



Grundig SAT Systems



HEAD-END STATION PROGRAMME

2012/2013

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You will find every components which are necessary for your head-end system. Beginning with our entry range of Basic Line and continuative with our Standard Line range to the point of Professional Line range.

There are two new modules in the Basic Line range which can transmodulate 4 transponders either to QAM or to COFDM.

We can present several innovations in Standard Line and Professional Line range. One new cassette is able to convert up to 12 FM stations from digital cable signals. The FM stations can be fed in in high-class signal quality with it. Additional there is a version which can transmodulate DVB-C signals to other center frequencies in QAM.

Another innovation is the MPEG-4 encoder. An MPEG-2 encoded signal via HDMI, YPbPr or ASI can be encoded to MPEG-4 to the LAN output, the ASI output and to QAM or COFDM.

There is a new cassette which can transcode a DVB-S2 (MPEG-4) signal to a PAL channel.

For the first time you will find for the most of the products a QR code. You can get to the relevant product site on our homepage and download e.g. the manual, the assembly instruction or the corresponding firmware for this product.

We are sure to offer you an attractive and well-balanced product portfolio for meeting your demands.

On behalf of the Board of Directors

Fred Huebner



Digital Head-End Station System STC 160

The digital head-end station system STC 160 provides reception and conversion of digital satellite TV channels and radio stations. It features a flexible module design. The STC 160 allows conversion of up to 16 TV channels in PAL resp. OIRT because of the quad module design. The output modulators are suitable for adjacent channels and it is not necessary to adjust them. The output channel range covers the complete needed spectrum of channel 02 up to channel 69 including special channels S 03 up to S 20 and the hyperband range of channels S 21 up to S 41 for PAL resp. R 01 up to R 12, s 01 up to s 38 and C 21 up to C 69 for OIRT. Decoding of encrypted channels can be done via the Common Interface. Furthermore the transmodulation to QAM or COFDM for up to 16 transponders is possible. The supplied fixing brackets are suitable either for wall mounting of the STC 160 or for fixing it in a 19" rack. An integrated control unit for adjusting all input and output parameters is included in the excellent price-performance ratio.

HEAD-END STATION SYSTEM		STC 160
Conversion		16 x Digital SAT
Selection of channels		suitable for adjacent channels
Input/output impedance/Programming		75 Ω/integrated control unit
Software update		via RS-232 interface
External AV connection		4 x via every modulator module with HAV 160
Input data		
Input frequency range		177.5 – 226.5 MHz 474 – 858 MHz 950 – 2150 MHz
LNC voltage/max. current		12 V/350 mA
Output data		
Output level		max. 102 dBμV
Power supply		
Mains supply/Frequency 50/60 Hz		180 – 265 V AC
Power consumption	equipped with	4 x HDC 470 CI AV, 4 x HMS 470, 1 x SID 162, 1 x HOC 168 99 W 8 x HDMH 660 CI TPS, 1 x SID 162, 1 x HOC 168 83 W
Weight (fully loaded)		approx. 20 kg
Dimensions (W x H x D) without mounting brackets		44.3 (19") x 35.5 (8 HU) x 22.8 cm

low power consumption



BASIC LINE OF HEAD-END STATION SYSTEMS

Quad QPSK-AV-Transcoder

The HDC 470 CI AV module has two input tuners.

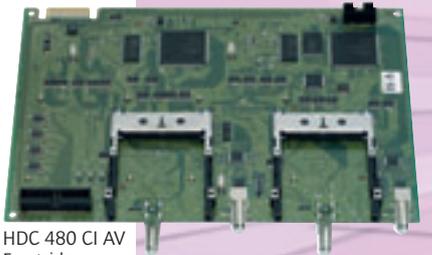
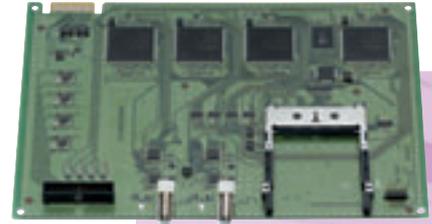
The number of channels, which have to be converted, is selectable for every input tuner.

Decoding of up to 4 encrypted TV channels is possible via the Common Interface with tuner 1.

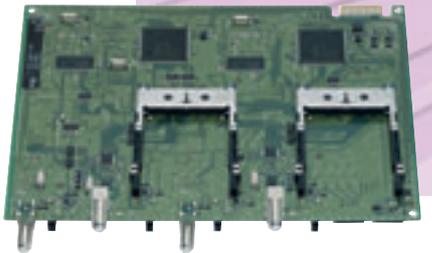
With the HDC 480 CI AV module there is an own input tuner with separate Common Interface for every converted channel.



	HDC 470 CI AV	HDC 480 CI AV
No. of input tuners	2	4
No. of AV outputs	4	4
Input frequency range	950 - 2150 MHz	950 - 2150 MHz
Input symbol rate	1 - 45 Msymb/s	1 - 45 Msymb/s
No. of converted TV channels	4	4
Common Interface	For up to 4 channels via tuner 1	4 x
LNB supply	12 V/350 mA	12 V / 350 mA



HDC 480 CI AV Frontside



HDC 480 CI AV Backside

Quad COFDM-AV-Transcoder

The Quad COFDM-AV-transcoder HDCT 460 AV converts four TV channels out of two multiplexes. The number of channels, which have to be converted, is selectable for every input tuner.

Either 3 TV channels of tuner 1 and 1 TV channel of tuner 2 or 2 TV channels of tuner 1 and 2 TV channels of tuner 2 can be converted. This ensures a maximum of flexibility.

The Quad COFDM-AV-Transcoder HDCT 461 AV converts four TV channels out of one multiplex.



	HDCT 460 AV	HDCT 461 AV
No. of input tuners	2	1
No. of AV outputs	4	4
Input frequency range	177.5 - 226.5 MHz (VHF) 474 - 858 MHz (UHF)	177.5 - 226.5 MHz (VHF) 474 - 858 MHz (UHF)
No. of carriers	2 k and 8 k	2 k and 8 k
Input symbol rate	acc. to EN 300 744	acc. to EN 300 744
No. of converted TV channels	4	4



Quad AV modulator HMM 470, HMS 470 and HFM 470

The modulator modules of the STC 160 are designed in single-sideband technology. Therefore they are suitable for adjacent channels. Up to 4 AV signals can be fed in. Each module is equipped with four independent modulators which can be set freely. You are not forced to adjust adjacent channels. This means a maximum flexibility in projecting cable networks. The module HFM 470 converts the 4 AV signals into 4 free selectable FM frequencies.

	HMM 480	HMM 480 OIRT	HMS 480	HFM 470
Input signals	4 x AV	4 x AV	4 x AV	4 x AV
Channel grid	suitable for adjacent channels	Suitable for adjacent channels	suitable for adjacent channels	300 kHz
Sound output	mono	mono	stereo	stereo
Standard	B/G, CCIR	D/K, OIRT	B/G, CCIR	FM
Output channels/ Output frequencies	C 02 – C 69 incl. S 03 – S 14 S 16 – S 41	R 01 – R 12 s 01 – s 38 C 21 – C 69	S 03 – S 14 S 16 – S 41	87.5 – 108 MHz



HMM 480



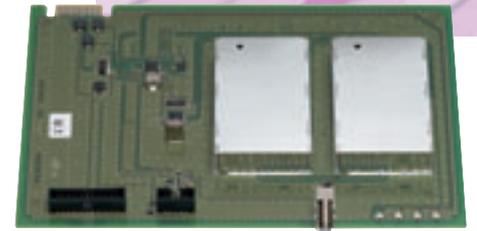
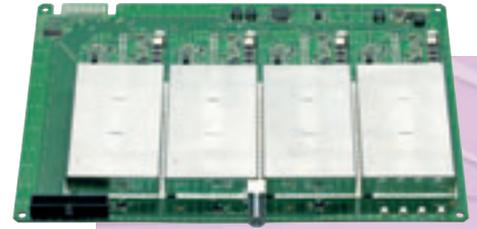
HMM 480 OIRT



HMS 480



HFM 470

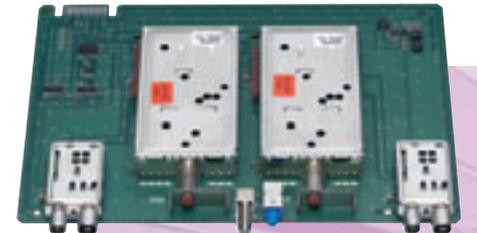


Conversion from Digital Terrestrial to Digital Terrestrial (COFDM - COFDM)

Terrestrial modules for conversion of two terrestrial digital signals into two freely selectable channels in the VHF/UHF band. The carriers can be switched off separately. Bandwidth 7/8 MHz switchable.



	HDMT 263	HDMT 265
No. of inputs	2	2
No. of loop-through outputs	2	2
No. of converted channels	2	2
Input frequency range	146 – 862 MHz	146 – 862 MHz
Output channels	C 05 – C 12 S 09 – S 16	C 21 – C 69



BASIC LINE OF HEAD-END STATION SYSTEMS

Transmodulation from Digital SAT to Digital Cable (DVB-S - QAM and DVB-S2 - QAM)

These modules transmodulate two different DVB-S2 resp. DVB-S modulated data streams (SCPC or MCPC) to two QAM-modulated data streams.

The integrated TP module serves for data processing of the demodulated transport stream: This allows service information to be changed (NIT - Network Information Table), data rates increased (stuffing) and individual programs to be deleted from the transport stream, whereby the remaining channels can then be transmitted with bandwidth optimization. Moreover, the Operator ID can be set.

With the models of the MultiDigital series up to 12 channels can be decoded of the transport stream via the Common Interface which is fed in tuner A.

	HDM 660 CI TPS	HDMH 660 CI TPS
No. of inputs	2	2
No. of converted transponders	2	2
Input frequency range	950 - 2150 MHz	950 - 2150 MHz
Input symbol rate DVB-S QPSK	1 - 45 Msymb/s	2 - 45 Msymb/s
Input symbol rate DVB-S2 QPSK	-	10 - 30 Msymb/s
Input symbol rate DVB-S2 8PSK	-	10 - 31 Msymb/s
Output symbol rate	1 - 7.5 MBaud	1 - 7.5 MBaud
Modulation scheme	QAM 4, 16, 32, 64, 128, 256	QAM 4, 16, 32, 64, 128, 256
Software download	via RS-232	via RS-232
Output frequency range	45 - 862 MHz	45 - 862 MHz



HDM 660 CI TPS



HDMH 660 CI TPS

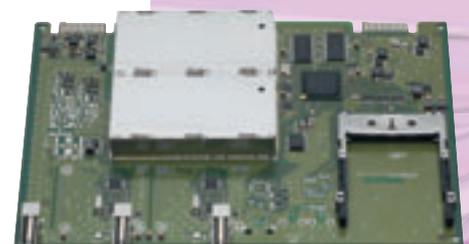
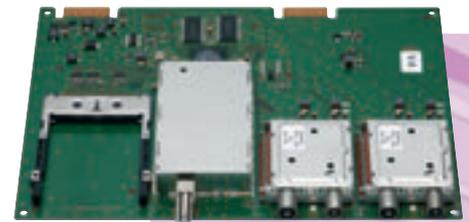
Transmodulation from Digital SAT to Digital Terrestrial and Digital Terrestrial to Digital Cable

These modules transmodulate either two different DVB-S-modulated data streams (SCPC or MCPC) to two COFDM-modulated data streams or two different DVB-T-modulated data streams to two QAM-modulated data streams.

The integrated TP module serves for data processing of the demodulated transport stream: This allows service information to be changed (NIT - Network Information Table), data rates increased (Stuffing) and individual channels to be deleted from the transport stream, whereby the remaining channels can then be transmitted with bandwidth optimization. Moreover, the Operator ID can be set.

Decoding of up to 12 encrypted TV channels (dependent on the used CAM) is possible via the Common Interface via tuner 1.

	HDMT 660 CI TPS	HDM 660 T
No. of inputs	2	2
No. of converted transponders	-	2
No. of converted multiplexes	2	-
Input frequency range	177.5 - 226.5 MHz (VHF) 474 - 858 MHz (UHF)	950 - 2150 MHz
Input symbol rate	acc. to EN 300 744	1 - 45 Msymb/s
Output symbol rate	1 - 7.5 MBaud	-
Modulation scheme	QAM 4, 16, 32, 64, 128 and 256	QPSK, 16-QAM und 64-QAM
No. of carriers	2 k and 8 k	2 k, 4 k and 8k
Guard Interval	-	1/4, 1/8, 1/16, 1/32
Software download	via RS-232	via RS-232
Output frequency range/ Channel infrequency	45 - 862 MHz	42 - 860 MHz



HDMT 660 CI TPS



HDM 660 T

Quad Transmodulation from Digital SAT to Digital Cable (DVB-S2 - QAM)

This module converts 4 DVB-S or DVB-S2 data streams to 4 QAM modulated data streams. The module has two SAT inputs and one HF output. Every of the four input tuners can be allocated one of the both SAT inputs.

For decoding of encrypted channels can be additionally inserted a CI module with converter A and C. The maximum number of decoded channel is dependent on the used CAM.

There are adjacent channels with converters A and B as well as converters C and D. However it is free channel selection of the converter groups A/B to C/D.

Available as from August 2012!

	HDMH 764 C
No. of inputs	2
No. of converted transponders	4
Input frequency range	910 - 2150 MHz
Input symbol rate DVB-S QPSK	1 - 45 MSymb/s
Input symbol rate DVB-S2 QPSK	4.5 - 45 MSymb/s
Input symbol rate DVB-S2 8PSK	4.5 - 45 MSymb/s
Output symbol rate	1 - 7.5 MBaud
Modulation scheme	QAM 4, 16, 32, 64, 128, 256
Software download	via RS-232
Output frequency range	42 - 868 MHz



Quad Transmodulation from Digital SAT to Digital Cable (DVB-S2 - COFDM)

This module converts 4 DVB-S or DVB-S2 data streams to 4 COFDM modulated data streams. The module has two SAT inputs and one HF output. Every of the four input tuners can be allocated one of the both SAT inputs.

For decoding of encrypted channels can be additionally inserted a CI module with converter A and C. The maximum number of decoded channel is dependent on the used CAM.

There are adjacent channels with converters A and B as well as converters C and D. However it is free channel selection of the converter groups A/B to C/D.

Available as from August 2012!

	HDMH 764 T
No. of inputs	2
No. of converted transponders	4
Input frequency range	910 - 2150 MHz
Input symbol rate DVB-S QPSK	1 - 45 MSymb/s
Input symbol rate DVB-S2 QPSK	4.5 - 45 MSymb/s
Input symbol rate DVB-S2 8PSK	4.5 - 45 MSymb/s
Output symbol rate	1 - 7.5 MBaud
Modulation scheme	QPSK, QAM 16, QAM 64
No. of carriers	2 k
Guard Interval	1/4, 1/8, 1/16, 1/32
Software download	via RS-232
Output frequency range	42 - 868 MHz



BASIC LINE OF HEAD-END STATION SYSTEMS

Terrestrial FM Amplifier

FM amplifier for wideband amplification of 87.5 – 108 MHz FM range. Six manually adjustable attenuator filters provide for attenuation of strong FM stations.

	HRM 225
No. of inputs	1
Frequency range	87.5 – 108 MHz
Gain	43 dB
Noise figure	6 – 9 dB
No. of adjustable filters	6
Minimum challes grid between converted FM stations	14 – 17 dB



Input distributor with LNB supply SID 162

The SAT IF distributor has 1 SAT IF input with 6 outputs and 1 SAT IF input with 4 outputs. These outputs are able to be cascaded for having 1 level with 10 outputs. The connected LNB can be supplied with 12 V and a maximum current of 800 mA. It is ideal suitable for the distribution of SAT IF signals because of its high isolation. There are included 8 HF cables in the delivery.



Input distributor with LNB supply SID 160

The SAT IF distributor has 1 SAT IF input with 9 outputs. The connected LNB can be supplied with 12 V and a maximum current of 800 mA. It is ideal suitable for the distribution of SAT IF signals because of its high isolation. There are included 8 HF cables in the delivery.



Output collector HOC 168

The output collector HOC 168 has 8 inputs, 1 output with max. 101 dB μ V and 1 measuring output which is attenuated by 20 dB.



Quad AV Adapter HAV 160

The quadruple AV adapter is necessary for feeding in of external AV signals via cinch connectors with the quadruple modulators HMS 470 and HMM 470.



Power Supply NT 160

Power supply for head-end station system STC 160.



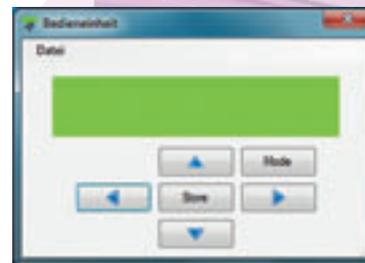
BASIC LINE OF HEAD-END STATION SYSTEMS

Remote Control Software PSW 160

The settings of a complete head-end station STC 160 or of single modules can be read and again transferred to other stations with the remote control software.

Furthermore the NIT can be read with QAM modules. For expanding an existing head-end station with QAM modules of another company the frequencies of this system can be added in the NIT of the STC 160 system.

DVB-C channels can be allocated a Logical Channel Number (LCN).



SNMP Management System RCU 160

The head-end station management system RCU 160 shows the following features:

- SNMP capable management interface (LAN); connection with a LAN router via DSL as standard.
- Enquiry and controlling of the most important parameters and device data via remote control with the GUI of the head-end station software PSW 160.
- Non volatile storage of the configuration data (back-up storage) of every channel with the remote PC.
- Software update via FTP connection.



RCA 162 - Extension Unit for RCU 160

Adaptor for the integration of a second head-end station system STC 160 with the SNMP management system RCU 160.

