Headend Technology

Modern systems for future-proof installations
Our Company
The BKtel Group has its origin in the foundation of BKtel communications in 1997. The group was extended in 2002 with BKtel systems (merged with BKtel communications in 2009), BKtel components (2006), BKtel Photonics (2014) and BKtel networks in 2017. Further international offices were founded in China and Japan for the growing Asian market. The entire group has currently a workforce of over 130 employees worldwide, based in Germany in Hückelhoven, (near Düsseldorf), in Rosenheim (near Munich) and in Kornwestheim (near Stuttgart).

The company develops and manufactures products in the field of interactive FTTH-, Video Overlay-, RFOG- and HFC-networks for high performance data, telephone and cable TV services. The high quality products as well as the comprehensive support in designing optical networks make BKtel to one of the leading suppliers in the FTTH and HFC market.

Our Products
BKtel develops equipment and software for FTTH and HFC broadband networks. The product portfolio includes a wide range of products starting from equipment for optical transmission such as optical transmitters, amplifiers, and receivers and customer premises equipment, CATV headends, coaxial cable amplifiers. BKtel manufacturing facilities guarantee a high quality standard (ISO 9001 certified). Furthermore the company offers a complete range of services such as planning, installation and training.
The BKtel NEO headend series comprises of three individual product lines, the X Series, M Series and N Series. Each of these series provides the customer an optimized system solution for their specific requirements.

The NEO X Series is a modular headend system that enables a customer specific configuration thereby providing the broadest range of features. A selection of various transmodulators, IP streamers and EDGE modulators, H.264 encoder and an advanced CI solution are available for the X10 rack.

The compact NEO M Series is specialized on DVB transmodulation in DVB-C or DVB-T and facilitates the combined reception of DVB-S, S2, T, T2 and C signals. A six-way decoding option (CI) is available for each device.

The NEO N series is an 8 channel standalone FTA headend focused on reception of satellite signals and transmodulation for DVB-C distribution.

NeO N Series

The BKtel NEO headend series comprises of three individual product lines, the X Series, M Series and N Series. Each of these series provides the customer an optimized system solution for their specific requirements.

The NEO X Series is a modular headend system that enables a customer specific configuration thereby providing the broadest range of features. A selection of various transmodulators, IP streamers and EDGE modulators, H.264 encoder and an advanced CI solution are available for the X10 rack.

The compact NEO M Series is specialized on DVB transmodulation in DVB-C or DVB-T and facilitates the combined reception of DVB-S, S2, T, T2 and C signals. A six-way decoding option (CI) is available for each device.

The NEO N series is an 8 channel standalone FTA headend focused on reception of satellite signals and transmodulation for DVB-C distribution.

NeO M Series

The BKtel NEO headend series comprises of three individual product lines, the X Series, M Series and N Series. Each of these series provides the customer an optimized system solution for their specific requirements.

The NEO X Series is a modular headend system that enables a customer specific configuration thereby providing the broadest range of features. A selection of various transmodulators, IP streamers and EDGE modulators, H.264 encoder and an advanced CI solution are available for the X10 rack.

The compact NEO M Series is specialized on DVB transmodulation in DVB-C or DVB-T and facilitates the combined reception of DVB-S, S2, T, T2 and C signals. A six-way decoding option (CI) is available for each device.

The NEO N series is an 8 channel standalone FTA headend focused on reception of satellite signals and transmodulation for DVB-C distribution.

NeO X Series

The BKtel NEO headend series comprises of three individual product lines, the X Series, M Series and N Series. Each of these series provides the customer an optimized system solution for their specific requirements.

The NEO X Series is a modular headend system that enables a customer specific configuration thereby providing the broadest range of features. A selection of various transmodulators, IP streamers and EDGE modulators, H.264 encoder and an advanced CI solution are available for the X10 rack.

The compact NEO M Series is specialized on DVB transmodulation in DVB-C or DVB-T and facilitates the combined reception of DVB-S, S2, T, T2 and C signals. A six-way decoding option (CI) is available for each device.

The NEO N series is an 8 channel standalone FTA headend focused on reception of satellite signals and transmodulation for DVB-C distribution.
While technically being closely related to the X Series, the NEO M Series distinguishes itself mainly due to its compactness. Specialized on DVB transmodulation in DVB-C or DVB-T the M Series family facilitates the combined reception of DVB-S, S2, T, T2 and C signals. Comprehensive baseband signal processing with program filtering, NIT build and support for various LCN standards simplifies the operation of large scale deployments. The six-way decoding option (CI) available for each device features flexible serial or parallel decoding in a very wide field of applications. What's more, the NEO M Series provides power supply for LNBs and active DVB-T antennas, thus minimizing the need for additional external equipment. The cascading functionality facilitates management and remote configuration via HMT PC Software of up to four units of the same output type as a single system. The high level of energy efficiency allows a fan-less design for silent operation without the need for maintenance.

**SPECIAL FEATURES**

- Modular, expandable and future-proof headend system
- Unlimited cascadable via IP and internal switch
- Simultaneous reception of any DVB standard (DVB-S/-S2/-T/-T2/C/IPv6)
- Completely flexible input, output and baseband configuration
- Remultiplexing
- Flexible serial or parallel decoding and encoding
- HDMI H.264 Encoding
- Cross-module functions
- NIT generation and adjustments/change options
- LCN wizard, support for several LCN standards (NorDig, IEC 62216 and FRAN SAT PRO)
- High level of energy efficiency
- Low-noise fan with a very long service life
- Ten hot-swap insertion slots
- Remote configuration via HMT PC software

**NEO M Series**

The NEO X Series is the modular BKtel headend system that provides the broadest range of features giving the customer the flexibility to meet current and future signal processing requirements. The modular design enables a customer specific configuration in the X10 rack, which provides up to 10 insertion slots. A selection of various transmodulators, IP streamers and EDGE modulators, H.264 encoder and, last but not least, an advanced CI module are available for the X10 rack. Transport stream routing between all modules via a high speed backplane provides both an efficient and cost-effective complete system. Multiple X10 racks can be cascaded to enable a scalable evolution. Comprehensive baseband signal processing with program filter, NIT build and support for various LCN standards simplifies the operation of large scale deployments. The HMT software provides a user-friendly and intuitive interface which has been specially adapted for operating with the NEO Series. This software is freely available via the BKtel website. Programming is either performed locally on site or by remote access over a TCP/IP network. The X Series is not only compatible with standard 19” cabinets, but can also be wall mounted.

**SPECIAL FEATURES**

- All-in-one solution
- Cascadable up to 4 units via USB
- 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 antennas
- 6 CI slots for flexible individual or serial decoding
- Country-specific pre-programming
- High level of energy efficiency
- Low-noise fan with a very long service life
- Ten hot-swap insertion slots
- Remote configuration via HMT PC software

**NEO X Series**
The NEO N series is an 8 channel standalone FTA headend focused on reception of satellite signals and transmodulation for DVB-C distribution. Eight DVB-S(2) frontends, four Sat IF inputs, an internal multi-switch supporting DiSEqC 1.0 and remote power supply for one LNB, provide excellent values for the customer with a maximum of power and flexibility at the output. These features and the compact form factor, together with an attractive price performance ratio, are the key advantages specifically when upgrading to digital standards. Preconfigured upon delivery and with optional programming of customized channel packages via HMT, the N Series offers easy plug and play functionality. The internal wide range power supply is highly energy efficient. The fanless design offers silent operation without the need for maintenance.

**SPECIAL FEATURES**
- All-in-one solution
- Fully Flexible Output Configuration
- Four Sat IF Inputs with DiSEqC 1.0
- Wide Range Power Supply
- Configuration with HMT
- Very low power consumption (typ. 28W)
- Fanless design (no noise)
- Pre-programming of TV channels
- Simple programming thanks to channel packages

---

### System overview

**NEO N Series**

**Features Overview**

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>X Series</th>
<th>M Series</th>
<th>N Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modular / Partial Modular</td>
<td>✔️</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td>DVB-S(2) DVB-C transmodulation</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>DVB-S(2)/T(2)/C DVB-C / -T transmodulation</td>
<td>✔️</td>
<td></td>
<td>✔️</td>
</tr>
<tr>
<td>Power supply LNB / active antennas</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>CI function</td>
<td>✔️</td>
<td>✔️</td>
<td></td>
</tr>
<tr>
<td>TS routing</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>TS multiplexing</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>IP streaming (RTP / UDP)</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>EDGE modulation DVB-C / -T</td>
<td>✔️</td>
<td></td>
<td>✔️</td>
</tr>
<tr>
<td>HDMI encoding</td>
<td>✔️</td>
<td></td>
<td>✔️</td>
</tr>
<tr>
<td>RF amplifier / Preemphasis / 75Ω test port</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Fanless / noiseless</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>System cascadable</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Network compatible / remote configurable</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Power Supply Redundancy</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Wide range power supply</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
</tbody>
</table>
Central Management Software
HMT

The HMT software is required to operate a NEO X Series, M Series or N Series signal processing system and is available to download free of charge for Windows and Linux.

