply unit (UFN 800, pre-assembled), two function modules (UFX 800 pre-assembled, plus one more)
Power supply unit (UFN 800, 20610121)	
Power supply voltage	230 V ± 10 %/50–60 Hz
Max. power consumption [W]	437
Secondary voltage/max. permissible current	12.3 V/32.5 A
Signalling (LED)	Green (normal operation) Red (under voltage or overcurrent) Red flashing (over voltage)
Output data	
Connection attenuation [dB]	Typical 15
General information	
Fan	2
Dimensions (H × W × D) [mm]	399 × 483 × 266
Permissible ambient temperature [°C]	-20 to +50
Weight [kg]	15.5

Type	UFX 800
Order no.	20610123
System interfaces	
Control interface [Mbps]	12
Fast Ethernet	2 × RJ 45
USB	2 × host (type A)
Reset	Button
System data	
Power consumption [W]	Typical 4
Temperature range [°C]	-20 to +50
Dimensions (H × W × D) [mm]	110.5 × 38.5 × 207
Weight [kg]	0.3

Type	UFN 800
Order no.	20610121
Input	
Nominal input voltage [V]	230 ± 10%
Mains frequency [Hz]	50-60
Input power [W]	Max. 437
Nominal input current [A]	< 1.9
Inrush current limitation [A]	≤ 20
Efficiency [%]	Typical > 92
Power factor correction	EN 61000-3-2
Output	
Output power [W]	400
Output voltage/current	12.3 V/0.5 ... 32.5 A
Output current limitation	$36.5 < I_{sec} < 38.5$ A (short-circuit proof)
Overvoltage protection [V]	> 14
Interference voltages	≤ 250 mVss (50 Hz to 1 MHz)
Redundancy	Parallel connection of several power supply units possible
Monitoring	
Temperature sensor	Request for current interior temperature via USW 800 software
Base unit fan	Function/error status request via USW 800 software
Remote control	Reset and restart via USW 800 software
Signalling (LED)	
Green (output voltage 11.3–14 V)	Normal operation
Red (output voltage < 10.6 V)	Undervoltage
Red (flashing) [V]	Overvoltage (output voltage > 14)
Red [A]	Overcurrent (output current > 35.5)
Safety (VDE approved)	
Protection class	1
Excess temperature switch-off	Automatic
System data	
Mains connection	Inlet connector for non-heating apparatus
Temperature range [°C]	-20 to 50
Dimensions (H × W × D) [mm]	166 × 78 × 230
Weight [kg]	1.6

Type	UFO 878	UFO 874
Order number	20610127	20610128
Inputs		
Sat IF input [Ω]	4 × F connector, 75	
Frequency range [MHz]	950-2150	
Decoupling [dB]	> 25	
Return loss [dB]	Typical 10	
DiSEqC™ 1.0	Vert./Horiz., Low/High; Sat. pos. (A/B/C/D)	
Switching levels	14/18 V, 0/22 kHz	
Remote feed current	Max. 60 mA (per input)	
Front-end		
DVB-S2	8 ×	4 ×
Frequency plan [MHz]	1 (950–2150)	
AFC regulation range [MHz]	± 3 (symbol rate < 10 Ms/s) ± 5 (symbol rate > 10 Ms/s) (950–2150)	
Input level range [dBµV]	60-110	
Permissible level difference [dB]	12	
Demodulation DVB-S		
Standard	EN 300 421 (1)	
QPSK input symbol rate [MS/s]	1-5	
Code rate (Viterbi)	½, ⅔, ¾, ⅚, ⅚, ⅞	
Roll off [%]	35	
Demodulation DVB-S2		
Standard	EN 302 307 (2)	
QPSK input symbol rate [MS/s]	2-47	
Code rate (LDPC)	½, ⅗, ⅔, ¾, ⅘, ⅚, ⅚, ⁹⁄₁₀	
8PSK input symbol rate [MS/s]	2-31.5	
Code rate (LDPC)	⅗, ⅔, ¾, ⅚, ⅚, ⁹⁄₁₀	
Roll off [%]	20/25/35	
System interfaces		
Data interface [Mbps]	800 net	
Control interface [Mbps]	12	
TS routing to backplane	Max. 2 × 16 transport streams (right and left)	
MPEG-TS processor		
Channel filter	✓	
PID filter	✓	

PSI/SI processing	Cable NIT, LCN, PCR correction, CAT	
Stuffing	Automatic	
QAM modulator		
Output channels	8 × DVB-C (J.83A)	4 × DVB-C (J.83A)
QAM constellation [QAM]	16, 32, 64, 128, 256	
Symbol rate [MS/s]	2.25-7.25	
Roll off [%]	15	
RF output		
DVB-C output [Ω]	1 × F connector, 75	
Frequency range [MHz]	47–1006 (fine tuning in 125-kHz steps)	
Frequency range [MHz] (channel list)	47–86/110–862 (set-up via channel list)	
Return loss [dB]	14 (47 MHz) -1.5 dB/oct.	
Output level [dBµV]	97	
Output level setting range [dB]	-20 (in 0.5 dB steps)	
Level stability [dB]	± 0.8	
Frequency stability [ppm]	35	
MER [dB]	≥ 45	
Shoulder attenuation [dB]	≥ 60 (at normal level)	
Spurious emissions [dB]	≥ 60	
System data		
Power consumption [W]	Typical 24 (at 12 V)	Typical 14 (at 12 V)
Temperature range [°C]	-20 to +50	
Protective shut-down [°C]	> 70	
Dimensions (H × W × D) [mm]	265 × 36 × 220	
Weight [kg]	1.1	

Type	UFO 836	UFO 876
Order no.	20610132	2061133
Inputs		
Sat IF/terr. /cable [Ω]	4 × F connector, 75	
Decoupling [dB]	> 25	
Return loss [dB]	Typical 10	
DiSEqC™ 1.0	Vert./Horiz., Low/High; Sat. pos. (A/B/C/D)	
Switching levels	14/18 V, 0/22 kHz	
Remote feed current [A]	Max. 0.060 (per input)	
Front-end		
DVB–S(2)/-T/-T2/-C	4 ×	
Frequency plan [MHz]	1	