BASIC LINE PLANNING OVERVIEW

(examples)

Digital SAT QPSK (DVB-S) to PAL Stereo or Mono

	STC 160	HDC 470 CI AV	Stereo HMS 480	or Mono HMM 480	SID 162
GSS Order No.:	G.AK 30-00	G.AK 74-00	G.AK 90-00	G.AK 89-00	G.AK 54-20
	Volume	Volume	Volume	Volume	Volume
4 channels	1	1	1	1	1
8 channels	1	2	2	2	1
12 channels	1	3	3	3	1
16 channels	1	4	4	4	2
20 channels	2	5	5	5	2
24 channels	2	6	6	6	3
28 channels	2	7	7	7	3
32 channels	2	8	8	8	4

Digital SAT (QPSK DVB-S resp. DVB-S2) to Digital Cable (QAM)

	STC 160	QPSK DVB-S → QAM with TP function	or QPSK DVB-S/ DVB-S2 → QAM HDTV with TP function	HOC 168	SID 162
		HDM 660 CI TPS	HDMH 660 CI TPS		
GSS Order No.:	G.AK 30-00	G.AK 72-00	G.AK 75-00	G.AK 71-00	G.AK 54-20
	Volume	Volume	Volume	Volume	Volume
2 Transponders	1	1	1		1
4 Transponders	1	2	2		1
6 Transponders	1	3	3		1
8 Transponders	1	4	4		1
10 Transponders	1	5	5	1	2
12 Transponders	1	6	6	1	2
14 Transponders	1	7	7	1	2
16 Transponders	1	8	8	1	2

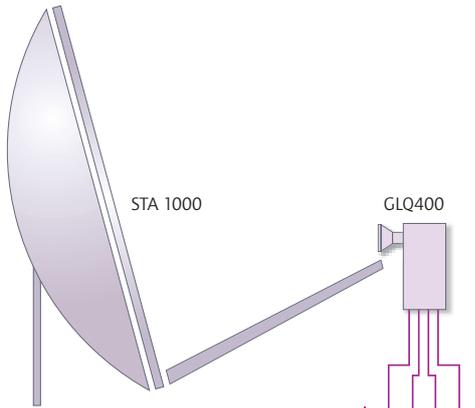
Digital SAT (QPSK, DVB-S/DVB-S2) to Digital Terrestrial (COFDM, DVB-T)

	STC 160	HDM 660 T	HOC 168	SID 162
GSS Order No.:	G.AK 30-00	G.AK 81-00	G.AK 71-00	G.AK 54-20
	Volume	Volume	Volume	Volume
Channels from 2 transponders	1	1		1
Channels from 4 transponders	1	2		1
Channels from 6 transponders	1	3		1
Channels from 8 transponders	1	4		1
Channels from 10 transponders	1	5	1	2
Channels from 12 transponders	1	6	1	2
Channels from 14 transponders	1	7	1	2
Channels from 16 transponders	1	8	1	2

	SID 160	SID 162	SDA 512	HRM 225
GSS Order No.:	G.AK 54-00	G.AK 54-20	G.AK 01-00	G.AK 73-00
Remark	SAT - IF distributor 1 input, 9 outputs	SAT - ZF distributor 1 input to 4 outputs, 1 input to 6 outputs	Multi Amplifier 4xSAT-In, 1xT-In, 4xSAT Out, 1xT-Out, 12dB	FM Amplifier

BASIC LINE PLANNING OVERVIEW

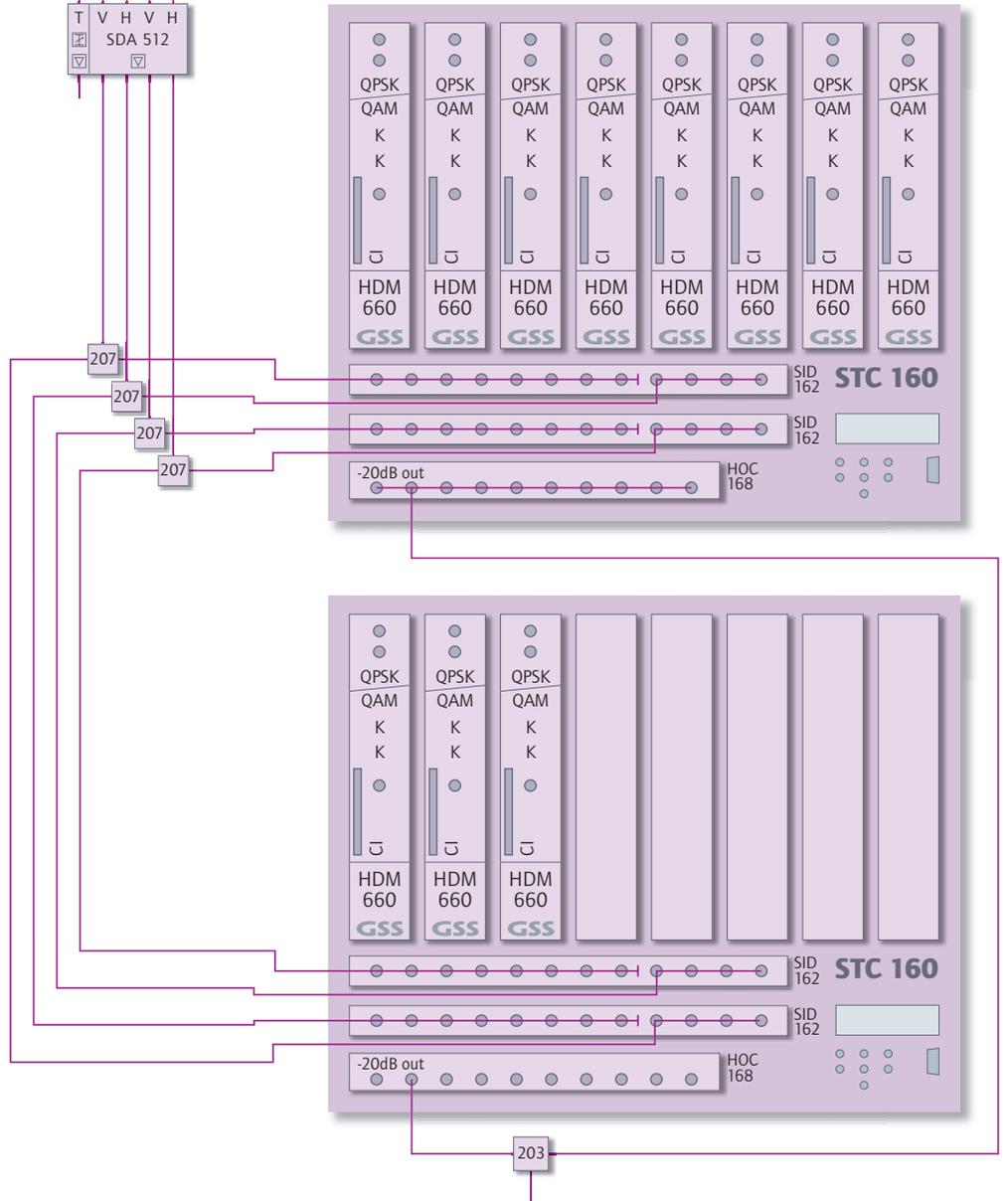
(examples)



- 1 STA 1000
- 1 GLQ400
- 1 SDA 512
- 4 SRS 207 DC
- 2 STC 160
- 4 SID 162
- 2 HOC 168
- 8 HDM 660 CI TPS
- 3 HDMH 660 CI TPS
- 1 SR 203

STC 160

16 transponders from QPSK to QAM
6 transponders from 8PSK/QPSK to QAM
from one satellite



Head-End Station System STC 1200

- Slots for 12 cassettes (up to 24 channels)
- Suitable for all digital, analogue TV and radio cassettes
- Max. output level 106 dB μ V
- Simple software adaption for control unit (BE-REMOTE) possible via RS-232 socket
- Electronical software supported level adjustment via the control unit

Head-End Station System STC 816

- Slots for 8 cassettes
- Output level max. 100 dB μ V
- Suitable for all digital, analogue TV and radio cassettes
- Simple software adaption for control unit (BE-PROFESSIONAL) possible via RS-232 socket
- Electronic software supported level adjustment via the control unit
- Suitable for wall-mounting and fixing in 19" rack

Head-End Station System	STC 1200	STC 816
No. of slots for cassettes	12	8
Delivery status	unloaded	unloaded
Fit for adjacent channels	yes	yes
Input/output impedance/Programming	75 Ω /Integrated Control Unit BE-REMOTE	75 Ω /Integrated Control Unit BE-PROFESSIONAL
S/N weighted	55 dB	55 dB
Input data		
Input frequency range	47 - 862 MHz, 950 - 2150 MHz	47 - 862 MHz, 950 - 2150 MHz
Input distributor	3 pieces each with 4 and 6 outputs	2 pieces each with 4 and 6 outputs
Power feed for LNB	18 V/1000 mA	18 V/1000 mA
Output data		
HF output level/HF level adjusting electronic	max. 106 dB μ V/-31 dB	max. 100 dB μ V/-31 dB
Output frequency range dependent upon cassettes	47 - 862 MHz	47 - 862 MHz
Power supply		
Mains voltage/Frequency 50/60 Hz	195 - 260 V	195 - 260 V
Power consumption	equipped with	
	12 x HDM 2380 P CI	8 x HDM 2380 P CI
	12 x HDTV 1000 ASI LAN	8 x HDTV 1000 ASI LAN
	148 W	97 W
	137 W	90 W
Weight (fully loaded)	approx. 30 kg	approx. 20 kg
Dimensions (W x H x D)	70.0 O x 38.3 x 31.5 cm	48.3 x 39.7 (9 HU) x 30.2 cm

low power consumption



STANDARD LINE OF HEAD-END STATION SYSTEMS

Extension unit PST 19-1

- 19" cabinet with 1 HU
- Slot for 1 cassette
- Suitable for all digital, analogue TV and radio cassettes with own microcontroller
- Programming via a control unit BE-REMOTE or BE-REMOTE PROFESSIONAL (not available in the delivery)

Head-End Station System	PST 19-1
No. of slots for cassettes	1
Delivery status	unloaded
Fit for adjacent channels	yes
Input/output impedance/Programming	75 Ω /via external Control Unit BE-REMOTE or BE-REMOTE PROFESSIONAL
S/N weighted	55 dB
Input data	
Input frequency range	47 - 862 MHz, 950 - 2150 MHz
Input distributor	-
Power feed for LNC	-
Output data	
HF output level/HF level adjusting	max. 80 dB μ V / -
Output frequency range dependent upon cassettes	47 - 862 MHz
Power supply	
Mains voltage/Frequency 50/60 Hz	12 V DC via wall power supply unit
Power consumption	equipped with
	1 x HDM 2380 P CI 12 W
	1 x HDTV 1000 ASI LAN 11 W
Weight (fully loaded)	max. 3.3 kg
Dimensions (W x H x D)	48.2 (19") x 4.3 (1 HE) x 20.5 cm

low power consumption



SAT TRANSCODING DIGITAL

Satellite Double Reception Cassette from Digital SAT to PAL (QPSK - PAL) and OIRT (QPSK - OIRT)

This double cassette transcodes two QPSK signals (SCPC or MCPC) to two selectable PAL channels in the frequency range 45 - 862 MHz. Up to two encrypted TV programs can also be converted with the appropriate CA module via the channel A common interface. The WSS setting allows 16:9 channels to be viewed with the correct picture format. VPS and PDC signals and teletext information are also converted. DVB and teletext subtitles can be displayed. When radio stations are converted, the name of the radio station as well as the now and next information are displayed on the screen.

	HDM 2380 P CI ^{*)}	HDM 2380 OIRT CI ^{*)}
No. of inputs	2	2
No. of converted channels	2	2
Sound output	stereo	mono
Input frequency range	950 - 2150 MHz	950 - 2150 MHz
Input symbol rate	1 - 45 Msymb/s	1 - 45 Msymb/s
Software download	via RS-232	via RS-232
Output channels	C 02 - C 04, C 05 - C 12, S 03 - S 41, C 21 - C 69	R 01 - R 12 s 01 - s 38 C 21 - C 69

*) with fully equipped STC 322
max. 3 pcs. HDM 2370/2380 P CI,
resp. max. 12 pcs. HDM 2370/2380 P CI
and 4 free slots are necessary



SAT CONVERSION DIGITAL

12-fold Stereo Satellite Reception Cassette from Digital SAT to FM (DVB-S2 - FM)

This cassette converts two DVB-S(2) signals to 12 selectable FM stations.



	HDTV 1000 FM
No. of inputs	2
No. of converted frequencies	12
Input frequency range	925 - 2150 MHz
Input symbol rate	2 - 45 Msymb/s
Software download	via RS-232
Output frequency range	87.5 - 108 MHz



CASSETTES FOR STANDARD LINE OF HEAD-END STATION SYSTEMS

SAT TRANSCODING DIGITAL

Satellite Single Reception Cassette from Digital SAT to PAL (DVB-S2 - PAL)

Fullband-Modulator with excellent signal quality

This cassette transcodes a DVB-S2 signal to one selectable PAL channel in the frequency range 45 - 862 MHz. The output channel is suitable for adjacent channels. An encrypted TV channel can be decoded with the appropriate CA module via the Common Interface. The WSS setting allows 16:9 channels to be viewed with the correct picture format. VPS and PDC signals and teletext information are also converted. DVB and teletext subtitles can be displayed.

Available as from Quarter 3, 2012!



	HDM 400 P CI
No. of inputs	1
No. of converted channels	1
Sound output	stereo
Input frequency range	950 - 2150 MHz
Input symbol rate DVB-S (QPSK)	1 - 45 MSymb/s
Input symbol rate DVB-S2 (QPSK)	1 - 45 MSymb/s
Input symbol rate DVB-S2 (8PSK)	2 - 32 MSymb/s
Common Interface	•
Software download	via RS-232
Output channels	C 02 - C 04, C 05 - C 12 S 03 - S 41, C 21 - C 69



TERRESTRIAL TRANSCODING DIGITAL

Stereo Terrestrial Double Reception Cassette from Digital Terrestrial or Digital Cable to PAL in CCIR standard (COFDM or QAM - PAL)

This double cassette transcodes two COFDM or QAM signals into two selectable PAL channels in the frequency range 45 - 862 MHz. Encrypted TV channels can also be converted with the appropriate CA module via the common interface. The WSS setting allows 16:9 channels to be viewed with the correct picture format. VPS and PDC signals and teletext information are also converted. DVB and teletext subtitles can be displayed. When radio stations are converted, the name of the radio station as well as the now and next information are displayed on the screen.



HDMT 2180 P CI

No. of inputs	2
No. of converted channels	2
Input frequency range	177.5 - 226.5 MHz 474 - 858 MHz
No. of carriers	2 k and 8 k
Input symbol rate	acc. to EN 300 744
Software download	via RS-232
Output channels	C 02 - C 04, C 05 - C 12, S 03 - S 41, C 21 - C 69



Conversion from Digital Terrestrial to Digital Terrestrial (COFDM - COFDM)

Terrestrial cassette for conversion of two terrestrial digital signals into two freely selectable channels in the frequency range 42 - 860 MHz. Bandwidth 7/8 MHz switchable.



HDMT 1290

No. of inputs	2
No. of converted multiplexes	2
Input frequency range	177.5 - 226.5 MHz (VHF) 467 - 858 MHz (UHF)
Input symbol rate	acc. to EN 300 744
Modulation scheme	QPSK, 16-QAM and 64-QAM
No. of carriers	2 k, 4 k and 8 k
Guard interval	1/4, 1/8, 1/16 and 1/32
Output frequency range	42 - 860 MHz



CASSETTES FOR STANDARD LINE OF HEAD-END STATION SYSTEMS

SAT CONVERSION DIGITAL

Conversion from Digital Cable or Digital Terrestrial to Digital Cable (DVB-C - QAM or DVB-T - QAM) (HDMC 1000 C) resp. to FM (HDMC 1000 FM)

The setting of the parameters can be easily set with an automatic search via the control unit of the head-end station.

Furthermore the cassettes are featured with additional interfaces which make them universal:

- ASI input and ASI output (ASI = Asynchronous Serial Interface acc. to DIN EN 50083-9)
- 100 MBit LAN interface (Ethernet)

For decoding of encrypted channels can be additionally inserted a CI module with converter A. The maximum number of decoded channel is dependent on the used CAM.



	HDMC 1000 C	HDMC 1000 FM
No. of inputs	2	2
No. of converted transponders/multiplexes	2	2
Input frequency range	47 - 862 MHz	47 - 862 MHz
Input symbol rate	acc. to EN 300 744 (DVB-T) acc. to EN 300 429 (DVB-C)	acc. to EN 300 744 (DVB-T) acc. to EN 300 429 (DVB-C)
Output	2 x QAM	12 x FM
Modulation scheme	QAM 4, 16, 32, 64, 128, 256	-
Output symbol rate	1 - 7.5 MBaud	-
ASI in / ASI out interface	•	•
Ethernet interface	•	•
Common Interface	•	•
Software download	via RS-232	via RS-232
Output frequency range	45 - 862 MHz	87.5 - 108 MHz



SAT CONVERSION DIGITAL

Transmodulation from Digital SAT to Digital Cable (QPSK - QAM)

These cassettes transmodulate two different QPSK-modulated data streams (SCPC or MCPC) to two QAM modulated data streams.

HDM 510 CI TPS: The integrated TP module serves for data processing of the demodulated transport stream: This allows service information to be changed (NIT - Network Information Table), data rates increased (Stuffing) and individual channels to be deleted from the transport stream, whereby the remaining channels can then be transmitted with bandwidth optimization. Moreover, the Operator ID can be set.



	HDM 500 C	HDM 510 CI TPS
No. of inputs	2	2
No. of converted transponders	2	2
Input frequency range	950 - 2150 MHz	950 - 2150 MHz
DVB-S Modes	1/2, 2/3, 3/4, 5/6, 7/8	1/2, 2/3, 3/4, 5/6, 7/8
Input symbol rate	1 - 45 Msymb/s	1 - 45 Msymb/s
Output symbol rate	6.9 MBaud	1 - 7 MBaud
Modulation scheme	QAM 4, 16, 32, 64, 128, 256	QAM 4, 16, 32, 64, 128, 256
Common Interface	-	•
TP function	-	•
Software download	via RS-232	via RS-232
Output frequency range/ Channel infrequency	42 - 860 MHz	42 - 860 MHz



CASSETTES FOR STANDARD LINE OF HEAD-END STATION SYSTEMS

SAT CONVERSION DIGITAL

Conversion from HDTV Digital to HDTV Digital Cable (DVB-S2 - QAM)

This cassette transmodulates two different DVB-S2 or DVB-S modulated data streams (SCPC or MCPC) to two QAM modulated data streams. The setting of the parameters can be easily set with an automatic search via the control unit of the head-end station.