**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)

Software option “SNMP Monitoring”

The SNMP software extension was developed for the NEO X Series headend system and is a chargeable software option. This extension provides an SNMP interface through which all important status parameters such as module status, fan status, signal qualities etc. of a headend system can be monitored.

**Features**
- Provision of an SNMP interface for monitoring a system, comprising a base unit (master) and, as the case may be, one or more extension units (slaves)
- The SNMP agent runs exclusively on the base unit
- The SNMP agent is configured through SNMP. This includes the configuration of the access control, the SNMPv3 user and the notifications
- Support of all NEO X Series modules, except X10-A1
The NEO X Series signal processing system

NEO X Series Base unit X10

Basic unit/module carrier with ten insert positions
Includes a power supply unit (X10-PS), backplane, central control module (X10-CM), fan unit, passive output RF combiner and cover.

Features
- Ten hot-plug insertion slots for NEO X Series modules
- Three dedicated hot-plug system insertion slots for the power supply unit (X10-PS), control module (X10-CM) and extensions (e.g. X10-A1)
- NEO X Series modules are supplied with power and communicate with each other via the high-speed backplane
- Safe heat dissipation is ensured thanks to two energy-saving, monitored fans and optimised air ducting over the modules’ cooling elements

Power supply unit for NEO X Series base unit X10-PS

Features
- Power supply unit for use in NEO X Series base units/module carriers (supplied with the X10 base unit/module carrier)
- Built in redundancy allowing parallel operation of two X10 in daisy chain mode via the cable X10-RC
- Easy to replace thanks to being installed at the front of NEO X Series base unit/module carrier
- Automatic overtemperature switch-off
- Low peak inrush current < 20 A

Central control module X10-CM

Features
- Central control module for controlling all channel units in the NEO X Series signal processing system in conjunction with the HMT software (supplied with the X10 base unit/module carrier)
- Two Fast Ethernet ports for managing and unlimited cascading of base units without an external switch
- Management interface with a high level of performance thanks to parallel communication; also the interface to the inserted NEO X Series modules
- Power ON reset for NEO X Series series modules

Amplifier X10-A1

Features
- Amplifier can be inserted into the X10 base unit/module carrier directly
- Set-up via the X10-CM central control module in conjunction with the HMT 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 NEO X Series base unit/module carrier
- Lightning protection (1.2/50 μs 2 kV) at the RF output
- Excellent dynamic range under high channel loading
**NEO X Series modules**

NEO X Series 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 DSEqC™ capability for internally splitting the signals in a completely flexible way. Powerful program 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 have been designed with push-pull technology, are capable of hot plugging and also feature voltage and temperature sensors. A status LED informs the user of the modules’ operating condition at a glance.

**NEO X Series modules**

**XC04S** • Page 16

4-way transmodulator
DVB-S(2) – DVB-C (J.83A)

**XC06M** • Page 17

6-way multi-standard transmodulator
DVB-S(2)/T(2)/C – DVB-C (J.83A)

**XT04S** • Page 19

4-way transmodulator
DVB-S(2) – DVB-T

**XC08S** • Page 16

8-way transmodulator
DVB-S(2) – DVB-C (J.83A)

**XC06M-X** • Page 18

6-way multi-standard transmodulator
DVB-S(2)/T(2)/C – DVB-C (J.83A)

**XT06M** • Page 17

6-way multi-standard transmodulator
DVB-S(2)/T(2)/C – DVB-T

**XC06M-X** • Page 18

6-way multi-standard transmodulator/multiplexer
DVB-S(2)/T(2)/C – DVB-C (J.83A)

**XT06M-X** • Page 18

6-way multi-standard transmodulator/multiplexer
DVB-S(2)/T(2)/C – DVB-T

**XTD04S** • Page 19

4-way transmodulator
DVB-S(2) – DVB-T

**X164S** • Page 20

8-way IP streamer
DVB-S(2) – DVB-IPTV

**X164i** • Page 21

8-way transmodulator
DVB-IPTV – DVB-C (J.83A)

**X108i** • Page 21

8-way transmodulator
DVB-IPTV – DVB-T

**XB04H-EX** • Page 23

4-way HDMI Encoder

**Xi64S** • Page 20

8-way IP streamer
DVB-S(2) – DVB-IPTV

**Xi32M** • Page 20

4-way IP streamer
DVB-S(2)/T(2)/C - DVB-IPTV

**Xi32M** • Page 20

4-way IP streamer
DVB-S(2)/T(2)/C - DVB-IPTV

**XB06CI** • Page 22

6-way CI module

** XB04H-EX ** • Page 23

4 way HDMI Encoder
The NEO X Series signal processing system

### 8/4-way transmodulator DVB-S(2) – DVB-C (J.83A)
- XC08S, XC04S

**Features**
- B-way (XC08S)/4-way (XC04S) transmodulator DVB-S/S2 - DVB-C (QPSK/8PSK – QAM)
- Flexible baseband data exchange with neighbouring modules, e.g. XB06-CI for decoding
- Outstanding data (MER ≥ 45 dB) through direct implementation as an FPGA solution
- Four Sat IF inputs with DiSEqC™1.0 functionality for sat multi-switches, flexibly distributable across eight/four frontends

### 6-way transmodulator DVB-S2/T2/C – DVB-C (J.83A)/DVB-T
- XC06M, XT06M

**Features**
- 6-way transmodulator DVB-S(2)/T(2)/C – DVB-C (J.83A)/DVB-T transmodulator with four-way multi-standard frontend and maximum six DVB-compliant output channels:
  - XC06M: six output channels in DVB-C (J.83A)
  - XT06M: six output channels in DVB-T
- Flexible baseband data exchange with neighbouring modules, e.g. XB06-CI for decoding
- Four Sat IF/terr./cable inputs with DiSEqC™1.0 functionality for sat multi-switches, flexibly distributable across four frontends

### FEaTures
- Comprehensive baseband signal processing with, e.g. extended channel filter functionality
- B/4 DVB-C-compliant output channels (J.83A)
- High level of energy efficiency, power consumption: Typ. 24/14 W @ 12 V

### FEaTures
- Outstanding data (MER ≥ 45 / ≥ 42 dB) through direct implementation as an FPGA solution
- Comprehensive baseband signal processing with, e.g. extended channel filter functionality
- High level of energy efficiency, power consumption: Typically 14/17 W @ 12 V
The NEO X Series signal processing system

**6-way transmodulator/multiplexer**

**DVB-S(2)/T(2)/C – DVB-C (J.83A)/DVB-T**

**Features**

- **6-way transmodulator/multiplexer** DVB-S(2)/T(2)/C – DVB-C (J.83A)/DVB-T
- **transmodulator** with four-way multi-standard frontend and maximum six DVB-compliant output channels:
  - XC06M-X: six output channels in DVB-C (J.83A)
  - XT06M-X: six output channels in DVB-T
- **3-in-1 MUX** per output channel:
  - Enables three freely selectable input transport streams (frontend or neighbour modules) to be multiplexed per output channel
  - PSI/SI MUX provides the complete new configuration of PAT, SDT, EIT etc.
  - Flexible baseband data exchange with neighbouring modules, e.g. XB06-CI for decoding
- **Outstanding data (MER ≥ 45/≥ 42 dB) through direct implementation as an FPGA solution**
- **Comprehensive baseband signal processing** with, e.g. extended channel filter functionality
- **High level of energy efficiency, power consumption**
  - Typically 17 W @ 12 V

**Features**

- **6-way transmodulator/multiplexer** DVB-S(2)/T(2)/C – DVB-C (J.83A)/DVB-T
- **transmodulator** with four-way multi-standard frontend and maximum six DVB-compliant output channels:
  - XC06M-X: six output channels in DVB-C (J.83A)
  - XT06M-X: six output channels in DVB-T
- **3-in-1 MUX** per output channel:
  - Enables three freely selectable input transport streams (frontend or neighbour modules) to be multiplexed per output channel
  - PSI/SI MUX provides the complete new configuration of PAT, SDT, EIT etc.
  - Flexible baseband data exchange with neighbouring modules, e.g. XB06-CI for decoding
- **Outstanding data (MER ≥ 45/≥ 42 dB) through direct implementation as an FPGA solution**
- **Comprehensive baseband signal processing** with, e.g. extended channel filter functionality
- **High level of energy efficiency, power consumption**
  - Typically 17 W @ 12 V