Type	UFO 876/MX	
Order no.	20610145	
Inputs		
Sat IF/terr./cable [Ω]	4 × F connector, 75	
Decoupling [dB]	> 25	> 25
Return loss [dB]	Typical 10	
DiSEqC™ 1.0	Vert./Horiz., Low/High; Sat. pos. (A/B/C/D)	
Switching levels [kHz]	14/18 V, 0/22	
Remote feed current [mA]	Max. 60 (per input)	
Front-end		
DVB-S(2)/-T/-T2/-C	4 ×	
Frequency plan [MHz]	1	
Input level range [dBμV]	60-100	
Front-end		
Permissible level difference [dB]	20	
Demodulation DVB-S		
Standard	EN 300 421	
Frequency range [MHz]	950-2150	
QPSK input symbol rate [MS/s]	1-45	
Code rate (Viterbi)	½, ⅔, ¾, ⅚, ⅞	
AFC regulation range [MHz]	± 5	
Roll off [%]	20/25/35	
Demodulation DVB-S2		
Standard	EN 302 307, TR 102-376	
QPSK input symbol rate [MS/s]	1-45	
Code rate (LDPC)	½, ⅗, ⅔, ¾, ⅘, ⅚, ⅘, ⁹⁄₁₀	
8PSK input symbol rate [MS/s]	1-45	
Code rate (LDPC)	⅗, ⅔, ¾, ⅚, ⅘, ⁹⁄₁₀	
Roll off [%]	20/25/35	
Frequency range [MHz]	42-870	
Guard interval	¼, ⅛, ¹⁄₁₆, ¹⁄₃₂	
Standard	EN 300744, NorDig Unified 2.2.1, D-Book 7.0, supports all C.R, G.I, LP and HP streams	
Demodulation DVB-T (COFDM)		
FEC	½, ⅔, ¾, ⅚, ⅞	

FFT mode [k]	2, 8
Bandwidth [MHz]	6, 7, 8
Constellation [QAM]	QPSK, 16, 64
Demodulation DVB-T2 (COFDM)	
Standard	EN 302755-V1.31, DVB-T2 Lite compliant, single and multiple PLP support, NorDig Unified 2.2.1, D-Book 7.0
Guard interval	¹⁄₁₂₈, ¹⁄₃₂, ¹⁄₁₆, ¹⁹⁄₂₅₆, ⅛, ¹⁹⁄₁₂₈, ¼
FEC	½, ⅗, ⅔, ¾, ⅘, ⅚
FFT mode [k]	1, 2, 4, 8, 16, 32
Bandwidth [MHz]	1.7/5/6/7/8
Constellation [QAM]	QPSK, 16, 64, 256
Demodulation DVB-C	
Standard	EN 300429/ITU J.83 Annex A/C
Frequency range [MHz]	42-862
Input symbol rate [MS/s]	1-7.2
Constellation [QAM]	4/16/32/64/128/256
MPEG-TS processor	
Channel filter	✓
PID filter	✓
Conflict management	SID and PID conflicts are resolved automatically
Manually editable SID	For creating channel lists and replacing channels
PSI/SI processing	Cable NIT, LCN, PCR correction, CAT
Stuffing	Automatic
Multiplex	
3-in-1 MUX	3 freely selectable input transport streams (front-end or neighbouring modules) per output channel
PSI/SI MUX	PAT, SDT, EIT, etc. are completely reconfigured
Modulator	
Output channels	6 × DVB-C (J.83A)
Constellation [QAM]	16/32/64/128/256
Symbol rate [MS/s]	2.25-7.25
Roll off [%]	15
RF output	
Output [Ω]	1 × F connector, 75
Frequency range [MHz]	47–1006 (fine tuning in 125-kHz steps)

Type	UFO 876/MX
Order no.	20610145
RF output	
Frequency range [MHz] (channel list)	47-96/110-858 (set-up via channel list)
Return loss [dB]	14 (47 MHz) -1.5 dB/oct.
Output level [dBµV]	97
Output level setting range [dB]	-20 (in 0.5 dB steps)
Level stability [dB]	± 0.8
Frequency stability [ppm]	35
MER [dB]	≥ 44
Shoulder attenuation [dB]	≥ 60 (at normal level)
Spurious emissions [dB]	≥ 60
System data	
Power consumption [W]	Typical 19 (at 12 V)
Temperature range [°C]	-20 to +50
Protective shut-down [°C]	> 70
Dimensions (H × W × D) [mm]	265 × 36 × 220
Weight [kg]	1.1

Type	UFO 844	UFO 848
Order no.	20610138	2060000002
Inputs		
Sat IF/terr./cable [Ω]	4 × F connector, 75	
Decoupling [dB]	> 25	
Return loss [dB]	Typical 10	
DiSEqC™ 1.0	Vert./Horiz., Low/High; Sat. pos. (A/B/C/D)	
Switching levels [kHz]	14/18 V, 0/22	
Remote feed current [mA]	Max. 60 (per input)	
Front-end		
DVB-S(2)/-T/-T2/-C	4 ×	4 × DVB-S(2)
Frequency plan [MHz]	1	
Input level range [dBµV]	60-100	60-110
Permissible level difference [dB]	20	12
Demodulation DVB-S		
Standard	EN 300 421	

Frequency range [MHz]	950-2150	
QPSK input symbol rate [MS/s]	1-45	
Code rate (Viterbi)	½, ⅔, ¾, ⅚, ⅞	
Roll off [%]	20/25/35	
AFC regulation range [MHz]	± 5	
Demodulation DVB-S2		
Standard	EN 302 307, TR 102-376	
QPSK input symbol rate [MS/s]	1-45	
Code rate (LDPC)	½, ⅗, ⅔, ¾, ⅘, ⅚, ⅞, ⁹⁄₁₀	
8PSK input symbol rate [MS/s]	1-45	1-31.5
Code rate (LDPC)	⅗, ⅔, ¾, ⅚, ⅞, ⁹⁄₁₀	
Roll off [%]	20/25/35	
Demodulation DVB-T (COFDM)		
Standard	EN 300744, NorDig Unified 2.2.1, D-Book 7.0, supports all C.R, G.I, LP and HP streams	–
Frequency range [MHz]	42-870	–
Guard interval	¼, ⅛, ¹⁄₁₆, ¹⁄₃₂	–
FEC	½, ⅔, ¾, ⅚, ⅞	–
FFT mode [k]	2, 8	–
Bandwidth [MHz]	6, 7, 8	–
Constellation [QAM]	QPSK, 16, 64	–
Demodulation DVB-T2 (COFDM)		
Standard	EN 302755-V1.31, DVB-T2 Lite compliant, single and multiple PLP support, NorDig Unified 2.2.1, D-Book 7.0	–
Guard interval	¹⁄₁₂₈, ¹⁄₃₂, ¹⁄₁₆, ¹⁹⁄₂₅₆, ⅛, ¹⁹⁄₁₂₈, ¼	–
FEC	½, ⅗, ⅔, ¾, ⅘, ⅚	–
FFT mode	1k, 2k, 4k, 8k, 16k, 32k	–
Bandwidth [MHz]	1.7/5/6/7/8	–
Constellation [QAM]	QPSK, 16, 64, 256	–
Demodulation DVB-C		