The cassette can be used very flexible because of the input and output constellation. That means that at the input two signals with different polarisations and at the output two signals free selectable (no adjacent channel setting necessary!) can be selected.

The integrated TP module serves for data processing of the demodulated transport stream: This allows service information to be changed (NIT - Network Information Table) data rates increased (stuffing) and individual programs to be deleted from the transport stream. Moreover, the Operator ID can be set.

Up to 12 channels can be decoded with the smartcard of the provider depending on the Conditional Access Module (CAM).



	HDTV 610 CI TPS
No. of inputs	2
No. of converted transponders	2
Input frequency range	950 - 2150 MHz
DVB-S Modes (QPSK)	1/2, 2/3, 3/4, 5/6, 7/8
DVB-S2 Modes (QPSK)	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
DVB-S2 Modes (8PSK)	3/5, 2/3, 3/4, 5/6, 8/9, 9/10
Symbol rate DVB-S (QPSK)	1 - 45 Msymb/s
Symbol rate DVB-S2 (QPSK)	1 - 45 Msymb/s
Symbol rate DVB-S2 (8PSK)	1 - 45 Msymb/s
Output symbol rate	1 - 7.5 MBaud
Modulation scheme	QAM 4, 16, 32, 64, 128, 256
Common Interface	•
TP Module	•
Software download	via RS-232
Output frequency range/ Channel infrequency	45 - 862 MHz



CONVERSION DIGITAL

DVB Transmodulator DVB-S(2) or DVB-T to DVB-C (QAM) or DVB-T (COFDM) with LCN (logical channel number)

These cassettes transmodulate two digital satellite signals or two digital terrestrial signals to two digital cable signals (QAM or COFDM). It can be multiplexed or deleted from the data streams single channels. Further there is one Common Interface (CI). It can be decoded encrypted signals (e.g. Pay TV). The QAM modulation is adjustable with 4, 16, 32, 64, 128 and 256 QAM. A 2k, 4k and 8k mode can be selected with the COFDM modulation. It can be adjusted to QPSK, 16-QAM or 64-QAM with both modes.

The integrated TP module serves for data processing of the demodulated transport stream: This allows service information to be changed (NIT - Network Information Table), data rates to be increased (stuffing) and individual channels to be deleted from the transport stream, whereby the remaining channels can then be transmitted with bandwidth optimization. Moreover, the Operator ID can be set.

Furthermore the cassettes are featured with additional interfaces which make them universal:

- ASI input and ASI output (ASI = Asynchronous Serial Interface acc. to EN 50083-9)
- 100 MBit LAN interface (Ethernet).

Data streams of the digital signals can be put out for further operation or can be fed in from external sources for QAM modulation for distribution in cable networks.

The channel table can be set resp. the programming can be done with the Control and Remote Control Software. If the featured LCN functionality can be used the sorting of the channels is not necessary in the connected receivers (in cassette with DVB-S2 tuner only).

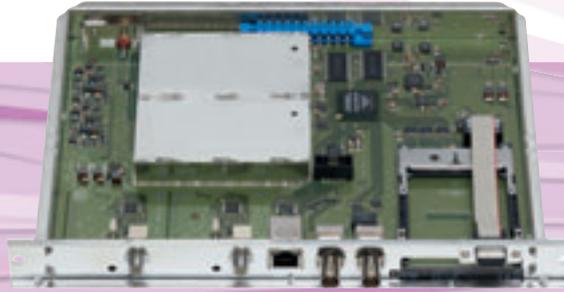
	HDTV 1000 ASI LAN	HDTV 1000 T	HDMT 1000 ASI LAN	HDMT 1000 T
No. of inputs	2	2	2	2
No. of converted transponders	2	2	-	-
No. of converted multiplexes	-	-	2	2
Input frequency range	950 - 2150 MHz	950 - 2150 MHz	177.5 - 226.5 MHz 474 - 858 MHz	177.5 - 226.5 MHz 474 - 858 MHz
No. of carriers of input	-	-	2 k and 8 k	2 k and 8 k
Input symbol rate	-	-	acc. to EN 300 744	acc. to EN 300 744
DVB-S modes (QPSK)	1/2, 2/3, 3/4, 5/6, 7/8	1/2, 2/3, 3/4, 5/6, 7/8	-	-
DVB-S2 modes (QPSK)	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10	-	-
DVB-S2 modes (8PSK)	3/5, 2/3, 3/4, 5/6, 8/9, 9/10	3/5, 2/3, 3/4, 5/6, 8/9, 9/10	-	-
Symbol rate DVB-S (QPSK)	1 - 45 Msymb/s	1 - 45 Msymb/s	-	-
Symbol rate DVB-S2 (QPSK)	1 - 45 Msymb/s	1 - 45 Msymb/s	-	-
Symbol rate DVB-S2 (8PSK)	1 - 45 Msymb/s	1 - 45 Msymb/s	-	-
Output symbol rate	1 - 7.5 MBaud	-	1 - 7.5 MBaud	-
Modulation scheme	QAM 4, 16, 32, 64, 128, 256	QPSK, 16-QAM and 64-QAM	QAM 4, 16, 32, 64, 128, 256	QPSK, 16-QAM and 64-QAM
No. of carriers of output	-	2 k, 4 k and 8k	-	2 k, 4 k and 8k
Guard Interval	-	1/4, 1/8, 1/16, 1/32	-	1/4, 1/8, 1/16, 1/32
ASI in/ASI out interface	•	•	•	•
Ethernet interface	•	•	•	•
Common Interface	•	•	•	•
TP function	•	•	•	•
Software download	via RS-232	via RS-232	via RS-232	via RS-232
Output frequency range/ Channel infrequency	42 - 860 MHz	42 - 860 MHz	42 - 860 MHz	42 - 860 MHz



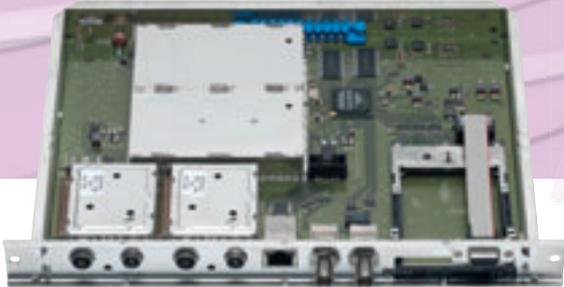
CASSETTES FOR STANDARD LINE OF HEAD-END STATION SYSTEMS



HDTV 1000 ASI LAN



HDTV 1000 T



HDMT 1000 ASI LAN



HDMT 1000 T

multi
MD
digital®

DVB
Digital Video
Broadcasting

HDTV

IPTV converters	HDTV 1000 SPTS	HDTV 1000 MPTS	HDMT 1000 SPTS	HDMT 1000 MPTS
No. of inputs DVB-S(2)	2	2	-	-
No. of inputs DVB-T	-	-	2	2
Common Interface	via Tuner A	via Tuner A	via Tuner A	via Tuner A
ASI input	•	•	•	•
LAN input	-	-	-	-
QAM input	-	-	-	-
COFDM output	-	-	-	-
FM output	-	-	-	-
ASI output	-	-	-	-
LAN output	16x SPTS in Unicast/ Multicast	2x Multicast	16x SPTS in Unicast/ Multicast	2x Multicast



IPTV converters	HMPT 1000 C	HMPT 1000 T	HADA 5100 SPTS	HMPT 1000 FM
No. of inputs DVB-S(2)	• *)	• *)	-	-
No. of inputs DVB-T	-	-	-	-
Common Interface	-	-	-	-
ASI input	-	-	5 x	-
LAN input	•	•	-	•
QAM input	•	-	-	-
COFDM output	-	•	-	-
FM output	-	-	-	12 x
ASI output	•	•	•	-
LAN output	-	-	SPTS/MPTS	-



*) Input A
either LAN or tuner

The table only shows an overview
of the IP cassettes.
Further information can be found
in the special brochure about IPTV.

SAT CONVERSION DIGITAL

DVB Scrambling Cassettes

Meanwhile there are scrambling systems on the market which are able to scramble transport streams exclusively via a special CAM module.

With this system the cablenet provider is able to scramble and market defined channel bouquets.

The individual marketing of TV content and TV channels is a main part of the digitalization.

For this purpose there is a simple solution for small and mid-range cablenet providers.



HDTV 1001 C



HDTV 1001 T



HDMT 1001 C



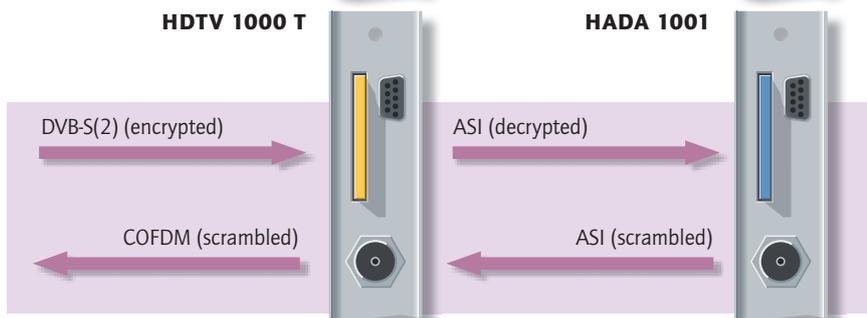
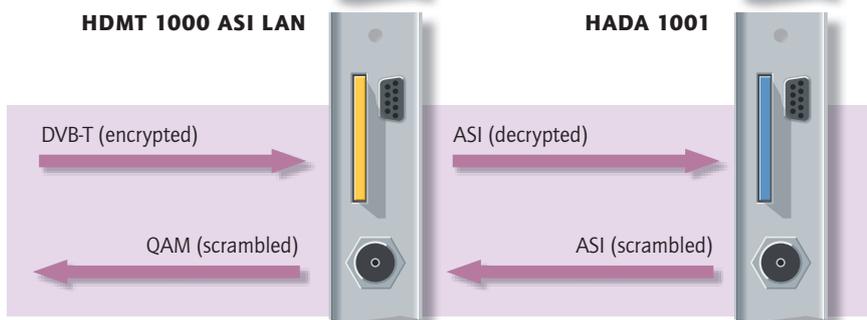
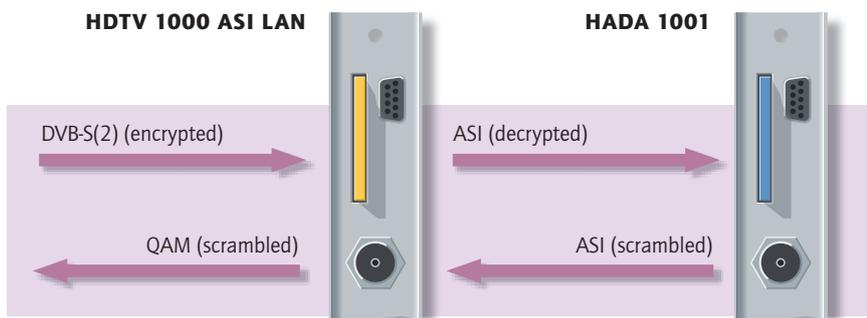
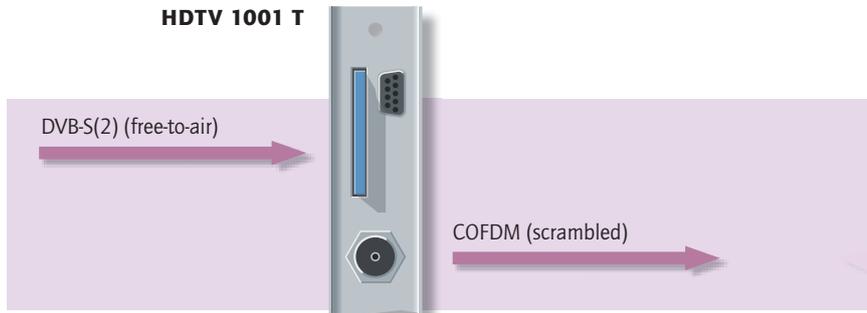
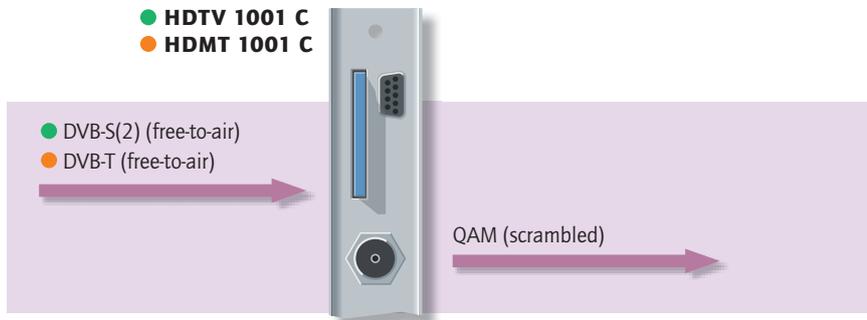
HADA 1001



	HDTV 1001 C	HDTV 1001 T	HDMT 1001 C	HADA 1001
No. of inputs	2	2	2	2
No. of converted transponders	2	2	2	2
Input frequency range	950 - 2150 MHz	950 - 2150 MHz	177.5 - 226.5 MHz	
474 - 858 MHz	950 - 2150 MHz			
No. of carriers of input	-	-	2 k and 8 k	-
Input symbol rate	-	-	acc. to EN 300 744	-
DVB-S modes (QPSK)	1/2, 2/3, 3/4, 5/6, 7/8	1/2, 2/3, 3/4, 5/6, 7/8	-	1/2, 2/3, 3/4, 5/6, 7/8
DVB-S2 modes (QPSK)	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10	-	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
DVB-S2 modes (8PSK)	3/5, 2/3, 3/4, 5/6, 8/9, 9/10	3/5, 2/3, 3/4, 5/6, 8/9, 9/10	-	3/5, 2/3, 3/4, 5/6, 8/9, 9/10
Symbol rate DVB-S (QPSK)	1 - 45 Msymb/s	1 - 45 Msymb/s	-	1 - 45 Msymb/s
Symbol rate DVB-S2 (QPSK)	1 - 45 Msymb/s	1 - 45 Msymb/s	-	1 - 45 Msymb/s
Symbol rate DVB-S2 (8PSK)	1 - 45 Msymb/s	1 - 45 Msymb/s	-	1 - 45 Msymb/s
Output symbol rate	1 - 7.5 MBaud	acc. to EN 300 744	1 - 7.5 MBaud	1 - 7.5 MBaud
Modulation scheme	QAM 4, 16, 32, 64, 128, 256	QPSK, 16-QAM and 64-QAM	QAM 4, 16, 32, 64, 128, 256	QAM 4, 16, 32, 64, 128, 256
No. of carriers of output	-	2 k, 4 k and 8k	-	-
Guard Intervall	-	1/4, 1/8, 1/16, 1/32	-	-
ASI in/ASI out interface	•	•	•	•
Ethernet interface	•	•	•	•
Common Interface	via Tuner A	via Tuner A	via Tuner A	via ASI in
TP function	•	•	•	•
Software download	via RS-232	via RS-232	via RS-232	via RS-232
Output frequency range/ Channel infrequency	45 - 862 MHz	42 - 860 MHz	45 - 862 MHz	-



CASSETTES FOR STANDARD LINE OF HEAD-END STATION SYSTEMS



SCRAMBLING OF FREE-TO-AIR TRANSPORT STREAMS



SCRAMBLING OF ALREADY ENCRYPTED TRANSPORT STREAMS

- CAM for scrambling of transport streams
- CAM for decrypting of transport streams

CASSETTES FOR STANDARD LINE OF HEAD-END STATION SYSTEMS

MPEG4 Encoder HDE 400

This cassette is an MPEG-4 encoder which encodes an HD video or a SD video and audio signal to an MPEG-4 data stream. The encoded signal can be outputted at the ASI output and LAN output and at the QAM resp. COFDM modulator.

The video inputs are selectable with HDMI (HD), YPbPr (SD/HD) and CVBS (SD). There are supported every current HDTV formats up to a resolution by 1920 x 1080p 50/60 Hz and TV standards like PAL, NTSC and SECAM. The stereo audio signal can be inputted either to the Cinch sockets or to the SPDIF interface.

The MPEG-4 encoder generates a transport stream according to standard H.264/AVC High Profile Level 4.0 with a 8 bit wide TSI Interface with clock and frame sync signal with data rates between 1.5 and 31 MBit/s. The data rate of the audio channel is between 32 kBit and 384 kBit and supports the following sound standards: Stereo, Joint-Stereo, Mono and Dual.

The ASI transport stream can be cascaded. The encoded video and audio data streams are automatically inserted or they can be manually edited.

The transport stream can alternatively outputted at the LAN connector in SPTS resp. MPTS with format UDP or RTP.

The transport stream (ASI/SPTS/MPTS) includes every service ID which are necessary for the reception with a set top box.

It can be selected between COFDM and QAM at the HF output. The following modulation schemes are supported: 4-, 16-, 32-, 64-, 128- und 256-QAM, with COFDM: QPSK 16-, 64-QAM in 2 k mode.

ENCODING OF ANALOGUE AV SIGNALS

Conversion from AV analogue to ASI

The **HDE 210** converts two analogue video and audio signals into two MPEG2 data streams. These data streams are outputted at the ASI interface or LAN (IPTV) interface.

The analogue video signal can be fed in either via the video (yellow) cinch connectors (CVBS) or via the S-Video connectors (Y/C). The stereo audio signals are fed in via the audio (red and white) cinch connectors. PAL BG (4.43 MHz) and PAL N (3.58 MHz) are supported.

The analogue video and audio signals are digitalized and are the input signal for the MPEG2 encoder. An existing teletext signal is digitalized via the MPEG2 encoder and can be used at the output of the ASI transport stream.

The MPEG2 encoder generates a transport stream according to ISO/IEC 13818-2 at an 8-bit wide TS interface with clock and frame sync signal with data rates between 2 MBit/s and 15 MBit/s. The data rate of the audio channel is between 192 kBit/s and 384 kBit/s and supports the following sound modes: stereo, joint stereo, mono and dual.

The ASI transport stream can be cascaded. This means that the encoded AV data streams are fed in automatically or they can be edited manually.

The transport stream can be outputted alternatively as SPTS (Single Program Transport Stream) resp. MPTS (Multi Program Transport Stream) in UDP (User Data Protocol) format or RTP (Real-Time Transport Protocol).