**Features**

- **6-way transmodulator/multiplexer** DVB-S(2)/T(2)/C – DVB-C (J.83A)/DVB-T
- **transmodulator** with four-way multi-standard frontend and maximum six DVB-compliant output channels:
  - XC06M-X: six output channels in DVB-C (J.83A)
  - XT06M-X: six output channels in DVB-T
- **3-in-1 MUX** per output channel:
  - Enables three freely selectable input transport streams (frontend or neighbour modules) to be multiplexed per output channel
  - PSI/SI MUX provides the complete new configuration of PAT, SDT, EIT etc.
  - Flexible baseband data exchange with neighbouring modules, e.g. XB06-CI for decoding
- **Outstanding data (MER ≥ 45/≥ 42 dB) through direct implementation as an FPGA solution**
- **Comprehensive baseband signal processing** with, e.g. extended channel filter functionality
- **High level of energy efficiency, power consumption**
  - Typically 17 W @ 12 V

**Features**

- **4-way transmodulator DVB-S(2) – DVB-T**
  - **XT04S**
  - **Features**
    - **4-way transmodulator** DVB-S/S2 – DVB-T (QPSK/8PSK – COFDM)
    - **Flexible baseband data exchange** with neighbouring modules, e.g. XB06-CI for decoding
    - **Four inputs** with DiSEqC1.0TM functionality for sat multi-switches, flexibly distributable across four frontends
    - **Four DVB-T-compliant output channels**, 47-862 MHz, 2k mode
  - **Outstanding data (MER ≥ 42 dB) through direct implementation as an FPGA solution**
  - **Comprehensive baseband signal processing** with, e.g. extended channel filter functionality
  - **High level of energy efficiency, power consumption**
    - Typically 14 W @ 12 V

**Features**

- **4-way transmodulator DVB-S(2) – DVB-T**
  - **XT04S**
  - **Features**
    - **4-way transmodulator** DVB-S/S2 – DVB-T (QPSK/8PSK – COFDM)
    - **Flexible baseband data exchange** with neighbouring modules, e.g. XB06-CI for decoding
    - **Four inputs** with DiSEqC1.0TM functionality for sat multi-switches, flexibly distributable across four frontends
    - **Four DVB-T-compliant output channels**, 47-862 MHz, 2k mode
  - **Outstanding data (MER ≥ 42 dB) through direct implementation as an FPGA solution**
  - **Comprehensive baseband signal processing** with, e.g. extended channel filter functionality
  - **High level of energy efficiency, power consumption**
    - Typically 14 W @ 12 V
The NEO X Series signal processing system

**8-way IP streamer DVB-S(2) – DVB-IPTV**

**Features**
- 8-way IP streamer DVB-S(2) – DVB-IPTV
- IP streamer with 8 DVB-S(2) front-ends
- Converts DVB-S(2) input signals into 8 x MPTS or 32 x SPTS
- Four Sat IF inputs with DiSEqC™ functionality for Sat multi-switches, flexibly distributable across 8 frontends

**8-way transmodulator DVB-IPTV – DVB-C/DVB-T**

**Features**
- Flexible baseband data exchange with neighbouring modules, e.g. XB06-CI for decoding
- Comprehensive baseband signal processing with, e.g. extended channel filter functionality
- High level of energy efficiency, power consumption: Typically 15 W @ 12 V

**4-way IP streamer DVB-S(2)/T(2)/C – DVB-IPTV**

**Features**
- 4-way IP streamer DVB-S(2)/T(2)/C – DVB-IPTV
- IP streamer with 4 multi-standard front-ends DVB-S2/T2/C
- Converts multi-standard input signals into 4 x MPTS or 32 x SPTS
- Four Sat IF/terrestrial/cable inputs with DiSEqC™ functionality for Sat multi-switches, flexibly distributable across four frontends

**4-way transmodulator DVB-IPTV – DVB-C/DVB-T**

**Features**
- Flexible baseband data exchange with neighbouring modules, e.g. XB06-CI for decoding
- Comprehensive baseband signal processing with, e.g. extended channel filter functionality
- High level of energy efficiency, power consumption: Typically 16/17 W @ 12 V

**Input**
- 4 x SAT
- 4 x CABLE

**Output**
- 4 x MPTS

**Input**
- 4 x SAT
- 4 x CABLE

**Output**
- 4 x MPTS

**Input**
- 4 x SAT
- 4 x CABLE

**Output**
- 4 x MPTS

**Input**
- 1 GB Ethernet

**Output**
- 8 x MPTS or SPTS
## 6-way CI module
### XB06-CI

**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 in case of a CAM error to increase decoding reliability (redundancy)
- Each CAM fitted can be individually reset and restarted (power ON reset) or permanently enabled/disabled

These features increase the service availability considerably.

<table>
<thead>
<tr>
<th>Standard</th>
<th>Special Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI/CI</td>
<td>Hot Plug</td>
</tr>
<tr>
<td>CAM</td>
<td>CAM Check</td>
</tr>
<tr>
<td>CAM Mode</td>
<td>Hot Plug</td>
</tr>
<tr>
<td>CAM</td>
<td>CI</td>
</tr>
<tr>
<td>CAM</td>
<td>CAM Check</td>
</tr>
<tr>
<td>CAM Mode</td>
<td>Hot Plug</td>
</tr>
</tbody>
</table>

![XB06-CI](image)

## FEATURES
- Six CI slots, each intended to accommodate one CAM
- Flexible baseband data exchange with neighbouring modules, e.g., XC08S
- Monitoring of the decoding status and automatic reconfiguration in the event of an error

## 4-way HDMI Encoder
### XB04H-EX HDMI Encoder

**Features**
- 4-way HDMI Encoder with MPEG2 TS Multiplexing
- Supported video formats
  - 576i50, 720p50, 1080i50
- Two integrated MPEG2-TS multiplexers
- 4 HDMI input signals can be multiplexed in any order into 1 or 2 MPEG2 transport streams
- Excellent picture quality
- Encoded signals can be transmitted via DVB-C (e.g., XC06M), DVB-T (e.g., XT06M) and IP (e.g., XI064S) by flexible data exchange with neighboured modules
- Comprehensive baseband processing with e.g. extended program filter functionality
- High level of energy efficiency, 14W@12V

<table>
<thead>
<tr>
<th>Input</th>
<th>Transponding</th>
<th>Encoder</th>
<th>Baseband</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 x HDMI Type A</td>
<td>4 x MPEG2 + TS</td>
<td>4 x Output</td>
<td></td>
</tr>
<tr>
<td>teased signals</td>
<td>NTSC / PAL</td>
<td>Audio</td>
<td></td>
</tr>
<tr>
<td>4 x Audio + Data</td>
<td>H.264 Video + Audio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(DVB) + Data</td>
<td>(DVB) + Data</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

![XB04H-EX](image)

**FEATURES**
- Flexible baseband data exchange with neighboured modules, e.g., for DVB-C and IP transmission
- Comprehensive baseband processing with e.g. extended program filter functionality
- High level of energy efficiency, 14W@12V

![XB04H-EX](image)
The NEO M Series Systems

18-way headend DVB-S(2)/T(2)/C – DVB-C
MC18SM-CI, MC18SM

The MC18SM is an ultra compact headend for transmodulation in DVB-C. It facilitates the combined reception of 16 x DVB-S, S2 transponders and 2 x DVB-S, S2, T, T2 and C signals. Remote power supply for two LNB and an active antenna minimizes the need for additional external equipment. The MC18SM-CI is equipped with an advanced six-way decoding option (CI).

Features
- Standalone headend with 16 DVB-S(2) frontends, 2 multi-standard frontends DVB-S(2)/ (T2)/C and 18 DVB compliant output channels (flexibly adjustable):
  - MC018SM-CI: 18 DVB-C compliant output channels with six CI slots
  - MC018SM : 18 DVB-C compliant output channels
- Eight Sat IF inputs with DiSEqCTM 1.0 functionality for Sat multi-switches and one Sat/terrestrial/cable input
- All transmission parameters can be set using the HMT management software
- Comprehensive baseband signal processing with program filter functionality such as NIT, LCN
- Up to four units cascadable via USB link

Excellent output values thanks to direct implementation as an FPGA solution
- Remote maintenance and configuration
- Cascadable via USB
- Comprehensive baseband signal processing (program filter, NIT, LCN...)

The NEO M Series Systems

- MC18SM-CI, MC18SM
- MC08M-CI, MC08M
- MT08M-C, MT08M
8-way headend DVB-S(2)/T(2)/C – DVB-C
MC08M-CI, MC08M

The MC08M is a compact headend for transmodulation in DVB-C. It facilitates the combined reception of 8 x DVB-S, S2, T, T2 and C signals. Remote power supply for one LNB and an active antenna minimizes the need for additional external equipment. The MC08M-CI is equipped with an advanced six-way decoding option (CI).