Standard	EN 300429/ITU J.83 Annex A/C	–
Frequency range [MHz]	47-862	–
Input symbol rate [MS/s]	1-7.2	–
Constellation [QAM]	4/16/32/64/128/256	–
MPEG-TS processor		
Channel/PID filter	✓	
PSI/SI processing	PCR correction, CAT, PID, SID, TSID, ONID remapping	
Stuffing	Automatic	
IP Stream		
Output	1 GB Ethernet, 1000 BaseT	
Protocol	UDP/RTP, IPv4, SAP	
Transmission method	Unicast/Multicast	
Transport stream	32 × SPTS/4 × MPTS	64 × SPTS/8 × MPTS
Max. output data rate per TS [Mbps]	60	1-100
IP services	ARP, Ping	
System data		
Power consumption [W]	Typical 10 (at 12 V)	Typical 18 (at 12 V)
Temperature range [°C]	-20 to +50	

Symbol rate [MS/s]	2.25-7.25
Roll off [%]	15
RF output	
Output [Ω]	1 × F connector, 75
Frequency range [MHz]	47–1006 (fine tuning in 125-kHz steps)
Frequency range (channel list) [MHz]	47–86/110–862 (set-up via channel list)
Return loss [dB]	14 (47 MHz) -1.5 dB/oct.
Output level [dBµV]	97
Output level setting range [dB]	-20 (in 0.5 steps)
Level stability [dB]	± 0.8
Frequency stability [ppm]	35
MER [dB]	≥ 45
Shoulder attenuation [dB]	≥ 60 (at normal level)
Spurious emissions [dB]	≥ 60
System data	
Power consumption [W]	Typical 16 (at 12 V)
Temperature range [°C]	-20 to +50
Protective shut-down [°C]	> 70
Dimensions (H × W × D) [mm]	265 × 36 × 220
Weight [kg]	1.1

Type	UFO 828
Order no.	20610142
Input	
IP	1 GB Ethernet, 1000BaseT
Protocols	UDP/RTP
Transmission method	Unicast/Multicast
Max. input data rate per transport stream [Mbps]	80
TS inputs	8 × SPTS/MPTS
IP services	IPv4, ARP, Ping, SAP, IGMP
MPEG-TS processor	
Channel/PID filter	✓
Manually editable SID	For channel list structure
PSI/SI processing	Cable NIT, LCN, PCR correction, CAT
Stuffing	Automatic
QAM modulator	
Output channels	8 × DVB-C (J.83A)
Constellation [QAM]	16/32/64/128/256

Type	UVO 830
Order no.	20610130
Input	
Input socket [Ω]	1 × F connector, 75
Frequency range [MHz]	47-1006
Test output	
Test socket [Ω]	1 × F connector, 75
Level relative to the output [dB]	-25
Output	
Output socket [Ω]	1 × F connector, 75
Output	
Max. output level (at 862 MHz) [dBµV]	113
Max. output level (at 1006 MHz) [dBµV]	112

System data	
Gain [dB]	Max. 30
Adjustable pre-emphases [dB]	6, 9, 12, 15
Power consumption [W]	Typical 14.2
Temperature range [°C]	-20 to +50
Dimensions (H × W × D) [mm]	110.5 × 38.5 × 207
Weight [kg]	0.3

Type	UFZ 800
Order no.	20610124
Communication	USB-UART Bridge
Data rate [kbaud]	Max. 115
Power rating	UFO®compact channel units
5 V lead [A]	3
12 V lead [A]	2
31 V lead [mA]	Typical 11
Interfaces	
Backplane	Connector (f), 40-pin
Power supply	8-core cable and plug
Communication	6-pin mini-DIN connector
System data	
Power consumption [W]	< 1
EMC [dBpW]	Max. 20 (EN 50083-2, A1)
Temperature range [°C]	-20 to +50
Dimensions (H × W × D, without cable) [mm]	122 × 43 × 23
Weight (incl. leads) [kg]	0.15

Type	UFO 97-18	UFO 97-18/ CI	UFO 97-18 HDMI	UFO 97-18 HDMI/ CI
Order no.	206500003	206500004	206500005	206500006
Inputs				
Sat IF input	8 × F connector, 75 Ω			
Sat/terr./cable input	1 × F connector, 75 Ω			
Decoupling [dB]	> 25			
Return loss [dB]	Typical 10			
DiSEqC™ 1.0	Vert./Horiz., Low/High; [MHz] Sat. pos. (A/B/C/D)			

Switching planes [V/kHz]	14/18, 0/22
Remote feed current for LNB [mA]	Max. 250 (at F socket no. 3 and 7), max. 60 (at F socket no. 1, 2, 4, 5, 6, 8)
Remote feed current for active Antenna (5 V) [mA]	100 (at F socket no. 9)
Front-end	
DVB-S/-S2/	16 ×
DVB-S/S2/T/T2/C	2 ×
Frequency plan [MHz]	1
Input level range [dBµV]	60-100
Permissible level difference [dB]	20
Demodulation DVB-S	
Standard	EN 300 421
Frequency range [MHz]	950-2150
QPSK input symbol rate [MS/s]	1-45
Code rate (Viterbi)	½, ⅔, ¾, ⅚, ⅞
Roll off [%]	20, 25, 35
AFC regulation range [MS/s]	± 5
Demodulation DVB-S2	
Standard	EN 302 307, TR 102-376
QPSK input symbol rate [MS/s]	1-45
Code rate (LDPC)	½, ⅗, ⅔, ¾, ⅘, ⅚, ⅘, ⁹⁄₁₀
8PSK input symbol rate [MS/s]	1-45
Code rate (LDPC)	⅗, ⅔, ¾, ⅚, ⅘, ⁹⁄₁₀
Roll off [%]	20/25/35
Demodulation DVB-T (COFDM)	
Standard	EN 300744, NorDig Unified 2.2.1, D-Book 7.0, supports all C.R, G.I, LP and HP streams
Frequency range [MHz]	47-862
Guard interval	¼, ⅛, ⅟₁₆, ⅟₃₂
FEC	½, ⅔, ¾, ⅚, ⅞
FFT mode	2k, 8k
Bandwidth [MHz]	6, 7, 8
Constellation [QAM]	QPSK, 16, 64
Demodulation DVB-T2 (COFDM)	
Standard	EN 302755-V1.31, DVB-T2 Lite compliant, single and multiple PLP support, NorDig Unified 2.2.1, D-Book 7.0