The transport stream (ASI/SPTS/MPTS) contains every necessary service IDs which are necessary for the reception with a DVB receiver unit (e.g. set-top box).

The firmware update of this cassette can be done via the RS-232 interface.

Multiplex Cassette with 5 ASI inputs and 1 ASI output

The **HADA 5100** is equipped with 5 ASI inputs and 1 ASI output. It converts 5 ASI/SPTS/MPTS input channels to 1 ASI/MPTS output channel. Every input channel has one ASI input.

The fed data streams are individually editable and are merged to 1 data stream in the TPS module. This data stream is outputted via the ASI output or the LAN interface.

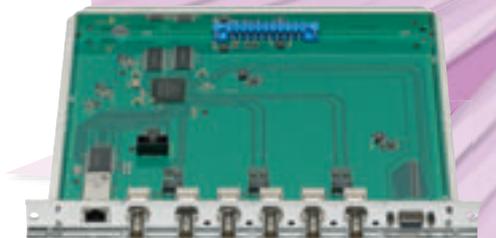
It can be allocated an own hardware IP address for the operation of this cassette in a LAN network.



HDE 400



HDE 210



HADA 5100



HDE 400



HDE 210



HADA 5100

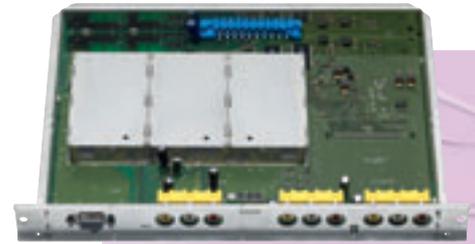
CASSETTES FOR STANDARD LINE OF HEAD-END STATION SYSTEMS

AV SIGNAL CONVERSION

AV Cassette

AV cassette for the input of 3 different AV signals via cinch sockets (e.g. camera, DVD player).

	HRC 300 AV
No. of inputs	3 (per input 1 x video, 2 x audio)
Sound output	stereo
Input frequency range	20 Hz - 5 MHz
Output channels	C 02 - C 04, C 05 - C 12, S 03 - S 41, C 21 - C 69



Terrestrial FM Amplifier

FM amplifier for wideband amplification of 87.5 - 108 MHz FM range. Six manually adjustable attenuator filters provide for attenuation of strong FM stations.

	HRM 325
No. of inputs	1
Frequency range	87.5 - 108 MHz
Gain	43 dB
Noise figure	6 - 9 dB
No. of adjustable filters	6
FM transmitter reduction per filter	14 - 17 dB



Terrestrial FM Cassette

Terrestrial FM cassette for conversion of four freely selectable FM stations to the 87.5 - 108 MHz frequency range.

	HRM 326/4
No. of inputs	1
No. of FM converters	4
Input level range	10 - 95 dB μ V
Input frequency range	87.5 - 108 MHz
Output frequency range	87.5 - 108 MHz
Minimum channel grid between converted FM stations	300 kHz



ACCESSORIES FOR STANDARD LINE OF HEAD-END STATION SYSTEMS

Monitoring Cassette HSCU 6000

The frequency range from 47 – 862 MHz can be monitored in the wideband system with the HSCU 6000 monitoring cassette. The following parameters are checked: Analogue TV video carrier (AM), analogue TV audio carrier (FM), analogue radio audio carrier (FM) as well as the digital QAM signal. The level as well as the synchronising pulse is evaluated for the analogue TV video carrier; the station idents. can be read out via the VPS signal. Stations without Idents. can be edited subsequently on a PC. This also applies for corresponding radio stations. The analogue TV video carrier is checked continuously by means of level evaluation. In the radio range, in addition to level monitoring, the station names can also be evaluated using the RDS Ident. Stations without RDS Ident. can also be edited subsequently. The level, as well the bit rate error, is measured for digital TV output signals in order to obtain error-free indication of a signal failure. All DC voltages from the power supply are also measured and evaluated. A search function also allows access to all station parameters for every TV viewer via an info channel. This can also be fed into the system over an integrated FM modulator.

The HSCU 6000 has the following interfaces: Signal input, measuring output for connection of a measuring instrument, emergency power supply input, RS-232 interface as well as one audio and video output.



Management Unit HRCU 8 incl. PC Software PSW 1000

The HRCU 8 allows connection of 1 PC, 1 analogue or GSM modem as well as 8 head-end station systems or 7 head-end station systems and 1 monitoring cassette HSCU 6000. The system allows remote configuration via the analogue or GSM modem. The service data reported in combination with the HSCU 6000 monitoring unit is provided automatically by the RCU 8 management unit as SMS or facsimile.

The PSW 1000 software also supplied requires the following system conditions for the PC: 486, 5 MB capacity on hard disk, operating system Windows 95/98/ME/XP/2000. With this software, the head-end station systems STC 1200, STC 816, STC 316 and STR 19-8 can be preprogrammed using the RS-232 interface contained in the control unit. This can also be accomplished from a remote location using an analogue or GSM modem. Moreover, errors reported by the HSCU 6000 monitoring cassette are displayed.



SNMP Management System RCU 1

It is possible to connect two devices (control units, monitoring cassette HSCU 6000 and redundancy system PRS 16/8) to one system with the management system RCU 1. It can be transmitted several alert messages with the monitoring cassette HSCU 6000 in case of failure at broadcast monitoring as email via RCU 1. The configuration of the system can be done via the connection of a PC, via LAN at RCU 1 or via a connected network.

It is necessary to use the PSW 1000 software for configuration of the setup of the head-end station.



ACCESSORIES FOR STANDARD LINE OF HEAD-END STATION SYSTEMS

Control and Remote Control Software PSW 1000

This software allows the head-end station systems STC 332, STC 316, STC 816, STC 1200 and STR 19-8 to be pre-programmed via the RS-232 interface contained in the control stage. This can also be accomplished from another location with an analogue or GSM modem. The set also includes a special control unit required for operation of the software.

System conditions PC: 486, 5 MB space on hard disk, operating system Windows 95/98/ME/XP/2000.



Power Supply NT 120

Power supply for head-end station systems STC 332, STC 316 and STC 1200 and together with power supply adapter for STC 800 and STC 850. Does not include control unit.



Power Supply NT 190

Power supply for STC 816 and 19" rack STR 19-8. Delivery without control unit.

Control Unit BE-REMOTE

Control unit for the head-end stations STC 332, STC 316, STC 816, STC 1200, STR 19-8 und PST 19-1 and together with adapter board STC 880 for the head-end stations STC 800, STC 850 and STC 880.



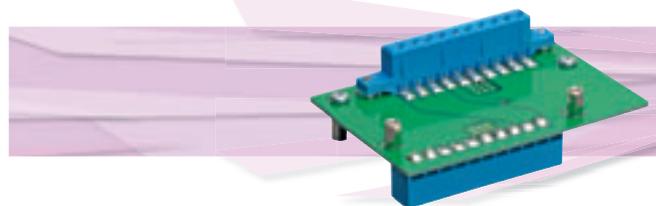
Adapter Board STC 880

Adapter board required for retrofitting STC 800, STC 850 and STC 880 head-end stations with BE-REMOTE control unit.



Power Supply Adaptor STC 8XX

The power supply unit NT 120 can be installed and used in the cabinets STC 800 and STC 850 with this adaptor. The adaptor board STC 880 and the control unit BE-REMOTE is also needed for the operation.



Cover Plate

Cover plate for empty slots

STANDARD LINE PLANNING OVERVIEW

(examples)

Digital SAT QPSK (DVB-S) to PAL

		STC 1200	HDM 2380 P CI
GSS Order No.:		G.AS 11-00	G.AS 17-00
		Volume	Volume
4 channels	Stereo	1	2
8 channels	Stereo	1	4
12 channels	Stereo	1	6
16 channels	Stereo	1	8
20 channels	Stereo	1	10
24 channels	Stereo	1	12

Digital SAT (QPSK, DVB-S/DVB-S2) to Digital Terrestrial (COFDM, DVB-T)

		STC 1200	HDTV 1000 T
GSS Order No.:		G.AS 11-00	G.AS 19-00
		Volume	Volume
Channels from 2 transponders		1	1
Channels from 4 transponders		1	2
Channels from 8 transponders		1	4
Channels from 12 transponders		1	6
Channels from 16 transponders		1	8
Channels from 20 transponders		1	10
Channels from 24 transponders		1	12

Digital SAT (QPSK DVB-S resp. DVB-S2) To Digital Cable (QAM)

		QPSK DVB-S → QAM without TP function	or QPSK DVB-S → QAM with TP function	or QPSK DVB-S/ DVB-S2 → QAM HDTV with TP function
	STC 1200	HDM 500 C	HDM 510 CI TPS	HDTV 610 CI TPS
GSS Order No.:	G.AS 11-00	G.AS 15-00	G.AS 14-00	G.AS 13-00
	Volume	Volume	Volume	Volume
4 transponders	1	2	2	2
6 transponders	1	3	3	3
8 transponders	1	4	4	4
10 transponders	1	5	5	5
12 transponders	1	6	6	6
14 transponders	1	7	7	7
16 transponders	1	8	8	8
18 transponders	1	9	9	9
20 transponders	1	10	10	10
22 transponders	1	11	11	11
24 transponders	1	12	12	12

Professional Head-End Station Systems of the PSU series

These professional head-end station systems ensure optimum supply of network clusters with highly differing infrastructures. The remote control feature for this head-end stations ensures maximum convenience.

It is possible to do software updates from the distance with the SNMP management system PRCU 12. All remote monitoring and remote configuration functions can be done with it.

With the PRCU 8 intelligent remote control unit, all parameters can be set remotely with a connectable analogue or GSM modem, which also operates with a prepaid card. This allows extremely convenient reprogramming. With the professional cassettes, the output carriers can be switched on and off to activate redundant cassettes for service.

The special monitoring cassette PSCU 6000 also offers a further possibility of monitoring the entire head-end. Here, the entire frequency range from 47 MHz to 862 MHz is scanned continuously. This also allows signals to be monitored which cannot be converted in a PSU system. The level or synchronising pulse is monitored for analogue TV and radio stations. The bit error rate is evaluated for the digital channels.

If service is required, a fault message is transmitted automatically either via SMS and/or facsimile.

Moreover, an information channel can be fed into the wideband network over the PSCU 6000 monitoring cassette. All channel information, including RDS names for the radio stations are displayed to TV viewers with this feature. The names of radio stations without RDS information can be edited.

A specially developed modulator allows an S/N ratio (weighted) of 60 dB to be achieved with the professional system.

This increases the cascading capability of the line amplifier in the wideband network.

Professional Head-End Station PSU 12

- Slots for 12 cassettes (up to 24 channels)
- Suitable for all digital TV, analogue and radio cassettes
- Simple software adaption for control unit (BE-REMOTE) possible via RS-232 socket
- Electronical software supported level adjustment via the control unit



Head-End Station System		PSU 12
No. of slots for cassettes		12
Delivery status		unloaded
Fit for adjacent channels		yes
Input/output impedance/Programming		75 Ω/Integrated Control Unit BE-REMOTE
S/N weighted		60 dB
Input data		
Input frequency range		47 – 862 MHz, 950 – 2150 MHz
Input distributor		3 pieces each with 4 and 6 outputs/ 63 – 98 dBμV
Power feed for LNB		18 V/1000 mA
Output data		
HF output level/HF level adjusting electronic		max. 80 dBμV/-20 dB
Output frequency range dependent upon cassettes		47 – 862 MHz
Power supply		
Mains voltage/Frequency 50/60 Hz		195 –260 V
Power consumptions	equipped with	12 x PSDP 6200 148 W 12 x PHDQ 1000 ASI LAN 137 W
Weight (fully loaded)		max. 30 kg
Dimensions (W x H x D)		70.0 x 38.3 x 31.5 cm

low power consumption



PROFI LINE OF HEAD-END STATION SYSTEMS

Professional Head-End Station PSU 8-16

- Slots for 8 cassettes
- Suitable for all digital TV, analogue and radio cassettes
- Simple software adaption for control unit (BE-PROFESSIONAL) possible via RS-232 socket
- Electronic software supported level adjustment via the control unit
- Suitable for wall-mounting and fixing in 19" rack

KLASSE
A
CLASS

S/N
60 dB

Monitor
GSM
Control



PSU 8-16

Head-End Station System	PSU 8-16	
No. of slots for cassettes	8	
Delivery status	unloaded	
Fit for adjacent channels	yes	
Input/output impedance/Programming	75 Ω/Integrated Control Unit BE-PROFESSIONAL	
S/N weighted	55 dB	
Input data		
Input frequency range	47 - 862 MHz, 950 - 2150 MHz	
Input distributor	2 pieces each with 4 and 6 outputs	
Power feed for LNC	18 V/1000 mA	
Output data		
HF output level/HF level adjusting electronic	max. 80 dBμV/-31 dB	
Output frequency range dependent upon cassettes	47 - 862 MHz	
Power supply		
Mains voltage/Frequency 50/60 Hz	195 - 260 V	
Power consumptions	equipped with	8 x PSDP 6200 97 W
		1 x PHDQ 1000 ASI LAN 90 W
Weight (fully loaded)	approx. 20 kg	
Dimensions (W x H x D)	48.3 x 39.7 (9 HU) x 30.2 cm	

low power consumption



SAT CONVERSION DIGITAL

Stereo Satellite Double Reception Cassette from Digital SAT to PAL in CCIR standard (QPSK - PAL)

This double cassette transcodes two QPSK signals (SCPC or MCPC) into two selectable PAL channels in the frequency range 45 – 862 MHz. Up to two encrypted TV channels can also be converted to the appropriate CA module via the channel A common interface. The WSS setting allows 16:9 channels to be displayed in the correct picture format. VPS and PDC signals and teletext information are also converted. DVB and teletext subtitles can be displayed. When radio stations are converted, the name of the radio station as well as the now and next information are displayed on the screen. A time control which can be set with the control unit allows daily switchover between two stations in one polarisation plane. The carriers can be switched off separately.

	PSDP 6200
No. of inputs	2
No. of converted channels	2
Sound output	stereo
Input frequency range	950 – 2150 MHz
Input symbol rate	1 – 45 Msymb/s
Software download	via RS-232
Output channels	C 02 – C 04, C 05 – C 12, S 03 – S 41, C 21 – C 69



DVB Digital Video Broadcasting
multi MD digital®



SAT CONVERSION DIGITAL

12-fold Stereo Satellite Reception Cassette from Digital SAT to FM (DVB-S2 - FM)

This cassette converts two DVB-S(2) signals to 12 selectable FM stations.

	PHDF 1000
No. of inputs	2
No. of converted frequencies	12
Input frequency range	925 – 2150 MHz
Input symbol rate	2 – 45 Msymb/s
Software download	via RS-232
Output frequency range	87.5 – 108 MHz



DVB Digital Video Broadcasting
multi MD digital®



CASSETTES FOR PROFI LINE OF HEAD-END STATION SYSTEMS

SAT TRANSCODING DIGITAL

Satellite Single Reception Cassette from Digital SAT to PAL (DVB-S2 - PAL)

Fullband-Modulator with excellent signal quality

This cassette transcodes a DVB-S2 signal to one selectable PAL channel in the frequency range 45 – 862 MHz. The output channel is suitable for adjacent channels. An encrypted TV channel can be decoded with the appropriate CA module via the Common Interface. The WSS setting allows 16:9 channels to be viewed with the correct picture format. VPS and PDC signals and teletext information are also converted. DVB and teletext subtitles can be displayed.

Available as from Quarter 3, 2012!



PHDP 4000

No. of inputs	1
No. of converted channels	1
Sound output	stereo
Input frequency range	950 – 2150 MHz
Input symbol rate DVB-S (QPSK)	1 – 45 MSymb/s
Input symbol rate DVB-S2 (QPSK)	1 – 45 MSymb/s
Input symbol rate DVB-S2 (8PSK)	2 – 32 MSymb/s
Common Interface	•
Software download	via RS-232
Output channels	C 02 – C 04, C 05 – C 12 S 03 – S 41, C 21 – C 69

DVB multi
Digital Video MD
Broadcasting digital®



Stereo Terrestrial Cable Double Reception Cassette from Digital Terrestrial or Digital Cable to PAL in CCIR standard (COFDM or QAM - PAL)

This double cassette transcodes two COFDM or QAM signals into two selectable PAL channels in the frequency range 45 - 862 MHz. Encrypted TV channels can also be converted with the appropriate CA module via the common interface. The WSS setting allows 16:9 channels to be viewed with the correct picture format. VPS and PDC signals and teletext information are also converted. DVB and teletext subtitles can be displayed.

When radio stations are converted, the name of the radio station as well as the now and next information are displayed on the screen.



	PTDP 8200
No. of inputs	2
No. of converted channels	2
Input frequency range	177,5 - 226,5 MHz 474 - 858 MHz
No. of carriers	2 k and 8 k
Input symbol rate	according to EN 300 744
Software download	via RS-232
Output channels	C 02 - C 04, C 05 - C 12, S 03 - S 41, C 21 - C 69



Conversion from Digital Terrestrial to Digital Terrestrial (COFDM - COFDM)

Terrestrial cassette for conversion of two terrestrial digital signals into two freely selectable channels in the frequency range 42 - 860 MHz. The carriers can be switched off separately. Bandwidth 7/8 MHz switchable.



	PTDT 9200
No. of inputs	2
No. of converted multiplexes	2
Input frequency range	177.5 - 226.5 MHz (VHF) 467 - 858 MHz (UHF)
Input symbol rate	acc. to EN 300 744
Modulation scheme	QPSK, 16-QAM and 64-QAM
No. of carriers	2 k, 4 k and 8 k
Guard interval	1/4, 1/8, 1/16 and 1/32
Output frequency range	42 - 860 MHz



CASSETTES FOR PROFI LINE OF HEAD-END STATION SYSTEMS

SAT CONVERSION DIGITAL

Conversion from Digital Cable or Digital Terrestrial to Digital Cable (DVB-C - QAM or DVB-T - QAM) (PQDQ 1000) resp. to FM (PQDF 1000)

The setting of the parameters can be easily set with an automatic search via the control unit of the head-end station.