Features
- Standalone headend with eight-way multi-standard frontend DVB-S2/T2/C, 6-way decoding (CI) and eight DVB-compliant output channels (flexibly adjustable):
  - MC08M-CI: eight output channels in DVB-C with six CI slots
  - MC08M: eight output channels in DVB-C
- Four Sat IF inputs with DiSEqC™1.0 functionality for sat multi-switches and one terrestrial/cable input, flexibly distributable across eight multi-standard frontends
- All transmission parameters can be set using the HMT management software
- Comprehensive baseband signal processing with channel filter functionality such as NIT, LCN cascadable (16-way multi-standard frontend, 12-way decoding (CI) and 16 x QAM/COFDM via USB link)

8-way headend DVB-S(2)/T(2)/C – DVB-T
MT08M-CI, MT08M

The MT08M is a compact headend for transmodulation in DVB-T. It facilitates the combined reception of 8 x DVB-S, S2, T, T2 and C signals. Remote power supply for one LNB and an active antenna minimizes the need for additional external equipment. The MT08M-CI is equipped with an advanced six-way decoding option (CI).

Features
- Standalone headend with eight-way multi-standard frontend DVB-S2/T2/C, 6-way decoding (CI) and eight DVB-compliant output channels (flexibly adjustable):  
  - MT08M-CI: eight output channels in DVB-C with six CI slots
  - MT08M: eight output channels in DVB-C
- Four Sat IF inputs with DiSEqC™1.0 functionality for sat multi-switches and one terrestrial/cable input, flexibly distributable across eight multi-standard frontends
- All transmission parameters can be set using the HMT management software
- Comprehensive baseband signal processing with channel filter functionality such as NIT, LCN cascadable (16-way multi-standard frontend, 12-way decoding (CI) and 16 x QAM/COFDM via USB link)
The NEO N Series System

- The NEO N Series System 29
- NEO N Series tuning instructions 30
- Connection example and overview of functions 31

Features
- Standalone headend with 8 DVB-S(2) frontends, and 8 DVB-C compliant output channels (flexibly adjustable)
- Pre-programmed TV channels and radio stations
- Four Sat IF inputs with DiSEqC™ 1.0 functionality for Sat multi-switches
- All transmission parameters can be set using the HMT management software
- Comprehensive baseband signal processing
  - For setting a constant output data rate (stuffing) with PCR correction
  - With program filter to hide specific TV channels and radio stations
- Fan-less design for wall mounting (no noise)

Main Features
- All in one solution (integrated multiswitch), plug and play
- DiSEqC™ 1.0 and power supply for LNBF
- Pre-programming of TV and radio channels
- Fanless design (no noise)
- High level of energy efficiency (28W)

8-way DVB-S(2) - DVB-C transmodulation headend NC08S
NEO N Series tuning instructions

Its plug-and-play condition on delivery means the NEO N Series headend can be used without any further configuration work. Preconfigured upon delivery, 78 TV channels and nine radio stations will be available immediately (via Astra 19.2° East, transponder allocation; see table below).

The settings and numeric values given in the following are only examples and may not necessarily match the condition on delivery. In future, additional pre-set configurations will be made available for the operation of two NEO N Series units or for reception from other satellites. These can be downloaded free on request via email: info@bktel.com. When operating two NEO N Series units, ensure that the relevant output channels do not overlap. The output signals of both headends can then be combined via RF splitters.

### NEO N Series tuning instructions

<table>
<thead>
<tr>
<th>Channel</th>
<th>Input</th>
<th>Transponder/Programm</th>
<th>SD/HD</th>
<th>Band</th>
<th>Polarisation</th>
<th>Transp. Frequency</th>
<th>Sat FF/</th>
<th>MHz</th>
<th>SR</th>
<th>Standard</th>
<th>CR</th>
<th>Output channel</th>
<th>Symbol rate</th>
<th>Output level</th>
<th>QAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 A</td>
<td>Das Erste, BR, HR, SWR, WDR</td>
<td>SD High Horizontal</td>
<td>11836</td>
<td>1236</td>
<td>27500</td>
<td>DVB-S</td>
<td>3/4</td>
<td>S21</td>
<td>6.9</td>
<td>-2</td>
<td>64</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 A</td>
<td>ZDF, Sat1, KIXA, ZDFinfo, ZDFfultur, ZDF neo</td>
<td>SD High Horizontal</td>
<td>11954</td>
<td>1354</td>
<td>27500</td>
<td>DVB-S</td>
<td>3/4</td>
<td>S22</td>
<td>6.9</td>
<td>-2</td>
<td>64</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 A</td>
<td>MDR, NDR, RBB, SWR</td>
<td>SD High Horizontal</td>
<td>12110</td>
<td>1510</td>
<td>27500</td>
<td>DVB-S</td>
<td>3/4</td>
<td>S23</td>
<td>6.9</td>
<td>-2</td>
<td>64</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 A</td>
<td>RTL, N-TV, RTL2, RTL Living, RTLunino, Vox</td>
<td>SD High Horizontal</td>
<td>12188</td>
<td>1588</td>
<td>27500</td>
<td>DVB-S</td>
<td>3/4</td>
<td>S24</td>
<td>6.9</td>
<td>-2</td>
<td>64</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 A</td>
<td>Pro Sieben, Sat1, Kabel eins, N24</td>
<td>SD High Horizontal</td>
<td>12545</td>
<td>1945</td>
<td>22000</td>
<td>DVB-S</td>
<td>5/6</td>
<td>S25</td>
<td>6.9</td>
<td>-2</td>
<td>64</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 A</td>
<td>Anixe, Das Verte, 1-2-3 TV, TLC Germany, Six Deutschland</td>
<td>SD High Horizontal</td>
<td>12460</td>
<td>1860</td>
<td>27500</td>
<td>DVB-S</td>
<td>3/4</td>
<td>S26</td>
<td>6.9</td>
<td>-2</td>
<td>64</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 B</td>
<td>VIVA, Nickelodeon</td>
<td>SD High Vertical</td>
<td>11973</td>
<td>1373</td>
<td>27500</td>
<td>DVB-S</td>
<td>3/4</td>
<td>S27</td>
<td>6.9</td>
<td>-2</td>
<td>64</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 B</td>
<td>Sport1, DMAX, HSE24, SonnenklarTV, Astro TV</td>
<td>SD High Vertical</td>
<td>12480</td>
<td>1880</td>
<td>27500</td>
<td>DVB-S</td>
<td>3/4</td>
<td>S28</td>
<td>6.9</td>
<td>-2</td>
<td>64</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NC08S condition on delivery, transponder Astra 19.2° East and output channel assignment
## Technical data

### NEO X Series

<table>
<thead>
<tr>
<th>Type</th>
<th>33</th>
</tr>
</thead>
<tbody>
<tr>
<td>X10</td>
<td>33</td>
</tr>
<tr>
<td>X10-CM</td>
<td>33</td>
</tr>
<tr>
<td>X10-PS</td>
<td>33</td>
</tr>
<tr>
<td>XC08S / XC04S</td>
<td>34</td>
</tr>
<tr>
<td>XT06M / XC06M</td>
<td>34</td>
</tr>
<tr>
<td>XT06M-X / XC06M-X</td>
<td>36</td>
</tr>
<tr>
<td>XT04S</td>
<td>37</td>
</tr>
<tr>
<td>X32M / X64S</td>
<td>38</td>
</tr>
<tr>
<td>XC08I / XT08I</td>
<td>39</td>
</tr>
<tr>
<td>XB06-CI</td>
<td>40</td>
</tr>
<tr>
<td>X10-RC</td>
<td>41</td>
</tr>
<tr>
<td>XB04H-EX</td>
<td>41</td>
</tr>
</tbody>
</table>

### NEO M Series

<table>
<thead>
<tr>
<th>Type</th>
<th>42</th>
</tr>
</thead>
<tbody>
<tr>
<td>MT08M / MC08M / MT08M-CI / MC08M-CI</td>
<td>42</td>
</tr>
<tr>
<td>MC18SM / MC18SM-CI</td>
<td>44</td>
</tr>
</tbody>
</table>

### NEO N Series

<table>
<thead>
<tr>
<th>Type</th>
<th>46</th>
</tr>
</thead>
<tbody>
<tr>
<td>NC08S</td>
<td>46</td>
</tr>
</tbody>
</table>