Guard interval	$1/128$, $1/32$, $1/16$, $19/256$, $1/8$, $19/128$, $1/4$
FEC	$1/2$, $3/5$, $2/3$, $3/4$, $4/5$, $5/6$
FFT mode	1k, 2k, 4k, 8k, 16k, 32k
Bandwidth [MHz]	1.7/5/6/7/8
Constellation [QAM]	QPSK, 16, 64, 256
Demodulation DVB-C	
Standard	EN 300 429/ITU J.83 Annex A/C
Frequency range [MHz]	47-862
Input symbol rate [MS/s]	1-7.2
Constellation [QAM]	4/16/32/64/128/256
HDMI encoder	
Video format	– / 1920 × 1080p50 (HD), 1920 × 1080i50 (HD),1280 × 720p50 (HD), 720 × 576i50 (SD)
Audio format [kHz]	48 (PCM)
LED status display	Off: No active HDMI source connected Red: No valid input signal****)** Green: Input format, encoder output OK
Audio/video encoding	
Encoding, ISO/IEC 14496-10	High profile
H.264 Profile | Level	High profile | 3.0 / 3.2 / 4.0
Chroma format	4:2:0
Video format	– / 1920 × 1080p50 (HD), 1920 × 1080i50 (HD),1280 × 720p50 (HD), 720 × 576i50 (SD)
Video data rate, adjustable for each encoded video [Mbit/s]	22-25 22-25
Encoding, ISO/IEC 11172-3	MPEG 1 Layer-II
Audio data rate [kbit/s]	96, 128, 192, 256, 320, 384
Audio format	Mono/stereo/2-tone
MPEG-TS processor	
Channel filter	✓
PSI/SI processing	Cable NIT, LCN, PCR correction, CAT
LCN data	NorDig Descriptor V1

Stuffing	Automatic			
Decoding				
6 CAM slots	–	PCMCIA interface	–	PCMCIA interface
TS routing CAM	–	Individual and serial decoding	–	Individual and serial decoding
Modulator				
Output channels	18 × DVB-C (J.83A)		20 × DVB-C (J.83A)	
Constellation	16/32/64/128/256 QAM			
Symbol rate [MS/s]	2.25-7.25			
Roll off [%]	15			
RF output				
Output	1 × F connector, 75 Ω			
Frequency range [MHz]	47–1006 (fine tuning in 125-kHz steps)			
Frequency range (channel list) [MHz]	47–86/110–862 (set-up via channel list)			
Return loss [dB]	14 (47 MHz) -1.5 dB/oct.			
Output level [dBµV]	107			
Output level setting range [dB]	-20 (in 0.5 dB steps)			
Level stability [dB]	± 0.5			
Frequency stability [ppm]	35			
MER [dB]	≥ 45			
Shoulder attenuation [dB]	≥ 60 (at normal level)			
Spurious emissions [dB]	≥ 60			
Test output				
Test socket	1 × F connector, 75 Ω			
Level relative to the output [dB]	-25			
System data				
Power consumption [W]	32-35	35-39	43	
Temperature range [°C]	0 to +45			
Mains voltage [V]	100-240			
Protective shut-down [°C]	> 70			
Dimensions (H × W × D) [mm]	482 × 44 × 488			
Weight [kg]	7.8	8.9	8.5	9.6

Type	UFO IP512	UFO IP512/ CI	UFO IP512 HDMI	UFO IP512 HDMI/ CI
Order no.	206500001	206500002	206500007	206500008
Inputs				
Sat IF input	8 × F connector, 75 Ω			
Sat/terr./cable input	1 × F connector, 75 Ω			
Decoupling [dB]	> 25			
Return loss [dB]	Typical 10			
DiSEqC™ 1.0	Vert./Horiz., Low/High; [MHz] Sat. pos. (A/B/C/D)			
Switching planes [V/kHz]	14/18, 0/22			
Remote feed current for LNB [mA]	Max. 250 (at F socket no. 3 and 7), max. 60 (at F socket no. 1, 2, 4, 5, 6, 8)			
Remote feed current for active Antenna (5 V) [mA]	100 (at F socket no. 9)			
Front-end				
DVB-S/-S2/	16 ×			
DVB-S/S2/T/T2/C	2 ×			
Frequency plan [MHz]	1			
Input level range [dBµV]	60-100			
Permissible level difference [dB]	20			
Demodulation DVB-S				
Standard	EN 300 421			
Frequency range [MHz]	950-2150			
QPSK input symbol rate [MS/s]	1-45			
Code rate (Viterbi)	½, ⅔, ¾, ⅚, ⅞			
Roll off [%]	20, 25, 35			
AFC regulation range [MS/s]	± 5			
Demodulation DVB-S2				
Standard	EN 302 307, TR 102-376			
QPSK input symbol rate [MS/s]	1-45			
Code rate (LDPC)	½, ⅗, ⅔, ¾, ⅘, ⅚, ⅚, ⅞, ⁹⁄₁₀			
8PSK input symbol rate [MS/s]	1-45			
Code rate (LDPC)	⅗, ⅔, ¾, ⅚, ⅞, ⁹⁄₁₀			
Roll off [%]	20/25/35			
Demodulation DVB-T (COFDM)				
Standard	EN 300744, NorDig Unified 2.2.1, D-Book 7.0, supports all C.R, G.I, LP and HP streams			
Frequency range [MHz]	47-862			
Guard interval	¼, ⅛, ¹⁄₁₆, ¹⁄₃₂			
FEC	½, ⅔, ¾, ⅚, ⅞			
FFT mode	2k, 8k			
Bandwidth [MHz]	6, 7, 8			
Constellation [QAM]	QPSK, 16, 64			
Demodulation DVB-T2 (COFDM)				
Standard	EN 302755-V1.31, DVB-T2 Lite compliant, single and multiple PLP support, NorDig Unified 2.2.1, D-Book 7.0			
Guard interval	¹⁄₁₂₈, ¹⁄₃₂, ¹⁄₁₆, ¹⁹⁄₂₅₆, ⅛, ¹⁹⁄₁₂₈, ¼			
FEC	½, ⅗, ⅔, ¾, ⅘, ⅚			
FFT mode	1k, 2k, 4k, 8k, 16k, 32k			
Bandwidth [MHz]	1.7/5/6/7/8			
Constellation [QAM]	QPSK, 16, 64, 256			
Demodulation DVB-C				
Standard	EN 300 429/ITU J.83 Annex A/C			
Frequency range [MHz]	47-862			
Input symbol rate [MS/s]	1-7.2			
Constellation [QAM]	4/16/32/64/128/256			
MPEG-TS processor				
Channel filter	✓			
PSI/SI processing	Cable NIT, LCN, PCR correction, CAT			
LCN data	NorDig Descriptor V1			
Stuffing	Automatic			
Decoding				
6 CAM slots	–	PCMCIA interface	–	PCMCIA interface
TS routing CAM	–	Individual and serial decoding	–	Individual and serial decoding
IP output				
IP connection	1 GB Ethernet/1000 BaseT/RJ45			
IP protocol	UDP/RTP			
IP services	IPv4/AARP/PING/SAP			
IP transmission method	Unicast/Multicast			
IP transport stream	512 × SPTS/18 × MPTS			
Max. output data rate per transport stream [Mbps]	1-100			