Furthermore the cassettes are featured with additional interfaces which make them universal:

- ASI input and ASI output (ASI = Asynchronous Serial Interface acc. to DIN EN 50083-9)
- 100 MBit LAN interface (Ethernet)

For decoding of encrypted channels can be additionally inserted a CI module with converter A. The maximum number of decoded channel is dependent on the used CAM.

	PQDQ 1000	PQDF 1000
No. of inputs	2	2
No. of converted transponders/multiplexes	2	2
Input frequency range	47 - 862 MHz	47 - 862 MHz
Input symbol rate	acc. to EN 300 744 (DVB-T) acc. to EN 300 429 (DVB-C)	acc. to EN 300 744 (DVB-T) acc. to EN 300 429 (DVB-C)
Output	2 x QAM	12 x FM
Modulation scheme	QAM 4, 16, 32, 64, 128, 256	-
Output symbol rate	1 - 7.5 MBaud	-
ASI in / ASI out interface	•	•
Ethernet interface	•	•
Common Interface	•	•
Software download	via RS-232	via RS-232
Output frequency range	45 - 862 MHz	87.5 - 108 MHz



SAT CONVERSION DIGITAL

Transmodulation from Digital SAT to Digital Cable (QPSK-QAM)

This cassette transmodulates two different QPSK-modulated data streams (SCPC or MCPC) to two QAM modulated data streams.

The integrated TP module serves for data processing of the demodulated transport stream: This allows service information to be changed (NIT - Network Information Table), data rates to be increased (stuffing) and individual channels to be deleted from the transport stream, whereby the remaining channels can then be transmitted with bandwidth optimization. Moreover, the Operator ID can be set.



PSDQ 5100 CI TPS	
No. of inputs	2
No. of converted transponders	2
Input frequency range	950 - 2150 MHz
DVB-S Modes	1/2, 2/3, 3/4, 5/6, 7/8
Input symbol rate	1 - 45 Msymb/s
Output symbol rate	1 - 7 MBaud
Modulation scheme	QAM 4, 16, 32, 64, 128, 256
Common Interface	•
TP function	•
Software download	via RS-232
Output frequency rang / Channel infrequency	42 - 860 MHz



CASSETTES FOR PROFI LINE OF HEAD-END STATION SYSTEMS

SAT CONVERSION DIGITAL

Conversion from HDTV Digital to HDTV Digital Cable (DVB-S2 - QAM)

This cassette transmodulates two different DVB-S2 or DVB-S modulated data streams (SCPC or MCPC) to two QAM modulated data streams. The setting of the parameters can be easily set with an automatic search via the control unit of the head-end station.

The cassette can be used very flexibly because of the input and output constellation. That means that at the input two signals with different polarisations and at the output two signals free selectable (no adjacent channel setting necessary!) can be selected.

The integrated TP module serves for data processing of the demodulated transport stream: This allows service information to be changed (NIT - Network Information Table) data rates to be increased (stuffing) and individual programs to be deleted from the transport stream. Moreover, the Operator ID can be set.

Up to 12 channels can be decoded with the smartcard of the provider depending on the Conditional Access Module (CAM).



	PHDQ 6100 CI TPS
No. of inputs	2
No. of converted transponders	2
Input frequency range	950 - 2150 MHz
DVB-S Modes (QPSK)	1/2, 2/3, 3/4, 5/6, 7/8
DVB-S2 Modes (QPSK)	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
DVB-S2 Modes (8PSK)	3/5, 2/3, 3/4, 5/6, 8/9, 9/10
Symbol rate DVB-S (QPSK)	1 - 45 Msymb/s
Symbol rate DVB-S2 (QPSK)	1 - 45 Msymb/s
Symbol rate DVB-S2 (8PSK)	1 - 45 Msymb/s
Output symbol rate	1 - 7.5 MBaud
Modulation scheme	QAM 4, 16, 32, 64, 128, 256
Common Interface	•
TP Module	•
Software download	via RS-232
Output frequency range/ Channel infrequency	45 - 862 MHz



SAT CONVERSION DIGITAL

DVB Transmodulator DVB-S(2) or DVB-T to DVB-C (QAM) or DVB-T (COFDM) with LCN (logical channel number)

These cassettes transmodulate two digital satellite signals or two digital terrestrial signals to two digital cable signals (QAM or COFDM). It can be multiplexed or deleted from the data streams single channels. Further there is one Common Interface (CI). It can be decoded encrypted signals (e.g. Pay TV). The QAM modulation is adjustable with 4, 16, 32, 64, 128 and 256 QAM. A 2k, 4k and 8k mode can be selected with the COFDM modulation. It can be adjusted to QPSK, 16-QAM or 64-QAM with both modes.

The integrated TP module serves for data processing of the demodulated transport stream: This allows service information to be changed (NIT - Network Information Table), data rates to be increased (Stuffing) and individual channels to be deleted from the transport stream, whereby the remaining channels can then be transmitted with bandwidth optimization. Moreover, the Operator ID can be set.

Furthermore the cassettes are featured with additional interfaces which make them universal:

- ASI input and ASI output (ASI = Asynchronous Serial Interface acc. to EN 50083-9)
- 100 MBit LAN interface (Ethernet)

Data streams of the digital signals can be put out for further operation or can be fed in from external sources for QAM modulation for distribution in cable networks.

The channel table can be set resp. the programming can be done with the Control and Remote Control Software. If the featured LCN functionality can be used the sorting of the channels is not necessary in the connected receivers (in cassette with DVB-S2 tuner only)

	PHDQ 1000 ASI LAN	PHDT 1000	PTDQ 1000 ASI LAN	PTDT 1000
No. of inputs	2	2	2	2
No. of converted transponders	2	2	-	-
No. of converted multiplexes	-	-	2	2
Input frequency range	950 - 2150 MHz	950 - 2150 MHz	177.5 - 226.5 MHz 474 - 858 MHz	177.5 - 226.5 MHz 474 - 858 MHz
No. of carriers of input	-	-	2 k and 8 k	2 k and 8 k
Input symbol rate	-	-	acc. to EN 300 744	acc. to EN 300 744
DVB-S modes (QPSK)	1/2, 2/3, 3/4, 5/6, 7/8	1/2, 2/3, 3/4, 5/6, 7/8	-	-
DVB-S2 modes (QPSK)	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10	-	-
DVB-S2 modes (8PSK)	3/5, 2/3, 3/4, 5/6, 8/9, 9/10	3/5, 2/3, 3/4, 5/6, 8/9, 9/10	-	-
Symbol rate DVB-S (QPSK)	1 - 45 Msymb/s	1 - 45 Msymb/s	-	-
Symbol rate DVB-S2 (QPSK)	1 - 45 Msymb/s	1 - 45 Msymb/s	-	-
Symbol rate DVB-S2 (8PSK)	1 - 45 Msymb/s	1 - 45 Msymb/s	-	-
Output symbol rate	1 - 7.5 MBaud	-	1 - 7.5 MBaud	-
Modulation scheme	QAM 4, 16, 32, 64, 128, 256	QPSK, 16-QAM and 64-QAM	QAM 4, 16, 32, 64, 128, 256	QPSK, 16-QAM and 64-QAM
No. of carriers of output	-	2 k, 4 k and 8k	-	2 k, 4 k and 8k
Guard Interval	-	1/4, 1/8, 1/16, 1/32	-	1/4, 1/8, 1/16, 1/32
ASI in/ASI out interface	•	•	•	•
Ethernet interface	•	•	•	•
Common Interface	•	•	•	•
TP function	•	•	•	•
Software download	via RS-232	via RS-232	via RS-232	via RS-232
Output frequency range/ Channel infrequency	42 - 860 MHz	42 - 860 MHz	42 - 860 MHz	42 - 860 MHz



CASSETTES FOR PROFI LINE OF HEAD-END STATION SYSTEMS



PHDQ 1000 ASI LAN



PHDT 1000



PTDQ 1000 ASI LAN



PTDT 1000



IPTV converters	PHIS 1000	PHIM 1000	PTIS 1000	PTIM 1000
No. of inputs DVB-S(2)	2	2	-	-
No. of inputs DVB-T	-	-	2	2
Common Interface	via Tuner A	via Tuner A	via Tuner A	via Tuner A
ASI input	•	•	•	•
LAN input	-	-	-	-
QAM input	-	-	-	-
COFDM output	-	-	-	-
FM output	-	-	-	-
ASI output	-	-	-	-
LAN output	16x SPTS in Unicast/Multicast	2x Multicast	16x SPTS in Unicast/Multicast	2x Multicast



IPTV converters	PMDQ 1000	PMDT 1000	PAIS 5100	PMDF 1000
No. of inputs DVB-S(2)	• *)	• *)	-	-
No. of inputs DVB-T	-	-	-	-
Common Interface	-	-	-	-
ASI input	-	-	5 x	-
LAN input	•	•	-	•
QAM input	•	-	-	-
COFDM output	-	•	-	-
FM output	-	-	-	12 x
ASI output	•	•	•	-
LAN output	-	-	SPTS/MPTS	-

The table only shows an overview of the IP cassettes. Further information can be found in the special brochure about IPTV.

*) Input A either LAN or tuner



SAT CONVERSION DIGITAL

DVB Scrambling Cassettes DVB Scrambling Cassettes

Meanwhile there are scrambling systems on the market which are able to scramble transport streams exclusively via a special CAM module.

With this system the cablenet provider is able to scramble and market defined channel bouquets.

The individual marketing of TV content and TV channels is a main part of the digitalization.

For this purpose there is a simple solution for small and mid-range cablenet providers.



PHDQ 1001



PHDT 1001



PTDQ 1001



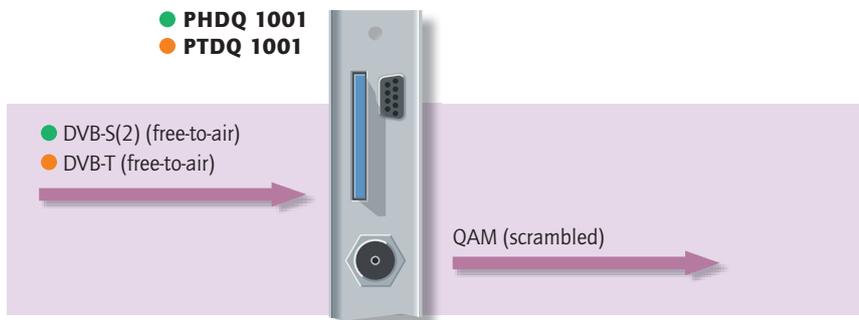
PADA 1001



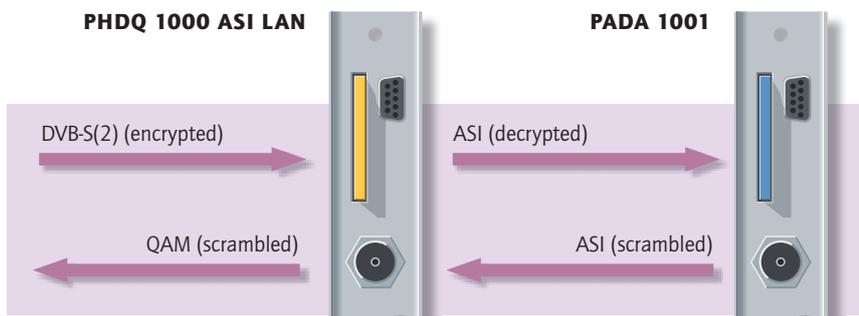
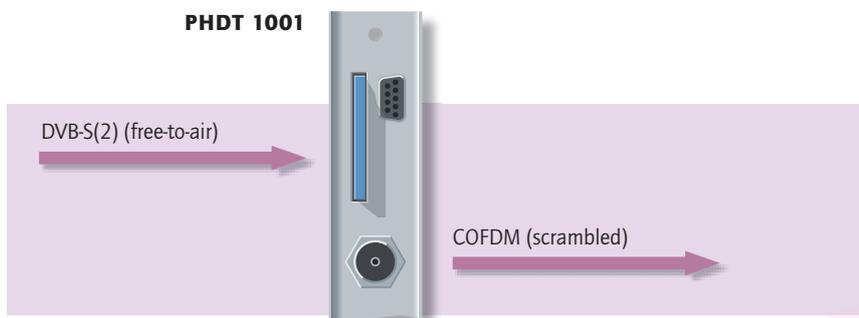
	PHDQ 1001	PHDT 1001	PTDQ 1001	PADA 1001
No. of inputs	2	2	2	2
No. of converted transponders	2	2	2	2
Input frequency range	950 - 2150 MHz	950 - 2150 MHz	177.5 - 226.5 MHz	
474 - 858 MHz	950 - 2150 MHz			
No. of carriers of input	-	-	2 k and 8 k	-
Input symbol rate	-	-	acc. to EN 300 744	-
DVB-S modes (QPSK)	1/2, 2/3, 3/4, 5/6, 7/8	1/2, 2/3, 3/4, 5/6, 7/8	-	1/2, 2/3, 3/4, 5/6, 7/8
DVB-S2 modes (QPSK)	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10	-	1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
DVB-S2 modes (8PSK)	3/5, 2/3, 3/4, 5/6, 8/9, 9/10	3/5, 2/3, 3/4, 5/6, 8/9, 9/10	-	3/5, 2/3, 3/4, 5/6, 8/9, 9/10
Symbol rate DVB-S (QPSK)	1 - 45 Msymb/s	1 - 45 Msymb/s	-	1 - 45 Msymb/s
Symbol rate DVB-S2 (QPSK)	1 - 45 Msymb/s	1 - 45 Msymb/s	-	1 - 45 Msymb/s
Symbol rate DVB-S2 (8PSK)	1 - 45 Msymb/s	1 - 45 Msymb/s	-	1 - 45 Msymb/s
Output symbol rate	1 - 7.5 MBaud	acc. to EN 300 744	1 - 7.5 MBaud	1 - 7.5 MBaud
Modulation scheme	QAM 4, 16, 32, 64, 128, 256	QPSK, 16-QAM and 64-QAM	QAM 4, 16, 32, 64, 128, 256	QAM 4, 16, 32, 64, 128, 256
No. of carriers of output	-	2 k, 4 k and 8k	-	-
Guard Intervall	-	1/4, 1/8, 1/16, 1/32	-	-
ASI in/ASI out interface	•	•	•	•
Ethernet interface	•	•	•	•
Common Interface	via Tuner A	via Tuner A	via Tuner A	via ASI in
TP function	•	•	•	•
Software download	via RS-232	via RS-232	via RS-232	via RS-232
Output frequency range/ Channel infrequency	45 - 862 MHz	42 - 860 MHz	45 - 862 MHz	-



CASSETTES FOR PROFI LINE OF HEAD-END STATION SYSTEMS

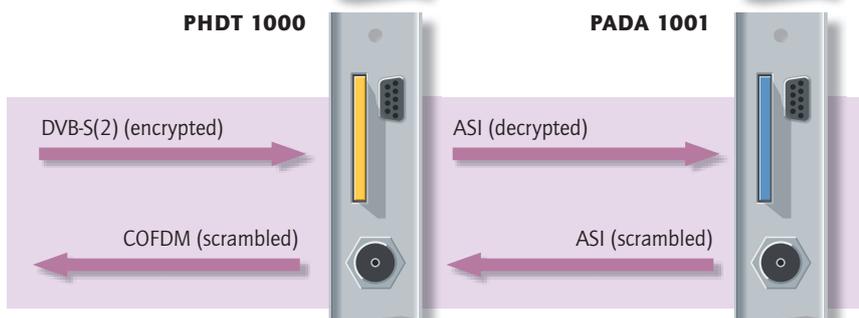
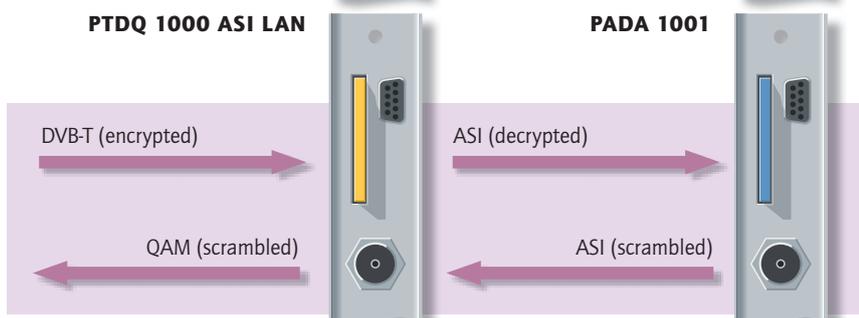


SCRAMBLING OF FREE-TO-AIR TRANSPORT STREAMS



SCRAMBLING OF ALREADY ENCRYPTED TRANSPORT STREAMS

- CAM for scrambling of transport streams
- CAM for decrypting of transport streams



Multimedia Streaming Cassette PSMS 1000

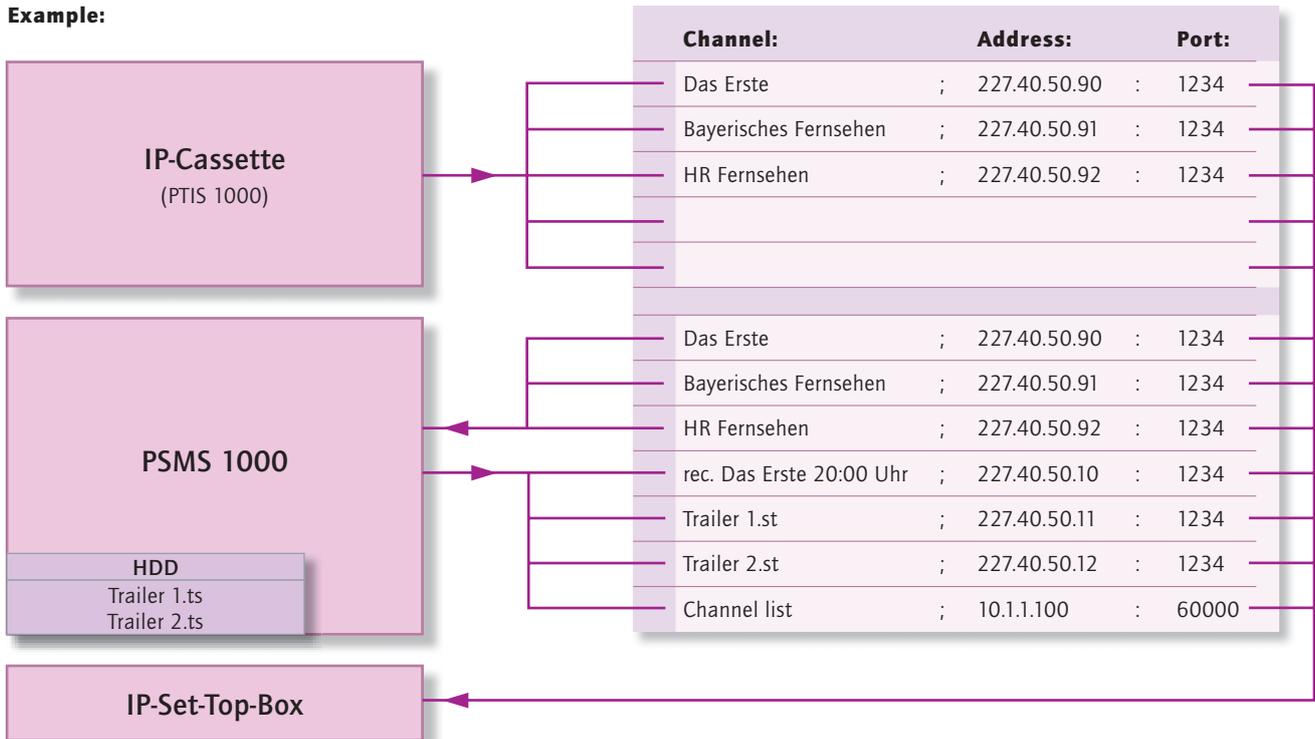
The PSMS 1000 is a cassette which converts data streams to Multicast data streams. The data streams can be transmitted to an internal HDD via FTP. Furthermore the cassette is able to record time controlled and replay Multicast data streams. The PSMS 1000 can additionally output a channel list which can be loaded by specific IPTV set top boxes.