---

### NEO X Series processing

<table>
<thead>
<tr>
<th>Type</th>
<th>X10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order no.</td>
<td>690065</td>
</tr>
<tr>
<td>Type of mounting</td>
<td>Installation in 19&quot; cabinets or for wall mounting</td>
</tr>
<tr>
<td>Number of insertion slots</td>
<td>Ten slots freely configurable, Two pre-assembled slots (X10-PS / X10-CM), One for special functions (e.g. X10-A1)</td>
</tr>
<tr>
<td>Power-supply unit (X10-PS, 20610121)</td>
<td>Mains voltage 230 V ± 10 % / 50 ... 60 Hz, Max. power consumption 437 W, Secondary voltage/max. permissible current 12.3 V/32.5 A, Signaling (LED) Green (normal operation), Red (undervoltage or overvoltage), Red flashing (overvoltage)</td>
</tr>
<tr>
<td>RF combiner</td>
<td>Insertion loss [dB] Typ. 15</td>
</tr>
<tr>
<td>General</td>
<td>Fans 2, Dimensions (HxWxD) [mm] 399 x 483 x 266, Ambient temperature range [°C] -20 ... +50, Weight [kg] 15.5</td>
</tr>
<tr>
<td>Type</td>
<td>X10-CM</td>
</tr>
<tr>
<td>Order no.</td>
<td>690067</td>
</tr>
<tr>
<td>System interfaces</td>
<td>Control interface [Mbps] 12, Fast Ethernet 2 x RJ 45, USB 2 x Host (type A), Reset Button</td>
</tr>
<tr>
<td>System data</td>
<td>Power consumption [W] Typ. 4, Temperature range [°C] -20 ... +50, Dimensions (HxWxD) [mm] 110.5 x 38.5 x 207, Weight [kg] 0.3</td>
</tr>
</tbody>
</table>

### NEO M Series processing

<table>
<thead>
<tr>
<th>Type</th>
<th>X10-PS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order no.</td>
<td>690066</td>
</tr>
<tr>
<td>Output</td>
<td>Input power [W] 400, Output voltage/current 12.3 V / 0.5 ... 32.5 A, Output current limitation 36.5 &lt; Isec &lt; 38.5 A (short-circuit proof), Overvoltage protection [V] &gt; 14, Interference voltages ≤ 250 mV (50 Hz to 1 MHz), Redundancy Parallel operation of two units possible</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Temperature sensor Readout of indoor temperature via software HMT, Function/error status data via software, HMT, Remote control Reset and start via software HMT</td>
</tr>
<tr>
<td>Signalling (LED)</td>
<td>Green [V] Normal operation (output voltage 11.3 ... 14), Red [V] Undervoltage (output voltage &lt; 10.6), Red (blinking) [V] Overvoltage (output voltage &gt; 14), Red [A] Overcurrent (output current &gt; 35.5)</td>
</tr>
<tr>
<td>Safety (VDE approved)</td>
<td>Protection class 1, Excess temperature switch-off Automatic</td>
</tr>
<tr>
<td>System data</td>
<td>Mains connection Panel connector C14, Temperature range [°C] -20 ... +50, Dimensions (HxWxD) [mm] 166 x 78 x 230, Weight [kg] 1.6</td>
</tr>
</tbody>
</table>

[† more information on next page]
## Technical data

### Type

<table>
<thead>
<tr>
<th>Type</th>
<th>XCO8S</th>
<th>XCO4S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order no.</td>
<td>690069</td>
<td>690070</td>
</tr>
<tr>
<td>Inputs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAT IF Input [Q]</td>
<td>4 × F-Connector, 75</td>
<td></td>
</tr>
<tr>
<td>Frequency range [MHz]</td>
<td>950 ... 2,150</td>
<td></td>
</tr>
<tr>
<td>Decoupling [dB]</td>
<td>&gt; 25</td>
<td></td>
</tr>
<tr>
<td>Return loss [dB]</td>
<td>Ty. 10</td>
<td></td>
</tr>
<tr>
<td>DiSEqC™/1.0</td>
<td>Vert./Horiz., Low/High, Sat. Pos. (A/B/C/D)</td>
<td></td>
</tr>
</tbody>
</table>

### Switch-over polarisations

- 14/18 V, 0/22 kHz
- 35/42 kHz
- 1/2, 2/3, 3/4, 4/5, 5/6, 6/7, 7/8

### Remote lead current

Max. 60 mA (per input)

### Front end

#### DVB-S2

- 8 × 4 x
- Frequency grid [MHz] | 1 (950 ... 2,150 MHz)
- A.F.C-control range (MHz) | 35 |
- Input level range [dBµV] | 60 ... 110 |
- Permissible level difference [dB] | 12 (950 ... 2,150 MHz) |
- Demodulation DVB-S2

**Standard**
- EN 300 421 (1)
- Input symbol rate QPSK [MS/s] | 1 ... 45 |
- Code rate (Viterbi) | 1/2, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 |
- Return loss [dB] | 97 |
- Setting output level [dB] | -20 (in 0.5 dB steps) |
- Signal stability [dB] | > 0.75 |
- Frequency stability [ppm] | 35 |
- MER [dB] | ≥ 45 |
- Shoulder attenuation [dB] | ≥ 60 (at standard level) |
- Spurious emissions [dB] | ≥ 60 |

**System data**
- Power consumption [W] | 14 |
- Setting output level [dB] | -20 (in 0.5 dB steps) |
- Signal stability [dB] | ≤ 0.75 |
- Frequency stability [ppm] | 35 |
- MER [dB] | ≥ 42 |
- Shoulder attenuation [dB] | ≥ 60 (at standard level) |
- Spurious emissions [dB] | ≥ 60 |

### System interfaces

- Data interface [MBit/s] | 800 |
- Control interface [MHzp] | 12 |
- TS routing to backplane | Max. 2 x 16 transport streams (right and left) |

### MPEG-TS processor

- Program filter | ✓ |
- PID filter | ✓ |
- PSI/SI processing | Cable-NIT, LCN, PCR correction, CAT Stiffing | Automatic |

### HFC-HFC

**Type**
- Order no. | 690072 |
- SAT IF Input [Q] | 4 x F-Connector, 75 |
- Decoupling [dB] | > 25 |
- Return loss [dB] | Ty. 10 |
| DiSEqC™/1.0 | Vert./Horiz., Low/High, Sat. Pos. (A/B/C/D) |

### Switch-over polarisations

- 14/18 V, 0/22 kHz
- 35/42 kHz
- 1/2, 2/3, 3/4, 4/5, 5/6, 6/7, 7/8

### Remote lead current

Max. 60 mA (per input)

### Front end

#### DVB-S2/T/T2-C

- 4 x
- Frequency grid [MHz] | 1 |

---

**Further information on page 35**
## Technical data

### HFC-HFC

<table>
<thead>
<tr>
<th>Type</th>
<th>XT06M-X</th>
<th>XD6M-X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order no.</td>
<td>690074</td>
<td>690073</td>
</tr>
<tr>
<td>Inputs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sat IF/tv/cable [Q]</td>
<td>4 x F-Connector, 75</td>
<td></td>
</tr>
<tr>
<td>Decoupling [dB]</td>
<td>&gt; 25</td>
<td>&gt; 25</td>
</tr>
<tr>
<td>Return loss [dB]</td>
<td>Typ. 10</td>
<td></td>
</tr>
<tr>
<td>DiSEqC™ 1.0</td>
<td>1 x F-Connector, 75</td>
<td></td>
</tr>
<tr>
<td>Switching levels [kHz]</td>
<td>14/18 V, 0/22</td>
<td></td>
</tr>
<tr>
<td>Remote feed current [mA]</td>
<td>Max. 60 (per input)</td>
<td></td>
</tr>
</tbody>
</table>

### Front end

- **DVB-S(Q)/T/T2/-C:** 4 x
- **Frequency grid [MHz]:** 1
- **Input level range [dBμV]:** 60 ... 100
- **Permissible level difference [dB]:** 20

### Demodulation DVB-S

- **Standard:** EN 300 421
- **Frequency range [MHz]:** 950 ... 2,150
- **Input symbol rate QPSK [Ms/s]:** 1 ... 45
- **Roll off [%]:** 1/2, 2/3, 3/4, 5/6, 6/7, 8/9, 9/10
- **AFC-control range [MHz]:** ± 5
- **Demodulation DVB-S2:**
  - **Standard:** EN 302 307, TR 102-376
  - **Input symbol rate QPSK [Ms/s]:** 1 ... 45
  - **Code rate (LDPC):** 1/2, 2/3, 3/4, 4/5, 5/6, 6/7, 7/8, 8/9, 9/10
  - **Input symbol rate 8PSK [Ms/s]:** 1 ... 45
  - **Code rate (LDPC):** 1/2, 2/3, 3/4, 5/6, 6/7, 8/9, 9/10
  - **Roll off [%]:** 1/2, 2/3, 3/4, 5/6, 6/7, 8/9, 9/10
- **Demodulation DVB-T (COFDM):**
  - **Standard:** EN 300744, DVB-T 2.2.1, D-Book 7.0
  - **Frequency range [MHz]:** 50.5 ... 858
  - **Guard interval:** 1/4, 1/8, 1/16, 1/32
  - **Roll off [%]:** 1/2, 2/3, 3/4, 5/6, 7/8
- **Switch-over polarisations:** 14/18 V, 0/22 kHz
- **Remote feed current [mA]:** Max. 60 (per input)