System data

Power consumption [W]	32-35	35-39	43	
Temperature range [°C]	0 to +45			
Mains voltage [V]	100-240			
Protective shut-down [°C]	> 70			
Dimensions (H × W × D) [mm]	482 × 44 × 488			
Weight [kg]	8.1	9.2	8.8	9.9

Type	UFO 87	UFO 87/CI
Order no.	20610135	20610137
Bandwidth [MHz]	6, 7, 8	
Constellation [QAM]	QPSK, 16, 64	

Demodulation DVB-T2 (COFDM)

Standard	EN 302755-V1.31, DVB-T2 Lite compliant, single and multiple PLP support, NorDig Unified 2.2.1, D-Book 7.0
Guard interval	1/128, 1/32, 1/16, 19/256, 1/8, 19/128, 1/4
FEC	1/2, 3/5, 2/3, 3/4, 4/5, 5/6

Demodulation DVB-T2 (COFDM)

FFT mode [k]	1, 2, 4, 8, 16, 32
Bandwidth [MHz]	1.7/5/6/7/8
Constellation [QAM]	QPSK, 16, 64, 256

Demodulation DVB-C

Standard	EN 300429/ITU J.83 Annex A/C
Frequency range [MHz]	42-1002
Input symbol rate [MS/s]	1-7.2
Constellation [QAM]	4/16/32/64/128/256

MPEG-TS processor

Channel filter	✓	
PSI/SI processing	Cable NIT, LCN, PCR correction, CAT	
LCN data	NorDig Descriptor V1	
Stuffing	Automatic	

Decoding

	UFO 87	UFO 87/CI
6 CAM slots	–	PCMCIA interface
TS routing CAM	–	Individual and serial decoding

Modulator

Output channels	8 × DVB-C (J.83A)
Constellation [QAM]	16/32/64/128/256
Symbol rate [MS/s]	2.25-7.25
Roll off [%]	15 15

*) The power consumption is dependent on the input and output configuration (data without LNB supply or remote feeding for active antennas)

RF output

Output [Ω]	1 × F connector, 75
Frequency range [MHz]	47–1006 (fine tuning in 125-kHz steps)
Frequency range (channel list) [MHz]	47–86/110–862 (set-up via channel list)
Return loss [dB]	14 (47) -1.5/oct.
Output level [dBµV]	105
Output level setting range [dB]	-20 (in 0.5 steps)
Level stability [dB]	± 0.8
Frequency stability [ppm]	35
MER [dB]	≥ 44
Shoulder attenuation [dB]	≥ 60 (at normal level)
Spurious emissions [dB]	≥ 60

Test output

Test socket [Ω]	1 × F connector, 75
Level relative to the output [dB]	25

System data

Power consumption [W]	33–37 *)	37-46 *)
Temperature range [°C]	0 to +45	
Mains voltage [V]	100-240	
Protective shut-down [°C]	> 70	
Dimensions (H × W × D) [mm]	97 × 350 × 244	
Weight [kg]	Approx. 4	Approx. 4.5

Type	UFO 87-18	UFO 87-18/CI
Order no.	2060000003	2060000004
Inputs		
Sat IF input	8 × F connector, 75 Ω	
Sat/terr./cable input	1 × F connector, 75 Ω	
Decoupling [dB]	> 25	
Return loss [dB]	Typical 10	
DiSEqC™ 1.0	Vert./Horiz., Low/High; [MHz] Sat. pos. (A/B/C/D)	
Switching planes [V/kHz]	14/18, 0/22	
Remote feed current for LNB [mA]	Max. 250 (at F socket no. 3 and 7), max. 60 (at F socket no. 1, 2, 4, 5, 6, 8)	
Remote feed current for active Antenna (5 V) [mA]	100 (at F socket no. 9)	