The setting of the IP address can be done with the control unit of the PSU 12 or PSU 8-16.

Further settings like allocation of the data streams or editing of the channel list can be done with a standard web browser.



Example:



CASSETTES FOR PROFI LINE OF HEAD-END STATION SYSTEMS

MPEG4 Encoder PADE 4000

This cassette is an MPEG-4 encoder which encodes an HD video or a SD video and audio signal to an MPEG-4 data stream. The encoded signal can be outputted at the ASI output and LAN output and at the QAM resp. COFDM modulator.

The video inputs are selectable with HDMI (HD), YPbPr (SD/HD) and CVBS (SD). There are supported every current HDTV formats up to a resolution by 1920 x 1080p 50/60 Hz and TV standards like PAL, NTSC and SECAM. The stereo audio signal can be inputted either to the Cinch sockets or to the SPDIF interface.

The MPEG-4 encoder generates a transport stream according to standard H.264/AVC High Profile Level 4.0 with a 8 bit wide TSI Interface with clock and frame sync signal with data rates between 1.5 and 31 MBit/s. The data rate of the audio channel is between 32 kBit and 384 kBit and supports the following sound standards: Stereo, Joint-Stereo, Mono and Dual.

The ASI transport stream can be cascaded. The encoded video and audio data streams are automatically inserted or they can be manually edited.

The transport stream can alternatively outputted at the LAN connector in SPTS resp. MPTS with format UDP or RTP.

The transport stream (ASI/SPTS/MPTS) includes every service ID which are necessary for the reception with a set top box.

It can be selected between COFDM and QAM at the HF output. The following modulation schemes are supported: 4-, 16-, 32-, 64-, 128- und 256-QAM, with COFDM: QPSK 16-, 64-QAM in 2 k mode.

ENCODING OF ANALOGUE AV SIGNALS

Conversion from AV analogue to ASI

The **PADE 7006** converts two analogue video and audio signals into two MPEG2 data streams. These data streams are outputted at the ASI interface or LAN (IPTV) interface.

The analogue video signal can be fed in either via the video (yellow) cinch connectors (CVBS) or via the S-Video connectors (Y/C). The stereo audio signals are fed in via the audio (red and white) cinch connectors. PAL BG (4.43 MHz) and PAL N (3.58 MHz) are supported.

The analogue video and audio signals are digitalized and are the input signal for the MPEG2 encoder. An existing teletext signal is digitalized via the MPEG2 encoder and can be used at the output of the ASI transport stream.

The MPEG2 encoder generates a transport stream according to ISO/IEC 13818-2 at an 8-bit wide TS interface with clock and frame sync signal with data rates between 2 MBit/s and 15 MBit/s. The data rate of the audio channel is between 192 kBit/s and 384 kBit/s and supports the following sound modes: stereo, joint stereo, mono and dual.

The ASI transport stream can be cascaded. This means that the encoded AV data streams are fed in automatically or they can be edited manually.

The transport stream can be outputted alternatively as SPTS (Single Program Transport Stream) resp. MPTS (Multi program Transport Stream) in UDP (User Data Protocol) format or RTP (Real-Time Transport Protocol).

The transport stream (ASI/SPTS/MPTS) contains every necessary service IDs which are necessary for the reception with a DVB receiver unit (e.g. set-top box).

The firmware update of this cassette can be done via the RS-232 interface.

Multiplex Cassette with 5 ASI inputs and 1 ASI output

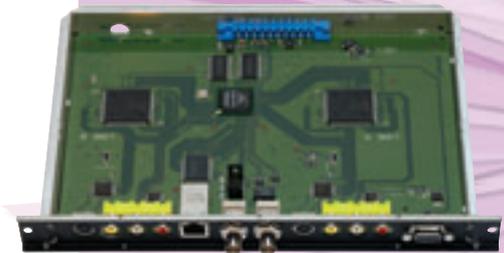
The **PADA 5100** is equipped with 5 ASI inputs and 1 ASI output. It converts 5 ASI/SPTS/MPTS input channels to 1 ASI/MPTS output channel. Every input channel has one ASI input.

The fed data streams are individually editable and are merged to 1 data stream in the TPS module. This data stream is outputted via the ASI output or the LAN interface.

It can be allocated an own hardware IP address for the operation of this cassette in a LAN network.



PADE 4000



PADE 7006



PADA 5100



PADE 4000



PADE 7006



PADA 5100

CASSETTES FOR PROFI LINE OF HEAD-END STATION SYSTEMS

AV SIGNAL CONVERSION

AV Cassette

AV cassette for the input of 3 different AV signals via cinch sockets (e.g. camera, DVD player).

PAVP 4300

No. of inputs	3 (per input 1 x video, 2 x audio)
Sound output	stereo
Input frequency range	20 Hz - 5 MHz
Output channels	C 02 - C 04, C 05 - C 12, S 03 - S 41, C 21 - C 69

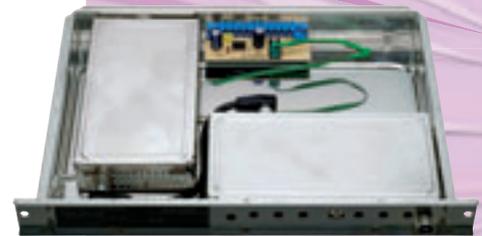


Terrestrial FM Amplifier

FM amplifier for wideband amplification of 87.5 - 108 MHz FM range. Six manually-adjustable attenuator filters provide for attenuation of strong FM stations.

PTAF 2000

No. of inputs	1
Frequency range	87.5 - 108 MHz
Gain	43 dB
Noise figure	6 - 9 dB
No. of adjustable filters	6
FM transmitter reduction per filter	14 - 17 dB



Terrestrial FM Cassette

Terrestrial FM cassette for conversion of four freely selectable FM to the 87.5-108 MHz frequency range.

PTFF 2000

No. of inputs	1
No. of FM converters	4
Input level range	10 - 95 dB μ V
Input frequency range	87.5 - 108 MHz
Output frequency range	87.5 - 108 MHz
Minimum channel grid between converted FM stations	300 kHz



ACCESSORIES FOR PROFI LINE OF HEAD-END STATION SYSTEMS

Monitoring Cassette PSCU 6000

The frequency range from 47 – 862 MHz can be monitored in the wideband system with the PSCU 6000 monitoring cassette. The following parameters are checked: Analogue TV video carrier (AM), analogue TV audio carrier (FM), analogue radio audio carrier (FM) as well as the digital QAM signal. The level as well as the synchronising pulse is evaluated for the analogue TV video carrier; the station ident. can be read out via the VPS signal. Stations without Ident. can be edited subsequently on a PC. This also applies for corresponding radio stations. The analogue TV video carrier is checked continuously by means of level evaluation. In the radio range, in addition to level

monitoring, the station names can also be evaluated using the RDS Ident. Stations without RDS Ident. can also be edited subsequently. The level, as well as the bit rate error, is measured for digital TV output signals in order to obtain error-free indication of a signal failure. All DC voltages from the power supply are also measured and evaluated. A search function also allows access to all station parameters for every TV viewer via an info channel. This can also be fed into the system over an integrated FM modulator.

The PSCU 6000 has the following interfaces: Signal input, measuring output for connection of a measuring instrument, emergency power supply input, RS-232 interface as well as one audio and video output.



Hybrid Amplifier PAMP 4

This hybrid amplifier is designed using state-of-the-art GaAs technology. It has 4 interstage RF inputs, one main output as well as one RF measuring output (-30 dB). Each of the four inputs can be adjusted to the same input level with the aid of the

associated level adjustment. The frequency dependent sloping position of the RF cables can be compensated with a level adjustment. The main output can be attenuated by 20 dB with the aid of the output level adjustment. An interstage element in the amplifier can be switched off for low output signals with the same signal-to-noise ratio (- 8 dB).



RF input

Input frequency range	47 – 862 MHz
Input impedance	75 Ω
Input level	max. 86 dBμV
Input level adjusting range	0 bis -20 dB
Gain	typ. 37 dB or 29 dB resp. with deactivated Interstage stage
Noise figure	typ. 7 dB

RF output

Output frequency range	47 – 862 MHz
Output impedance	75 Ω
Measuring output	-30 dB ± 1 dB
Max. output level up to 862 MHz	
60 dB IMA 3 rd sequence	123 dBμV
60 dB CTBA (Cenelec)	110 dBμV
60 dB CSOA (Cenelec)	113 dBμV
Output level adjusting range	0 – 20 dB
Equalization (sloping position)	0 to -20 dB

SNMP Management System PRCU 12

The head-end station management system PRCU 12 shows the following features:

- SNMP capable management interface (LAN); connection with a LAN router via DSL as standard
- Enquiry and controlling of the most important parameters and device data via remote control with the GUI of the head-end station software PSW 1000
- Non volatile storage of the configuration data (back-up storage) of every channel with the remote PC
- Software update via FTP connection

- Failure signalling and transferring of error messages
- Error messages via email
- Simulation of the control unit
- Time-controlled switching on and off of the cassettes
- Automatic monitoring of level-, bit error rate-, RDS- and line synchronous pulse with PSCU 6000

Scope of delivery:

- Industrial PC with 16 internal RS-232 interfaces
- LAN controlled 8-fold outlets 230 V EP 8X with timeshift switching on of the outlets at power blackout
- 19" professional cabinet



Management Unit PRCU 8 incl. PC Software PSW 1000

The PRCU 8 allows connection of 1 PC, 1 analogue or GSM modem as well as 8 head-end station systems or 7 head-end station systems and 1 monitoring cassette PSCU 6000 or 6 head-end station systems, 1 monitoring cassette PSCU 6000 and one backup system PRS 16/8. The system allows remote configuration via the analogue or GSM modem. The service data reported in combination with the PSCU 6000 monitoring unit is provided automatically by the PRCU 8 management unit as SMS or facsimile.

The PSW 1000 software also supplied requires the following system conditions for the PC: 486, 5 MB capacity on hard disk, operating system Windows 95/98/ME/XP/2000. With this software, the head-end station systems PSU 12, PSU 8, PSU 8-16 and PGT 8 can be preprogrammed using the RS-232 interface contained in the control unit. This can also be accomplished from a remote location using an analogue or GSM modem. Moreover, errors reported by the PSCU 6000 monitoring cassette are displayed. When the PRS 16/8 backup system is installed, it can also be configured with the PSW 1000 software.



Backup System PRS 16/8

The backup system is suitable for control of backup cassettes, which can be switched on in the system. With the backup system, up to 16 different satellite levels can be switched on, on up to 8 different backup cassettes. This is required when a cassette in use fails and requires temporary replacement by a backup cassette. With this system, only one backup cassette is required per type.

This system is controlled by the PRCU 8 remote control unit. The system includes one mounting bracket suitable for 19" rack as well as wall installation, one data cable for connection to the PRCU 8 and the backup system with 16 inputs with 16 loop outputs for transfer of the signals to the head-end station systems and 8 switchable outputs to the backup cassettes. The PRS 16/8 is 4 HU high.



ACCESSORIES FOR PROFI LINE OF HEAD-END STATION SYSTEMS MODEMS

Power Supply NT 120

Power supply for head-end station systems PSU 12 and PSU 8.
Delivery without control unit.

Power Supply NT 190

Power supply for PSU 8-16 and 19" rack PGT 8.
Delivery without control unit.

Universal Panel PUP 1

This universal panel is suitable for installation in a 19" rack as well as wall installation. The professional remote control unit PRCU 8 can be fastened to it. In addition, the PUP 1 provides a holder for the documents on the corresponding head-end station system. The panel is 3 HU high.

Cover Plate

Cover plate for empty slots

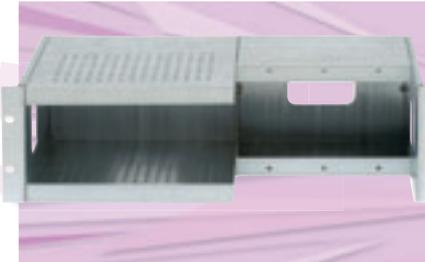


LAN Adapter

The LAN adapter allows integration of the professional head-end station system into a present network using the PRCU 8 remote control unit and PSW 1000 PC software.

GSM Modem Set G-MOD

This GSM modem set is provided for use in a head-end station system in combination with a PRCU 8 resp. HRCU 8 remote control unit and the PSW 1000 PC software. The modem is immediately ready for operation after installation. It is also suitable for connection of an STC series head-end station system using the BE-REMOTE PLUS control unit and the PSW 1000 PC software. The GSM modem set consists of a professional GSM modem, matching power supply and data cable for connection to the PRCU or BE-REMOTE PLUS control unit, one GSM antenna and 6 m antenna cable.



ISDN A/B-Converter AB-CONVERTER

This ISDN A/B converter can be connected to any SO bus and is fully compatible with the PSW 1000 PC software version in combination with the analogue modem set.

Analogue Modem Set A-MOD

This analogue modem set is provided for use in a head-end station system in combination with a PRCU 8 resp. HRCU 8 remote control unit and the PSW 1000 PC software. The modem is immediately ready for operation after installation. It is also suitable for connection of an STC series head-end station system using the BE-REMOTE PLUS control unit and the PSW 1000 PC software. The analogue modem set consists of a professional V.34 33.6 k modem, matching power supply and data cable for connection to the PRCU or BE-REMOTE PLUS control unit.

SNMP MANAGEMENT SYSTEM

SNMP Management System RCU 1

The head-end station management system RCU 1 shows the following features:

- SNMP capable management interface (LAN); connection with a LAN router via DSL as standard
- Enquiry and controlling of the most important parameters and device data via remote control with the GUI of the head-end station software PSW 1000
- Non volatile storage of the configuration data (back-up storage) of every channel with the remote PC
- Software update via FTP connection
- Failure signalling and transferring of error messages
- Error messages via email
- Graphical user interface / Simulation of the control unit optimised for PDAs
- Time-controlled switching on and off of the cassettes
- Automatic monitoring of level-, bit error rate-, RDS- and line synchronous pulse with PSCU 6000