### Modulator

- **Output channels:** 6 x DVB-T, 2k mode
- **Frequency range [MHz]:** 950 ... 2,150
- **Input level range [dBμV]:** 60 ... 100
- **Permissible level difference [dB]:** 12 (950 ... 2,150 MHz)

### Demodulation DVB-T

- **Standard:** EN 300421 (1)
- **Input symbol rate QPSK [Ms/s]:** 1 ... 45
- **Code rate (Viterbi):** 1/2, 2/3, 3/4, 4/5, 5/6, 6/7, 7/8
- **Roll off [%]:** 35
- **Demodulation DVB-T2:**
  - **Standard:** EN 302555/S3.1, DVB-T2 Lite compliant, Single and Multiple PLP Support, NorDig Unified 2.2.1, D-Book 7.0
  - **Frequency range [MHz]:** 47 ... 862 MHz
  - **Symbol rate:** 1/2, 2/3, 3/4, 4/5, 5/6, 6/7, 7/8, 8/9
  - **Guard interval:** 1/128, 1/8, 1/4, 1/32, 1/64, 1/128, 1/256, 1/512
  - **Roll off [%]:** 20, 25, 35

### System data

- **Power consumption [W]:** Typ. 1 ... 1.5 W
- **Temperature range [°C]:** -20 ... +50
- **Shoulder attenuation [dB]:** > 70
- **Dimensions (W x D x H):** 265 x 36 x 220
- **Weight [kg]:** 1.1

### More information on next page
**Type** | **X132M** | **X164S**
--- | --- | ---
Order no. | 690076 | 690053

**Inputs**
- Sat If/Ter./cable (Ω) | 4 x F-Connector, 75
- Decoupling (dB) | > 25
- Return path loss (dB) | Typ. 10
- DiSEqC™ 1.0 | Vert./Horiz., Low/High, Sat Pos. (A/B/C/D)
- Switching levels (kHz) | 14/18 V, 0/22
- Remote lead current (mA) | Max. 60 (per input)

**Front end**
- DVB-S2/T/T2/C | 4 x
- Frequency grid (MHz) | 1
- Input level range (dBμV) | 60 ... 100 60 ... 110
- Permissible level difference (dB) | 20 12

**Demodulation DVB-S**
- Standard | EN 300421
- Frequency range (MHz) | 950 ... 2,150
- Input symbol rate QPSK (Ms/s) | 1 ... 45 2 ... 45
- Code rate (LPDC) | 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
- Roll off (%) | 20, 25, 35 35
- Demodulation DVB-S2 | Standard
- Frequency range (MHz) | 950 ... 2,150
- Input symbol rate QPSK (Ms/s) | 1 ... 45 2 ... 45
- Code rate (LPDC) | 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
- Roll off (%) | 20, 25, 35
- Demodulation DVB-C (COFDM)
- Standard | EN 300429/ITU J.83 Annex A/C
- Frequency range (MHz) | 950 ... 2,150
- Input symbol rate QPSK (Ms/s) | 1 ... 7.2
- Constellation (QAM) | 4/16/32/64/128/256
- MPEG-TS processor
  - Program/PID filter
  - PSI/SI processing
  - Stiffing
  - Automatic (MPTS)
- IP stream
  - Output | 1 GB Ethernet, 1000 BaseT
  - Protocol | UDP/RTP
  - Transmission mode
  - Transport stream | 32 x SPTS/4 x MPTS 64 x SPTS / 8 x MPTS
- Max. output data rate per TS (Mbps) | 1 ... 100
- IP services | IPv4, ARP, Ping, SAP
- System data
  - Power consumption | Typ. 10 W (at 12 V)
  - Temperature range (°C) | -20 ... +50
  - Protective switch-off (°C) | > 70
  - Dimensions (H x W x D) (mm) | 265 x 36 x 220
  - Weight (kg) | 1.1

**Demodulation DVB-T (COFDM)**
- Standard | EN 300275-V1.31, DVB-T2 Lite compliant, Single and multiple PIP, NorDig Unified 2.2.1, D-Book 7.0
- Frequency range (MHz) | 950 ... 2,150
- Input symbol rate QPSK (Ms/s) | 1 ... 34
- Code rate (LPDC) | 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
- Roll off (%) | 20, 25, 35
- Demodulation DVB-T2 (COFDM)
- Standard | EN 300421
- Frequency range (MHz) | 950 ... 2,150
- Input symbol rate QPSK (Ms/s) | 1 ... 34
- Code rate (LPDC) | 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
- Roll off (%) | 20, 25, 35
- Demodulation DVB-C
- Standard | EN 300429/ITU J.83 Annex A/C
- Frequency range (MHz) | 950 ... 2,150
- Input symbol rate QPSK (Ms/s) | 1 ... 45 2 ... 45
- Constellation (QAM) | 4/16/32/64/128/256
- MPEG-TS processor
  - Program/PID filter
  - PSI/SI processing
  - Stiffing
  - Automatic (MPTS)
- IP stream
  - Output | 1 GB Ethernet, 1000 BaseT
  - Protocol | UDP/RTP
  - Transmission mode
  - Transport stream | 32 x SPTS/4 x MPTS 64 x SPTS / 8 x MPTS
- Max. output data rate per TS (Mbps) | 1 ... 100
- IP services | IPv4, ARP, Ping, SAP
- System data
  - Power consumption | Typ. 10 W (at 12 V)
  - Temperature range (°C) | -20 ... +50
  - Protective switch-off (°C) | > 70
  - Dimensions (H x W x D) (mm) | 265 x 36 x 220
  - Weight (kg) | 1.1
### Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>XB06-CI</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order no.</td>
<td>690079</td>
<td></td>
</tr>
<tr>
<td>User interfaces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 CAM insert positions</td>
<td>PCMCIA interface</td>
<td>(As per EN 50221)</td>
</tr>
<tr>
<td>Supported CAM types [CAM]</td>
<td>5V</td>
<td>(3.3 V CAMs are not supported)</td>
</tr>
<tr>
<td>System interfaces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data interface [MBit/s]</td>
<td>800 (net)</td>
<td>To adjacent modules</td>
</tr>
<tr>
<td>Control interface [Mbps]</td>
<td>12</td>
<td>To control module (X10-CM)</td>
</tr>
<tr>
<td>TS routing to backplane</td>
<td>Max. 2 x 1.6 transport streams (right and left)</td>
<td>Combined with NEO X Series® modules, for example XCO8S, and configuration via HMT</td>
</tr>
</tbody>
</table>

**Function and option**

- **MPEG-TS routing [CAM]**: Free assignment of up to 6
- **Serial connection of up to 3**
- **Specific decryption configuration**: Decryption/No decryption for each service or each PID
- **Default configuration**: Encoding/No encoding for all unconfigured services
- **Decryption 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, Upate Mode, CAM-PhMT optimisation
- **Extraction of information on service and elementary streams from SI tables**: For display in HMT
- **Removal of decryption information [tables, descriptors, etc.]**: Following successful decoding

**CAM options and information**

- **Displays status and names**: For each CAM inserted
- **Memory function**: Can be edited individually for each CAM
- **Power On/Off**: Each inserted CAM can be individually activated/deactivated
- **Mode for CAM software update**: Following successful decoding

**CAM status detection**

- **Slot empty, CAM inserted, CAM ready**: CAM name

<table>
<thead>
<tr>
<th>System data</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power consumption [W]</td>
<td>&lt; 2.5/Typ. &lt; 10</td>
<td>Without CAM with 6 CAMs per 1.25W</td>
</tr>
<tr>
<td>Current drain per CAM [A]</td>
<td>Max. 0.5</td>
<td></td>
</tr>
<tr>
<td>EMV [dBpsW]</td>
<td>Max. 20</td>
<td>EN 50083-2, A1</td>
</tr>
<tr>
<td>Temperature range [° C]</td>
<td>-20 ... +50</td>
<td></td>
</tr>
<tr>
<td>Protective switch-off [° C]</td>
<td>&gt; 70</td>
<td>In case of excess temperature</td>
</tr>
<tr>
<td>Dimensions [H x W x D] [mm]</td>
<td>265 x 36 x 220</td>
<td></td>
</tr>
<tr>
<td>Weight [kg]</td>
<td>1.1</td>
<td>Without CAMs</td>
</tr>
</tbody>
</table>