Front-end	
DVB-S/-S2/	16 ×
DVB-S/S2/T/T2/C	2 ×
Frequency plan [MHz]	1
Input level range [dBμV]	60-100
Permissible level difference [dB]	20
Demodulation DVB-S	
Standard	EN 300 421
Frequency range [MHz]	950-2150
QPSK input symbol rate [MS/s]	1-45
Code rate (Viterbi)	½, ⅔, ¾, ⅚, ⅞
Roll off [%]	20, 25, 35
AFC regulation range [MS/s]	± 5
Demodulation DVB-S2	
Standard	EN 302 307, TR 102-376
QPSK input symbol rate [MS/s]	1-45
Code rate (LDPC)	½, ⅗, ⅔, ¾, ⅘, ⅚, ⁸⁄₉, ⁹⁄₁₀
8PSK input symbol rate [MS/s]	1-45
Code rate (LDPC)	⅗, ⅔, ¾, ⅚, ⁸⁄₉, ⁹⁄₁₀
Roll off [%]	20/25/35
Demodulation DVB-T (COFDM)	
Standard	EN 300744, NorDig Unified 2.2.1, D-Book 7.0, supports all C.R, G.I, LP and HP streams
Frequency range [MHz]	47-862
Guard interval	¼, ⅛, ¹⁄₁₆, ¹⁄₃₂
FEC	½, ⅔, ¾, ⅚, ⅞
FFT mode	2k, 8k
Bandwidth [MHz]	6, 7, 8
Constellation [QAM]	QPSK, 16, 64
Demodulation DVB-T2 (COFDM)	
Standard	EN 302755-V1.31, DVB-T2 Lite compliant, single and multiple PLP support, NorDig Unified 2.2.1, D-Book 7.0
Guard interval	¹⁄₁₂₈, ¹⁄₃₂, ¹⁄₁₆, ¹⁹⁄₂₅₆, ⅛, ¹⁹⁄₁₂₈, ¼
FEC	½, ⅗, ⅔, ¾, ⅘, ⅚
FFT mode	1k, 2k, 4k, 8k, 16k, 32k
Bandwidth [MHz]	1.7/5/6/7/8

Constellation [QAM]	QPSK, 16, 64, 256	
Demodulation DVB-C		
Standard	EN 300 429/ITU J.83 Annex A/C	
Frequency range [MHz]	47-862	
Input symbol rate [MS/s]	1-7.2	
Constellation [QAM]	4/16/32/64/128/256	
MPEG-TS processor		
Channel filter	✓	
PSI/SI processing	Cable NIT, LCN, PCR correction, CAT	
LCN data	NorDig Descriptor V1	
Stuffing	Automatic	
Decoding		
6 CAM slots	–	PCMCIA interface
TS routing CAM	–	Individual and serial decoding
Modulator		
Output channels	18 × DVB-C (J.83A)	
Constellation	16/32/64/128/256 QAM	
Symbol rate [MS/s]	2.25-7.25	
Roll off [%]	15	
RF output		
Output	1 × F connector, 75 Ω	
Frequency range [MHz]	47–1006 (fine tuning in 125-kHz steps)	
Frequency range (channel list) [MHz]	47–86/110–862 (set-up via channel list)	
Return loss [dB]	14 (47 MHz) -1.5 dB/oct.	
Output level [dBμV]	107	
Output level setting range [dB]	-20 (in 0.5 dB steps)	
Level stability [dB]	± 0.5	
Frequency stability [ppm]	35	
MER [dB]	≥ 45	
Shoulder attenuation [dB]	≥ 60 (at normal level)	
Spurious emissions [dB]	≥ 60	
Test output		
Test socket	1 × F connector, 75 Ω	
Level relative to the output [dB]	25	
System data		
Power consumption [W]	32-35 *)	35-39 *)
Temperature range [°C]	0 to +45	
Mains voltage [V]	100-240	
Protective shut-down [°C]	> 70	

Dimensions (H × W × D) [mm]	97 × 350 × 244	
Weight [kg]	Approx. 4	Approx. 4.5

Type	UFO 87-18 HDMI	UFO 87-18 HDMI/CI
Order no.	206500010	206500011
Inputs		
Sat IF input	8 × F connector, 75 Ω	
Sat/terr./cable input	1 × F connector, 75 Ω	
Decoupling [dB]	> 25	
Return loss [dB]	Typical 10	
DiSEqC™ 1.0	Vert./Horiz., Low/High; [MHz] Sat. pos. (A/B/C/D)	
Switching planes [V/kHz]	14/18, 0/22	
Remote feed current for LNB [mA]	Max. 250 (at F socket no. 3 and 7), max. 60 (at F socket no. 1, 2, 4, 5, 6, 8)	
Remote feed current for active Antenna (5 V) [mA]	100 (at F socket no. 9)	
Front-end		
DVB-S/-S2/-S2X	16 ×	
DVB-S/S2/T/T2/C	2 ×	
Frequency plan [MHz]	1	
Input level range [dBµV]	55-100	
Permissible level difference [dB]	20	
Demodulation DVB-S		
Standard	EN 300 421	
Frequency range [MHz]	950-2150	
QPSK input symbol rate [MS/s]	1-45	
Code rate (Viterbi)	½, ⅔, ¾, ⅚, ⅞	
Roll off [%]	20, 25, 35	
AFC regulation range [MS/s]	± 5	
Demodulation DVB-S2		
Standard	EN 302 307, TR 102-376	
QPSK input symbol rate [MS/s]	1-45	
Code rate (LDPC)	½, ⅗, ⅔, ¾, ⅘, ⅚, ⅞, ⁸⁄₉, ⁹⁄₁₀	
8PSK input symbol rate [MS/s]	1-45	
Code rate (LDPC)	⅗, ⅔, ¾, ⅚, ⁸⁄₉, ⁹⁄₁₀	

Roll off [%]	20/25/35
Demodulation DVB-S2X	
Standard	EN 302 307-2
Demodulation DVB-T (COFDM)	
Standard	EN 300744, NorDig Unified 2.2.1, D-Book 7.0, supports all C.R, G.I, LP and HP streams
Frequency range [MHz]	47-862
Guard interval	¼, ⅛, ¹⁄₁₆, ¹⁄₃₂
FEC	½, ⅔, ¾, ⅚, ⅞
FFT mode	2k, 8k
Bandwidth [MHz]	6, 7, 8
Constellation [QAM]	QPSK, 16, 64
Demodulation DVB-T2 (COFDM)	
Standard	EN 302755-V1.31, DVB-T2 Lite compliant, single and multiple PLP support, NorDig Unified 2.2.1, D-Book 7.0
Guard interval	¹⁄₁₂₈, ¹⁄₃₂, ¹⁄₁₆, ¹⁹⁄₂₅₆, ⅛, ¹⁹⁄₁₂₈, ¼
FEC	½, ⅗, ⅔, ¾, ⅘, ⅚
FFT mode	1k, 2k, 4k, 8k, 16k, 32k
Bandwidth [MHz]	1.7/5/6/7/8
Constellation [QAM]	QPSK, 16, 64, 256
Demodulation DVB-C	
Standard	EN 300 429/ITU J.83 Annex A/C
Frequency range [MHz]	47-862
Input symbol rate [MS/s]	1-7.2
Constellation [QAM]	4/16/32/64/128/256
HDMI encoder	
Video format	1920 × 1080p50 (HD), 1920 × 1080i50 (HD),1280 × 720p50 (HD), 720 × 576i50 (SD)
Audio format [kHz]	48 (PCM)
LED status display	Off: No active HDMI source connected Red: No valid input signal**) Green: Input format, encoder output OK
Audio/video encoding	
Encoding, ISO/IEC 14496-10	High profile
H.264 Profile | Level	High profile | 3.0 / 3.2 / 4.0
Chroma format	4:2:0
Video format	1920 × 1080p50 (HD), 1920 × 1080i50 (HD),1280 × 720p50 (HD), 720 × 576i50 (SD)
Video data rate, adjustable for each encoded video [Mbit/s]	22-25
Encoding, ISO/IEC 11172-3	MPEG 1 Layer-II