OVERVIEW OF CASSETTES FOR HEAD-END STATION SYSTEMS

Type of cassette	Single/Double/Quad	Input range	Output range	Standard of output signal	mechanically not suitable for STC 316/STC 332	Minimum software version in control unit						Order no.
						STC 800, CT 800,	STC 850, STC 2400	STC 880, STC 80, CT 880	BE 120	BE 332/BE-PLUS	BE-REMOTE	
SAT TV cassettes												
HRM 331	D	950 – 2150 MHz	C 02 – C 04 S 03 – S 24, C 05 – C 12	CCIR		27	03	10	17	4	G.AE 83-00	
HRM 333 A	D	950 – 2150 MHz	S 03 – S 24, C 05 – C 12	CCIR		27	03	10	17	4	G.AE 97-00	
HRM 334	D	950 – 2150 MHz	S 21 – S 41	CCIR		27	03	10	17	4	G.AE 84-00	
HRM 335 A	D	950 – 2150 MHz	C 21 – C 69	CCIR		27	03	10	17	4	G.AE 98-00	
HRM 341	D	950 – 2150 MHz	R 01 – R 05, D 01 – D 05 s 02 – s 21, R 06 – R 12	OIRT		27	04	11		4	G.AF 01-00	
HRM 343	D	950 – 2150 MHz	s 02 – s 21, R 06 – R 12	OIRT		27	04	11	17	4	G.AF 02-00	
HRM 345	D	950 – 2150 MHz	C 21 – C 69	OIRT		27	04	11	17	4	G.AF 03-00	
HRM 800	S	950 – 1750 MHz	S 08 – S 20, C 05 – C 12	CCIR	•	01	01	01	10	17	G.AV 70-00	
HRM 801	S	950 – 1750 MHz	C 02 – C 04	CCIR	•	01	01	01	10	17	G.AV 92-00	
HRM 802	S	950 – 1750 MHz	C 21 – C 40	CCIR	•	01	01	01	10	17	G.AV 93-00	
HRM 851	S	950 – 2050 MHz	C 02 – C 04	CCIR	•	19	19	01	10	17	G.AX 96-00	
HRM 852	S	950 – 2050 MHz	C 21 – C 40	CCIR	•	19	19	01	10	17	G.AX 97-00	
HRM 853	S	950 – 2050 MHz	C 21 – C 40	SECAM L	•	19	19	01	10	17	G.AX 88-00	
HRM 854	S	950 – 2050 MHz	S 21 – S 41	CCIR	•	21	21	01	10	17	G.AY 41-00	
HRM 855	S	950 – 2050 MHz	R 06 – R 12, s 04 – s 17, D 06 – D 12, Z 06 – Z 16	OIRT China	•	19	19	01	10	17	G.AX 98-00	
HRM 857	S	950 – 2050 MHz	C 21 – C 40 D 13 – D 27	OIRT China	•	01	01	01	10	17	G.AY 01-00	
HRM 858	S	950 – 2050 MHz	S 08 – S 20, C 05 – C 12	CCIR	•	19	19	01	10	17	G.AX 73-00	
HRM 858 A	S	950 – 2050 MHz	S 04 – S 20, C 05 – C 12	CCIR	•	21	21	01	10	17	G.AY 42-00	
HRM 859	S	950 – 2050 MHz	R 01 – R 05 D 01 – D 05	OIRT China	•	19	19	01	10	17	G.AY 02-00	
HRM 863	S	950 – 2050 MHz	C 41 – C 57	SECAM L	•	19	19	01	10	17	G.AY 99-00	
HRM 861	S	950 – 2050 MHz	C 02 – C 04	CCIR	•	19	19	01	10	17	G.AZ 23-00	
HRM 864	S	950 – 2050 MHz	C 21 – C 40	CCIR	•	19	19	01	10	17	G.AZ 22-00	
HRM 866	S	950 – 2050 MHz	C 41 – C 57	CCIR	•	19	19	01	10	17	G.AD 97-00	
HRM 883	D	950 – 2050 MHz (2150 MHz)	S 03 – S 30, C 05 – C 12	CCIR	•		22	01	10	17	G.AY 80-00	
HRM 883-2	D	950 – 2150 MHz with 2 x Decoder	S 03 – S 30, C 05 – C 12	CCIR	•		22	01	10	17	G.AC 30-00	
HRM 885	D	950 – 2050 MHz (2150 MHz)	R 06 – R 12, s 02 – s 27 D 06 – D 12, Z 02 – Z 26	OIRT China	•		22	01	10	17	G.AC 67-00	
HRM 1231	D	950 – 2150 MHz	C 02 – C 04 S 03 – S 24, C 05 – C 12	CCIR			*)	03	17	17	5	G.AG 85-00
HRM 1233	D	950 – 2150 MHz	S 03 – S 24, C 05 – C 12	CCIR			*)	03	17	17	5	G.AG 79-00
HRM 1234	D	950 – 2150 MHz	S 21 – S 41	CCIR			*)	03	17	17	5	G.AG 86-00
HRM 1235	D	950 – 2150 MHz	C 21 – C 69	CCIR			*)	03	17	17	5	G.AG 78-00
HRM 1231 A	D	950 – 2150 MHz	C 02 – C 04 S 03 – S 24, C 05 – C 12	CCIR			*)		27	27	6	G.AI 25-00
HRM 1233 A	D	950 – 2150 MHz	S 03 – S 24, C 05 – C 12	CCIR			*)		27	27	6	G.AI 26-00
HRM 1234 A	D	950 – 2150 MHz	S 21 – S 41	CCIR			*)		27	27	6	G.AI 27-00
HRM 1235 A	D	950 – 2150 MHz	C 21 – C 69	CCIR			*)		27	27	6	G.AI 28-00

the active cassettes are grayed-out

*) STC 880 together with control unit BE-REMOTE and adapter board only

Type of cassette	Single/Double/Quad	Input range	Output range	Standard of output signal	Minimum software version in control unit							Order no.
					Does not fit in	STC 316/STC 332	STC 800, CT 800,	STC 850, STC 2400	STC 880, STC 80, CT 880	BE 120	BE 332/BE-PLUS	
Terrestrial cassettes												
HTM 300		9 x UHF, 2 x VHF, 1 x FM	selectiv				25	01	10	17	4	G.AG 12-00
HRM 381	D	C 02 – C 69	R 01 – R 05, D 01 – D 05, s 02 – s 21, R 06 – R 12	OIRT			29	06	11	17	4	G.AF 26-00
HRM 383	D	C 02 – C 69	s 02 – s 21, R 06 – R 12	OIRT			27	04	11	17	4	G.AF 27-00
HRM 385	D	C 02 – C 69	C 21 – C 69	OIRT			27	04	11	17	4	G.AF 20-00
HRM 391	D	C 02 – C 69	C 02 – C 04 S 03 – S 24, C 05 – C 12	CCIR			29	06	10	17	4	G.AF 24-00
HRM 393	D	C 02 – C 69	S 03 – S 24, C 05 – C 12	CCIR			27	04	10	17	4	G.AF 25-00
HRM 394	D	C 02 – C 69	S 21 – S 41	CCIR			28	05	10	17	4	G.AF 21-00
HRM 395	D	C 02 – C 69	C 21 – C 69	CCIR			27	04	10	17	4	G.AE 85-00
HRM 810	S	C 02 – C 12, C 21 – C 69	S 08 – S 20, C 05 – C 12	CCIR	•	01	01	01	10	17		G.AV 95-00
HRM 811	S	C 02 – C 12, C 21 – C 69	C 02 – C 04	CCIR	•	01	01	01	10	17		G.AW 17-00
HRM 815	S	R 01 – R 12, C 21 – C 69, Z 01 – Z 16, D 01 – D 57	R 06 – R 12, s 04 – s 17, Z 06 – Z 16, D 06 – D 12	OIRT China	•	08	08	01	10	17		G.AX 18-00
HCM 814	S	C 02 – C 12, C 21 – C 69	C 21 – C 40	CCIR	•	01	01	01	10	17		G.AC 12-00
HCM 893	S	C 02 – C 69,	S 03 – S 30, C 05 – C 12	CCIR	•		22	01	10	17		G.AD 08-00
HCM 895	S	R 01 – R 12, C 21 – C 69, s 01 – s 38, Z 01 – Z 38, D 01 – D 57	R 06 – R 12, s 02 – s 21, D 06 – D 12, Z 02 – Z 26	OIRT China	•		22	01	10	17		G.AD 07-00
FM cassettes												
HDM 2360 FM	D	950 – 2150 MHz (QPSK)	87.5 – 108 MHz	FM					30*)	30*)		G.AI 23-00
HDMC 1000 FM	T	47 – 862 MHz	87.5 – 108 MHz	FM						44		G.AS 48-00
HDTV 1000 FM	T	925 – 2150 MHz	87.5 – 108 MHz	12x FM						43		G.AS 39-00
HRM 322	D	950 – 2150 MHz ADR/subcarrier	87.5 – 108 MHz	FM			27	01	10	17		G.AG 77-00
HRM 324/2	D	950 – 2150 MHz ADR/subcarrier	87.5 – 108 MHz	FM			27	01	14	17		G.AF 47-00
HRM 325		87.5 – 108 MHz	87.5 – 108 MHz	FM			27	01	10	17		G.AE 63-00
HRM 326/4		87.5 – 108 MHz	selectiv	FM			27	01	10	17		G.AE 64-00
HRM 824/2	D	950 – 2150 MHz ADR/subcarrier	87.5 – 108 MHz	FM	•	25	25	01	10	17		G.AE 16-00
HRM 825		87.5 – 108 MHz	87.5 – 108 MHz	FM	•	01	01	01	10	17		G.AW 88-00
HRM 826/4		87.5 – 108 MHz	selectiv	FM	•	24	24	01	10	17		G.AC 90-00
AV conversion cassettes												
HRC 300 AV	3 x	3 x Video and Audio (stereo)	C 02 – C 69 incl. S 03 – S 41	CCIR						37		G.AS 22-00
HRC 310 AV	3 x	3 x Video and Audio (mono)	according to modulator	CCIR					16	17		G.AG 48-00
HRC 312 AV S	3 x	3 x Video and Audio (stereo)	according to modulator	CCIR						34		G.AI 84-00
HRM 831 AV	S	Video and Audio	C 02 – C 04	CCIR	•	05	05	01	10	17		G.AZ 96-00
HRM 834 AV	S	Video and Audio	C 21 – C 40	CCIR	•	01	01	01	10	17		G.AC 11-00
HRM 836 AV	S	Video and Audio	S 21 – S 41	CCIR	•	21	21	01	10	17		G.AD 92-00

the active cassettes are grayed-out
 *) with fully equipped STC 322 max. 3 pcs. HDM 236x,
 resp. max. 12 pcs. HDM 236x and 4 free slots are necessary

OVERVIEW OF CASSETTES FOR HEAD-END STATION SYSTEMS

Type of cassette	Single/Double/Quad	Input range	Output range	Standard of output signal	Minimum software version in control unit							Order no.
					Does not fit in STC 316/STC 332	STC 800, CT 800, STC 850, STC 2400	STC 880, STC 80, CT 880	BE 120	BE 332/BE-PLUS	BE-REMOTE	STC 1880	
Digital conversion cassettes												
HADA 1001	S	ASI	ASI	MPEG2						37	G.AS 28-00	
HADA 5100	-	5 x ASI	ASI	MPEG2						42	G.AS 29-00	
HADA 5100 SPTS	-	5 x ASI	IPTV	SPTS						41	G.AS 37-00	
HDE 200	D	AV	TS	MPEG2						35	G.AS 01-00	
HDE 210	D	AV	TS (ASI)	MPEG2						41	G.AS 23-00	
HDE 400	S	HDMI/YPbPr/ASI	ASI/LAN/COFDM or QAM	TS						44	G.AS 49-00	
HDM 100 C	S	950 – 2150 MHz	S 21 – S 41	QAM	•	25	25	01	10	17	G.AD 37-00	
HDM 100 P	S	950 – 2150 MHz	S 03 – S 30, C 05 – C 12	CCIR	•	25	25	01	10	17	G.AD 36-00	
HDM 203 QMX	Q	TS	S 02 – S 21, C 05 – C 12	QAM						35	G.AS 02-00	
HDM 204 QMX	Q	TS	S 21 – S 41	QAM						35	G.AS 03-00	
HDM 205 QMX	Q	TS	C 21 – C 69	QAM						35	G.AS 04-00	
HDM 303 P	S	950 – 2150 MHz	S 03 – S 30, C 05 – C 12	CCIR			25	01	10	17	G.AE 65-00	
HDM 303 PA	S	950 – 2150 MHz	S 03 – S 24, C 05 – C 12	CCIR			27	04	10	17	G.AF 82-00	
HDM 305 P	S	950 – 2150 MHz	C 21 – C 69	CCIR			27	03	10	17	G.AE 86-00	
HDM 314 C	S	950 – 2150 MHz	S 21 – S 41	QAM			25	01	10	17	4	G.AE 67-00
HDM 315 C	S	950 – 2150 MHz	C 21 – C 69	QAM			25	04	10	17	4	G.AF 74-00
HDM 353 P	S	950 – 2150 MHz	s 02 – s 21, R 06 – R 12	OIRT			27	03	10	17		G.AE 66-00
HDM 355 P	S	950 – 2150 MHz	C 21 – C 69	OIRT			27	03	10	17		G.AE 99-00
HDM 363 P CI	S	950 – 2150 MHz	S 03 – S 24, C 05 – C 12	CCIR			25	01	10	17	4	G.AG 33-00
HDM 365 P CI	S	950 – 2150 MHz	C 21 – C 69	CCIR			25	01	10	17	4	G.AG 34-00
HDM 374 C	D	950 – 2150 MHz	S 21 – S 41	QAM					11	17	4	G.AF 72-00
HDM 375 C	D	950 – 2150 MHz	C 21 – C 69	QAM					12	17	4	G.AF 73-00
HDM 384 C	D	950 – 2150 MHz	S 21 – S 41	QAM					21	21		G.AH 63-00
HDM 385 C	D	950 – 2150 MHz	C 21 – C 69	QAM					21	21		G.AH 64-00
HDM 384 TP	D	950 – 2150 MHz	S 21 – S 41	QAM					24	24		G.AI 09-00
HDM 385 TP	D	950 – 2150 MHz	C 21 – C 69	QAM					24	24		G.AI 10-00
HDM 473 MX	D/S	950 – 2150 MHz	S 02 – S 21, C 05 – C 12	QAM						30		G.AI 78-00
HDM 474 MX	D/S	950 – 2150 MHz	S 21 – S 41	QAM						30		G.AI 79-00
HDM 475 MX	D/S	950 – 2150 MHz	C 21 – C 69	QAM						30		G.AI 80-00
HDM 483 TPS	D	950 – 2150 MHz	S 02 – S 21, C 05 – C 12	QAM						30		G.AI 61-00
HDM 484 TPS	D	950 – 2150 MHz	S 21 – S 41	QAM						30		G.AI 62-00
HDM 485 TPS	D	950 – 2150 MHz	C 21 – C 69	QAM						30		G.AI 63-00
HDM 493 BC	D/S	950 – 2150 MHz	S 02 – S 21, C 05 – C 12	QAM						30		G.AI 64-00
HDM 494 BC	D/S	950 – 2150 MHz	S 21 – S 41	QAM						30		G.AI 65-00
HDM 495 BC	D/S	950 – 2150 MHz	C 21 – C 69	QAM						30		G.AI 66-00
HDM 400 P CI	S	950 – 2150 MHz	C 02 – C 69 incl. S 03 – S 41	CCIR						44		G.AS 46-00
HDM 500 C	D	950 – 2150 MHz	45 – 862 MHz	QAM						37		G.AS 15-00
HDM 510 CI TPS	D	950 – 2150 MHz	45 – 862 MHz	QAM						37		G.AS 14-00
HDM 2361 P CI	D	950 – 2150 MHz	C 02 – C 04 S 03 – S 24, C 05 – C 12	CCIR						27*)		G.AI 01-00
HDM 2363 P CI	D	950 – 2150 MHz	S 03 – S 24, C 05 – C 12	CCIR						27*)		G.AI 02-00
HDM 2364 P CI	D	950 – 2150 MHz	S 21 – S 41	CCIR						27*)		G.AI 03-00
HDM 2365 P CI	D	950 – 2150 MHz	C 21 – C 69	CCIR						27*)		G.AI 04-00
HDM 2370 P CI	D	950 – 2150 MHz	C 02 – C 69 incl. S 03 – S 41	CCIR						37*)		G.AS 10-00
HDM 2380 OIRT CI	D	950 – 2150 MHz	R 01 – R 12 s 01 – s 38, C 21 – C 69	OIRT						37*)		G.AS 32-00
HDM 2380 P CI	D	950 – 2150 MHz	C 02 – C 69 incl. S 03 – S 41	CCIR						37*)		G.AS 17-00

the active cassettes are grayed-out

*) with fully equipped STC 322 max. 3 pcs. HDM 23xx, resp. max. 12 pcs. HDM 23xx and 4 free slots are necessary

Type of cassette	Single/Double/Quad	Input range	Output range	Standard of output signal	Minimum software version in control unit							Order no.
					Does not fit in STC 316/STC 332	STC 800, CT 800, STC 850, STC 2400	STC 880, STC 80, CT 880	BE 120	BE 332/BE-PLUS	BE-REMOTE	STC 1880	
Digital conversion cassettes												
HDMC 1000 C	T	47 – 862 MHz	45 – 862 MHz	QAM						44	G. AS 45-00	
HDMT 163 P CI	S	178 – 226 MHz (8 MHz) 177.5 – 226.5 MHz (7 MHz) 474 – 858 MHz (8 MHz)	S 03 – S 24, C 05 – C 12	CCIR		25	01	10	17	4	G.AH 60-00	
HDMT 164 P CI	S	178 – 226 MHz (8 MHz) 177.5 – 226.5 MHz (7 MHz) 474 – 858 MHz (8 MHz)	S 21 – S 41	CCIR		25	01	10	17	4	G.AH 66-00	
HDMT 165 P CI	S	178 – 226 MHz (8 MHz) 177.5 – 226.5 MHz (7 MHz) 474 – 858 MHz (8 MHz)	C 21 – C 69	CCIR		25	01	10	17	4	G.AH 67-00	
HDMT 384 TP	D	178 – 226 MHz (8 MHz) 177.5 – 226.5 MHz (7 MHz) 474 – 858 MHz (8 MHz)	S 21 – S 41	QAM				30	30		G.AI 67-00	
HDMT 473 MX	D/S	178 – 226 MHz (8 MHz) 177.5 – 226.5 MHz (7 MHz) 474 – 858 MHz (8 MHz)	S 02 – S 21, C 05 – C 12	QAM					35		G.AS 07-00	
HDMT 474 MX	D/S	178 – 226 MHz (8 MHz) 177.5 – 226.5 MHz (7 MHz) 474 – 858 MHz (8 MHz)	S 21 – S 41	QAM					35		G.AS 08-00	
HDMT 475 MX	D/S	178 – 226 MHz (8 MHz) 177.5 – 226.5 MHz (7 MHz) 474 – 858 MHz (8 MHz)	C 21 – C 69	QAM					35		G.AS 09-00	
HDMT 484 TPS	D	178 – 226 MHz (8 MHz) 177.5 – 226.5 MHz (7 MHz) 474 – 858 MHz (8 MHz)	S 21 – S 41	QAM					30		G.AK 55-00	
HDMT 1000 ASI LAN	D	177.5 – 226.5 MHz 474 – 858 MHz	45 – 862 MHz	QAM					37		G.AS 18-00	
HDMT 1000 SPTS	D	177.5 – 226.5 MHz 474 – 858 MHz	IPTV	SPTS					37		G.AS 18-20	
HDMT 1000 MPTS	D	177.5 – 226.5 MHz 474 – 858 MHz	IPTV	MPTS					37		G.AS 18-10	
HDMT 1000 T	T	177.5 – 226.5 MHz 474 – 858 MHz	42 – 860 MHz	COFDM					42		G.AS 38-00	
HDMT 1001 C	D	177.5 – 226.5 MHz 474 – 858 MHz	45 – 862 MHz	QAM					37		G.AS 27-00	
HDMT 1290	D	177.5 – 226.5 MHz 474 – 858 MHz	42 – 860 MHz	COFDM					41		G.AS 30-00	
HDMT 1293	D	146 – 862 MHz	S 03 – S 24, C 05 – C 12	COFDM					36		G.AS 05-00	
HDMT 1295	D	146 – 862 MHz	C 21 – C 69	COFDM					36		G.AS 06-00	
HDMT 2161 P CI	D	177.5 – 226.5 MHz 474 – 858 MHz	C 02 – C 04 S 03 – S 24, C 05 – C 12	CCIR					30*)		G.AI 57-00	
HDMT 2163 P CI	D	177.5 – 226.5 MHz 474 – 858 MHz	S 03 – S 24, C 05 – C 12	CCIR					30*)		G.AI 68-00	
HDMT 2164 P CI	D	177.5 – 226.5 MHz 474 – 858 MHz	S 21 – S 41	CCIR					30*)		G.AI 69-00	
HDMT 2165 P CI	D	177.5 – 226.5 MHz 474 – 858 MHz	C 21 – C 69	CCIR					30*)		G.AI 70-00	
HDMT 2180 P CI	D	177.5 – 226.5 MHz 474 – 858 MHz	C 02 – C 69 incl. S 03 – S 41	CCIR					41*)		G.AS 31-00	

the active cassettes are grayed-out

*) with fully equipped STC 322 max. 3 pcs. HDM 236x,
resp. max. 12 pcs. HDM 236x and 4 free slots are necessary