---

**Type XB04H-EX**

<table>
<thead>
<tr>
<th>Type</th>
<th>XB04H-EX</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order no.</td>
<td>690080</td>
<td></td>
</tr>
<tr>
<td>Redundancy system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connection</td>
<td>2 x X10</td>
<td></td>
</tr>
<tr>
<td>Redundancy mode</td>
<td>Half-load parallel operation of both power supplies</td>
<td></td>
</tr>
<tr>
<td>Automatic switch-over in the event of failure</td>
<td>Seamless (uninterrupted operation for the X10 system)</td>
<td></td>
</tr>
<tr>
<td>Power supply in the event of failure</td>
<td>One power supply takes over the power supply of X10 units</td>
<td></td>
</tr>
<tr>
<td>Max. power consumption of X10 units [W]</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Power consumption X10 (X10-CM and fan unit) [W]</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Power distribution between both X10 units</td>
<td>May be asymmetric</td>
<td></td>
</tr>
<tr>
<td>Hot pluggable</td>
<td>Replacing power units without affecting the headend operation</td>
<td></td>
</tr>
<tr>
<td>Signals in the event of failure</td>
<td>LED on power supply and HMT</td>
<td></td>
</tr>
<tr>
<td>Potential equalisation</td>
<td>According to DIN EN 60728-11 and DIN EN 60065</td>
<td></td>
</tr>
</tbody>
</table>

**Data link cable**

- **Length [m]**: 1.1
- **Connectors**: 5-pin

**System data**

- **Power consumption [W]**: Typ. 14 / max. 18
- **Temperature range [° C]**: 0 ... 50
- **Protective switch-off [° C]**: > 70
- **Dimensions [H x W x D] [mm]**: 265 x 36 x 220
- **Weight [kg]**: 1.1

---

**Additional information on next page**

---

**Type X10-RC**

<table>
<thead>
<tr>
<th>Type</th>
<th>X10-RC</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order no.</td>
<td>690087</td>
<td></td>
</tr>
<tr>
<td>Redundancy system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connection</td>
<td>2 x X10</td>
<td></td>
</tr>
<tr>
<td>Redundancy mode</td>
<td>Half-load parallel operation of both power supplies</td>
<td></td>
</tr>
<tr>
<td>Automatic switch-over in the event of failure</td>
<td>Seamless (uninterrupted operation for the X10 system)</td>
<td></td>
</tr>
<tr>
<td>Power supply in the event of failure</td>
<td>One power supply takes over the power supply of X10 units</td>
<td></td>
</tr>
<tr>
<td>Max. power consumption of X10 units [W]</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Power consumption X10 (X10-CM and fan unit) [W]</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Power distribution between both X10 units</td>
<td>May be asymmetric</td>
<td></td>
</tr>
<tr>
<td>Hot pluggable</td>
<td>Replacing power units without affecting the headend operation</td>
<td></td>
</tr>
<tr>
<td>Signals in the event of failure</td>
<td>LED on power supply and HMT</td>
<td></td>
</tr>
<tr>
<td>Potential equalisation</td>
<td>According to DIN EN 60728-11 and DIN EN 60065</td>
<td></td>
</tr>
</tbody>
</table>

**Data link cable**

- **Length [m]**: 1.1
- **Connectors**: 5-pin

---

**Type XB04H-EX**

<table>
<thead>
<tr>
<th>Type</th>
<th>XB04H-EX</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bit rate [Mbps]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Encoding ISO / IEC 11172-3</td>
<td>MPEG-1, Layer II</td>
<td></td>
</tr>
<tr>
<td>Sampling frequency [kHz]</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>Bit rate</td>
<td>96, 128, 192, 256, 320, 384 kbps</td>
<td></td>
</tr>
<tr>
<td>Audio format</td>
<td>mono / stereo / 2-tone</td>
<td></td>
</tr>
<tr>
<td>MPEG-TS processor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SI data processing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Configuration of service and provider name, TS-ID, ON-ID, service ID, PMT PID, video PID, audio PID, PCR PID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiplex</td>
<td>4 : 2 in any combination</td>
<td></td>
</tr>
</tbody>
</table>

**System data**

- **Power consumption [W]**: Typ. 14 / max. 18
- **Temperature range [° C]**: 0 ... 50
- **Protective switch-off [° C]**: > 70
- **Dimensions [H x W x D] [mm]**: 265 x 36 x 220
- **Weight [kg]**: 1.1

---

1 It is recommended to wire the two power supplies at different phases. This is beneficial if one phase fails in redundancy operation mode.
## NEO M Series

### Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>MT08M</th>
<th>MC08M</th>
<th>MT08M-Ci</th>
<th>MC08M-Ci</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order no.</td>
<td>690083</td>
<td>690081</td>
<td>690084</td>
<td>690082</td>
</tr>
</tbody>
</table>

#### Inputs
- **Sat IF input [Ω]** 4 x F-Connector, 75
- **Terr. / cable input [Ω]** 1 x F-Connector, 75
- **Decoupling [dB]** > 25
- **Return loss [dB]** Typ. 10
- **DSEqualizer**
  - **Vert./High/Low/Sat Pos. [A/B/C/D]**
- **Switching levels [kHz]** 14/18 V, 0/22

#### Decoding
- **DiSEqC 1.0 Vert./Horiz., Low/High; Sat.Pos. (A/B/C/D)**
- **Switching levels [kHz]** 14/18 V, 0/22

#### Remote feed current
- **for LNB [mA]** Max. 250 (on F-type socket No. 3)
- **for active antenna (5 V) [mA]** 100 (on F-type socket No. 5)

#### Front end
- **DVB-S(2)/-T/-T2/-C 8 x**
- **Frequency grid [MHz]** 1
- **Input level range [μV]** 60 ... 100
- **Permissible level difference [dB]** 20

#### Demodulation DVB-S
- **Standard** EN 300 421
- **Frequency range [MHz]** 950 ... 2,150
- **Input symbol rate QPSK [MS/s]** 1 ... 45
- **Roll off [%]** 20, 25, 35
- **AFC control range [MHz]** ± 5

#### Demodulation DVB-S2
- **Standard** EN 302 307, TR 102-376
- **Input symbol rate QPSK [MS/s]** 1 ... 45
- **Code rate (LDCP)** 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 6/7, 8/9, 10
- **Input symbol rate BPSK [MS/s]** 1 ... 45
- **Code rate (LDCP)** 3/5, 2/3, 3/4, 5/6, 8/9, 9/10

#### Demodulation DVB-T
- **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, 1/8, 1/4
- **FEC 1/2, 3/4, 5/6, 7/8**
- **Roll off [%]** 20, 25, 35

#### Demodulation DVB-C
- **Standard** EN 300429/ITU J.83 Annex A/C
- **Frequency range [MHz]** 48 ... 858
- **Input symbol rate [MS/s]** 1 ... 7.2
- **Constellation [QAM]** 4, 16, 32, 64, 128, 256

### 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, 1/8, 1/4
- **FEC 1/2, 3/4, 5/6, 7/8**
- **Roll off [%]** 20, 25, 35

### Outputs
- **Test output**
  - **Test socket [Ω]** 1 x F-Connector, 75
  - **Level relative to the output [dB]**
  - **System data**
    - **Power consumption [W]**
      - **Input symbols [kHz]**
        - 1/4, 1/16, 1/32
        - 1/4, 1/16, 1/32
    - **Temperature range [°C]** 0 ... +45
    - **Mains voltage [V]** 100-240
    - **Protective switch-off [°C]** > 70

### RF output
- **Output [dB]** 1 x F-Connector, 75
- **Frequency range [MHz]** 47 ... 1,006 (fine adjustment in 125 kHz steps)
- **Frequency range (channel list) [MHz]** 47 ... 86/110 ... 862
- **Return path loss [dB]** 14 (47) - 1.5 dB/Oct.
- **Output level [dBμV]** 105
- **Output level [dBμV]** 105
- **Setting output level [dB]** -20 (In 0.5 steps)

### MPEG-TS processor
- **Programm filter**
  - **PSI/SI processing** Cable-NIT, LCN, PCR correction, CAT
  - **LCN Data**
    - **NoDGData**
      - **NoDGData**
    - **NoDGData**
    - **NoDGData**
- **Stuffing** Automatic
- **6 CAM insert positions** - - PCMCIA interface
- **TS routing CAM** - - Individual and serial decoding

### More information on next page
## Technical data

### Type
- **MC18SM**
- **MC18SM-Ci**

#### Inputs
- **Sat IF input [Ω]**
  - 8 x F-Connector, 75
- **SAT / Terr. / cable input [Ω]**
  - 1 x F-Connector, 75
- **Decoupling [dB]**
  - > 25
- **Return loss [dB]**
  - Typ. 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 for LNB [mA]**
  - Max. 250 (on F-type socket No. 3 and 7)
- **Remote feed current for active antenna (5 V) [mA]**
  - 100 (on F-type socket No. 9)

#### Front end
- **DVB-S(2)**
  - 16
- **DVB-S(2)/T2/C**
  - 2
- **Frequency grid [MHz]**
  - 1
- **Input level range [dBμV]**
  - 60 ... 100
- **Permissible level difference [dB]**
  - 20

#### Demodulation DVB-S
- **Standard**
  - EN 300 421
- **Frequency range [MHz]**
  - 950 ... 2,150
- **Input symbol rate QPSK (MS/a)**
  - 1 ... 45
- **Code rate (W/Leads)**
  - 1/2, 2/3, 3/4, 5/6, 7/8
- **Roll off [%]**
  - 20, 25, 35
- **AF control range [MHz]**
  - ± 5