Audio data rate [kbit/s]	96, 128, 192, 256, 320, 384	
Audio format	Mono/stereo/2-tone	
MPEG-TS processor		
Channel filter	✓	
PSI/SI processing	Cable NIT, LCN, PCR correction, CAT	
LCN data	NorDig Descriptor V1	
Stuffing	Automatic	
Decoding		
6 CAM slots	–	PCMCIA interface
TS routing CAM	–	Individual and serial decoding
Modulator		
Output channels	20 × DVB-C (J.83A)	
Constellation	16/32/64/128/256 QAM	
Symbol rate [MS/s]	2.25-7.25	
Roll off [%]	15	
RF output		
Output	1 × F connector, 75 Ω	
Frequency range [MHz]	47–1006 (fine tuning in 125-kHz steps)	
Frequency range (channel list) [MHz]	47–86/110–862 (set-up via channel list)	
Return loss [dB]	14 (47 MHz) -1.5 dB/oct.	
Output level [dBµV]	107	
Output level setting range [dB]	-20 (in 0.5 dB steps)	
Level stability [dB]	± 0.5	
Frequency stability [ppm]	35	
MER [dB]	≥ 45	
Shoulder attenuation [dB]	≥ 60 (at normal level)	
Spurious emissions [dB]	≥ 60	
Test output		
Test socket	1 × F connector, 75 Ω	
Level relative to the output [dB]	25	
System data		
Power consumption [W]	41-46 *)	42-46 *)
Temperature range [°C]	0 to +45	
Mains voltage [V]	100-240	
Protective shut-down [°C]	> 70	

*) The power consumption is dependent on the input and output configuration (data without LNB supply or remote feeding for active antennas)
**) Signals and resolutions that are not DVB-compliant are processed without format adaptation, and can lead to incompatibilities with terminal devices.

Dimensions (H × W × D) [mm]	97 × 350 × 244	
Weight [kg]	Approx. 4	Approx. 4.5

Type	UFO 80
Order no.	2060000006
Inputs	
Sat IF input [Ω]	4 × F connector, 75 Ω
Frequency range [MHz]	950-2150
Decoupling [dB]	Min. 25
Return loss [dB]	Typical 10
DiSEqC™ 1.0	Vert./Horiz., Low/High; satellite position (A/B/C/D)
Switching planes [V/kHz]	14, 18 / 22
Remote feed current for LNB [mA]	Max. 250 (at F socket no. 3)
Remote feed current [mA]	Max. 100 (at F socket no. 1, 2, 4)
Front-end	
DVB-S2	8 ×
Frequency plan [MHz]	1 (950–2150)
AFC regulation range [MHz]	± 3 (symbol rate < 10 Ms/s) ± 5 (symbol rate > 10 Ms/s) (950–2150)
Input level range [dBµV]	60-110
Permissible level difference [dB]	12
Demodulation DVB-S	
Standard	EN 300 421 (1)
QPSK input symbol rate [MS/s]	2-45
Code rate (Viterbi)	½, ⅔, ¾, ⅚, ⅚, ⅞
Roll off [%]	35
Demodulation DVB-S2	
Standard	EN 302 307 (2)
QPSK input symbol rate [MS/s]	1-34
Code rate (LDPC)	½, ⅗, ⅔, ¾, ⅘, ⅚, ⅚, 9⁄10
8PSK input symbol rate [MS/s]	1-31.5
Code rate (LDPC)	3/5, 2/3, 3/4, 5/6, 8/9, 9/10
Roll off	20/25/35
MPEG-TS processor	

Baseband processing	Channel/PID filter
PSI/SI processing	PCR correction
Stuffing	Automatic
QAM modulator	
Symbol rate [MS/s]	1.5-7.15
Roll off [%]	15
RF output	
DVB-C output [Ω]	1 × F connector, 75
Frequency range [MHz]	47–1006 (fine tuning in 125-kHz steps)
Frequency range (channel list) [MHz]	47-86 / 110–862 (set-up via channel list)
Return loss [dB]	14 (47 MHz) -1.5 dB/oct.
Output level [dBµV]	97
Output level setting range [dB]	-20 (in 0.5 dB steps)
Level stability [dB]	Typical ± 0.75
Frequency stability [ppm]	Typical 35
MER [dB]	Typical ≥ 45
Shoulder attenuation [dB]	≥ 60 (at normal level)
Spurious emissions [dB]	≥ 60
System data	
Power consumption [W]	Typical 28
Temperature range [°C]	0–+40
Mains voltage [V]	100–230 ± 10 %
Dimensions (H × W × D) [mm]	288 × 275 × 60
Weight [kg]	3.0

Audio	
Encoding	MPEG-1 Layer II, MPEG-2 AAC, MPEG-4 AAC
Sampling frequency [kHz]	192
Bit rate [kbps]	MPEG-1, Layer II: 64, 96, 128, 192, 256, 320, 384 MPEG-2-AAC: 128, 192, 256, 320
DVB-C	
Standard	EN 300429 V1.2.1
Constellation [QAM]	J.83A: 16/32/64/128/256
Bandwidth [MHz]	8, 7-8
Symbol rate [MS/s]	2-6.96
MER [dB]	≥ 33
DVB-T (COFDM)	
Standard	EN 300 744
Guard interval	¼, ⅛, 1/16, 1/32
FEC	½, ⅔, ¾, ⅚, ⅞
FFT Mode	2k/8k
Bandwidth	6, 7, 8
Constellation	QPSK, 16/64 QAM
MER	≥ 33
Ports	
RF input/output	F connector
USB	TYPE A (software update)
External power supply unit	
Input voltage range	100-240
Output voltage	12
Output current	2
General information	
Temperature range	5 to +40
Power consumption	Max. 11.5
Dimensions [H × W × D]	172 × 115 × 32
Weight	0.6