OVERVIEW OF CASSETTES FOR HEAD-END STATION SYSTEMS

Type of cassette	Single/Double/Quad	Input range	Output range	Standard of output signal	Minimum software version in control unit						Order no.
					Does not fit in STC 316/STC 332	STC 800, CT 800,	STC 850, STC 2400	STC 880, STC 80, CT 880	BE 120	BE 332/BE-PLUS	
Digital conversion cassettes											
HDTV 583 TPS	D	950 – 2150 MHz	S 02 – S 21, C 05 – C 12	QAM						34	G.AK 42-00
HDTV 584 TPS	D	950 – 2150 MHz	S 21 – S 41	QAM						34	G.AK 36-00
HDTV 585 TPS	D	950 – 2150 MHz	C 21 – C 69	QAM						34	G.AK 38-00
HDTV 592 BC	D/S	950 – 2150 MHz	60 – 86 MHz	QAM						34	G.AK 43-00
HDTV 593 BC	D/S	950 – 2150 MHz	S 02 – S 21, C 05 – C 12	QAM						34	G.AK 44-00
HDTV 594 BC	D/S	950 – 2150 MHz	S 21 – S 41	QAM						34	G.AK 45-00
HDTV 595 BC	D/S	950 – 2150 MHz	C 21 – C 69	QAM						34	G.AK 46-00
HDTV 610 CI TPS	D	950 – 2150 MHz	45 – 862 MHz	QAM						37	G.AS 13-00
HDTV 1000 ASI LAN	D	950 – 2150 MHz	45 – 862 MHz	QAM						37	G.AS 12-00
HDTV 1000 SPTS	D	950 – 2150 MHz	IPTV	SPTS						37	G.AS 12-20
HDTV 1000 MPTS	D	950 – 2150 MHz	IPTV	MPTS						37	G.AS 12-10
HDTV 1000 S	D	950 – 2150 MHz	IPTV	SPTS						41	G.AS 34-00
HDTV 1000 T	D	950 – 2150 MHz	42 – 860 MHz	COFDM						37	G.AS 19-00
HDTV 1001 C	D	950 – 2150 MHz	45 – 862 MHz	QAM						37	G.AS 25-00
HDTV 1001 T	D	950 – 2150 MHz	42 – 860 MHz	COFDM						37	G.AS 26-00
HMPT 1000 C	D	IPTV / MPTS	45 – 862 MHz	QAM						37	G.AS 12-30
HMPT 1000 T	D	IPTV / MPTS	42 – 860 MHz	COFDM						37	G.AS 19-10
HMPT 1000 FM	T	IPTV / MPTS	87.5 – 108 MHz	12 x FM						43	G.AS 40-00
HSPT 1000 C	D	IPTV / SPTS	45 – 862 MHz	QAM						41	G.AS 36-00
HSPT 1000 T	D	IPTV / SPTS	42 – 860 MHz	COFDM						41	G.AS 35-00
HSMS 100	-	IPTV / SPTS	IPTV / SPTS	SPTS						44	G.AS 41-00
Monitoring cassettes											
HSCU 6000		47 – 862 MHz	C 21 – C 69	CCIR						37	G.AS 16-00
SAT-TV cassettes											
PSAP 1000	D	950 – 2150 MHz	C 02 – C 04 S 03 – S 24, C 05 – C 12	CCIR	21						G.AH 27-00
PSAP 3000	D	950 – 2150 MHz	S 03 – S 24, C 05 – C 12	CCIR	21						G.AH 28-00
PSAP 4000	D	950 – 2150 MHz	S 21 – S 41	CCIR	21						G.AH 30-00
PSAP 5000	D	950 – 2150 MHz	C 21 – C 69	CCIR	21						G.AH 29-00
Terrestrial cassettes											
PTAP 1000	D	C 02 – C 69	C 02 – C 04 S 03 – S 24, C 05 – C 12	CCIR	21						G.AH 35-00
PTAP 3000	D	C 02 – C 69	S 03 – S 24, C 05 – C 12	CCIR	21						G.AH 36-00
PTAP 4000	D	C 02 – C 69	S 21 – S 41	CCIR	21						G.AH 38-00
PTAP 5000	D	C 02 – C 69	C 21 – C 69	CCIR	21						G.AH 37-00
FM cassettes											
PHDF 1000	T	925 – 2150 MHz	87.5 – 108 MHz	12 x FM	43						G.AP 39-00
PQDF 1000	T	47 – 862 MHz	87.5 – 108 MHz	FM	44						G.AP 48-00
PSDF 2000	D	950 – 2150 MHz (QPSK)	87.5 – 108 MHz	FM	30						G.AI 22-00
PSRF 2000	D	950 – 2150 MHz ADR/subcarrier	87.5 – 108 MHz	FM	21						G.AH 34-00
PTAF 2000		87.5 – 108 MHz	87.5 – 108 MHz	FM	21						G.AH 32-00
PTFF 2000		87.5 – 108 MHz	87.5 – 108 MHz	FM	21						G.AH 33-00
AV conversion cassette											
PAVP 3000	3 x	3 x Video and Audio (stereo)	according to modulator	CCIR	34						G.AP 10-00
PAVP 4300	3 x	3 x Video and Audio (stereo)	C 02 – C 69 incl. S 03 – S 41	CCIR	34						G.AP 22-00

the active cassettes are grayed-out

Type of cassette	Single/Double/Quad	Input range	Output range	Standard of output signal	Minimum software version in control unit	Order no.
Digital conversion cassettes						
PADA 1001	S	ASI	ASI	MPEG2	37	G.AP 28-00
PADA 5100	-	5 x ASI	ASI	MPEG2	42	G.AP 29-00
PAIS 5100	-	5 x ASI	IPTV	SPTS	41	G.AP 37-00
PADE 4000	S	HDMI/YPbPr/ASI	ASI/LAN/COFDM or QAM	TS	44	G.AP 49-00
PADE 7005	D	AV	TS	MPEG2	35	G.AP 01-00
PADE 7006	D	AV	TS (ASI)	MPEG2	37	G.AP 24-00
PEDQ 3005 QMX	Q	TS	S 02 – S 21, C 05 – C 12	QAM	35	G.AP 02-00
PEDQ 4005 QMX	Q	TS	S 21 – S 41	QAM	35	G.AP 03-00
PEDQ 5005 QMX	Q	TS	C 21 – C 69	QAM	35	G.AP 04-00
PHDF 1000	T	925 – 2150 MHz	87.5 – 108 MHz	12 x FM	43	G.AP 39-00
PHDP 4000	S	950 – 2150 MHz	C 02 – C 69 incl. S 03 – S 41	CCIR	44	G.AP 46-00
PHDQ 1000 ASI LAN	D	950 – 2150 MHz	45 – 862 MHz	QAM	37	G.AP 12-00
PHDQ 1001	D	950 – 2150 MHz	45 – 862 MHz	QAM	37	G.AP 25-00
PHDQ 2002 BC	D/S	950 – 2150 MHz	60 – 86 MHz	QAM	34	G.AK 48-00
PHDQ 3002 BC	D/S	950 – 2150 MHz	S 02 – S 21, C 05 – C 12	QAM	34	G.AK 49-00
PHDQ 4002 BC	D/S	950 – 2150 MHz	S 21 – S 41	QAM	34	G.AK 50-00
PHDQ 5002 BC	D/S	950 – 2150 MHz	C 21 – C 69	QAM	34	G.AK 51-00
PHDQ 3003 TPS	D	950 – 2150 MHz	S 02 – S 21, C 05 – C 12	QAM	34	G.AK 47-00
PHDQ 4003 TPS	D	950 – 2150 MHz	S 21 – S 41	QAM	34	G.AK 37-00
PHDQ 5003 TPS	D	950 – 2150 MHz	C 21 – C 69	QAM	34	G.AK 39-00
PHDQ 6100 CI TPS	D	950 – 2150 MHz	45 – 862 MHz	QAM	37	G.AP 13-00
PHDT 1000	D	950 – 2150 MHz	42 – 860 MHz	COFDM	37	G.AP 19-00
PHDT 1001	D	950 – 2150 MHz	42 – 860 MHz	COFDM	37	G.AP 26-00
PHIS 1000	D	950 – 2150 MHz	IPTV	SPTS	37	G.AP 12-20
PHIS 1000 S	D	950 – 2150 MHz	IPTV	SPTS	41	G.AP 34-00
PHIM 1000	D	950 – 2150 MHz	IPTV	MPTS	37	G.AP 12-10
PMDF 1000	T	IPTV/MPTS	87.5 – 108 MHz	12 x FM	43	G.AP 40-00
PMDQ 1000	D	IPTV / MPTS	45 – 862 MHz	QAM	37	G.AP 12-30
PMDT 1000	D	IPTV / SPTS	42 – 860 MHz	COFDM	37	G.AP 19-10
PQDQ 1000	T	47 – 862 MHz	45 – 862 MHz	QAM	44	G.AP 45-00

the active cassettes are grayed-out

OVERVIEW OF CASSETTES FOR HEAD-END STATION SYSTEMS

Type of cassette	Single/Double/Quad	Input range	Output range	Standard of output signal	Minimum software version in control unit	Order no.
Digital conversion cassettes						
PSDF 2000	D	950 – 2150 MHz	87.5 – 108 MHz	FM	30	G.AI 22-00
PSDN 4000	S	950 – 2150 MHz	S 21 – S 41	QAM	21	G.AH 41-00
PSDP 3000	S	950 – 2150 MHz	S 03 – S 24, C 05 – C 12	CCIR	21	G.AH 39-00
PSDP 5000	S	950 – 2150 MHz	C 21 – C 69	CCIR	21	G.AH 40-00
PSDP 1200	D	950 – 2150 MHz	C 02 – C 04 S 03 – S 24, C 05 – C 12	CCIR	21	G.AI 05-00
PSDP 3200	D	950 – 2150 MHz	S 03 – S 24, C 05 – C 12	CCIR	21	G.AI 06-00
PSDP 4200	D	950 – 2150 MHz	S 21 – S 41	CCIR	21	G.AI 07-00
PSDP 5200	D	950 – 2150 MHz	C 21 – C 69	CCIR	21	G.AI 08-00
PSDP 6200	D	950 – 2150 MHz	C 02 – C69 incl. S 03 – S 41	CCIR	37	G.AP 23-00
PSDQ 4000 C	D	950 – 2150 MHz	S 21 – S 41	QAM	21	G.AH 42-00
PSDQ 5000 C	D	950 – 2150 MHz	C 21 – C 69	QAM	21	G.AH 43-00
PSDQ 4001 TP	D	950 – 2150 MHz	S 21 – S 41	QAM	24	G.AH 95-00
PSDQ 5001 TP	D	950 – 2150 MHz	C 21 – C 69	QAM	24	G.AH 96-00
PSDQ 3002 BC	D/S	950 – 2150 MHz	S 02 – S 21, C 05 – C 12	QAM	30	G.AI 56-00
PSDQ 4002 BC	D/S	950 – 2150 MHz	S 21 – S 41	QAM	30	G.AI 57-00
PSDQ 5002 BC	D/S	950 – 2150 MHz	C 21 – C 69	QAM	30	G.AI 58-00
PSDQ 3003 TPS	D	950 – 2150 MHz	S 02 – S 21, C 05 – C 12	QAM	30	G.AI 71-00
PSDQ 4003 TPS	D	950 – 2150 MHz	S 21 – S 41	QAM	30	G.AI 72-00
PSDQ 5003 TPS	D	950 – 2150 MHz	C 21 – C 69	QAM	30	G.AI 73-00
PSDQ 3004 MX	D/S	950 – 2150 MHz	S 02 – S 21, C 05 – C 12	QAM	30	G.AI 81-00
PSDQ 4004 MX	D/S	950 – 2150 MHz	S 21 – S 41	QAM	30	G.AI 82-00
PSDQ 5004 MX	D/S	950 – 2150 MHz	C 21 – C 69	QAM	30	G.AI 83-00
PSDQ 5100 CI TPS	D	950 – 2150 MHz	45 – 862 MHz	QAM	37	G.AP 14-00
PSMS 1000	-	IPTV / SPTS	IPTV / SPTS	SPTS	44	G.AP 41-00
PSPQ 1000	D	IPTV / SPTS	45 – 862 MHz	QAM	41	G.AP 36-00
PSPT 1000	D	IPTV / SPTS	42 – 860 MHz	COFDM	41	G.AP 35-00

the active cassettes are grayed-out

OVERVIEW OF CASSETTES FOR HEAD-END STATION SYSTEMS

Type of cassette	Single/Double/Quad	Input range	Output range	Standard of output signal	Minimum software version in control unit PSU 12, PSU 8, PGT 8 and PSU 8-16 with BE-REMOTE PROFESSIONAL	Order no.
Digital conversion cassettes						
PTDP 3000	S	178 - 226 MHz (8 MHz) 177.5 - 226.5 MHz (7 MHz) 474 - 858 MHz (8 MHz)	S 03 - S 24, C 05 - C 12	CCIR	21	G.AI 11-00
PTDP 4000	S	178 - 226 MHz (8 MHz) 177.5 - 226.5 MHz (7 MHz) 474 - 858 MHz (8 MHz)	S 21 - S 41	CCIR	21	G. AI 12-00
PTDP 5000	S	178 - 226 MHz (8 MHz) 177.5 - 226.5 MHz (7 MHz) 474 - 858 MHz (8 MHz)	C 21 - C 69	CCIR	21	G.AI 13-00
PTDP 3200	D	177.5 - 226.5 MHz 474 - 858 MHz	S 03 - S 24, C 05 - C 12	CCIR	30	G.AI 75-00
PTDP 4200	D	177.5 - 226.5 MHz 474 - 858 MHz	S 21 - S 41	CCIR	30	G. AI 76-00
PTDP 5200	D	177.5 - 226.5 MHz 474 - 858 MHz	C 21 - C 69	CCIR	30	G.AI 77-00
PTDP 8200	T	177.5 - 226.5 MHz 474 - 858 MHz	C 02 - C 69 incl. S 03 - S 41	CCIR	41	G.AP 31-00
PTDQ 1000 ASI LAN	D	177.5 - 226.5 MHz 474 - 858 MHz	45 - 862 MHz	QAM	37	G.AP 18-00
PTDQ 1001	D	177.5 - 226.5 MHz 474 - 858 MHz	45 - 862 MHz	QAM	37	G.AP 27-00
PTDQ 4001	D	178 - 226 MHz (8 MHz) 177.5 - 226.5 MHz (7 MHz) 474 - 858 MHz (8 MHz)	S 21 - S 41	QAM	30	G.AI 74-00
PTDQ 3004 MX	D/S	177.5 - 226.5 MHz 474 - 858 MHz	S 02 - S 21, C 05 - C 12	QAM	35	G.AP 07-00
PTDQ 4004 MX	D/S	178 - 226 MHz (8 MHz) 177.5 - 226.5 MHz (7 MHz) 474 - 858 MHz (8 MHz)	S 21 - S 41	QAM	35	G.AP 08-00
PTDQ 5004 MX	D/S	178 - 226 MHz (8 MHz) 177.5 - 226.5 MHz (7 MHz) 474 - 858 MHz (8 MHz)	C 21 - C 69	QAM	35	G.AP 09-00
PTDT 1000	T	177.5 - 226.5 MHz 474 - 858 MHz	42 - 860 MHz	COFDM	42	G.AP 38-00
PTDT 3200	D	177.5 - 226.5 MHz 474 - 858 MHz	S 03 - S 24, C 05 - C 12	COFDM	36	G.AP 05-00
PTDT 5200	D	177.5 - 226.5 MHz 474 - 858 MHz	C 21 - C 69	COFDM	36	G.AP 06-00
PTDT 9200	D	177.5 - 226.5 MHz 474 - 858 MHz	42 - 860 MHz	COFDM	41	G.AP 30-00
PTIS 1000	D	177.5 - 226.5 MHz 474 - 858 MHz	IPTV	SPTS	37	G.AP 18-20
PTIM 1000	D	177.5 - 226.5 MHz 474 - 858 MHz	IPTV	MPTS	37	G.AP 18-10
Monitoring cassettes						
PSCU 6000		47 - 862 MHz	C 21 - C 69	CCIR	21	G.AH 45-00

the active cassettes are grayed-out

OVERVIEW OF CONTROL UNITS FOR HEAD-END STATION SYSTEMS

Control unit	Head-End Station System	LED	Front socket	Controller	Software Update	EEPROM
BE 8xx	Series 800 Series 880	-	SERVICE 4-pin	Motorola MC68HC705B32B 32 k - OTP	change of controller	internal
BE 120	STC 1200	red	SERVICE 4-pin	Motorola MC68HC705B32B 32 k - OTP	change of controller	internal
BE 332	STC 332	green	SERVICE 4-pin	Siemens C163 128 k - Flash	PC + PMS 1*	external
BE-PLUS	STC 1200 STC 332 STC 316	green	SERVICE 4-pin + RS-232 9-pin	Siemens C163 128 k - Flash	PC (RS-232)	external with socket
BE-REMOTE	STC 1200 STC 332 STC 316 STC 816 STR 19-8 PST 19-1	yellow	RS-232 9-pin	Mitsubishi M306NOFGTFP 256 k - Flash	PC (RS-232)	external with socket
BE-REMOTE PROFESSIONAL	PSU 12 PSU 8 PSU 8-16 PST 8 PST 19-1	yellow + illuminated display	RS-232 9-pin	Mitsubishi M306NOFGTFP 256 k - Flash	PC (RS-232)	external with socket

the active control units are grayed-out

* Programming Manager SAT 1 no longer available

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