#### Demodulation DVB-S2
- **Standard**
  - EN 302 307, TR 102-376
- **Input symbol rate QPSK (MS/a)**
  - 1 ... 45
- **Code rate (LDCP)**
  - 1/2, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
- **Input symbol rate BPSK (MS/a)**
  - 1 ... 45
- **Code rate (LDCP)**
  - 3/5, 2/3, 3/4, 5/6, 8/9, 9/10
- **Roll off [%]**
  - 20, 25, 35

### Demodulation DVB-C
- **Standard**
  - EN 300429/ITU J.83 Annex A/C
- **Frequency range [MHz]**
  - 48 ... 858
- **Input symbol rate (MS/a)**
  - 1 ... 72
- **Constellation [QAM]**
  - 4, 16, 32, 64, 128, 256

### MPEG-TS processor
- **Program filter**
  - ✓
- **PSI/SI processing**
  - Cable-NIT, LCN, PCR correction, CAT
- **LCN Data**
  - NOGIDIG Descriptor V1
- **Stuffing**
  - Automatic
- **6 CAM insert positions**
  - PCMCIA interface
- **TS routing CAM**
  - Individual and serial decoding

#### Modulator
- **Output channels**
  - 18 x DVB-C (J.83A)
- **Constellation [QAM]**
  - 16, 32, 64, 128, 256
- **Symbol rate [MS/s]**
  - 1.5 ... 7.15
- **Roll off [%]**
  - 15

#### RF output
- **Output [Ω]**
  - 1 x F-Connector, 75
- **Frequency range [MHz]**
  - 47 ... 1,006 (fine adjustment in 125 kHz steps)
- **Frequency range (channel list) [MHz]**
  - 47 ... 86/110 ... 862 (setting via channel list)
- **Return path loss [dB]**
  - 14 (47) -1.5 dB/Oct.
- **Output level [dBμV]**
  - 207
- **Level relative to the output [dB]**
  - ± 0.5
- **Signal stability [dB]**
  - ± 0.5
- **Frequency stability [ppm]**
  - 35
- **MER [dB]**
  - 45
- **Shoulder attenuation [dB]**
  - 60 (at standard level)
- **Spurious emissions [dB]**
  - 60

### System data
- **Power consumption [W]**
  - 32 ... 35
- **Temperature range [°C]**
  - 0 ... +45
- **Mains voltage [V]**
  - 100-240
- **Protective switch-off [°C]**
  - > 70
- **Dimensions (H x W x D) [mm]**
  - 97 x 350 x 244
- **Weight**
  - Approx. 4 kg
  - Approx. 4.5 kg

---

*more information on next page*
## NEO N Series

### Technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>NC08S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order no.</td>
<td>690060</td>
</tr>
<tr>
<td>Inputs</td>
<td></td>
</tr>
<tr>
<td>Sat IF Input [Ω]</td>
<td>4 x F-Connector, 75</td>
</tr>
<tr>
<td>Frequency range [MHz]</td>
<td>950 ... 2,150</td>
</tr>
<tr>
<td>Decoupling [dB]</td>
<td>&gt; 25</td>
</tr>
<tr>
<td>Return loss [dB]</td>
<td>Typ. 10</td>
</tr>
<tr>
<td>DiSEqC™ 1.0</td>
<td></td>
</tr>
<tr>
<td>Switch-over polarisations</td>
<td>14/18 V, 0/22 kHz</td>
</tr>
<tr>
<td>Remote feed current for LNB [mA]</td>
<td>max. 250 (on F-type Socket No. 3)</td>
</tr>
<tr>
<td>Remote feed current</td>
<td>Max. 60 mA (per input)</td>
</tr>
<tr>
<td>Remote feed current for LNB</td>
<td>Max. 250 mA (Port no. 3)</td>
</tr>
<tr>
<td>Front end</td>
<td></td>
</tr>
<tr>
<td>DVB-S2</td>
<td>8 x</td>
</tr>
<tr>
<td>Frequency grid [MHz]</td>
<td>1 (950 ... 2,150 MHz)</td>
</tr>
<tr>
<td>AFC-control range [MHz]</td>
<td>± 3 (symbol rate &lt; 10 Ms/s) / ± 5 (Symbol Rate &gt; 10 Ms/s)</td>
</tr>
<tr>
<td>Input level range [dBµV]</td>
<td>60 ... 110</td>
</tr>
<tr>
<td>Permissible level difference [dB]</td>
<td>12 (950 ... 2,150 MHz)</td>
</tr>
<tr>
<td>Demodulation DVB-S</td>
<td></td>
</tr>
<tr>
<td>Standard</td>
<td>EN 300 421 (1)</td>
</tr>
<tr>
<td>Input symbol rate QPSK [Ms/s]</td>
<td>2 ... 45</td>
</tr>
<tr>
<td>Code rate (Viterbi)</td>
<td>1/2, 2/3, 3/4, 5/6, 6/7, 7/8</td>
</tr>
<tr>
<td>Roll off [%]</td>
<td>35</td>
</tr>
<tr>
<td>Demodulation DVB-S2</td>
<td></td>
</tr>
<tr>
<td>Standard</td>
<td>EN 302 307 (2)</td>
</tr>
<tr>
<td>Input symbol rate QPSK [Ms/s]</td>
<td>1 ... 34</td>
</tr>
<tr>
<td>Code rate (LDPC)</td>
<td>1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 6/8, 8/9, 9/10</td>
</tr>
<tr>
<td>Input symbol rate BPSK [Ms/s]</td>
<td>1 ... 31.5</td>
</tr>
<tr>
<td>Code rate (LDPC)</td>
<td>3/5, 2/3, 3/4, 5/6, 8/9, 9/10</td>
</tr>
<tr>
<td>Roll off [%]</td>
<td>20, 25, 35</td>
</tr>
<tr>
<td>System interface</td>
<td></td>
</tr>
<tr>
<td>Control interface [Mbps]</td>
<td>12</td>
</tr>
<tr>
<td>MPEG-TS processor</td>
<td></td>
</tr>
<tr>
<td>Program filter</td>
<td>✓</td>
</tr>
<tr>
<td>PID filter</td>
<td>✓</td>
</tr>
<tr>
<td>PSI/SI processing</td>
<td></td>
</tr>
<tr>
<td>Cable-NIT, LCN, PCR correction, CAT Stuffing</td>
<td>Automatic</td>
</tr>
<tr>
<td>QAM modulator</td>
<td></td>
</tr>
<tr>
<td>Output channels</td>
<td>8 x DVB-C (1.13A)</td>
</tr>
<tr>
<td>QAM Constellation (QAM)</td>
<td>16, 32, 64, 128, 256</td>
</tr>
<tr>
<td>Symbol rate [MS/s]</td>
<td>1.5 ... 7.15</td>
</tr>
<tr>
<td>Roll off [%]</td>
<td>15</td>
</tr>
<tr>
<td>RF output</td>
<td></td>
</tr>
<tr>
<td>DVB-C Output [Ω]</td>
<td>1 x F-Connector, 75</td>
</tr>
<tr>
<td>Frequency range [MHz]</td>
<td>47 ... 1,006</td>
</tr>
<tr>
<td>Frequency range [channel list] [MHz]</td>
<td>47 ... 86/110 ... 862</td>
</tr>
<tr>
<td>Return loss</td>
<td>14 dB (47 MHz) - 1.5 dB/Oct.</td>
</tr>
<tr>
<td>Output level [dBµV]</td>
<td>97</td>
</tr>
<tr>
<td>Setting output level [dB]</td>
<td>-20 (in 0.5 dB steps)</td>
</tr>
<tr>
<td>Signal stability [dB]</td>
<td>± 0.75</td>
</tr>
<tr>
<td>Frequency stability [ppm]</td>
<td>35</td>
</tr>
<tr>
<td>MER [dB]</td>
<td>≥ 45</td>
</tr>
<tr>
<td>Shoulder attenuation [dB]</td>
<td>≥ 60 (at standard level)</td>
</tr>
<tr>
<td>Spurious emissions [dB]</td>
<td>≥ 60</td>
</tr>
<tr>
<td>System Data</td>
<td></td>
</tr>
<tr>
<td>Power consumption typ.</td>
<td>28W (without DiSEqC and LNB power)</td>
</tr>
<tr>
<td>Temperature range °C</td>
<td>0 ... 40</td>
</tr>
<tr>
<td>Mains voltage</td>
<td>100 - 240V ± 10%</td>
</tr>
<tr>
<td>Dimensions (H x W x D)</td>
<td>288 x 275 x 60</td>
</tr>
<tr>
<td>Weight [kg]</td>
<td>3.0</td>
</tr>
</tbody>
</table>