Type	**UFX 10**
Order no.	206500014
HDMI input	
Video	
Encoding	MPEG-4 AVC/H.264
H.264 profile	Main profile
H.264 level	Level 4.0
Resolution	1920 × 1080i/p (HD), 1280 × 720i/p (HD), 576i/p, 480i/p
Bit rate [Mbps]	1-12
HDMI output	
Video	4k loop through

Type	**UFX 894**
Order no.	20610151
User interfaces	
Signal input	4 × HDMI socket
Status indication	4 × status LED for encoder function, 1 × status LED for overall unit

Encoder data video	
Video standard	MPEG-4 H.264/AVC (ISO/IEC14496-10)
H.264 profile	High profile
H.264 level	Level 3.0/3.2/4.0
Video formats	1920 × 1080/50p (HD) 1920 × 1080/50i (HD) 1280 × 720/50p (HD) 720 × 576/50i (SD)
Bit rate [Mbps]	2–25 (SD & HD), adjustable for each encoded video
Encoder data audio	
Audio standard	MPEG 1 layer II (ISO/IEC 11172-3)
Sampling frequency [kHz]	48
Bit rate [kbps]	64, 96, 128, 192, 256, 320, 386, adjustable
Audio mode	Mono/stereo/2-tone, adjustable
Transport stream	
Adjustable parameters	Service and provider name, TS-ID, ON-ID, service ID, PMT PID, video PID, audio PID, PCR PID
Backplane interface	Transmission of transport streams to neighbouring modules after multiplex
Multiplexer	4 to 2 in each combination; 4:0/3:1/2:2/1:3/0:4
System data	
Power consumption [W]	Typical < 16
Temperature range [°C]	-20 to +50
Protective shut-down [°C]	> 70
Dimensions (H × W × D) [mm]	265 × 36 × 220
Weight [kg]	1.1
Output channels	8 × DVB-C (J.83A)
QAM constellation [QAM]	16, 32, 64, 128, 256
Frequency range [MHz]	47–1006 (fine tuning in 125-kHz steps)
Frequency range (channel list) [MHz]	47–86/110–862 (set-up via channel list)
Return loss [dB]	14 (47 MHz) -1.5 dB/oct.
Output level [dBµV]	97
Output level setting range [dB]	-20 (in 0.5 dB steps)
Level stability [dB]	Typical ± 0.75
Frequency stability [ppm]	Typical 35
MER [dB]	Typical ≥ 45
Shoulder attenuation [dB]	≥ 60 (at normal level)
Spurious emissions [dB]	≥ 60

System data	
Power consumption [W]	Typical 28
Temperature range [°C]	0–+40
Mains voltage [V]	100–230 ± 10 %
Dimensions (H × W × D) [mm]	288 × 275 × 60
Weight [kg]	3.0

Type	UFZ 896	Comments
Order no.	20610129	
User interfaces		
6 CAM slots	PCMCIA interface	(in accordance with EN 50221)
Supported CAM types [CAM]	5-V	(3.3-V CAMs are not supported)
System interfaces		
Data interface [Mbps]	800 (net)	To neighbouring modules
Control interface [Mbps]	12	Central control unit (UFX 800)
TS routing to backplane	Max. 2 × 16 transport streams (right and left)	In conjunction with UFOcompact Plus® modules, e.g. UFO 878, configuration via USW 800
Function and option		
MPEG-TS routing [CAM]	Free assignment of up to 6	Possible in combination with the series and parallel operation modes
	Serial connection of up to 3	For an MPEG-TS to increase decoding capacity
	Parallel operation of up to 3	Automatic switching in the event of an error with one CAM; redundancy
Decoding functions	Specific decoding configuration	Decode/do not decode for each service or PID
	Default configuration	Decode/do not decode for all non-configured services
	Decoding monitoring	Resending of CA PMTs or CAM reset if decoding fails
SI data processing	ES status monitoring and SI data analysis in front of and behind each CAM	Automatic reconfiguration in case of error
	Advanced configuration functions	PMT list mode, update mode, CA PMT optimisation
	Extraction of information on service and elementary currents from SI tables	For display in USW 800
	Removal of encoding information (tables, descriptors, etc.)	Following successful decoding
CAM options and information	Supports decoding, encoding and processing CAMs	–
	Displays status and names	For each CAM inserted
	Memo function	Can be edited individually for each CAM
	Power On/Off	Each CAM being used can be activated/deactivated separately
	Mode for CAM software update	–
CAM status detection	Slot empty, CAM inserted, CAM ready, CAM name	–
System data		
Power consumption [W]	< 2.5/typ. < 10	Without CAM/with 6 CAMs per 1.25
Current drain per CAM	Max. 0.5 A	–
EMC [dBpW]	Max. 20	EN 50083-2, A1
Temperature range [°C]	-20 to +50	–
Protective shut-down [°C]	> 70	In case of excess temperature
Dimensions (H × W × D) [mm]	265 × 36 × 220	–
Weight [kg]	1.1	Without CAMs

For your Notes

For your Notes

Domestic sales
KATHREIN Digital Systems GmbH
Eiselauer Weg 13
89081 Ulm
order@kathrein-ds.com

Austrian sales
KATHREIN Digital Systems GmbH
Gnigler Straße 56
5020 Salzburg
Tel.: +43 662 875 531
Fax: +43 662 878 344-9
office@kathrein-gmbh.at
www.kathrein-gmbh.at

International sales
KATHREIN Digital Systems GmbH
Eiselauer Weg 13
89081 Ulm
international-sales@kathrein-ds.com
www.kathrein-ds.com | Sales International

Technical Support Service
KATHREIN Digital Systems GmbH
Eiselauer Weg 13
89081 Ulm
Tel.: +49 731 270 909 70
Fax +49 731 92 767-22
support@kathrein-ds.com

KATHREIN Digital Systems GmbH
Anton-Kathrein-Straße 1–3
83022 Rosenheim, Germany
www.kathrein-ds.com | info@kathrein-ds.com

KATHREIN
Digital Systems GmbH